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French-English Bilingual Children's Acquisition of the Past Tense

Johanne Paradis[1], Elena Nicoladis[1] and Martha Crago[2]
[1]University of Alberta and [2]Université de Montréal

1. Introduction

In usage-based or constructivist approaches to language acquisition, the distribution and frequency of structures in the input are key mechanisms underlying acquisition patterns and rates (Tomasello, 2003). Children who learn two languages simultaneously from birth have, by definition, less exposure to each language than monolinguals acquiring each language. Therefore, usage-based approaches predict that bilingual children would lag behind monolinguals in achieving acquisition milestones because the frequency with which they hear input structures would be less (Tomasello, 2004).

Research examining whether bilinguals lag behind monolinguals in their morphosyntactic acquisition has produced conflicting findings (Erdos, Genesee, Crago & Debas, 2005; Gathercole, 2002, Gathercole & Thomas, 2005; Marchman, Martínez-Sussman & Dale, 2004; Nicoladis, Palmer & Marentette, in press; Paradis, Crago, Genesee & Rice, 2003; Paradis, Crago & Genesee, 2005/2006). This research has revealed that the extent to which bilingual-monolingual differences are apparent depends on factors such as variation in the amount of input between the two languages bilinguals receive, and relative complexity of the target structure examined. For example, bilingual children who received relatively more input in language$_a$ than language$_b$ at home and at school were more likely to approach monolingual levels of performance in language$_a$ (Erdos et al., 2005; Gathercole, 2002; 2006). In addition, acquisition of more transparent structures was less sensitive to the reduced input received by bilinguals, since for these structures bilinguals were more likely to approach monolingual levels of performance than for more opaque structures (Gathercole, 2002, 2006; Gathercole & Hoff, in press). Thus, the research indicates that bilinguals may lag behind monolinguals selectively, but not globally, in acquisition milestones.

In this study we sought to determine whether French-English bilingual preschoolers lagged behind their monolingual peers in their acquisition of the past tense. More specifically, we wanted to see whether language dominance and transparency/opacity of target structure played interacting roles in determining monolingual-bilingual differences. We defined dominant language as the language in which a bilingual child received more input. With respect to

transparency and opacity for the past tense, we considered the regular past tense form as transparent and the irregular past tense forms as opaque. In section 1.1, we elaborate on our rationale for this distinction.

1.1 The Exemplar-Based Model of the lexicon and the past tense

We adopt Bybee's Exemplar-Based Model (EBM) of the lexicon as the basis for our definition of transparency and opacity in target structures (Bybee, 1995, 2001, 2002). In the EBM, multi-morphemic words are stored fully inflected and interconnected in the lexicon. They are inter-connected through shared phonological form and semantic features. Thus, verb stems and their inflected constructions, e.g., *walk*, *walk-ed*, *walk-ing*, *walk-s*, are all stored in the lexicon, and inter-connected through the shared phonological segments and semantics. They are also connected through some shared phonological segments of the stem, and phonological and semantic features of inflectional morphemes, with *talk*, *talk-ed*, *talk-ing*, *talk-s*. Thus, *walked* and *talked* would be connected at the level of [-ed] via phonological form and semantic features, and would also be connected at this level with other stem+ed words in the lexicon, i.e, *worked*, *picked*, etc.

Individual phonological/semantic forms have varying degrees of lexical strength in the EBM. Token frequency in the input and in the language user's output increases lexical strength of a word directly, and indirectly to the other words, mono- and multi-morphemic, it is connected to phonologically and semantically. The greater the lexical strength of a word, the more likely it will be accessed appropriately and produced accurately in the speech of language learners. Amore crucial aspect of the EBM is the role of type frequency. The type frequency of a verb form, or "schema", is the number of unique stem+morpheme constructions in the lexicon of that type. Type frequency determines the lexical strength of that stem+morpheme schema. Put differently, the productivity of a schema like [verb [ed]]$_{\text{past tense}}$ is determined by the learner having a critical mass of verb forms with this suffix stored in the lexicon. Learners' accuracy and consistency in applying this schema to verbs with past temporal reference in language production is increased gradually through increasing the lexical strength of the schema by increasing its type frequency. Therefore, both token and type frequency are important determinants of learners' accuracy with verb morphology in the EBM.

With respect to English irregular verb forms, such as *run-ran*, or *take-took*, there are no schemata that operate across numerous forms, with a few exceptional but small lexical gangs like *ring-rang*, *sing-sang*. Irregular verbs are considered inflectional islands in the EBM, and as such, are entirely dependent on token frequency to build lexical strength and become accurately used in learners' production. Irregular forms are also subject to over-regularization (**runned* instead of *ran*), defined in the EBM as the over-application of the [verb [ed]]$_{\text{past tense}}$ schema due to its superior strength. Over-application would

occur until enough instances of the irregular form have been heard and used by the learner.

