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Bilingual Development in the Receptive and Expressive Domains: They Differ

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Abstract

In bilingual children, more so than in monolingual children, comprehension abilities exceed production abilities. While this receptive-expressive gap in bilinguals has been well documented, little is known about its development. The present study tracked growth in the Spanish and English receptive and expressive vocabularies of 52 bilingual children from 4.5 to 10 years. The children's English vocabularies grew faster than their Spanish vocabularies, more so in the expressive domain than the receptive domain. The proportion of children who were English-dominant also increased more in the expressive than the receptive domain. By age 10, the children's expressive skills were almost always English dominant while their receptive skills were most frequently balanced. Among children who hear a heritage language at home and a societal language at school, trajectories of dual language development differs in the expressive and receptive domains. These longitudinal data suggest continuity between the receptive-expressive gap observed in bilingual children and the receptive bilingualism often observed in adults.

Keywords

bilingual development; simultaneous bilingualism; receptive-expressive gap; receptive vocabulary; expressive vocabulary; passive bilingualism

Bilingual development has been better described with respect to expressive language skills than receptive language skills (Hoff, 2018). However, the available evidence suggests that the course of dual language development may be different in the expressive and receptive domains, particularly when one language is a heritage language and the other a societal language. Understanding how bilingual children's profiles of receptive dual language proficiency may differ from the profile suggested by their more readily observed expressive skills is relevant to many educational placement and clinical decisions made for bilingual children. The aim of the present study was to directly test the hypothesis that bilingual development in the expressive domain differs from bilingual development in the receptive domain using longitudinal data on the receptive and expressive vocabulary skills of 52

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Spanish-English bilingual children in the U.S., who were assessed at the ages of 4.5 and 10 years.

Previous Descriptive Findings

Previous longitudinal studies of bilingual development in children exposed to a heritage and societal language that have used measures of expressive language skill or composite measures of expressive and receptive skill have consistently found that once exposure to the majority language begins, majority language growth is more rapid than minority language growth and that, sooner or later, the majority language becomes the dominant language (Hoff, 2018, 2021; Gathercole & Thomas, 2009).

However, one study which measured receptive and expressive skill separately found that bilingual children who were majority language dominant in their expressive vocabulary were balanced in their language comprehension skills (Ribot & Hoff, 2014). This gap between bilingual children's skill level in receptive and expressive skills has been documented in several studies (see review in Gibson, Peña, & Bedore, 2014; Oller, Pearson, Cobo-Lewis, 2007). It is not merely a gap between how much children understand and how much they can produce, because comprehension abilities exceed production abilities in monolinguals as well. The gap in bilinguals is a gap relative to typical monolingual levels of receptive and expressive ability. In one or both of their languages, bilinguals' comprehension abilities are greater than would be predicted from their expressive abilities using monolingual norms as the reference. Bilinguals' receptive-expressive gap may reach its extreme in the adults who are receptive bilinguals, that is, bilingual in so far as they understand two languages, but monolingual with respect to expressive language abilities. That is a well-documented pattern of dual language skill among majority-heritage language bilinguals, and it is the heritage language that is only understood and not spoken (Sherkina-Lieber, 2020).

Hypothesized Underlying Processes

The processes that have been invoked to explain why the difference in difficulty between acquiring expressive and receptive skills should be greater for bilinguals than monolinguals include both concurrent influences and antecedent influences. The concurrent influences are related to how bilinguals manage two language systems and how the ambient language environment affects the activation and inhibition of each of a bilingual's languages. It has been proposed that a bilingual's two languages compete during the processes of speaking and listening and that children inhibit or suppress their first language in the face of the new, culturally dominant language (Gibson et al., 2012). Although this proposal addresses the gap in children who first acquire the heritage language at home and later the societal language at school, the competition between two languages should be true for simultaneous bilinguals as well. It is further postulated that suppression causes greater problems for production more than for comprehension because production is a more demanding task. However, it is not at all clear that these demonstrated concurrent influences are sufficient to explain the ubiquity of passive bilingualism among heritage language bilinguals.

