

Verb inflections as indicators of Bilingual SLI

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Abstract

This paper examines the verb inflectional system of 15 English-Hebrew preschool bilinguals: 6 typically developing (TD) bilinguals who attend regular preschools and 9 who attend “language preschools” following a prior assessment for language impairment. Using a case studies approach and multiple tasks (sentence completion, sentence imitation and enactment), we found that all bilinguals had the same root infinitive error types in their L1 English. Those diagnosed with impairment in both languages as well as those diagnosed with impairment only in L2 Hebrew had significantly more errors than TD bilinguals. In Hebrew, all bilinguals had difficulty using person morphology in past tense, with a significant difference between TD bilinguals and the other bilinguals. A qualitative difference in the type of errors was found between bilinguals impaired in both languages and those impaired only in L2. Those impaired in both languages, like typically developing bilinguals and monolingual SLI children, had more substitutions while those impaired only in L2 tended toward omission errors. This error is unusual for monolingual Hebrew typical and impaired acquisition, but reflects difficulties with uninterpretable person features which are not available in their L1 English. We argue that the quantitative and qualitative differences when found in both languages can be indicative of SLI, while a qualitative difference only in the second language is not.

1 Introduction

This paper reports on part of a larger study which examines the linguistic production of bilingual children, ages 4-7, placed in “language preschools” following a prior assessment for language impairment. The purpose of the study was to evaluate the relative contribution of the bilingual situation and the language impairment to the child’s linguistic representations and underlying processes. In the overall effort, we look at the interface of SLI and bilingualism, exploring the use of morpho-syntax, pragmatics, and discourse, as well as lexical, phonological, and sub-lexical processing. The present paper focuses on the use of the inflectional verbal system by English-Hebrew bilingual children. The findings point to specific errors which, when very frequent, might serve as indicators of SLI in “emerging” and “sequential” bilingual children. It is also suggested that not all children in “language preschools” who have been diagnosed as having language impairment in their L2 are necessarily SLI.

1.1 Definitions

The bilingual children studied in this paper are children from bilingual backgrounds who are able to function in two languages (carry a conversation and

understand) at a near native level (typical or impaired). Both simultaneous bilinguals and sequential bilinguals are included. Children are diagnosed for Specific Language Impairment (SLI) when they have normal performance IQ, score either 12 months or 1 SD below chronological age on standardized language tests, and have no: hearing disabilities, emotional or behavior problems, observed neurological deficit, or severe articulation/phonological deficit (Tallal & Stark 1981).

1.2 Linguistic Measures: Inflection

While English inflects its verbs for past tense and for third person singular in the present, Hebrew makes use of a wide array of verb inflections. In addition to tense, verbs are inflected for gender and number in the present tense and for gender, number and person in the past and future tenses. Studies of monolingual SLI (Bishop 1994; Clahsen 1991; Gopnik & Crago 1991; Rice & Wexler 1996) and typically developing bilinguals (Paradis, Crago, Genesee & Rice 2003) show that both populations use root infinitives (RIs) in English, e.g. David play ball. In Hebrew, however, SLI children do not omit inflections, but find past tense 2nd person inflection more difficult (Dromi, Leonard, Adam & Zadunaisky-Ehrlich 1999, Dromi, Leonard & Blass 2002). The present study focuses on past and present tenses only. Future tense, which is considered a feature of later acquisition and is marked in English by a modal rather than an inflection, was not studied. In English, the present study targets the production of past tense –ed and present tense 3rd person –s. In Hebrew, we look at the use of the four present tense forms: singular masculine (which has no overt inflection), singular feminine, plural masculine and plural feminine as well as eight past tense forms.

