
French–English Bilingual Children With SLI: How Do They Compare With Their Monolingual Peers?

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The goal of this study was to determine whether bilingual children with specific language impairment (SLI) are similar to monolingual age mates with SLI, in each language. Eight French–English bilingual children with SLI were compared to age-matched monolingual children with SLI, both English and French speaking, with respect to their use of morphosyntax in language production. Specifically, using the extended optional infinitive (EOI) framework, the authors examined the children’s use of tense-bearing and non-tense-bearing morphemes in obligatory context in spontaneous speech. Analyses revealed that the patterns predicted by the EOI framework were borne out for both the monolingual and bilingual children with SLI: The bilingual and monolingual children with SLI showed greater accuracy with non-tense than with tense morphemes. Furthermore, the bilingual and monolingual children with SLI had similar mean accuracy scores for tense morphemes, indicating that the bilingual children did not exhibit more profound deficits in the use of these grammatical morphemes than their monolingual peers. In sum, the bilingual children with SLI in this study appeared similar to their monolingual peers for the aspects of grammatical morphology examined in each language. These bilingual–monolingual similarities point to the possibility that SLI may not be an impediment to learning two languages, at least in the domain of grammatical morphology.

KEY WORDS: bilingualism, specific language impairment, first language acquisition, acquisition of morphosyntax, second language acquisition

The recent cross-linguistic research on the grammatical deficits exhibited by children with specific language impairment (SLI) has deepened our understanding of the essential nature of this disorder by demonstrating how impairment affects the language faculty regardless of what language is being learned (e.g., French: Jakubowicz, Nash, Rigaud, & Gérard, 1998; Paradis & Crago, in press-b; German: Rice, Ruff Noll, & Grimm, 1997; Hebrew: Dromi, Leonard, Adam, & Zadunaisky-Ehrlich, 1999; Italian: Bortolini, Caselli, & Leonard, 1997; Inuktitut: Crago & Allen, in press; and Spanish: Bedore & Leonard, 2001; Restrepo & Gutierrez-Clellen, 2001, inter alia). Although these cross-linguistic investigations with monolingual children have been instructive in elucidating the characteristics of SLI in different languages, they leave open the question of whether these characteristics are altered when two different languages reside within one individual. It would be of both theoretical and practical interest to know whether or not bilingual children with SLI could be considered “two monolinguals in one” with respect to the grammatical deficits they display in their two languages.

On the theoretical side, understanding how similar and dissimilar the manifestations of SLI are in bilingual and monolingual children would shed light on the capacity of an impaired language faculty to cope with dual language development. On the practical side, it would be important to know whether bilingualism is an impediment to acquisition under conditions of impairment in order for parents and professionals to make informed choices about language use with bilingual children in the home and in school.

There is a dearth of research on bilingual children with SLI, even though there are many bilingual children in North America, and even worldwide (Tucker, 1998). A small body of research has focused on issues in the effective assessment and treatment of bilingual children with language disorders, and in the differential diagnosis of bilingual children who are normally developing from those with language disorders (Damico, Oller, & Storey, 1983; Gutierrez-Clellen, 1996; Nicoladis & Genesee, 1997; Perozzi & Chavez Sanchez, 1992; Schiff-Myers, 1992; Thordardottir, Ellis Weismer, & Smith, 1997; Westernoff, 1991). While offering important insights in applied domains, none of this research includes systematic comparisons of the linguistic characteristics of SLI in bilingual and monolingual children. Similarly, Bruck's (1982) study of the educational outcomes of English-speaking children with SLI in French immersion schools is important in that it demonstrated that these children appeared to learn as well in a second language environment as their counterparts with SLI who were enrolled in English language schools. However, Bruck's study did not include information about the children's oral proficiency in the French language and how it compared to their own English proficiency and to the French proficiency of their unaffected classmates.

Another lacuna in the prior research is the lack of precision in the definition of bilingualism. The term "bilingual children" has been used quite generally to refer to children who know two languages, without regard for whether they learned them in sequence or simultaneously, or whether they are still in the early stages of learning one of the two languages. For the purposes of this study, we use *bilingual* to refer to children who learn two languages simultaneously from birth or shortly after, and *second language* (L2) to refer to children who acquire two languages in sequence, and who may still be in the process of learning their second language (de Houwer, 1995; Vihman & McLaughlin, 1982). We prefer the term *dual language* to cover both the bilingual and L2 groups. The population of second language children is most likely larger than that of simultaneous bilinguals in North America. In particular, children whose first language is Spanish and who begin learning English as their second language at or just before school entry are a significant population of dual language children in certain regions of

the United States (see Bedore & Leonard, 2001; Gutierrez-Clellen, 1996; Restrepo & Gutierrez-Clellen, 2001). Although L2 children are possibly more numerous, they are not the optimal population with which to study the impact of dual language learning on SLI. This is because, by definition, they have had significantly less exposure to, and practice with, one of their two languages at school entry. Thus, any differences found between the English of an L2 child with SLI and the English of a monolingual child with SLI might be due to the L2 child's incomplete grasp of English, and not due to the potentially complicating effects of dual language learning on SLI. In contrast, simultaneous bilinguals, by definition, have had extensive and continuous exposure to and practice with both their languages by school entry, and therefore, any bilingual-monolingual differences in the SLI population could be more readily attributed to the effects of dual language learning on SLI.

An absence of appropriate differentiation between bilingual and L2 children is a confounding factor in the only extant study comparing the linguistic performance of monolingual and dual language children with SLI. Crutchley, Conti-Ramsden, and Botting (1997) compared the performance of bilingual (their definition) and monolingual children with SLI on a range of standardized language assessments in English and found that the bilingual children scored lower than the monolingual children on each kind of test. At a glance, these results might be interpreted as indicating that dual language learning has a deceleration effect on development under conditions of language impairment, effectively making the symptoms of impairment more severe than in monolinguals. However, all the bilingual children (with one exception) were from language minority backgrounds, typically from immigrant families, and in a majority English-speaking society; thus, most of them were actually L2 children. The composition of Crutchley et al.'s sample makes it difficult to understand whether knowledge of two languages was the source of the poorer performance of the bilinguals in comparison to monolinguals, or whether the bilingual children simply had not learned enough English at the time of testing to perform at the level of their monolingual peers—that is, a result no different from what one may expect from unaffected L2 children in comparison to their unaffected monolingual peers.