In the EBM, transparent morphology could be considered morphology with a high type frequency schema, and opaque morphology could be those forms with very low type frequency schemata or inflectional islands. Therefore, the regular past tense form would be a transparent structure, and the irregular past tense form an opaque structure. Furthermore, irregulars as a group should be later-acquired than regulars, and more sensitive to reduced input frequency as in bilingual acquisition, because token frequency is their only source of lexical strength.

1.2 The past tense in French and English

We have used the simple past in English to exemplify regular versus irregular forms, i.e., the verb+ed and strong verbs, respectively. A similar but not identical distinction can be made in French. Like other Romance languages, French has verb classes commonly referred to as conjugations. The past temporal reference verb form that is the closest semantically to the English simple past is the *passé composé*, a periphrastic construction of an auxiliary verb and a past participle. The participle form varies according to the conjugation. The vast majority of French verbs are 1st conjugation, and the present and *passé composé* are formed as follows: *il marche* 'he walks' / *il a marché* 'he walked'. The 2nd and 3rd conjugations can be construed as consisting of families of irregulars because the type frequencies of the participle forms are lower than the [verb [é]]$_{\text{past part}}$ schema for the 1st conjugation, and in some cases are simply inflectional islands. Some families of irregular participle forms in French have many more members than the *ring-rang/sing-sang* gangs in English, which may be the reason that over-regularization can take more than one form in French (Nicoladis et al, in press; Nicoladis & Paradis, 2006). In other words, there are more competing productive schemata than just the dominant regular schema from the 1st conjugation. For example, for the verb *prendre* 'to take', the correct *passé composé* form is *elle a pris* 'she took', but an over-regularized form could be either **elle a prenné* 'she taked', after the 1st conjugation, or **elle a prennu* 'she taked' after the family of verbs with infinitives ending in [-re] that have the participle ending in [-u].

Prior research on the acquisition of the past tense in English supports the EBM prediction that regular past tense forms are acquired earlier than irregular forms (with the exception of very highly frequent irregular forms like *went* and *had*). English-speaking children in the norming sample for the Test of Early Grammatical Impairment (TEGI: Rice & Wexler, 2001) used the past [-ed] correctly 89% of the time by ages 4;6-4;11, but used correct irregular verb forms less than 60% of the time at the same age (see also Nicoladis et al., in press). Research with much smaller sample sizes in French suggests that children use the regular past tense about 90% correctly between the ages of 4;0-6;0 (Jakubowicz & Nash, 2001; Paradis & Crago, 2001), roughly similar to English.

Finally, over-regularization errors have been found in both French and English acquisition of the past tense (Marchman & Bates, 1994; Marcus Pinker, Ullman, Hollander, Rosen, & Xu, 1992; Nicoladis et al., in press; Nicoladis & Paradis, 2006).

1.3 Predictions for this study

This study was designed to test the following predictions for accuracy in the use of the past tense in the English and French of bilingual and monolingual children the same age: (1) Any difference found in the accuracy in past tense production between bilinguals and monolinguals would be smaller for bilinguals in their dominant language; (2) Any difference found between bilinguals and monolinguals would be more pronounced for irregular than regular past tense forms; (3) There should be no differences between bilinguals and monolinguals in the acquisition sequences and patterns, thus regulars would be acquired before irregulars, and over-regularization errors would occur for both groups.

2. Method

2.1 Participants

Twenty-five French-English bilingual (simultaneous and very early sequential) and 12 French monolingual children aged 4;0 to 5;5 participated in the study. An English monolingual comparison group was not necessary because the bilinguals' performance could be compared to the norming sample used for the English past tense probe, since it was part of the TEGI. The children resided in either Edmonton or Montreal, Canada, and were attending a French language daycare, preschool or kindergarten.

2.2 Procedures

The bilingual children's parents were given a short questionnaire on language history of the child and current language use in the home. The children were given a receptive vocabulary test in both languages, the Peabody Picture Vocabulary Test (PPVT-III: Dunn & Dunn, 1997) and its French equivalent, *Échelle de vocabulaire en images Peabody* (EVIP: Dunn, Thériault-Whalen & Dunn, 1993). These measures were used to determine language dominance, the process for which is explained in Section 3.1. The children were given a past tense elicitation task in both languages, or just in French in the case of the monolinguals. The English task consisted of the past tense probe from the TEGI. For this probe, children were shown a picture of a child engaged in an activity followed by a picture of the child having completed the activity, and were given the following prompt: *Here, the boy is painting. Now he is done. Tell me what he did.* We designed a French version to mirror the TEGI past tense probe. The French past tense probe also consisted of paired images of activities in progress

