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Simultaneous bilingual language acquisition: The role of parental input on receptive vocabulary development

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Abstract

Parents often turn to educators and healthcare professionals for advice on how to best support their child's language development. These professionals frequently suggest implementing the 'one-parent–one-language' approach to ensure consistent exposure to both languages. The goal of this study was to understand how language exposure influences the receptive vocabulary development of simultaneous bilingual children. To this end, we targeted nine German–French children growing up in bilingual families. Their exposure to each language within and outside the home was measured, as were their receptive vocabulary abilities in German and French. The results indicate that children are receiving imbalanced exposure to each language. This imbalance is leading to a slowed development of the receptive vocabulary in the minority language, while the majority language is keeping pace with monolingual peers. The one-parent–one-language approach does not appear to support the development of both of the child's languages in the context described in the present study. Bilingual families may need to consider other options for supporting the bilingual language development of their children. As professionals, we need to provide parents with advice that is based on available data and that is flexible with regards to the current and future needs of the child and his family.

Keywords

French; German; language exposure; majority language; minority language; preschool-aged; receptive vocabulary; simultaneous bilinguals

I Introduction

A bilingual speaker can be broadly defined as an individual who can speak and understand two languages, whether the speaker's languages were learned during childhood or later in life. Although the majority of the world's population is bilingual (Grosjean, 1982; Richard, 1999), bilingual speech and language abilities are targeted in a relatively small body of

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linguistic research. By focusing on monolingual populations, our research fails to reflect the population in which it takes place resulting in data that has limited scope and application. The small body of research on bilingual children can make it difficult for teachers, speech-language pathologists, and other specialists working with these children to make recommendations that are supported by evidence.

Simultaneous bilingual children are exposed to both languages during infancy and early childhood (Patterson, 2002). Since these children are exposed to two languages, they necessarily receive less total exposure to each of their languages than would monolingual children. This difference in exposure results in linguistic knowledge being distributed unevenly across a bilingual's two languages (e.g. Bialystok et al., 2010). In addition, bilingual children are exposed to a more diverse set of linguistic structures than monolingual children. Despite the reduced exposure to each language, research has shown that many bilingual children meet this challenge and develop linguistic systems that are comparable to monolingual peers at least in one language (e.g. MacLeod et al., 2011; Paradis, 2009; Schaufeli, 1992) or in both languages (e.g. Fabiano-Smith and Goldstein, 2010; Mack, 2003). However, not all preschool-aged children that grow up in a bilingual environment become bilingual school-aged children; instead, many retain only a passive knowledge of the minority language and become productive speakers of the majority language (Fillmore, 1991).

Three main factors have been identified to explain why some children become bilingual whereas others become predominantly monolingual speakers of the majority language: the age of acquisition of each language, the amount of input for each language, and the language status of each language (majority/minority) (for review, see Pearson, 2007). For preschool-aged children, the amount of input for each language is strongly tied to the language environment found within the home and the language status of the two languages outside of the home.

The amount of exposure to the second language is a dynamic factor that may vary across time (Gathercole and Thomas, 2009; Oller et al., 2007). The role of parents and their commitment to the use of the minority language at home has been found to greatly impact a child's ability to become bilingual (Juan-Garau and Perez-Vidal, 2001). A common recommendation to bilingual families by educators and healthcare specialists is that the family adopt a 'one-parent–one-language' approach, but it is not clear that input from only one parent in the minority language is sufficient for children to continue using the minority language once they enter school (De Houwer, 2007; King and Fogle, 2006). More specifically, it might be important for children to be receiving language input in the minority language from both parents at home, since some regions may limit instruction in the minority language in public schools (e.g. English-only instruction in Arizona; French-only instruction in Québec) rather than making dual-language or bilingual programs available to families. In addition, both parents may be working and thus the child may require childcare, resulting in greater exposure to the majority language. Overall, the amount of minority language input that children require in order to become bilingual is not clear.