A potential antecedent source of the receptive-expressive gap is the accumulated effects of language experience. That is, the relation of language exposure to acquisition may be different in the expressive and receptive domains. Consistent with that argument, Gibson et al. (2014) found that the size of the receptive-expressive gap was related to the amount of language exposure—the gap was larger in children with less exposure. Findings from Elin Thordardottir (2014) may explain why: For both receptive and expressive vocabulary there is a nonlinear relation between amount of exposure and vocabulary size, that is, at some point increases in the amount of exposure yield little in terms of vocabulary knowledge. However, that point is different for receptive and expressive vocabulary. Elin Thordardottir (2014) found that exposure of approximately 40 to 60% of all input resulted in monolingual-like levels of receptive vocabulary knowledge whereas 70% exposure was required for children to achieve monolingual-like levels of expressive vocabulary skill.

Antecedent influences are also suggested by the frequency lag hypothesis which proposes that production requires stronger mental links between the sounds of words and their meanings than does comprehension (Gollan et al., 2008). These links are built out of experience. Because bilinguals' language experience is divided between two languages, bilinguals will have generally weaker links than monolinguals, which disadvantages production more than it disadvantages comprehension (Gollan et al., 2008). Furthermore, there is evidence that the development of expressive skills depends on the experience of using the language. Ribot, Hoff, & Burridge (2018) found that the rate of expressive vocabulary growth was predicted by both the amount of children's exposure and the amount of children's use of a language, whereas language comprehension skills did not depend on use—only exposure. The common pattern among bilingual children of choosing to speak the societal language even when being addressed in the heritage language would also, then, contribute to the development of expressive skills lagging compared to receptive skills.

The Present Study

In sum, the literature suggests that dual language growth trajectories are different in the expressive and receptive domains. The result of such diverging trajectories would be that the degree to which a bilingual is balanced or dominant in one of their languages can differ depending on the domain in question. In the present study we directly test these hypotheses against data from 52 Spanish-English bilingual children in the U.S. whose expressive and receptive vocabularies were assessed with the same instruments at the ages of 4.5 years and 10 years. Based on the available evidence we predict (1) that the difference in English and Spanish growth rates will be smaller for receptive vocabulary than for expressive vocabulary, and (2) that English dominance will grow more rapidly in the expressive domain than in the receptive domain.

Method

Participants

The participants were 52 Spanish-English bilingual children (26 girls) drawn from a larger longitudinal study in South Florida, in the U.S. Participants were all those who had complete data at 4.5 and 10 years—the only ages at which the present measures of expressive and

receptive vocabulary were administered. The children's mean ages at each assessment were 54.56 months (*SD*= .38) and 122.35 months (*SD* = 1.43). The children had one (*n* = 16) or two (*n* = 36) foreign-born parents who were native Spanish speakers. Their home language exposure at 4.5 was, on average, 37% English and 63% Spanish, but ranged from 15% to 100% Spanish. All the children had sufficient exposure to English to have some vocabulary knowledge in English by the age of 36 months, as measured by either parent report on the MacArthur-Bates inventories (Fenson et al., 1993; Jackson-Maldonado et al., 2003) or the examiner-administered *Expressive One-Word Picture Vocabulary Test*) (Brownell, 2001a). All children were born in the U.S., were full term and healthy at birth, with normal hearing based on parent report of otoacoustic emissions tests performed in the hospital. All children were screened for evidence of communicative delay at 30 months. Participants were recruited through advertisements in local magazines and at programs for parents with young children, as well as through word of mouth.

Procedure

In the context of visits to the home or, in approximately 15 percent of cases, visits to a university lab room or public library space, children were administered multiple assessments of their English and Spanish language development across several days. English and Spanish assessments were administered on separate days, in counterbalanced order. Information regarding the children's dual language exposure at home was collected *via* interview with the parent(s) or other primary caregiver. During the interview the caregivers were asked questions about the child's language exposure at home, at school, with extended family, and during extracurricular activities. Additionally, they were asked about literacy practices in each language.