To summarize, the scant prior research does not present adequate information about the impact of dual language learning on SLI. As a step toward this broad goal, we designed the present study to compare one aspect of expressive language among three groups of children with SLI: French monolingual, English monolingual, and French-English bilingual. More specifically, we designed this study to address the following question: Do bilingual children with SLI exhibit difficulties with the same morphosyntactic structures, and to the same extent,

as monolingual children with SLI in each language? Comparing the morphosyntactic abilities of bilingual children with SLI to those of monolingual age mates with SLI, in both languages, will further our understanding of whether bilingualism makes children with SLI display distinct behavior in this domain of language and, in so doing, inform us of the impact of dual language learning on SLI.

Simultaneous Bilingual Development: Dominance and Interdependence

Why would one expect the linguistic abilities of simultaneous bilingual children, with or without SLI, to be any different from those of monolingual children? In other words, it might be expected that, unlike L2 children, bilingual children could be considered “two monolinguals in one” because they have had extensive and sustained exposure to two languages from birth. Although bilingual children show many parallels to monolingual children, certain properties of their language development can cause them to appear unique. Our purpose in this section is to provide a sketch of how normally developing bilingual children are both similar and dissimilar to monolinguals, with a view to providing a rationale for our research question.

Some researchers have argued that children who acquire two languages simultaneously begin their acquisition process by establishing a unitary linguistic system for their dual language input, which only separates into two systems later (see Genesee, 1989, for review). However, much recent research has demonstrated that bilingual children have differentiated phonological, lexical, morphosyntactic, and discourse-pragmatic systems as early in development as 18 months of age (de Houwer, 1990; Genesee, Nicoladis, & Paradis, 1995; Johnson & Lancaster, 1998; Meisel, 1989; Paradis & Genesee, 1996; Quay, 1995, *inter alia*; except see Deuchar & Quay, 2000). In addition, many researchers have found that the overall patterns of language development in bilingual preschool children parallel those of monolinguals (de Houwer, 1990; Doyle, Champagne, & Segalowitz, 1978; Meisel, 1989, 1994; Nicoladis, 1995; Padilla & Liebman, 1975; Paradis & Genesee, 1996, 1997), with the possible exception of receptive vocabulary size (Doyle et al., 1978; Nicoladis & Genesee, 1996b; Rosenblum & Pinker, 1983; Umbel, Pearson, Fernández, & Oller, 1992). In contrast, two properties of bilingual development, dominance and crosslinguistic interdependence, could be a source of some dissimilarities between bilinguals and monolinguals.

Almost all studies of simultaneous bilingual children have found that even though they have been acquiring two languages from birth, these two languages often do not develop in perfect synchrony. The language in which bilingual children appear to have greater proficiency is

commonly referred to as their dominant language and the other as the nondominant language. Most researchers of simultaneous bilingual children consider dominance to be a measure of *relative* proficiency between the two languages that the child is learning; dominance is not typically construed as meaning a simultaneous bilingual child is incompetent in one of his or her languages (Genesee et al., 1995). Dominance can change over time and is typically closely linked to the amount of input the bilingual child receives in each language, which is seldom equal (see Genesee et al., 1995; Nicoladis, 1995). Dominance in one language may extend to the age of school entry and is a factor throughout the lifespan of most bilinguals (Baetens-Beardmore, 1982). Although dominance has been found to play a role in bilingual children’s language choice and use as a function of context and interlocutor (Genesee, Boivin, & Nicoladis, 1996; Genesee et al., 1995; Nicoladis & Genesee, 1996a), there is no consensus among researchers on the role of dominance on the acquisition rate of a particular aspect of morphosyntax (Paradis & Genesee, 1996, 1997; Schlyter, 1994; Schlyter & Håkansson, 1994). More specifically, it is largely unknown whether one could expect a bilingual child to acquire grammatical morphology more slowly in their nondominant language than in their dominant language. It is important to consider the role of dominance in the present study because a bilingual child with SLI might display levels of accuracy with morphosyntax similar to monolinguals with SLI, but in only their dominant language, and not in their nondominant language.

Another relevant property of bilingual acquisition is the interdependence of the children’s two developing languages. Although there is substantial evidence against the unitary language system hypothesis as described above, researchers have found that a bilingual child’s two language systems can interact with each other during acquisition. Paradis and Genesee (1996) identified three potential outcomes of interdependence in bilingual acquisition: acceleration, deceleration, and transfer. Acceleration means that a grammatical property may emerge earlier in one language than is typical in the monolingual context, presumably because of a facilitative influence of an analogous structure in the other language. Deceleration refers to the notion that the double burden of acquiring two languages slows down the process overall or, for particular structures, in both languages. Transfer refers to a process whereby a linguistic structure (e.g., word order in relative clauses) is borrowed from one language into the other for a temporary period during development. The outcome of such transfer would be some unique structural patterns in bilingual children’s expressive language when compared with monolinguals learning that language.

Researchers have found evidence for transfer in the phonological, morphological, and syntactic domains in

preschool bilingual children (Döpke, 1998; Müller & Hulk, 2001; Paradis, 2001; Yip & Matthews, 2000). In contrast, there has been no thorough and systematic research on the other forms of interdependence, and thus no evidence to date that acceleration or deceleration occur in normally developing bilingual children, although the folk wisdom on bilingualism would suggest the latter to be evident. It is relevant to investigate whether deceleration is apparent in bilingual children with SLI because even without dual language learning, children with language impairment display slower and protracted developmental growth in expressive language skills when compared to unaffected children. With respect to the present study, if the bilingual children with SLI display lower levels of accuracy with morphosyntax in both languages than their monolingual peers with SLI, this could be construed as evidence for bilingualism causing delay.

The Extended Optional Infinitive Phenomenon in SLI

Cross-linguistic research on grammatical deficits in SLI in Germanic and Romance languages has revealed that grammatical morphemes pose significant problems for children with this impairment (e.g., Bedore & Leonard, 2001; Bottari, Cipriani, Chilosi, & Pfanner, 2001; Clahsen, Bartke, & Göllner, 1997; Hansson, 1997; Paradis & Crago, in press-b; Rice et al., 1997). Cross-linguistic differences arise in the specific kinds of grammatical morphemes affected, and in the relative prominence of finite verbal morphology vis à vis other grammatical morphemes as loci of difficulty. Because deficits in finite verb morphology have been documented in both French and English SLI, this is an appropriate aspect of morphosyntax to focus on in order to address our question: Do bilingual children with SLI exhibit difficulties with the same morphosyntactic structures, and to the same extent, as monolingual children with SLI in each language?