Among adult second language learners, the sociolinguistic status of each language has been shown to be an important factor that mediates proficiency (Firth and Wagner, 2007; Segalowitz et al., 2009; Tarone, 2007). Among children, sociolinguistic factors, such as living in a bilingual community, may influence whether a child becomes bilingual (Gathercole and Thomas, 2009) and, if so, what level of proficiency will be attained in each language (Oller et al., 2007; Paradis, 2009). For example, some bilingual children live in an additive bilingual context where support exists for the two languages spoken and there are few external pressures to 'give up' one's first language (L1) (Paradis et al., 2011). In

contrast, other children live in a subtractive bilingual context where little support exists for the child's L1 and substantial pressures are at work to reduce the amount of the L1 in the environment (Paradis et al., 2011). Although preschool-aged children may not have a strong sense of sociolinguistic identity, they are sensitive to what language is being used in their environment by mirroring the frequency of code-switching (i.e. switching from one language to the other) of the adult speakers (Comeau et al., 2007; Juan-Garau and Perez-Vidal, 2001). In addition, the status of each language can influence the attitudes and opportunities that children have to use both of their languages. Outside the home, the majority or minority status of the language can determine the family's access to support and services and the communities' attitude toward bilingual language learning. Within the home, the status can influence different family members' attitudes and approaches to the two languages: for example, older school-aged siblings may refuse to use the minority language at home (Khattab, 2009; Schüpbach, 2006). Thus language status can impact family interactions, having a more widespread effect on home culture.

Vocabulary acquisition can serve as a window on bilingual language development. Bilingual children may have smaller vocabularies than monolingual children when measured in each of their languages; however, their conceptual vocabulary (i.e. knowledge of referents regardless of the language) has been found to be comparable to monolingual children (Pearson et al., 1993). Research has demonstrated the importance of measuring bilingual children in both of their languages in order to obtain a complete picture of their language abilities. With regards to receptive vocabulary, bilingual English–Spanish first-graders (Umbel et al., 1992) were found to keep pace with monolingual children in both Spanish and English, although they scored below the mean in both languages. This result demonstrated that bilingual language exposure was not a risk factor in vocabulary development. More recent studies have shown that receptive vocabulary is sensitive to differences in amount of exposure (Kohnert and Bates, 2002; Thordardottir, 2011). In her study of bilingual 4-year-olds learning English and French, Thordardottir found that when children received 40–60% exposure to a language, they were not different from monolingual children with regards to their receptive vocabulary. Lower exposure rates, however, did result in significantly lower receptive vocabulary scores for the given language. In a cross-sectional study of Spanish–English sequential bilingual school-aged children, children were found to shift from balanced vocabulary comprehension abilities at 5 to 7 years of age, to stronger abilities in English by the age of 11 to 13 years onward to adulthood (Kohnert and Bates, 2002). This shift in abilities was observed earlier for receptive than for expressive vocabulary. Finally, receptive vocabulary has been found to be sensitive to the context in which words are used: words used predominantly at home are understood in the language used at home, whereas words used predominantly at school are understood in the language used at school (Bialystok et al., 2010). Taken together, receptive vocabulary appears to be a strong candidate to observe the effects of language exposure on the majority and minority languages being acquired by bilingual children.

To understand why some bilingual children begin to demonstrate stronger receptive language skills in the majority language, we can turn to the three main factors described earlier: the age of acquisition of each language, the amount of input for each language, and the language status of each language (Pearson, 2007). A theoretical explanation, however, for language-maintenance outcomes on the family level is lacking (Tuominen, 1999). The goal of the current study is to understand how children's receptive vocabulary development is influenced by exposure to the majority and minority language. To this end, we explore how language exposure within and outside of the home influence receptive vocabulary development among simultaneous bilingual preschool-aged children acquiring French and German.

II Research questions

We targeted the following research questions in the present study. First, how much exposure to the majority language (French) and the minority language (German) do children receive in an average week? Second, to what extent are the children's receptive vocabularies developing in parallel in French and German? Finally, is there a relationship between the amount of exposure received in each language, and the relative vocabulary size of the language?