2 Method

2.1 Subjects

The subjects for this study were preschool children from bilingual or monolingual English-speaking homes, who attend regular preschools and special “language preschools” and have been exposed to Hebrew for at least two years. All children come from the same neighbourhood and same (middle-high) SES. Children are screened for both languages and are categorized in accordance with their linguistic abilities as diagnosed by standardized tests: CELF Preschool for English (Wiig, Secord & Semel 2004) for English and Goralnik (1995) for Hebrew. As for monolinguals, typical development (TD) is measured by a score of less than 1 SD below norm on the CELF in English and a score of less than 1.5 SD below norm on the Goralnik in Hebrew (following Dromi et al. 1999). This yields a division into children with typical development in both languages (TD), children with English typical development (E-TD), and children with atypical development in both languages (A-TD). Both E-TD and A-TD children attended the “language preschools”, while the TD children attended regular preschools.

This paper presents six case studies of TD children, four case studies of E-TD bilinguals and 5 case studies of A-TD bilinguals. The TD bilinguals are 3 boys (Im605, Nm509, Em506) and 3 girls (Ef601, Mf602, Af509), ages 5;5-6;5, three of whom were simultaneous bilinguals and three sequential bilinguals (two with 3 years of exposure to Hebrew and one with two years of exposure to Hebrew). The E-TD bilinguals are 2 boys and 2 girls, ages 4;1-6;6, all sequential bilinguals and the A-TD bilinguals are 3 boys and 2 girls, ages 5;5-6;9, 3 sequential bilinguals and 2 very early sequential bilinguals. Table 1 presents the E-TD and A-TD children’s length of

exposure to Hebrew and scores on CELF and the Goralnik (the pseudonyms contain the gender (male/female) and age information (years; months):

Table 1. Demographic information for E-TD and A-TD children

	Child	Age	Exposure	CELF	Goralnik
E-TD	Rf606	6;06	4	100	140
	Bm509	5;08	3	91	99
	Cm506	5;06	2	90	122
	Mf401	4;01	3.5	98	82
A-TD	Af609	6.9	2	63	148
	Of602	6.2	3.5	80	147
	Dm606	6.6	2	73	130
	Sm506	5.5	4 (Sim)	69	135
	Am506	5.6	4 (Sim)	67	121

2.2 Tasks

Data were collected using three controlled tasks: a sentence completion task within a story context, an enactment task (both based on Dromi et al. 1999), and an elicited imitation task. The **sentence completion** task targets production of 3rd person singular and plural, in present and past tense and examines children's ability to mark agreement. Three storybooks were used in Hebrew and two in English. In English, the stories tested the use of past tense –ed (as in 'Here grandpa helps; yesterday grandpa _____ (helped)') and present tense –s (as in 'Here the cats eat, and here the dog _____ (eats)'). In Hebrew, the stories tested the use of gender and number in the third person in past tense (e.g. 'ha-yeled raca likfoc; az hu _____(kafac)' the boy wanted to jump; so he jumped) and present tense (e.g., 'kan ha-kelev mexapes oxel, ve-kan ha-xatulot _____(mexapsot) oxel' here the dog [masc. sing.] look for [masc. sing] food, and here the cats [fem.] look for [fem. pl] food). The **elicited Imitation** task tested for the use of 3rd person singular and plural, in present and past tense in English and for person inflections in the past tense in Hebrew, targeting 5 inflections: 1st singular, 2nd singular masculine, 2nd singular feminine, 1st plural, and 2nd plural, in order to tap into children's knowledge of agreement. The **enactment** task (based on Dromi et al. 1999) was intended to elicit person inflections in Hebrew only and tested the same three singular forms examined by the imitation task in Hebrew, namely 1st person singular and 2nd person singular feminine and masculine.

Data analysis was conducted on a case by case basis for each child separately looking both at the percentage of correct responses and the frequency and type of errors in each task in both languages. The analysis is presented first for the TD bilinguals, then for E-TD bilinguals and finally the A-TD bilinguals. T-tests were used when applicable.