In this study, the children's production of finite verbal morphology was investigated using the extended optional infinitive (EOI) account (Rice & Wexler, 1996; Rice, Wexler, & Cleave, 1995; Rice, Wexler, & Hershberger, 1998, inter alia). The key claim of this account is that not all grammatical morphemes cause equal problems for children acquiring language with SLI. The EOI proposal is that tense-bearing morphology is a more pernicious source of deficits when compared with non-tense-bearing morphology. Tense-bearing morphology refers to both bound and unbound morphemes, such as inflectional suffixes and auxiliary verbs. Thus, tense-bearing morphology in this account does not refer to the surface form of individual morphemes, but rather it refers to a collection of morphemes of various forms that have in common the abstract grammatical feature

tense <tns> and, in some cases, agreement <agr> (for an elaboration of the ATOM account, see Wexler, 1998; Wexler, Schütze, & Rice, 1998).

Children's utterances without obligatory tense-bearing morphemes are called root infinitives, and because absence of tense marking is typically a variable process, the stage in development where this process occurs is the *optional infinitive stage*. The optional infinitive (OI) stage describes a period in normal development, and the *extended OI stage* refers to an analogous, but not identical stage, in impaired acquisition. In English, children in the OI/EOI stage optionally omit tense and tense/agreement inflections such as past [-ed] and the third-person singular present habitual [-s], as well as tense-bearing auxiliary verbs and the copula. The resulting root infinitive utterances are like those given in (1), with either the uninflected verb stem (1a), a bare participle (1b), or a zero copula (1c). The reason why an omitted copula is considered omission of tense/agreement morphology is that because this verb form can be considered to have no inherent meaning, its function is to bear tense/agreement features (Rice & Wexler, 1996; Wexler, 1998).

- (1)
- | | | |
|------------------------|-------------|-----------------------------------------|
| a. The truck go | in there. | [target: the truck goes in there] |
| b. The truck going | over there. | [target: the truck is going over there] |
| c. A truck over there. | | [target: a truck is over there] |

At the same time as children are showing difficulties with tense marking on verbs, they show comparatively greater accuracy with other aspects of grammatical morphology. For example, Rice and colleagues examined children's accuracy with non-tense morphemes like plural [-s] in noun phrases, the prepositions in/on, and the progressive [-ing] verbal suffix. Both 3-year-old normally developing (ND) children and older children with SLI showed significantly higher accuracy rates with non-tense than with tense morphemes. This finding suggests that in the OI/EOI stage, morphemes associated with tense are particularly vulnerable, and children do not have a generalized and equally distributed difficulty with all grammatical morphology.

Although a selective deficit on tense is common to both the OI and EOI stages, it is not the case that the EOI account suggests SLI to be a simple delay in normal development. Rice and Wexler (1996) showed that 3-year-old children who were matched by mean length of utterance in morphemes (MLU) to 5-year-old children with SLI were optionally omitting tense markers but to a much greater degree than younger controls. The 3-year-olds

were achieving accuracy rates of approximately 60% with tense morphemes, whereas the children with SLI achieved a mean accuracy rate of about 30%. This difference in profile for tense-bearing morphology use with language level being held constant indicates that the EOI characterization of the grammatical impairment in SLI embodies both the notions of delay and deviance (cf. Leonard, 1998). A final point about the EOI account is that Rice and colleagues do not make the claim that a selective deficit on tense is the only possible grammatical clinical marker in English or in other languages (see Rice & Wexler, 1996; Rice et al., 1998). Instead, the claim is that the properties of the acquisition of tense-bearing morphology in the affected and unaffected population make this aspect of morphosyntax an effective grammatical clinical marker in English, and potentially in other languages.

Research on tense marking in French-speaking children has shown that the OI account is applicable to the French context, although there are some differences with English (Ferdinand, 1996; Paradis & Genesee, 1996, 1997; Pierce, 1992). In contrast with English, the infinitive in French is an inflected form and the uninflected verb stem is the present tense form for the majority of regular verbs. Thus, the substitution of the infinitive for the present tense verb form, as exemplified in (2a), constitutes a root infinitive analogous to (1a). French does not have a periphrastic present tense such as the progressive, but the perfective past is a periphrastic verb form; therefore, bare past participle constructions (i.e., dropped auxiliary verbs) appear in the OI stage, as shown in (2b), which is parallel with the English example in (1b). Like English, copula omission is also found during the OI stage in French and an example is given in (2c).

(2)

- | | |
|------------------------------------------------------------------------------|----------------------------------|
| a. Le camion roul-er là
the truck roll-INF there
'truck go over there' | [target: le camion
roule là] |
| b. Le camion part-i
the truck leave-PASTPART
'truck gone' | [target: le camion
est parti] |
| c. Un camion là
a truck there
'truck over there' | [target: un camion
est là] |

Research on French-speaking children with SLI indicates that like their English-speaking counterparts, they optionally omit tense-marking morphology and display the same asymmetry between their abilities with tense and non-tense morphemes (Jakubowicz, Nash, & van der Velde, 1999; Paradis & Crago, 2000, in press-b). The French-speaking children with SLI studied in

Paradis and Crago (2000, in press-b) were marking tense about 82% of the time in obligatory context, as were the 7-year-old English-speaking children with SLI studied by Rice et al. (1998). However, the French-speaking children with SLI differed from their English-speaking peers with respect to how their language profiles lined up with those of younger, normally developing children at the same level of language development. In contrast to what Rice and colleagues found for English, Paradis and Crago found that French-speaking 3-year-olds matched by mean length of utterance in words (MLUW) to the children with SLI were at the very end of the OI stage, as evidenced by the fact that they marked tense more or less obligatorily (above 90%), like normally developing 7-year-old French-speaking children.

Predictions for the EOI Phenomenon in Bilinguals With SLI

If bilingual children with SLI demonstrate the same EOI pattern in both their languages as monolinguals do in one, they will display more profound deficits with tense-bearing than with non-tense-bearing morphology. Such a result would indicate that bilingual children with SLI have difficulties with the same morphosyntactic structures as monolingual children with SLI. The effects of dominance and deceleration are predicted to impact the extent of the difficulties with tense-bearing morphology shown by bilingual children. First, it is possible that bilingual children would show lower accuracy levels with tense-bearing morphology in their nondominant than in their dominant language, causing them to appear "more impaired" than monolinguals for one of their two languages. Second, it is possible that bilingual children would show lower accuracy levels with tense marking in both their languages, when compared to monolinguals, if their overall development is delayed.

Method

Participants

Our participants were three groups of children with SLI. A group of French–English bilingual children with SLI was recruited specifically for this study, and then appropriate age-matched cohorts from the previously collected data of monolingual French- and English-speaking children with SLI were selected. The monolingual children with SLI were shown in our previous work to have below age-level and language-level expected use of the target tense-bearing morphemes via comparisons with age-matched and MLU-matched, normally developing (ND) control groups. In order to focus on the monolingual versus bilingual SLI comparisons in the present study, these ND control groups have

not been included; however, the interested reader can examine our prior work for information on these ND–SLI comparisons (Paradis & Crago, 2000, in press-b, for French; Rice et al., 1995, 1998; Rice & Wexler, 1996, for English).