Measures

Receptive and Expressive Vocabulary—The bilingual children were administered the *Expressive One-Word Picture Vocabulary Test-Spanish Bilingual Edition* (*EOWPVT*, Brownell, 2001a) and the *Receptive One-Word Picture Vocabulary Test-Spanish Bilingual Edition* (*ROWPVT*, Brownell, 2001b). In the *EOWPVT*, the examiner presents an image and asks the child to provide a label for the image. In the *ROWPVT*, the examiner presents a plate with four images and asks the child to match the word that is heard to the object, action, or concept presented. Both of these tests are derived from instruments designed for use with monolingual English-speaking children; they were adapted for Spanish-English bilingual children by eliminating words that the developers judged to be culturally biased (e.g., fireplace) or to substantially differ in difficulty between English and Spanish.

These tests are intended to be administered in a way that allows children to recruit their knowledge in both their languages, accepting answers in either English or Spanish, and standard scores are based on that procedure administered to a sample of Spanish-English bilingual children. In the present study, we administered the receptive and expressive tests separately in only English and in only Spanish to assess children's knowledge in each language. As a result, there are no norms for the raw scores we obtained.

Language Dominance—We calculated three separate measures of language dominance at each age: a difference score (i.e., Language A score – Language B score on the same test), a ratio score (i.e., the weaker language score divided by the stronger language score), and a category assignment as Spanish-dominant, balanced, or English-dominant. For the difference score calculation, we designated English as language A, and thus the difference scores represent the degree to which the children were English dominant. Negative scores indicate Spanish dominance, a score of zero indicates perfect balance, positive scores indicate English dominance. We also calculated ratio measures of language dominance because it has been argued that difference scores are not comparable across different instruments or different ranges (Birdsong, 2016). To illustrate, an absolute difference of 10 (points or lexical items) does not mean the same thing for the difference between 40 and 50 as it does for the difference between 400 and 410. Ratio scores are thus decimals in which higher scores indicate greater balance, up to a score of 1, which would indicate perfect balance. A drawback to ratio measures is that they only capture differences in degree of dominance among speakers who are all dominant in the same direction. Therefore, we calculated a ratio measure of dominance only for those 33 children who were consistently English dominant across both ages and measures in both domains. The categorization of each child as Spanish-dominant, balanced, or English-dominant was accomplished by dividing each child's English score by their English + Spanish score. Children were categorized as Spanish-dominant if their English score was less than 40% of their total, as balanced if their English score was between 40% and 60% of their total, and as English-dominant if their English scores was more than 60% of their total score.

Data Analysis Approach

The hypothesis that growth rates for English and Spanish would differ was tested separately in two Age × Language ANOVAs, one with expressive vocabulary scores as the outcome measure and one with receptive vocabulary scores as the outcome measure. The obtained partial eta squared for the Age × Language interaction in each ANOVA provided estimates of the size of the difference between Spanish and English growth rates in each domain.

The hypothesis that English dominance would increase with age more for expressive than receptive scores was tested with the three different measures of dominance. For the continuous variables (i.e., the subtraction and ratio scores), the effects of age and domain and the Age × Domain interaction effect on degree of English dominance were tested in separate 2(Age) × 2(Domain) ANOVAs. We predicted a significant Age × Domain interaction in which English dominance increased more in the expressive than in the receptive domain. For the categorical measures of language dominance, the hypothesis that English dominance would increase more in the expressive than receptive domain was tested by comparing the age-related change in the distribution of children among dominance categories in each domain. The prediction was that the proportion of children who were English dominant would increase with age by a greater amount when dominance was based on expressive measures than when dominance was based on receptive measures.

Results

Research Question 1: (a) Do English and Spanish skill grow at different rates in the expressive and receptive domains? And (b) is the size of the difference in growth rate between languages greater in the expressive than the receptive domain.