3 Results

Our major finding is that the same kind of error is found in TD, E-TD and A-TD bilinguals, showing no qualitative difference across the three populations in English, and only a quantitative difference between the A-TD bilinguals on the one hand and the TD and E-TD bilinguals on the other hand. A qualitative difference was found, however, between the E-TD bilinguals and the other bilinguals in their L2 Hebrew,

suggesting that A-TD bilinguals and E-TD bilinguals do not show the same impairment.

Figures 1 and 2 present the percentage of target responses by task and language for the TD children (Figure 1) and for the E-TD and A-TD children (Figure 2). The total number of target responses appears next to the label for each of the tasks. TD children had no errors in the Hebrew enactment task, and a very low error rate in the other tasks, mostly less than 10% and never more than 20% (on the sentence completion task) (Figure 1). Figure 2 shows the within-subject variability for the language impaired children, as reflected in the different height of the bars for each child. Only one ETD girl achieved an 80% success level on all the tasks and another girl achieved this level on the three Hebrew tasks. All ETD children scored significantly better on the English imitation task (three achieving 80% success), and were on average better on the English sentence completion task. On the other hand, three of the four received the lowest scores on the Hebrew enactment task and were very weak on the Hebrew sentence completion task. There is a clear quantitative difference between the TD children and A-TD children in both languages, and between TD children and E-TD children in Hebrew.

Figure 1. TD Percentage of Target Responses by Task and Language

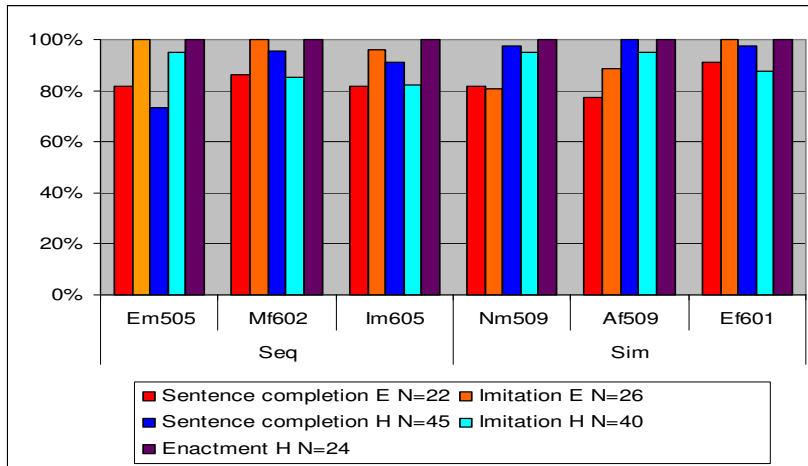
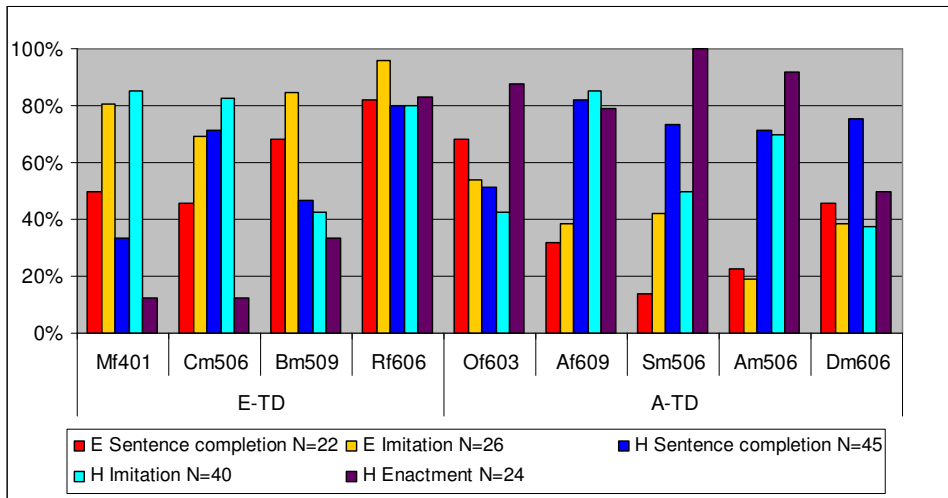