Bilingual Group

Eight bilingual children with SLI (mean age = 83 months [6;11]) participated in this study. The children had to meet certain criteria for inclusion in the study both as simultaneous bilinguals and as children with SLI. Simultaneous bilingualism was assessed through a questionnaire about the child's and the parents' language background from birth until the time of testing (completed by the parents with help from a research assistant) and through the research assistants' pretest interaction with the child. All of the children had been exposed to both French and English continuously from birth, and all spoke both languages productively and spontaneously at the time of our data collection. The parents' report of their children's spontaneity in both languages was confirmed by the research assistants' observations before the child was included in the study. Six of the 8 children received their language input according to the "one-parent one-language" style of presentation, where the English-speaking parent spoke mainly English to the child and the French-speaking parent spoke mostly French. Another child received mixed French and English input from one parent and English input from the other. The 8th child received both French and English input from his single-parent mother. In 6 of the families, both parents labeled themselves as bilingual, and most acquired both languages in childhood. The other 2 children's fathers had only a little or no knowledge of French. The children's families resided in bilingual areas of central Canada, either in or on the border of the predominantly French-speaking province of Québec. Hence, it is highly likely that these children were regularly exposed to French and English not only in the home, but in the community as well. Seven of the 8 children were attending French language schools or preschools. The other child attended a bilingual preschool from the ages of 3 to 5 years and was in the first grade at an English school at the time of testing.

All of these bilingual children were referred to us through certified speech-language pathologists (SLPs), and 7 of the 8 children were receiving speech-language treatment at the time of data collection. The 8th child had undergone a pre-evaluation only. Some of the children had been described as *dysphasique* (a French term that corresponds to SLI), language delayed, or SLI; however, in one case, language characteristics were described narratively, and no label was given. Regardless of the label or lack thereof, all of the children

had the following characteristics according to SLP, parent, or school report: (1) normal hearing levels; (2) no stuttering; (3) no severe phonological disorder; (4) no frank neurological problem (except 1 child had attention deficit disorder); (5) normal nonverbal intelligence as determined through scores on standardized tests (Leiter International Performance Scale–Revised [Leiter-R; Roid & Miller, 1997], Stanford–Binet Intelligence Scale [Stanford–Binet; Thorndike, Hagen, & Sattler, 1986], or Raven's Colored Progressive Matrices [Raven's Matrices; Raven, 1986]) and verbal IQ at least 1.5 *SDs* below the mean, or in a substantially lower percentile than their nonverbal IQ; and (6) scores lower than 1 *SD* below the mean on a standardized language test battery in one language, and a score lower than 1 *SD* below the mean on at least half of the subtests on a standardized language test in the other language (e.g., Test of Language Development 2–Primary [TOLD-P; Newcomer & Hammill, 1988], Clinical Evaluation of Language Fundamentals–3rd Edition [CELF-3; Semel, Wiig, & Secord, 1995], and Tests de Language Dudley/Delage [TLDD; Dudley & Delage, 1980; a standardized test of Québec French]). Regarding Criterion 6, the children were tested in both languages, and all children scored below the normal range in one language. Most children also scored below the normal range in their other language, but in the case of 2 children, for one of their languages, they scored within the normal limits on some subtests. The profile of these 2 children is the reason for the complex wording of Criterion 6. If the children had not been tested within the year, we tested them for nonverbal IQ using the Leiter-R, and for language using TOLD-P (English) and TLDD (French), in order to be certain that they still met the criteria for inclusion in the study.

Monolingual English Group

The English monolingual group consisted of 21 children with SLI who were residing in the Lawrence, Kansas, area at the time of data collection. These children were all participants in a 2-year longitudinal study, and the data we report here are from the phase in this study when the children with SLI were the closest in age to the bilingual children with SLI. At time of initial recruitment, the English-speaking children with SLI had been receiving intervention from certified SLPs in the year prior to kindergarten, and they met the following criteria for inclusion: (1) receptive and productive language performance 1 or more *SDs* below the mean for age expectations, (2) intellectual levels within the normal range, (3) no social–behavioral impairments, (4) normal hearing levels, and (5) no severe articulatory difficulties. These children with SLI continued to show below age-expected language abilities throughout the 2-year study. For more details, see Rice et al. (1998).

Monolingual French Group

The French monolingual group consisted of 10 children with SLI who were residing in the greater Montreal area, in the province of Québec in Canada, at the time of data collection. The children were recruited from special language classes in the public schools, and the normally developing children were recruited from summer camps and daycares. The children with SLI had been assessed by certified SLPs as *dysphasique* and belonged to either the subcategory “phonological-syntactic” or “lexical-syntactic,” both of which include morphosyntax as a core problem area. At the time of assessment, these children all scored 1.5 *SDs* or lower on the TLDD. They also met the following criteria for inclusion: (1) IQ within the normal limits, (2) no significant hearing loss, (3) no frank neurological damage, (4) no severe articulation problems, and (5) no social-emotional difficulties. For more details, see Paradis and Crago (in press-b).

Summary of Participants

The children’s ages, MLUW from 100 consecutive utterances in the transcripts, and sample size for group are presented in Table 1. The following abbreviations for the groups are used henceforth: ESLI = English-speaking children with SLI, BSLI = French-English bilingual children with SLI, FSLI = French-speaking children with SLI. E-BSLI and F-BSLI will be used when distinguishing between the two languages of the bilingual group.

The BSLI, FSLI, and ESLI children were all roughly 7- to 7-and-a-half years old (83–91 months) at the time of study. Mann-Whitney *U* comparisons of the mean ages of the following pairs showed that the children were appropriately age matched (BSLI = 83 vs. ESLI = 85, $z = -0.07$, $p > .05$; BSLI = 83 vs. FSLI = 91, $z = -1.777$, $p > .05$). Mann-Whitney *U* comparisons of mean MLUW also showed that these children were all at roughly the same level of language development (F-BSLI = 3.977 vs. FSLI = 3.977, $z = -1.244$, $p > .05$; E-BSLI = 3.801 vs. ESLI = 4.189, $z = -1.854$, $p > .05$).

Table 1. Mean ages and MLUWs for the bilingual and monolingual children.