Mean scores for each measure at each age are plotted in Figures 1a and 1b. Because the measures of expressive and receptive skill are not comparable, we address this research question with two separate 2(Age) × 2(Language) repeated measures ANOVAs, one with expressive skills and the other with receptive skills as the outcome, and then we compare the effects observed in each.

With expressive vocabulary scores as the outcome measure, the results of a 2(Age, 4.5 and 10 years) × 2(Language, English and Spanish) ANOVA indicated a significant main effect of age (F[1,51] = 569.67, p <.001, η_p^2 = .918, power = 1.00), a significant main effect of language (F[1,51] = 217.45, p <.001, η_p^2 = .810, power = 1.00), and a significant Age × Language interaction (F[1,51] = 321.77, p <.001, η_p^2 = .863, power = 1.00). Expressive vocabulary scores increased between 4.5 and 10 years; English scores were higher than Spanish scores at both time points, English scores increased more than Spanish scores did.

With receptive vocabulary as the outcome measure, the results of a 2(Age, 4.5 and 10 years) × 2(Language, English and Spanish) ANOVA indicated a significant main effect of age (F[1,51] = 657.97, p <.001, η_p^2 = .928, power = 1.00), a significant main effect of language (F[1,51] = 70.83, p <.001, η_p^2 = .581, power = 1.00), and a significant Age × Language interaction (F[1,51] = 42.06, p <.001, η_p^2 = .452, power = 1.00). Receptive vocabulary scores increased between 4.5 and 10 years; English scores were higher than Spanish scores at both time points, English scores increased more than Spanish scores did.

The general pattern of faster growth in English than Spanish was true for measures of expressive and receptive vocabulary. However, the degree to which English growth outpaced Spanish growth differed. The proportion of the variance in scores due to differences in growth associated with language (i.e., the partial eta squared for the Age × Language interaction) was 1.9 times greater for expressive than receptive skill.

Research Question 2: Does English dominance increase with age more in the expressive than in receptive domain?

The mean English dominance subtraction scores and ratio scores are presented for each domain and age in Table 1. When dominance was measured as the difference between the English and Spanish scores, there were significant effects of age (F[1,51] = 215.69, p <.001, η_p^2 = .809, power = 1.00), of domain (F[1,51] = 133.635, p <.001, η_p^2 = .724, power = 1.00), and a significant Age × Domain interaction (F[1,51] = 40.37, p <.001, η_p^2 = .442, power = 1.00). English dominance increased with age, was greater in the expressive than the receptive domain, and increased more in the expressive than the receptive domain.

When dominance was measured in terms of the ratio of the weaker to the stronger language, and thus only the 33 children who were consistently English dominant across ages and measures were included, a parallel 2(Age) × 2(Domain) ANOVA found only a significant

effect of domain (F[1,32] = 184.143, p <.001, η_p^2 = .852, power = 1.00), with dominance greater in expressive than receptive vocabulary knowledge. The effects of age and the Age × Domain interaction were not significant; both F values were less than 1. To ask whether the difference in findings between the analyses of subtraction and ratio scores might reflect characteristics of the subsample for whom ratio scores were calculated, we repeated the ANOVA on subtraction scores with only that subsample. The findings from the full sample were replicated. There were significant effects of age (F[1,32] = 107.31, p <.001, η_p^2 = .770, power = 1.00), of domain (F[1,32] = 102.83, p <.001, η_p^2 = .763, power = 1.00), and a significant Age × Domain interaction (F[1,32] = 17.21, p <.001, η_p^2 = .770, power = .980).

In sum, when dominance is measured as the difference between children's English and Spanish scores, English dominance increases from 4.5 to 10 years, more so in the expressive than in the receptive domain. When dominance is measured as the ratio of Spanish to English scores, English dominance is greater in the expressive than the receptive domain, but the degree of dominance does not change with age. The difference between the two findings exactly reflects the difference between the two measures: the ratio of Spanish to English vocabulary knowledge does not change from 4.5 to 10 years, but because both are increasing the same ratio at 10 years is a larger absolute difference than it is at 4.5 years.