III Methodology

1 Participants

Eleven simultaneous bilingual children were recruited for this study. For the purpose of this study, we defined 'simultaneous' bilingual as exposure to both German and French from birth. All were residents of Québec, a majority French-speaking province within Canada. One child (Child 8) did not complete the study because of family travel plans. The remaining 10 children (mean age 52 months) and their families were residents of a small city where 98% of the population speaks French as their first language (Statistics Canada, 2006). One child (Child 5) had recently moved to the province of Québec from Germany. All children were growing up in bilingual homes, where both German and French were used. Across all families, both parents worked full time and children received seven to eight hours of childcare on weekdays. Parents were home evenings and weekends. Parents reported that the children had a typical developmental history with no known cognitive or physical disabilities. One child (Child 10) was receiving speech-language pathology treatment for speech sound delay and thus was excluded from the present study. For the remaining children, parents reported no concerns regarding their speech or language development. Characteristics of the participants are given in Table 1.

2 Measures

a Language-use questionnaire—A language-use questionnaire was developed to evaluate a child's bilingual language use and exposure. The questionnaire has five main questions.

1. When was the child exposed to each language?
2. In which language do the following speakers address the child: mother, father, siblings(s), childcare provider, others, and how many hours does the child spend in the presence of these speakers on a typical weekday and over a typical weekend?
3. In which language does the child prefer to address the following listeners: mother, father, siblings(s), childcare provider, others?
4. How do the child's expressive and receptive language abilities rate on a five-point scale (1 = weak; 2 = below normal; 3 = age appropriate; 4 = above normal; 5 = advanced)?
5. In which language is the child exposed to television, movies, or the radio?

b Receptive vocabulary measures—To assess the children's receptive vocabulary in German, two subtests from the *Patholinguistische Diagnostik bei Sprachentwicklungsstörungen* (PDSS) from Kauschke and Siegmüller (2010) were used, namely the *Wortverständnis Nomen* to assess the comprehension of common nouns and the *Wortverständnis Verben* to assess the comprehension of verbs. The tasks require the child to point to the image that represents the word said by the evaluator. Each of the subtests contains one training item and 20 target items. Each target item is presented with three

distractors. The test was designed for children between ages 2;0 and 6;11 and has been standardized with 450 typically developing monolingual German-speaking children.

In French, the *Évaluation du Vocabulaire en Images Peabody* (EVIP: Dunn et al., 1993) was used. This French adaptation of the *Peabody Picture Vocabulary Test – Revised* is designed to measure receptive vocabulary of children from the ages of 2;6 to 18 years. It contains five training items, followed by a total of 170 test items placed in growing order of complexity covering a wide variety of semantic categories, including nouns, verbs, and adjectives. For each item, the child has to identify among four pictures the one that represents the word said by the evaluator. A floor item is provided at each six-month interval and can be adjusted such that a child should correctly identify eight consecutive items. A ceiling is established when a child incorrectly identifies six items within a group of eight consecutive items. The test was standardized on a sample of 4031 French Canadian children in the age range from 2;6 to 18 years, all of whom were attending either school or preschool.

3 Data collection procedures

A parent interview was conducted to verify the child's developmental history. During this interview, parents were also asked to provide a detailed description of the child's language context via the Language Use Questionnaire. Following the parent interview, the child's phonological abilities were evaluated using a picture-naming task; however, these results exceed the scope of the present study. This task was followed by an evaluation of their receptive vocabulary using the standardized tasks described above.

The data were collected by two master's degree students in a speech-language pathology program (the third and fourth authors). One student, a native French speaker, conducted the sessions in French with each child, and on a separate day the second student, a simultaneous French–German bilingual, conducted sessions in German with each child. The language of the interview was kept constant throughout, such that only German (or French) was spoken by the student with the parent and child during the session.