Language group	Age ^a	<i>n</i>	MLUW
ESLI	85	21	4.312
E-BSLI	83	8	3.801
F-BSLI	83	8	3.977
FSLI	91	10	3.977

Note. MLUW = mean length of utterance in words; ESLI = English specific language impairment; E-BSLI = English of the bilingual SLI group; F-BSLI = French of the bilingual SLI group; FSLI = French SLI.
^aMonths.

Procedures

We used coded spontaneous language samples as the data for this study. The primary reason for this choice was because this was the kind of data available from all the comparison groups. A secondary reason was because bilingual children with SLI are a relatively special population. We did not want to design an experimental paradigm for our initial investigation into a small sample of this population, but instead chose a method that is more likely to reliably yield data suitable for analysis.

Bilingual Group

The families of the bilingual children were initially visited by a research assistant and given a language background questionnaire. The Leiter-R, TOLD-P, and TTLD were administered if the child had not been tested within a year. On two subsequent visits, naturalistic 30–45-min play sessions with the child were videotaped, one in French and one in English. Both the parent and a research assistant who spoke the language of the session natively interacted with the child. The videotapes were transcribed according to the CHAT system (<http://childes.psy.cmu.edu>; MacWhinney, 2000) by the same bilingual research assistants who collected the data. Accuracy of transcription was verified using the following procedures. Thirty percent of each transcript was retranscribed from the videotapes by a different research assistant and then compared with the original transcription. First, a word agreement score was calculated by dividing the number of discrepant words by the total number of words. Word agreement scores for transcriptions were 83% for English and 81% for French. Second, percentage of discrepant utterances out of the total number of utterances was calculated to make an utterance agreement score. Utterance agreement scores were 92% for English and 88% for French. Composite agreement scores are 87.5% for English and 85% for French. The higher utterance agreement scores indicated that many of the word discrepancies were located within the same utterances. Finally, discrepant words and utterances were reviewed by the two assistants together, and a final decision on the transcription was obtained through consensus. Some utterances with multiple discrepant words were discarded from further analysis due to the inability to reach consensus.

Monolingual Groups

For the English-speaking children, data were collected in multiple sessions over 2 years. Sessions included taping naturalistic language production and responses to language probes, both of which were tasks designed to elicit production of certain target morphemes. The data for the present study come from the

naturalistic language production transcripts only. Because of this, some of the tense composite scores given here are somewhat different than those reported by Rice et al. (1998). For the French-speaking children, naturalistic language production data were collected in 45-min play sessions with students in a master's program in speech and language pathology, all of whom spoke French as their native language. Both the English and French monolingual children's spontaneous transcripts were checked for reliability. See Rice et al. (1998) and Paradis and Crago (in press-b) for further details on the reliability procedures.

Coding and Analyses

Transcripts were coded for use in obligatory context of the same tense morphemes in French and English that we have examined in our prior work on monolinguals. The reasons for examining the same morphemes are essentially replicability and comparability with the previously collected data from the monolingual groups. English tense-bearing morphemes used for this study were *be* as an auxiliary verb, *be* as the copula, third-person singular [-s], past tense [-ed], and irregular past tense. French tense-bearing morphemes used were: *être* [*be*] as the copula; *être/avoir* [*be/have*] as auxiliary verbs in the periphrastic (perfective) past tense (*passé composé*), which consists of the auxiliary and the past participle; *aller* [*go*] as the auxiliary verb in the periphrastic future tense (*futur proche*), which consists of the auxiliary and the infinitive, and the verb stem, which is the regular present indicative form for most persons in the paradigm. Other verb paradigms in French, such as the imperfective past (*imparfait*), were not used frequently enough by all the children or with a wide enough variety of verbs, and so could not be examined. Table 2 has a list of the tense morphemes in French and English, along with example utterances illustrating correct use and omission.

Transcripts were also coded for the use of non-tense-bearing morphemes in obligatory context in each language. The purpose of analyzing non-tense morphemes was to demonstrate that the children with SLI did not have equal problems with all grammatical morphology and, thus, displayed the EOI pattern. Our prior work showed that monolingual French- and English-speaking children with SLI did not have difficulty supplying these morphemes, so they were appropriate control forms. Non-tense morphemes in English were the progressive [-ing], prepositions *in/on*, and plural [-s], all from the set examined in Rice et al. (1995) and Rice and Wexler (1996). Direct translation equivalents for the English non-tense morphemes could not be used in French because of semantic and structural cross-linguistic differences. The non-tense morphemes used in French

were definite and indefinite determiners (*le, la, les* [definite: masc, fem, plural] and *un, une, des* [indefinite: masc, fem, plural]) and the prepositions *à/de* [*to/of/from*]. Unlike in English, Spanish, and Italian (Bedore & Leonard, 2001; Bottari et al., 2001; Restrepo & Gutierrez-Clellen, 2001; Rice & Wexler, 1996), French-speaking children with SLI do not have difficulties supplying determiners, so they make an appropriate control morpheme for this language comparable to the English set (cf. Jakubowicz et al., 1998; Paradis & Crago, in press-a, in press-b). Also, in spoken French the feature plural is marked on the determiner, not on the noun, unless the noun is irregular, so examining determiners was the closest analog for plural [-s] in English. The prepositions *à/de* were chosen because the contexts for these prepositions were more frequent in the transcripts than the approximate translations of *in/on* [*dans/sur*], and in any case, *dans/sur* are not used in identical constructions to *in/on* in English. As with the tense morphemes, Table 2 has a list of the non-tense morphemes in French and English, along with example utterances illustrating correct use and omission.

Because we used naturalistic language production data, each child used the target morphemes at different frequencies. For this reason, our accuracy scores are expressed in percentage correct out of obligatory contexts. If a child's transcript did not contain at least four obligatory contexts for a certain target morpheme, that child did not receive a score for the use of that morpheme because it was thought that the percentage calculated from a denominator of less than four would not be a reliable indicator of a child's ability to produce that morpheme. There were only two instances in our entire analyses of children not having the minimal four contexts criterion for inclusion of their score in the group data.

Using the same method for the transcription described above, we conducted reliability checks on the grammatical morpheme coding for the bilingual data, and an 88% rate of agreement was found for both languages. Reliability rates for coding were the same or higher for the French and English monolingual groups. They are reported in our previous work (Paradis & Crago, in press-b; Rice et al., 1998).

Percentage correct in obligatory context scores were calculated for each tense and non-tense morpheme on the basis of frequencies obtained with CLAN, the analysis companion to CHAT in the CHILDES system. The percentage accuracy scores for the individual morphemes for all children in both languages are given in the Appendix. Composite scores for the categories tense and non-tense were calculated as a mean of the scores for the individual morphemes in each category. The reasons for calculating composite scores are both conceptual and

Table 2. Examples of tense and non-tense morphemes in English and French.