Figure 2. E-TD and A-TD Percentage of Target Responses by Task and Language



In addition to the rate of errors which distinguishes TD bilinguals from E-TD and A-TD bilinguals, the type of errors also helps characterize the differences among these groups. Two types of errors were found in both languages (1-2), two were unique to English (3-4) and three were unique to Hebrew (5-7), as follows:

1. Wrong tense (past for present or present for past): **Here the boy jumps and the girl jumped* [target: jumps]. **Kan ha-yeled kofec ve-kan hayeladot kafcu* [target: kofcof].
2. Root infinitives: **The cat hops and the dog hop* [target: hops]. **ha-xatula kfca ve ha-kelev likfoc* [target: kacaf].
3. Error in 3rd person morphology with a plural subject: **The cat hops and the dogs hops* [target: hop].
4. V-ing without an auxiliary: **The cat hops and the dog hopping* [target: hops].
5. Gender error (mostly masculine substituted for feminine): **Ha-yeled kafac ve ha-yalda kafac* [Target: kafca]. **Ha-kelev mexapes oxel ve ha-xatulot mexapsim oxel* [Target: mexapsof].
6. Number error (mostly singular for plural): **Ha-yeled kafac, ha-yalda kafca, kulam kafac*. [Target: kafcu]. *b'yom ha-huledet cilamta et ha-buba*. [Target: cilamtem]
7. Person error (1st person for 2nd person or vice-versa): *etmol kafacti baxevel harbe zman* [Target: kafacf]. *b'yom ha-huledet cilamta et ha-buba* [Target: cilamti]

3.1 TD Bilinguals

Figures 3 and 4 present the frequency of error types in the sentence completion task in English and Hebrew, respectively, and Figures 5 and 6 present the frequency of error types in the imitation task in English and Hebrew, respectively, for the TD bilinguals. Figures 3-6 show that very few errors are found in both tasks (up to 10% for imitation and up to 20% for sentence completion). Most English errors are Root Infinitives (13% of relevant contexts) and resulted for 3rd person with plural subjects (13% of plural subjects), while most Hebrew errors are for gender in [present,

feminine, plural] forms (9 of 24 – 37%) and in [2nd person past] forms (23 of 144 – 15%).