The final analysis of dominance made use of the categorization of children, at each age and for each measure, as Spanish-dominant, balanced, or English-dominant. The distributions of children across these categories in each domain at each age are presented in Figure 2. Visual inspection of this figure shows that the distribution of children moved away from Spanish dominance and toward English dominance with age for both measures, more so for the expressive than receptive measures. The McNemar tests of difference, which examines group differences on a dichotomous variable, was used to test whether there was a difference between the 4.5 year measures and the 10 year measures in the proportion of children who were balanced or English dominant. The test indicated a significant difference for measures based on expressive vocabulary (p < .001) and no significant difference for measures based on receptive vocabulary (p = .549).

Discussion

The present study tested the hypothesis that trajectories of dual language growth in bilingual children exposed to a minority and majority language differ depending on whether expressive or receptive skills are the focus. The previous literature which documented receptive-expressive gaps in bilingual children and receptive bilingualism among adults suggested that parallel growth in two languages and balanced bilingualism were more frequently achieved in the receptive than in the expressive domain. However, few direct tests existed, and none examined growth across a 6-year period of language development.

Using scores on examiner administered tests of English and Spanish expressive and receptive vocabulary administered to a sample of Spanish-English bilingually developing children in the U.S., we found that English growth outpaced Spanish growth in both the expressive and receptive domains, but the size of the difference in English and Spanish growth rates was greater for expressive than receptive skills. The result of these different

growth rates is that the proportion of the sample that was English dominant in expressive skills increased from 4.5 to 10 years while the proportion of the sample that was English dominant in receptive skills did not change significantly.

The findings from the present study make important contributions to two different bodies of research. First, the current study provides one more piece of evidence to the growing literature that finds that bilingual children's acquisition of the societal language outpaces their acquisition of the heritage language from an early age—more so with respect to expressive language skills than with respect to receptive language skills. The finding that societal language abilities quickly surpass home language skills has been well documented (Gathercole & Thomas, 2009; Mancilla-Martinez, & Lesaux, 2011), and there is even some evidence that this shift towards dominance in the majority language may occur before children enter school (Hoff et al., 2018; Tulloch & Hoff, 2021). Second, the dual language growth patterns documented in the present study may provide a link between the receptive-expressive gap observed in young bilingual children (Gibson et al., 2012; 2014; 2018; 2020) and passive bilingualism in adulthood (Sherkina-Lieber, 2020). The developmental trends documented in the present study suggest that, among heritage language speakers in the U.S., one potential outcome for ultimate bilingual attainment could be comprehension abilities in two languages and production skills largely limited to the majority language. Individuals with that proficiency profile may understand many words in the heritage language but chose to only speak the majority language. This outcome has been documented in adults, and research suggests that while heritage language comprehension skills are stronger than production skills, they do not reach monolingual-like levels of proficiency (Montrul, 2016; Sherkina-Lieber et al., 2011).

However, it is important to note that this long-term outcome is not the outcome for all bilingual adults who grow up hearing a heritage language and a majority language. Some heritage language speakers attain monolingual-like levels of proficiency in their heritage language across a wide array of language measures (Giguere & Hoff, 2020). While strong skills in two languages is clearly possible, it is more common for heritage language receptive skills to be closer to monolingual-like levels of proficiency than their expressive skills (Giguere & Hoff, 2020). The present findings are also consistent with this dual language outcome.

A potential cause of this dual growth pattern is that these children are attending school in English only, as is typical for many children who hear a heritage language at home in the United States. English-only schooling can have both concurrent and developmental influences on dual language growth. The children may suppress the minority language in the presence of the culturally dominant language (Gibson et al., 2012), and their daily exposure to English will likely increase both in their adult-child interactions and their interactions with their peers (Erdemir & Brutt-Griffler, 2020). The changes that occur in language use and language exposure at school entry have been hypothesized to be an important inflection point in dual language development—and the point at which majority language development may outpace and take over home language development. In the present sample, Spanish dominance was vanishingly rare even at the younger age tested, but over a third of the sample was balanced in their expressive skills. After 5 and a half years, most of them

spent in majority language schooling, almost all the children were English-dominant in their expressive skills. In contrast, over half of the sample were balanced bilinguals in receptive skills at both ages.