Morpheme		Target example	Omission error example
English			
tns	3s (3rd person singular)	The teddy wants juice	The teddy want juice
tns	past- <i>ed</i> (regular past)	Brendan baked a cake last night	Brendan bake a cake last night
tns	past-irreg (irregular)	I went to Grandma's house last weekend	I go to Grandma's house last weekend. ^a
tns	copula (<i>to be</i>)	This one <i>is</i> a pirate	This one a pirate.
tns	<i>be</i> -aux (pres. prog.)	Brendan <i>is</i> baking a cake.	Brendan baking a cake.
ntns	prog- <i>ing</i> (pres. prog.)	Brendan is baking a cake	Brendan is bake a cake.
ntns	<i>in/on</i> (preposition)	The juice is <i>in</i> the cup	The juice is the cup.
ntns	plural- <i>s</i> (for nouns)	The pirates are eating.	The pirate are eating.
French			
tns	Past-aux (<i>avoir/être</i> , passé-composé)	Brigitte a joué hier. [Brigitte played yesterday]	Brigitte joué hier.
tns	Fut-aux (<i>aller</i> , futur proche)	Brigitte va jouer avec grandmaman demain [Brigitte is going to play with Grandma tomorrow]	Brigitte jouer avec grandmaman demain.
tns	v-stem (pres. indic.)	Brigitte joueØ avec grandmaman [Brigitte is playing with Grandma]	Brigitte jouer avec grandmaman ^b
tns	copula (<i>être</i>)	Ce bonhomme <i>est</i> une pirate [This man is a pirate]	Ce bonhomme une pirate.
ntns	det (determiners)	<i>Le</i> nounours est là [The teddy is over there]	Nounours est là.
ntns	<i>à/de</i> (preposition)	Je vais <i>à</i> la cuisine [I'm going to the kitchen]	Je vais la cuisine.

Note. tns = tense morpheme; ntns = non-tense morpheme; pres. prog = present progressive; pres. indic. = present indicative.

^aCases where children used an overregularized form (i.e., *goed* for *went*) were counted as correct because we were interested in tense omission errors, not commission errors.

^bNote that the error related to the use of the verb stem in French is distinct from the others in that a tense marker is not being omitted, but rather, a nonfinite inflection is added to the stem. It is beyond the scope of this article to discuss the relevance of this distinction; however, see Paradis and Crago (in press-b), for an account of the verb stem in the tense marking system in French.

methodological. Conceptually, the rationale behind a composite score for tense is that, in spirit with the EOI account, we were not examining the ability to supply a collection of individual morphemes, but instead were examining the ability to encode an abstract grammatical feature, tense, which is manifested in different kinds of morphemes, both within and between the two languages. The methodological reason behind the composite scores is comparability with the OI/EOI findings in our prior work, which were based on composite scores.

An additional series of CLAN analyses was performed on the transcripts from the bilingual children to determine their dominant language, if any. Dominance was determined by five measures taken in each language: (1) MLUW, (2) upper bound/longest utterance (UB), (3) number of unique word types in a 100-utterance stretch of discourse, (4) number of unique verb types in the same 100-utterance stretch of discourse, and (5) number of utterances in 30 min of discourse. These measures were designed to obtain a multifaceted

(morphosyntax, lexical, and volubility) assessment of dominance, which is important given that dual language children can vary in proficiency between multiple measures (Gutierrez-Clellen, 1996). It is important to note that because the children were tested in a fully bilingual environment (their homes), it would not be expected that the context of testing would have caused them to perform differently in one of their languages (cf. Gutierrez-Clellen, 1996). If a child received a higher score in one language for four or five of the measures, he or she was considered dominant in that language. If a child showed a two/three split, then he or she was considered balanced with slight dominance in the language where he or she received a higher score for three measures. The results in Table 3 show that 4 of the children were English dominant, 1 was French dominant, 2 were balanced with slight English dominance, and 1 was balanced with slight French dominance. It is interesting to note that although 7 of the 8 children were in French schools, it was not the case that 7 of the 8 children were dominant in French.

Table 3. Dominance measures for the bilingual SLI group.

Name	MLU ENG	MLU FR	UB ENG	UB FR	WOR ENG	WOR FR	VER ENG	VER FR	UTTS 30 E	UTTS 30 F	DOM
ANI	3.415	4.007	14	16	110	88	23	19	283	306	Fr/bal
KYL	4.241	4.176	12	14	123	74	26	13	410	280	Eng
YAN	4.230	3.861	12	8	97	69	18	17	349	140	Eng
JOS1	3.965	2.801	12	9	110	92	17	22	315	213	Eng
ANT	4.437	3.787	13	12	104	118	23	27	271	290	Fr/bal
ERI	3.657	2.971	10	7	99	87	23	23	136	274	Eng/bal
MAT	3.625	3.055	12	11	106	88	22	21	333	312	Eng
JOS2	2.840	4.247	9	14	55	90	8	18	156	151	Fr

Note. SLI = specific language impairment; MLU = mean length of utterance in words; UB = upper-bound or longest utterance; WOR = number of unique word types in a 100-utterance stretch of discourse; VER = number of unique verb types in a 100-utterance stretch of discourse; UTTS/30 = number of utterances in a 30-min stretch of discourse; DOM = dominance (language dominance is marked by higher scores in one language for 4 or 5 of the measures. When the breakdown is 2 to 3, then the child is considered balanced or slightly dominant.); bal = balance.

Results

The means and ranges of the percentage correct composite scores for the tense and non-tense morphemes in English and French are diagrammed in Figures 1 and 2. Figure 1 illustrates the difference in tense and non-tense morpheme score distribution in English between ESLI and E-BSLI. The means for tense were between 80% and 90%, with broad ranges, for both the monolingual and bilingual children. In contrast, the means were above 90% for the non-tense morphemes, with considerably smaller ranges. Figure 2 shows the distribution of scores for the French tense and non-tense morphemes. The means for the tense morphemes were between 80% and 90%, as they

were in English, whereas the means for the non-tense morphemes were well above 90%. Also similar to the distribution in English, the ranges were broader for tense than non-tense in French. In sum, the greater variation and lower mean scores for tense than non-tense morphemes show that both the monolingual and bilingual children conformed to the expected EOI patterns.

The sample sizes render these data inappropriate for parametric statistical analyses; therefore, a series of nonparametric pairwise comparisons was performed. Comparisons using the Wilcoxon signed rank test within each group of children revealed that the means for tense were significantly lower than for non-tense, confirming that the expected EOI pattern held for both the bilinguals

Figure 1. Percentage correct tense and non-tense morphemes (means and ranges) for monolingual and bilingual English.