Figure 3. TD frequency of error types in the sentence completion task - English

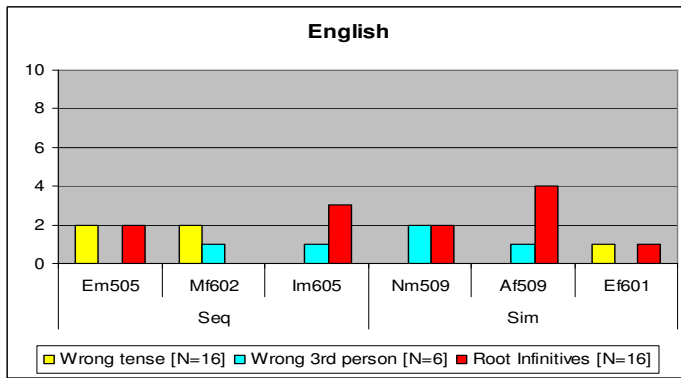


Figure 4. TD frequency of error types in the sentence completion task – Hebrew

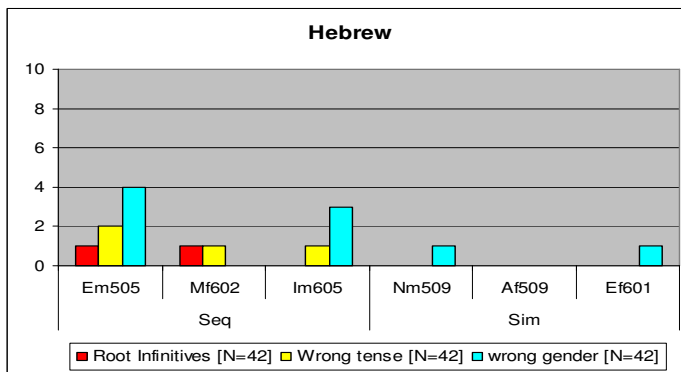


Figure 5. TD frequency of error types in the imitation task – English

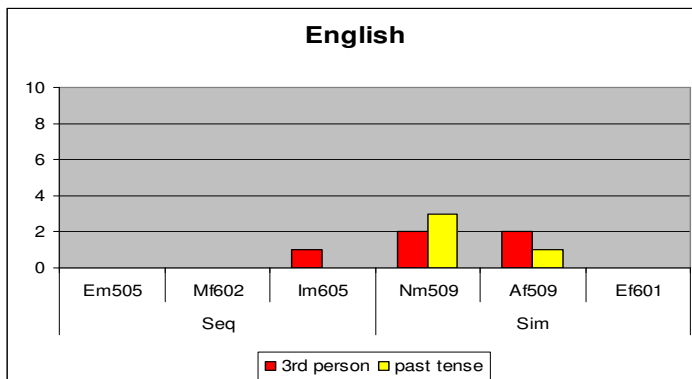
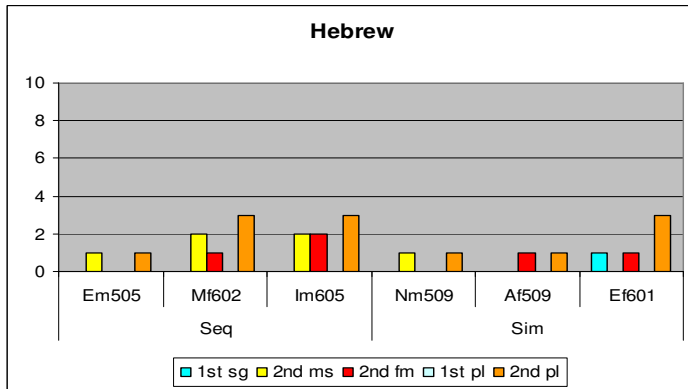


Figure 6. TD frequency of error types in the imitation task – Hebrew



3.2 E-TD Bilinguals

Figures 7 and 8 present the frequency of error types in the sentence completion task in English and Hebrew, respectively, and Figures 9 and 10 present the frequency of error types in the imitation task in English and Hebrew, respectively, for the E-TD bilinguals. Figure 11 presents the frequency of errors in the enactment task. The E-TD children show typically developing error frequencies, with a few more root infinitives in the production of the younger child (Figures 7 and 9). However, despite the typical error frequencies, all the E-TD children use 3rd person bare forms not found among the TD children (Figures 8 and 10). This latter type of error differs from the 1st/2nd person alternations found among TD children. In the enactment task, there is a very high error rate again with 3rd person bare forms (Figure 11).

Figure 7. E-TD frequency of error types in the sentence completion task – English