There are other developmental and concurrent factors, beyond the effects of schooling, that likely influence the dual receptive and expressive trajectories of heritage language speakers. The literature has suggested several, including relative heritage language exposure at home (Thordardottir, 2014) and language use (Ribot et al., 2018). Not only quantity of heritage language exposure, but also the number of sources of heritage language input and time spent in a country where the heritage language is spoken potentially influence the growth patterns observed in the present study. Future research is needed to account for individual differences in the trajectories of dual receptive and expressive growth in bilingually developing children.

Limitations and Conclusions

The present study measured only vocabulary and assessed vocabulary at only two time points. All conclusions are made on the assumptions that vocabulary knowledge indexes language proficiency more generally and that developmental changes from 4.5 years to 10 years can be extrapolated. To the degree that those assumptions are met, the present findings are evidence that expressive and receptive skills can follow different growth trajectories and that a child's skills in one of these domains cannot be inferred from skills in the other. The findings support an account of bilingual development in which expressive skills in the language that is heard and used less will grow at a slower rate than receptive skills. For children who grow up hearing a minority language at home but who attend school in the societal language, the result will be a substantial and growing gap between the home and school language in children's abilities to express themselves, but a smaller and slower developing gap in their abilities to understand. Finally, these longitudinal data suggest continuity between the receptive-expressive gap observed in bilingual children and the receptive bilingualism often observed in adults.

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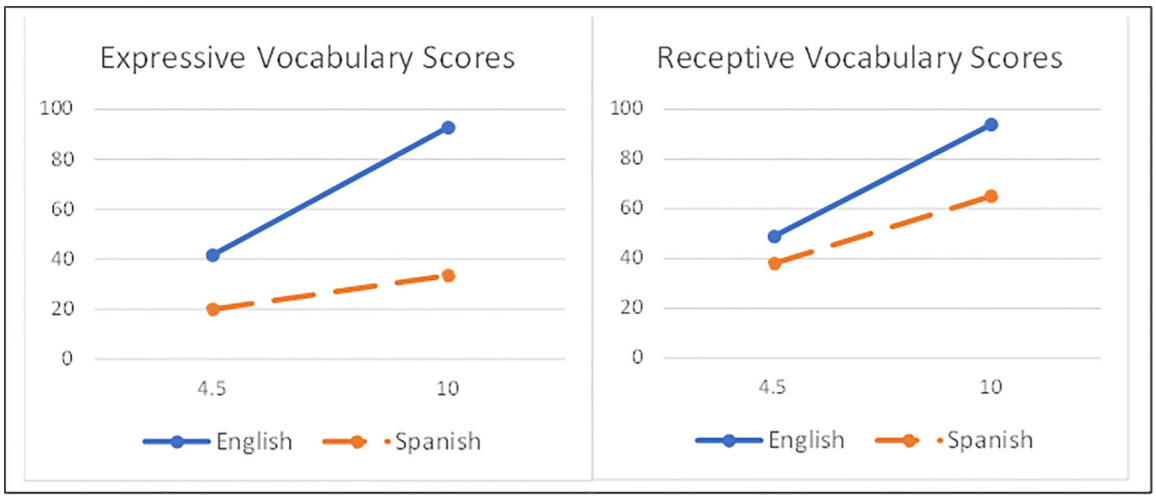

Figure 1.
Mean expressive (EOWPVT) and receptive (ROWPVT) vocabulary scores at 4.5 and 10 years, N = 52