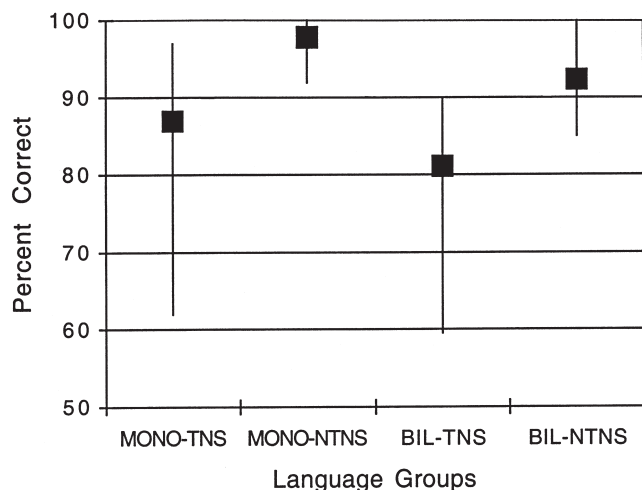
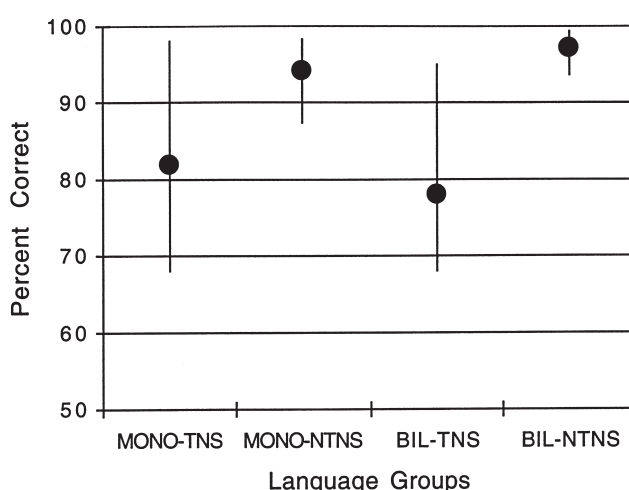


Figure 2. Percentage correct tense and non-tense morphemes (means and ranges) for monolingual and bilingual French.



and the monolinguals (ESLI = 87.3 vs. 97.8, $z = -3.986$, $p < .01$; E-BSLI = 80.1 vs. 92.4, $z = -2.521$, $p < .01$; FSLI = 81.9 vs. 94.9, $z = -2.701$, $p < .01$; F-BSLI = 89.7 vs. 97.1, $z = -2.366$, $p < .01$). In addition, Mann–Whitney U comparisons showed no significant difference between the monolingual and bilingual children for tense scores in each language, indicating that the bilingual children displayed difficulties with tense marking to the same extent as the monolinguals in both languages (ESLI = 87.3 vs. E-BSLI = 80.1, $z = -1.903$, $p > .05$; FSLI = 81.9 vs. F-BSLI = 89.7, $z = -1.866$, $p > .05$).

In spite of this similarity between the ESLI, FSLI, and BSLI groups as a whole, it is possible that on an individual basis, a bilingual child's dominance might have played a role in determining a differential score for tense in one language. Specifically, it might be the case that a child would have a higher tense accuracy score in his or her dominant language. In Table 4, we present the tense accuracy scores in each language for each bilingual child, along with his or her dominant language as determined by the measures given in Table 3. There was a match between dominance and language with a higher tense accuracy score for just 3 children, whose dominant language is shaded in gray. JOS1 was English dominant and had an 87% accuracy score in English compared to a 79.9% accuracy score in French. ANT was judged as balanced with a slight lead in French and tense accuracy scores fairly equal in both languages. Finally, JOS2 was dominant in French, matching his 94.5% score in French versus his 74.9% score in English.

Discussion

This study was undertaken to address the following question: Do bilingual children with SLI exhibit difficulties with the same morphosyntactic structures, and to the same extent in each language, as monolingual children with SLI? Use of morphosyntax in spontaneous speech was examined in three groups of children:

Table 4. Comparison of dominance and tense scores in both languages.

Name	Tense-English	Tense-French	Dominance
ANI	86.0	79.6	French/balanced
KYL	86.7	87.7	English
YAN	88.3	95.5	English
JOS1	87.4	79.9	English
ANT	90.1	91.8	French/balanced
ERI	68.1	96.0	English/balanced
MAT	59.6	92.5	English
JOS2	74.9	94.5	French

monolingual English-speaking, monolingual French-speaking, and bilingual French–English children with SLI. The bilingual children were simultaneous bilinguals and not second language learners; that is, they had been exposed to both languages consistently since birth. The morphosyntactic structures targeted in each language were sets of tense-bearing and non-tense-bearing morphemes. Composite scores for each set were calculated for the analyses.

According to the predictions of the EOI account, children with SLI learning languages like English and French should display substantial difficulties in supplying tense-bearing morphemes in obligatory context. In prior research on monolingual children with SLI, greater difficulties with tense marking morphemes was shown by lower accuracy and greater variation in scores, as compared to when they were provided non-tense (control) morphemes. Both the monolingual and the bilingual children in this study showed the pattern expected from the EOI account: tense morpheme accuracy scores in English and French were lower than accuracy scores for non-tense morphemes, and were more broadly distributed. Thus, we can conclude that the bilingual children with SLI displayed difficulties with this aspect of morphosyntax (tense), just like their monolingual peers. In other words, their dual language knowledge was not causing them to have different patterns of difficulty in this domain of morphosyntax than monolinguals.

This study was designed to find out not only whether bilinguals and monolinguals share the same areas of difficulty in morphosyntax, but also to find out whether they have difficulties to the same extent. This is important when comparing bilinguals with monolinguals for the following reasons: (1) Bilingual children tend to be dominant in one language and, thus, might have greater difficulties than monolinguals with tense-bearing morphology in their nondominant language; (2) it has been hypothesized, although not proven, that bilingual children might show decelerated development in both their languages because of the burden of acquiring two linguistic systems; thus, they might have greater difficulties than monolinguals with tense-bearing morphology in both their languages.

Among the bilingual children in this study, only 3 out of 8 showed a correspondence between lower tense accuracy scores and nondominant language. Thus, the majority of the bilingual children did not have lower tense scores in their nondominant language and so would not appear different from, or “more impaired” than, monolinguals in their nondominant language for this aspect of morphosyntax. Moreover, even for the minority of children who did show a tense-dominance relationship, their tense accuracy scores in their nondominant language were well within the range displayed by monolinguals, even if they

were below the mean. It is also important to point out that these 3 children still displayed the EOI pattern of lower tense than non-tense accuracy, even in their dominant language.