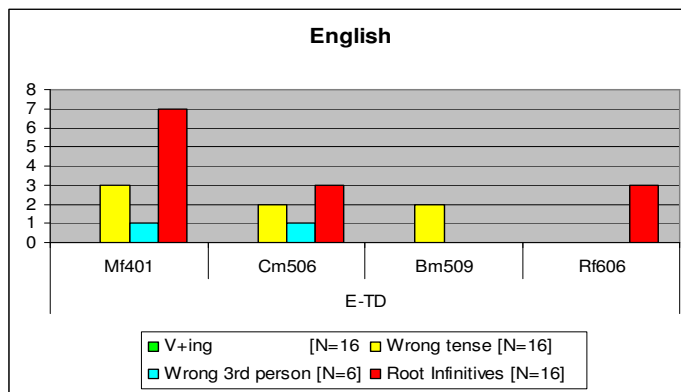


Figure 8. E-TD frequency of error types in the sentence completion task – Hebrew

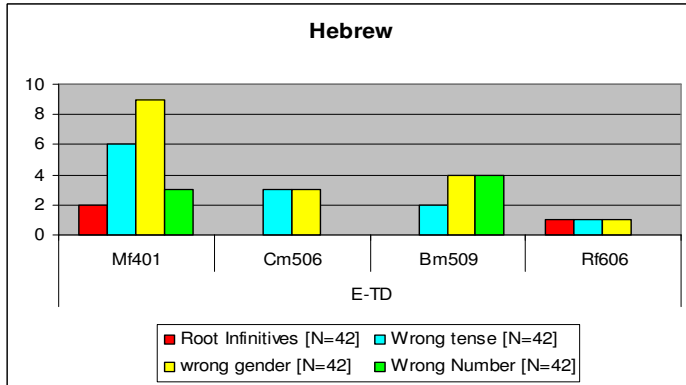


Figure 9. E-TD frequency of error types in the imitation task – English

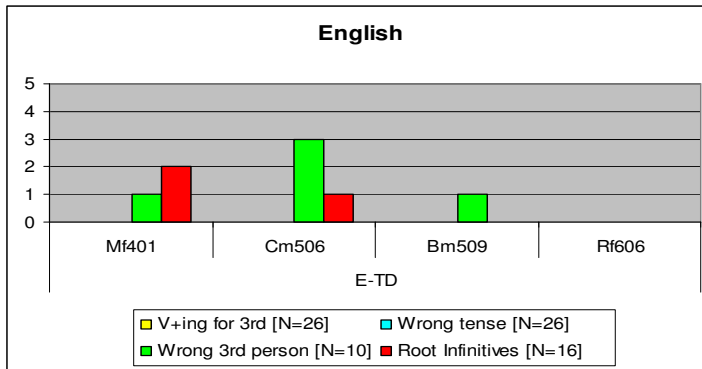


Figure 10. E-TD frequency of error types in the imitation task – Hebrew

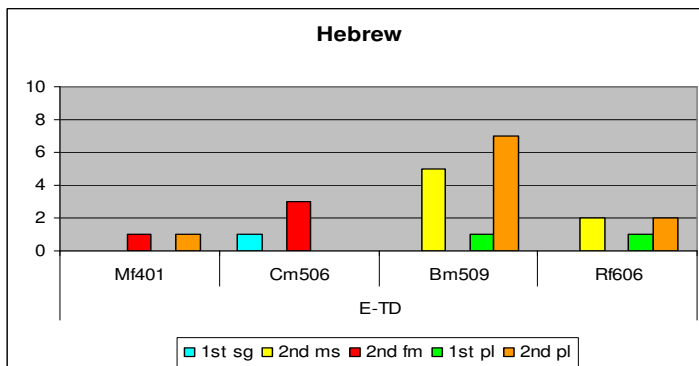
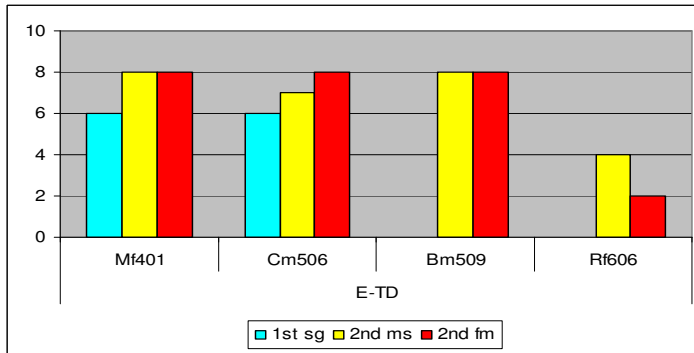


Figure 11. E-TD frequency of error types in the enactment task – Hebrew



3.3 A-TD Bilinguals

Figures 12 and 13 present the frequency of error types in the sentence completion task in English and Hebrew, respectively, and Figures 14 and 15 present the frequency of error types in the imitation task in English and Hebrew, respectively, for the A-TD bilinguals. Figure 16 presents the frequency of errors in the enactment task. While the TD bilinguals and E-TD used Root Infinitives in up to 20% of 3rd person and past contexts in English, the A-TD bilinguals used Root Infinitives in 50-60% of 3rd person and past contexts (Figures 12 and 14). All subjects showed some cases of erroneous tense and erroneous 3rd person, mostly with plural subjects.