4 Data analysis

a Language-use questionnaire—The most complex question to analyse was the amount of language exposure across speakers on a typical week. To analyse these results we used a standard day of 12 hours, and calculated the proportion of exposure to each language given this time period. When both languages were used in the same context – such as French and German used at home on weekdays – the time was equally divided between the two languages. For example, for a typical weekday a child who was reported to be exposed to only French during eight hours at daycare and was exposed to both French and German at home in the remaining four hours, the child's language exposure would be 10 hours of French (eight hours in daycare, and four hours shared with German) and two hours of German (four shared with French).

b Vocabulary tasks—The results from the systematic vocabulary tasks were calculated. In French, the guidelines for the EVIP were used to calculate the number of correct responses. This raw score was converted to the standard score and percentile rank. Based on the guidelines for establishing floor and ceiling items, children answered on average 36 items (range of 13–67 items). In German, the total number of correct responses was calculated for the noun-naming subtask and the verb-naming subtask of the PDSS. Children were asked to name all items for a total of 20 nouns and 20 verbs. This raw score was converted into a percentile rank based on the normative data for this task. The percentile rank was used to compare the results across children for French and German tasks.

IV Results

Three questions were targeted in the present study. First, how much exposure to the majority language (French) and the minority language (German) do children receive in an average week? Although we recruited children based on simultaneous exposure to French and German during infancy, remarkable homogeneity across the families was observed with regards to exposure to French and German during a typical week (see Table 2). In these families, both parents worked outside the home and children received full-time childcare in French. In this context, the exposure to the minority language, German, was limited to 17–29%. An exception to this pattern is Child 5 whose family had recently moved from Germany to the province of Québec. His language exposure pattern was the opposite of the other children: he received childcare from a German speaker and thus was exposed to German 71% of the time and French 29%. Taking a more descriptive look at the family language use, we see that all but one family (i.e. Child 3) observed the one-parent–one-language approach, and seven of these children were exposed to the minority language, German, through their mothers. For the eight children with siblings, only three were exposed to German by their siblings (i.e. Child 5, Child 7, and Child 11) and the remaining five children were exposed only to the majority language by their siblings. Taken together, we see that language exposure is unbalanced, with all but one child exposed to the majority language, French, for at least 71% of a typical week.

The second question we targeted was to what extent are the children's receptive vocabularies developing in parallel in French and German. As noted above, we used the percentile rank of the children's scores to compare across the German and French tasks (see Table 3). Based on this percentile rank, we note that children tended to have higher scores on the German-noun subtest than on the German-verb subtest (with the exception of Child 1 and Child 9). In the French test, all but two children (i.e. Child 5 and Child 6) had percentile ranks that were within or above the average range. A visual comparison of the children's percentile rank in German and French suggests that their receptive vocabulary was not developing in parallel in both languages, but rather that German was lagging behind French. The non-parametric Wilcoxon Signed Ranks Test was used to investigate this observation due to the small number of participants. The results support this observation: a significant difference was observed between the percentile rank on the German-noun subtest and the French test ($Z = -1.955$, $p < .05$), and for the German-verb subtest and the French test ($Z = -2.431$, $p < .02$).

The third question we targeted was whether a relationship existed between the amount of exposure received in each language, and the relative vocabulary size in each language. Due to the small sample size, we conducted a Spearman correlation, the nonparametric alternative to the Pearson correlation, with the exposure in percentage and the child's percentile rank for receptive vocabulary for the given language. In German, there was no significant correlation between the amount of exposure in German and the child's receptive vocabulary for nouns (*rho* = .599, $n = 9$, $p = .09$) or verbs (*rho* = .394, $n = 9$, $p = .29$). In contrast, we observed a positive correlation for French between the amount of exposure to French and the child's receptive vocabulary on the French receptive vocabulary task (*rho* = .876, $n = 9$, $p = .05$).

V Discussion

Our goal was to understand how children's receptive vocabulary was influenced by exposure to the majority and minority languages. Previous research has suggested that age of acquisition of each language, the amount of input for each language, and the language status of each language influence bilingual language development (Pearson, 2007). We

sought to explore how the amount of input for each language and language status influenced receptive vocabulary development among children who had been exposed to two languages simultaneously. We recruited simultaneous bilingual children who were growing up in bilingual homes where German and French were used since infancy. In the current context, French is the majority language spoken by those outside of the home and German is the minority language. Three research questions were targeted in the study:

1. How much exposure to the majority language (French) and the minority language (German) do children receive in an average week?
2. To what extent are the children's receptive vocabularies developing in parallel in French German?
3. Is there a relationship between the amount of exposure received in each language, and the relative vocabulary size of the language?