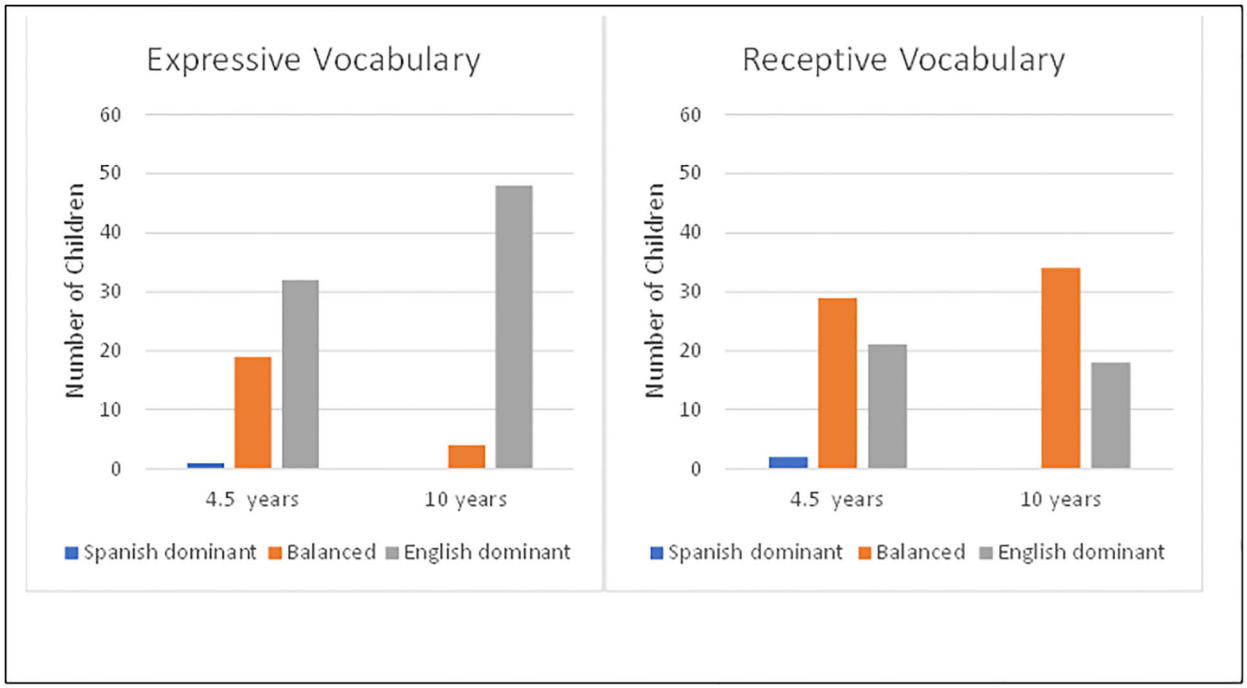

Figure 2.

Frequencies of Spanish dominance, balanced proficiency, and English dominance in bilingual children at 4.5 and 10 years in expressive and receptive vocabulary, N = 52.

Table 1

Means and 95% confidence intervals for subtraction and ratio score measures of bilingual children's English dominance in expressive and receptive vocabulary at 4.5 and 10 years

Measure	Child Age			
	4.5 years		10 years	
	Mean	CI	Mean	CI
Subtraction score[1] (N = 52)				
Expressive vocabulary	21.808	[15.850 – 27.765]	59.135	[53.308 – 64.962]
Receptive vocabulary	10.885	[6.479 – 15.290]	28.596	[22.274 – 34.918]
Subtraction score[1] (*n* =33)				
Expressive vocabulary	32.515	[26.612 – 38.418]	67.667	[60.669 – 74.665]
Receptive vocabulary	20.000	[16.160 – 23.840]	37.849	[29.986 – 45.711]
Ratio score[2] (*n* =33)				
Expressive vocabulary	.291	[.201 – .381]	.263	[.200 – .325]
Receptive vocabulary	.608	[.541 – .675]	.596	[.511 – .680]

[1] English raw score minus Spanish raw score

[2] Spanish raw score/English raw score

Note: Subtraction scores reported for the full sample (N=52) and for those children who were consistently English dominant (n = 33). Ratio scores reported only for those children who were consistently English dominant across time and measures