In the Hebrew sentence completion task, A-TD bilinguals, like older E-TD and TD bilinguals had about 10% errors, showing the same variety of errors (Figure 13). The increased rate of errors for the young E-TD girl reflects her use of 3rd person bare forms. In the imitation task, 2nd person targets triggered many substitutions. While the E-TDs opt for 3rd person bare forms, the A-TDs opt for 1st person (Figure 15). However (see Figure 16) this is not the case for the enactment task in which the A-TDs have an error rate almost identical to TDs. That is, while there is a higher error rate in imitation for A-TD bilinguals (up to 70%), there is a higher error rate in the enactment for E-TD group (60%),

Figure 12. A-TD frequency of error types in the sentence completion task - English

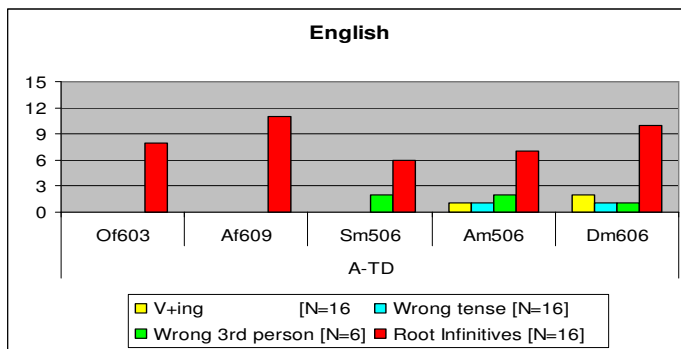


Figure 13. A-TD frequency of error types in the sentence completion task – Hebrew