The results from the first question revealed surprising homogeneity across the nine children with regards to exposure to the majority and minority languages. All but one family observed the one-parent–one-language approach, and the mothers provided German input for eight of the children. Three children (Children 5, 7, and 11) also received German input from their siblings. Across the children, both parents worked full time and thus the children received full-time childcare; for all but one child (Child 5), the childcare was provided in French. Child 5 was also the only child who had not begun attending daycare prior to his first birthday. As a result of the language use within and outside of the home, eight of the children received relatively high frequency of exposure to French (74–83%) and correspondingly low exposure to German (16–26%). The exception to this situation was Child 5, whose family had recently moved to the province of Québec, and he received childcare from a German speaker. We noted an interesting trend in the data with regards to the language used by siblings: of the seven children with siblings, five siblings used only the majority language within the home. This result suggests that within some of the homes, the common language was French; however, our questionnaire did not specifically ask what was the 'home language' (i.e. dominant language within the home). In a description of the process of shifting towards the majority language within a home, Schüpbach (2006) notes that the children, particularly once in school, play an important role in influencing language use within the home. We may be observing the beginnings of such a shift for the families of five of the children in this study. In future questionnaires, it will be important to include a question regarding dominant language used within the home.

The second question revealed generally strong receptive vocabulary abilities for the children in French (with the exception of Child 5 and Child 6), but much weaker receptive vocabulary abilities for German. The statistical analysis revealed that children had significantly weaker receptive language abilities in German than in French. A key result is that all the children performed within normal limits (defined as a percentile rank above the 10th percentile) in either German or French with regards to receptive vocabulary; thus there is no evidence that bilingual language exposure slows the pace of development. However, the results paint a negative picture with regards to the balanced development of the two languages: despite early and consistent exposure to German, this language is not keeping pace with the majority language, in this case French. The case of Child 5 highlights the importance of language status, since his receptive vocabulary shows the opposite pattern to those of his peers. He spent his childhood, until a few months prior to the study, living in Germany and exposed to French only at home. As a result, his German is within normal limits, but his French lags behind. Only one of the nine children (i.e. Child 11) demonstrated language abilities that were balanced in both languages. These results speak to the importance of evaluating children in both of their languages to obtain a complete picture of their receptive vocabulary development.

The third question investigated the possibility of a relationship between language exposure and receptive vocabulary. Previous studies have shown that amount of language exposure plays a key role in vocabulary development (Pearson et al., 1997; Thordardottir, 2011), but few studies have reported on simultaneous bilinguals (Thordardottir, 2011). Although a relationship was observed between exposure to the majority language and vocabulary development, no relationship was observed between minority language exposure and vocabulary development. These results suggest that other factors are at play in guiding vocabulary development in the minority language. Based on the present study, it is not clear what these factors may be: there are no obvious relationships with exposure to media, the child's reported language preference, or the language spoken by the mother, father, or siblings. A possible factor that should be considered in future studies is working memory. In cases where a child receives less exposure to one of his languages, learning new words in this language may depend more heavily on working memory than for the other language. Including a measure of working memory, such as a non-word repetition task, in future studies would shed light on this hypothesis.

The present study targeted a small group of children living in a unique bilingual context: German–French bilingual homes within a majority French community in North America. The three main shortcomings of this study are the following. We used parent reports, rather than observations, of language exposure within the home; however, observations within the home can be lengthy and may not reflect a 'typical' week. In addition, the presence of an outside observer could shift the language dynamics of the home. Second, the receptive language tasks were different in French than in German. Finding comparable tasks to assess language ability in two languages is challenging. In this case, we were able to use a norm-referenced receptive vocabulary assessment task in both French and German. Third, our sample size was limited, but reflects the small size of this community.

Despite these shortcomings, this study speaks to the precarious, challenging, and complex nature of bilingual language development, particularly with regards to the development of the minority language. Although the children were exposed to both French and German from infancy within the home, the influences of the majority language have already begun to be observed prior to entry in school. These children were exposed much more frequently to French, the majority language. We found that their receptive vocabulary in the majority language was keeping pace with monolingual peers, but their minority language was lagging behind.