With respect to the “bilingualism-causes-delay” hypothesis, the comparisons conducted between the tense accuracy scores of the bilinguals and monolinguals for each language indicated no differences between the groups. In other words, the bilingual children appeared to have difficulties with tense marking to the same extent as the monolingual children with SLI in both languages. Thus, dual language learning was not causing the bilingual children in this study to be delayed in their acquisition of tense marking. Furthermore, the bilingual children supplied non-tense morphology with higher accuracy rates, also similar to those of the monolinguals. Thus, they did not have across-the-board difficulties with grammatical morphology, nor were they lagging behind the monolinguals for these morphemes, both of which might be expected if bilingualism was associated with general deceleration in development.

The results of this study suggest that bilingual children with SLI show the same deficit patterns with respect to tense-marking morphology in each language as monolingual children with SLI. These results also tentatively point to a broader conclusion that bilingual language learning might not interfere with the overall course of language acquisition, even under conditions of impairment. Further research needs to be undertaken before this broad conclusion can be substantiated, however. In particular, it would be important to compare bilingual children with SLI to normally developing bilingual children. Such a comparison group would be needed to understand whether a linguistic structure that seems unique in bilinguals with SLI is due to the combination of bilingual language learning and SLI or simply due to bilingual language learning. For example, in the present study, the pattern of language learning in bilinguals was like that of the monolinguals, but if it had not been, one could not say for certain whether bilingualism alone, or bilingualism in conjunction with acquisition under conditions of impairment, was the underlying cause.

Further Implications

The results of this study have implications beyond the investigation of bilingual–monolingual differences. For example, these data from the bilingual children with SLI are relevant to theoretical issues in cross-linguistic acquisition, such as how properties of the input language affect children’s acquisition of morphosyntax, in particular, the emergence of morphosyntax bearing <tns>/<agr> features (cf. Wexler, 1998). First, if the surface phonological properties of the individual morphemes in each target language were the primary determinant of their

level of difficulty for children with SLI, it would be difficult to explain why plural [-s] emerges in English before third-person singular [-s] (Rice & Wexler, 1996). Cross-linguistic data from French monolinguals contribute to this line of argument because the surface forms of tense-bearing morphology are distinct from those in English; for example, the auxiliary verbs in this study are composed of vowels only, yet the problems they pose for affected learners are similar. Furthermore, the French–English bilingual children provide strong validating evidence supporting the cross-linguistic parallels between English and French because these cross-linguistic parallels are apparent *within* one individual. A second and related point is the question of whether amount of exposure to individual morphemes in a target language is also a primary determinant of level of difficulty for children with SLI. For example, is it possible that the sparse inflectional morphology of English accounts for the difficulties of children with SLI? In other words, inflected verbs are less frequent in an English-speaking child’s input than in the input of a child acquiring a language like Italian, so inflected verbs might be more prodigious to acquire to English. This argument is less convincing upon examination of the data from the bilingual children with SLI. Because they are simultaneous bilinguals, their frequency of exposure to input in each language is, by definition, less than that of monolingual age mates, yet the levels of accuracy they displayed in supplying tense-bearing morphology were similar to those of their monolingual peers. One of the central tenets of the EOI account of SLI is that the abstract grammatical features of <tns> and <agr> are the underlying source of difficulty and, thus, that the surface forms of individual morphemes and differential frequency of exposure would not be expected to play a major role in the acquisition of <tns>/<agr> morphemes. The data from the bilingual children with SLI lend further support to this central tenet of the EOI account. In sum, research on bilingual children with SLI can effectively contribute to theoretical issues concerning acquisition in all children with SLI and should be pursued for this reason (among others).

In addition to theoretical implications, the results of this study are pertinent to clinical issues regarding simultaneous bilingual children. First, the similarities between the bilingual and monolingual children suggest the possibility that assessment and intervention protocols used for monolinguals, even if only available in one language, might be effective for bilingual populations (cf. Thordardottir et al., 1997). Investigating this possibility, and whether it holds for aspects of language other than grammatical morphology and for younger bilingual children, would be a worthwhile focus for future research. Second, the outcome of this study is also relevant for clinicians’ advice to parents on language choice.

Many educators and health care professionals counsel parents of bilingual children who show signs of language delay or impairment to stop raising the child bilingually; in other words, they are advised to choose only one language to use with that child (Juarez, 1983; Thordardottir et al., 1997). The decision for a family to eliminate one language from a child's input can have nontrivial consequences, such as changing educational and career opportunities, limiting the ability of relatives to communicate with the child, or altering the child's ethnic identity (cf. Thordardottir et al., 1997). If future research on bilingual children with SLI presents the same results as those of this study, then we would know, empirically, that the rationale behind this clinical practice is questionable. Thus, if future research shows that bilingual children with SLI are not more severely impaired than monolingual children with SLI, then there is no reason not to raise children with SLI bilingually. More than any other finding, this study demonstrates profound linguistic strengths in children with SLI. Instead of demonstrating that bilingualism impedes language acquisition under conditions of impairment, the children in this study showed that they had the ability to learn two languages despite their impairment.

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Appendix

Table A1. Accuracy scores (mean percentage/standard deviations) for individual morphemes in English.

	Tense morpheme group					Non-tense morpheme group		
	3S-s	past-ed	past-irreg	cop-be	aux-be	prog-ing	plural-s	in/on
ESLI	86.5/16.8	83.4/25.0	85.9/10.8	93.2/6.5	87.6/15.1	99.1/2.2	96.6/4.7	97.8/3.4
E-BSLI	72.7/20.0	84.9/15.0	72.8/11.2	92.2/13.6	78.1/21.8	96.4/4.3	92.5/7.5	92.6/8.7

Note. 3S-s = 3rd-person singular; irreg = irregular; cop = copula; aux = auxiliary; prog = progressive; ESLI = English specific language impairment; E-BSLI = English of the bilingual SLI group.

Table A2. Accuracy scores (mean percentage/standard deviations) for individual morphemes in French.

	Tense morpheme group				Non-tense morpheme group	
	past-aux	fut-aux	v-stem/pres	copula	à/de	det
FSLI	82.8/12.0	74.8/26.2	88.8/6.9	81.2/12.0	94.0/8.6	94.0/5.0
F-BSLI	80.2/20.2	91.6/9.2	92.8/6.2	94.0/7.9	95.7/4.1	98.7/3.4

Note. past-aux = past tense auxiliary; fut-aux = future tense auxiliary; pres = present tense; det = determiner; FSLI = French specific language impairment; F-BSLI = French of the bilingual SLI group.