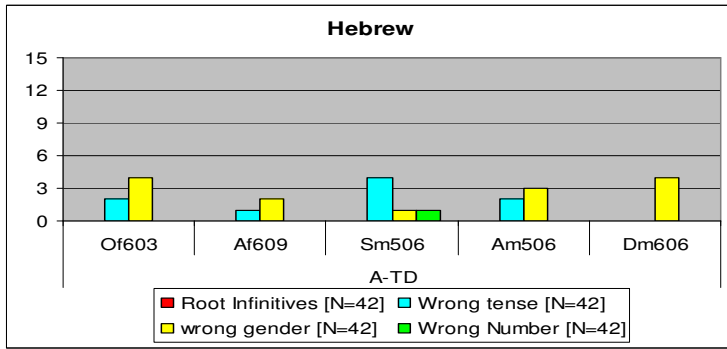


Figure 14. A-TD frequency of error types in the imitation task – English

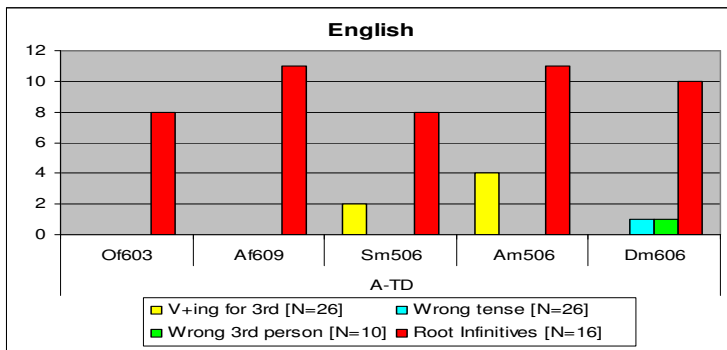


Figure 15. A-TD frequency of error types in the imitation task – Hebrew

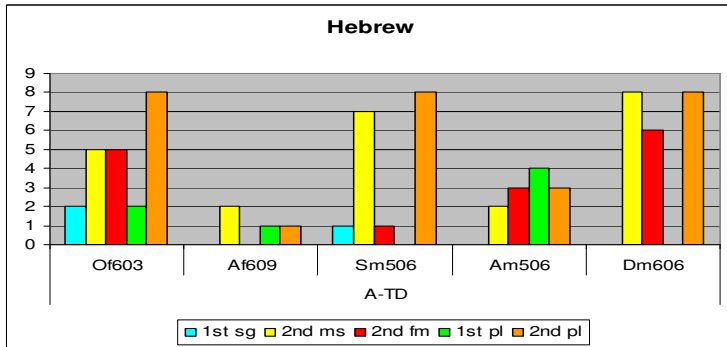
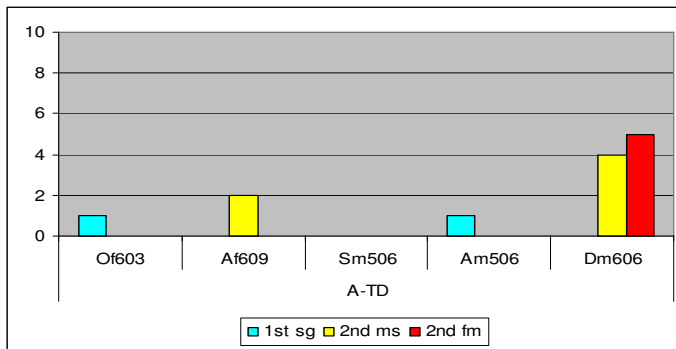


Figure 16. A-TD frequency of error types in the enactment task – Hebrew



4 Discussion and Conclusion

Studying the inflectional system of 15 English-Hebrew bilinguals, ages 4;1-6;9, we show that similar errors are found for all bilinguals, with a significance difference in quantity across the different groups ($p < 0.05$). In English, TD and E-TD bilinguals tend to use root infinitives in up to 20% of the relevant contexts. By contrast, A-TD bilinguals, like younger A-TD monolinguals showed the same kind of errors in 50-60% of the relevant contexts. In Hebrew, the TD bilinguals used the wrong person inflection in 16% of the contexts, which targeted verbs inflected for 1st and 2nd person. A-TD bilinguals substituted 1st and 2nd person forms like TD bilinguals, but in 50-60% of the relevant contexts. By contrast,, E-TD children opted for the bare form, omitting the person morphology altogether in 50%-60% of the relevant contexts.

These findings raise the question as to whether quantitative differences are enough to diagnose language impairment in bilinguals. Is the high ratio of root infinitives indicative of SLI in the A-TD bilinguals? Does this mean that the E-TD group is not SLI? Is the high ratio of person substitution indicative of SLI in the A-TD group? Are the omissions of person morphology in Hebrew indicative of SLI in the E-TD group?

We propose that since the E-TD bilinguals perform like TD children in their L1, they are not SLI, but rather slow second language learners, who have not mastered the inflectional system of their L2. More specifically, we suggest that their errors reflect a strategy which is unlike Hebrew typical and impaired acquisition. The E-TD bilinguals have difficulties with the uninterpretable person features which are not available in their L1. These features are sensitive to critical period (White 2003) and so the E-TD bilinguals have an error pattern that reflects the acquisition of the L2 after the critical period. For the A-TD children, though tense-marking may not be a qualitative clinical indicator of SLI in bilingual populations, the quantity of errors, when manifested in both languages, is a potential indicator. That is, quantitative and qualitative differences when found in both languages can be indicative of SLI, while a qualitative difference only in the second language is not. Further studies are necessary to establish this distinction in other language pairs and with data from other linguistic structures. In particular, language pairs that are similar in amount of inflection (both plentiful and scarce) should be studied to determine if the focus on inflection is justified as an indicator of SLI in bilinguals.

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