Faced with the challenge of supporting their child's language development, parents often turn to educators and healthcare professionals for advice. These professionals frequently suggest implementing the one-parent–one-language approach to ensure consistent exposure to both languages. The one-parent–one-language approach, however, does not appear to support the development of both of the child's languages in the context described in the present study (i.e. parents working full time, and family living in a subtractive bilingual context, with little support outside the home for the minority language). As noted by researchers working with other bilingual communities (De Houwer, 2007; Gathercole and Thomas, 2009; Juan-Garau and Perez-Vidal, 2001), bilingual families may need to consider other options for supporting the bilingual language development of their children. These options may include restricting the use of the majority language in the home, encouraging both parents to use the minority language, encouraging siblings to continue using the minority language, and increasing reading and media exposure to the minority language. In addition, parents might consider using more explicit language teaching approaches (Pearson et al., 1997). Since a family may not always prioritize language maintenance within the home due to complex family, social, and economic pressures (Tuominen, 1999), professionals need to support families in sustaining their language choices. The importance

of maintaining one's linguistic and cultural ties to the minority language are important in maintaining family relations and one's cultural identity (Fillmore, 2000; Kohnert et al., 2005; Mucherah, 2008). As professionals, we need to provide parents with advice that is based on available data and that is flexible with regards to the current and future needs of the child and his family.

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Table 1

Description of participants including age in months, gender, language used at home, language used by childcare provider, and age in months at which child began attending daycare.

Participant	Age (months)	Gender	Language used at home	Language used by childcare provider	Age that child began attending daycare (months)
1	44	male	both	French	10
2	62	male	both	French	6
3	66	male	both	French	10
4	53	male	both	French	9
5	68	male	both	German	29
6	31	male	both	French	9
7	42	female	both	French	9
9	44	male	both	French	10
11	71	female	both	French	6

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Table 2

Summary of results for language exposure for each child in German, including the overall ratio of exposure to German and French, the speakers of each language, the exposure to media, and the reported child's language preference.

Participant	Age (months)	Ratio of German exposure in a typical week	Weekday German speakers	Weekend German speakers	Ratio of French exposure in a typical week	Weekday French speakers	Weekend French speakers	Media	Child's language preference
1	44	0.26	mother	mother	0.74	daycare, father	father	both	French
2	62	0.26	mother	mother	0.74	daycare, father, siblings	father, siblings	both	French
3	66	0.26	mother, father	mother, father	0.74	daycare, father, siblings	mother, father, siblings	French	French
4	53	0.26	father	father	0.74	daycare, mother, siblings	mother, siblings	both	both
5	68	0.71	mother, babysitter, siblings	mother, siblings	0.29	father, mother	father, mother	both	German
6	31	0.29	mother	mother	0.71	father, daycare	father	both	both
7	42	0.26	mother, siblings	mother, siblings	0.74	daycare, father, siblings	father, siblings	both	both
9	44	0.17	mother	mother	0.83	daycare, father, siblings	father, siblings	both	French
11	67	0.26	mother, siblings	mother, siblings	0.74	daycare, father, siblings	father, siblings	both	both

Table 3

Participant age, ratio of exposure to German and French, and results from the receptive vocabulary task in German (PDSS noun and verb subtests) and French (EVIP) in percentile rank.

Participant	Age (months)	Ratio of German exposure in a typical week	Ratio of French exposure in a typical week	German: PDSS nouns subtest (percentile rank)	German: PDSS verb subtest (percentile rank)	French: EVIP (percentile rank)
1	44	0.26	0.74	<1	7	52
2	62	0.26	0.74	5	5	84
3	66	0.26	0.74	5	<1	51
4	53	0.26	0.74	17	14	95
5	68	0.71	0.29	33	25	<1
6	31	0.29	0.71	19	13	16
7	42	0.26	0.74	17	7	91
9	44	0.17	0.83	3	7	91
11	67	0.26	0.74	100	51	96

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