and activities completed. Children were given the following prompt: *Camille vend du lait aux élèves dans sa classe. Maintenant elle a fini. Dis-moi ce qu'elle a fait* 'Camille is selling milk to the pupils in her class. Now she's finished. Tell me what she did'. The target verbs on the English probe consisted of 10 regular and 8 irregular verbs. On the French probe, there were 8 regular and 11 irregular verbs. The slightly larger number of irregulars in French was due to ensuring certain families of irregular forms were well represented (cf. Nicoladis & Paradis, 2006). Scoring for the TEGI probe was conducted according to the instruction manual, in order to enable us to compare our findings with the TEGI norming sample, and scoring for the French probe was designed to be parallel to the system for the TEGI. Children's responses were coded first as scorable or unscorable on both probes. Unscorable forms consisted of responses using verb tense-aspect constructions other than the declarative simple past in English, the declarative *passé composé* in French, or declarative sentences with the verb stems in either language. Scorable responses in the past tense included correctly and incorrectly formulated attempts. If the child used a non-target verb, but used it in the past tense, this was counted as a scorable response, unless it was *did* in English or *a fait* 'did' or *a fini* 'finished' in French, since these forms were given in the prompts (cf., Rice & Wexler, 2001, p 155). Scorable responses were divided into percent correct for regular and irregular verbs, with bare verb stems and incorrectly formulated past tense forms counting as errors. The categorization of a verb as regular or irregular was based on the actual verb the child used and not the target verb given, if these differed. A second calculation was made for the irregular verbs, where a response was counted as an acceptable attempt if the irregular verb was produced using the correct or an over-regularized form, e.g., *digged* or *dug* would be scored as acceptable past tense forms for *dig*. This "irregular past finite" calculation measures whether the child was capable of marking the past tense, even if incorrectly, for these verbs (Rice & Wexler, 2001).

3. Results

3.1 Language dominance and age-matching

The bilingual children were divided into dominance groups according to the following criteria: (1) how long they had been exposed to each language since birth, (2) how much each language was currently being spoken in the home, (3) how many hours a week the child spent in French at the daycare/preschool/kindergarten. Because we wanted our dominance measure to reflect amount of input, the receptive vocabulary scores were used to verify our input-based dominance classification, and in two cases, to break a tie. In all but the tied cases, our input-based classification agreed with the vocabulary measures in that the child showed higher standard vocabulary scores in the dominant language. The dominance classification yielded 14 English-dominant and 11 French-dominant children.

In order to determine if the children were matched on age, two independent-sample t-test analyses were conducted. There was no difference between the ages in months of the bilinguals and the French monolinguals (57 vs. 54, $t(35) = 1.683$, $p = .101$), or between the ages in months of the English and French dominant bilinguals (58 vs. 55, $t(23) = 1.533$, $p = 1.39$).

3.2 English past tense

The bilingual children's mean percent correct scores for English past regulars, irregulars, and irregular past finite are given in Figure 1, along with the mean percent correct scores from the age-appropriate sub-group of the TEGI norming sample. A two-way mixed ANOVA on the scores from the bilinguals with dominance as a between-groups factor (English and French) and past tense type as a within subjects factor (regular and irregular) showed significant main effects for past tense type ($F(1, 21) = 87.80$, $p = .000$, G-G adjustment), for language dominance ($F(1, 21) = 7.57$, $p = .012$), and a significant interaction, ($F(1, 21) = 18.33$, $p = .000$, G-G adjustment). Therefore, the English-dominant bilinguals were more accurate with the regular past tense than the French-dominant bilinguals (88.6% vs. 44.8%), but there was virtually no difference between the dominance groups for the irregular past tense (23.07% vs. 20.3%). In contrast, for the irregular past finite scores (which were analyzed separately because they overlap with the scores for the irregulars), the English-dominant bilinguals scored higher than the French dominant bilinguals (82.2% vs. 43.2%, $t(21) = 2.55$, $p = .026$). Turning to comparisons with monolinguals, one sample t-tests showed that English dominant bilinguals had equal scores to the monolinguals for the regular verbs (88.6% vs. 87.7%, $t(13) = 0.256$, $p = 0.802$) and irregular past finite calculations (82.2% vs. 87%, $t(13) = -0.751$, $p = 0.466$), but had lower scores for the irregular verbs (23.07% vs. 52.7%, $t(13) = -5.957$, $p = .000$). The French-dominant bilinguals scored lower than the monolinguals for regulars (44.8% vs. 87%, $t(8) = -3.678$, $p = .006$), irregulars (20.3% vs. 52.7%, $t(8) = -3.919$, $p = .004$), and for the irregular past finite calculation (43.2% vs. 87%, $t(8) = -3.153$, $p = .014$).

3.3 French past tense

The bilingual and monolingual children's mean percent scores for the French past regulars, irregulars and the irregular past finite calculation are given in Figure 2. A two-way mixed ANOVA on the scores from the bilinguals and monolinguals with language group as a between-subjects factor (English-dominant, French-dominant and monolingual) and past tense type as a within-subjects factor (regular and irregular) yielded significant main effects for

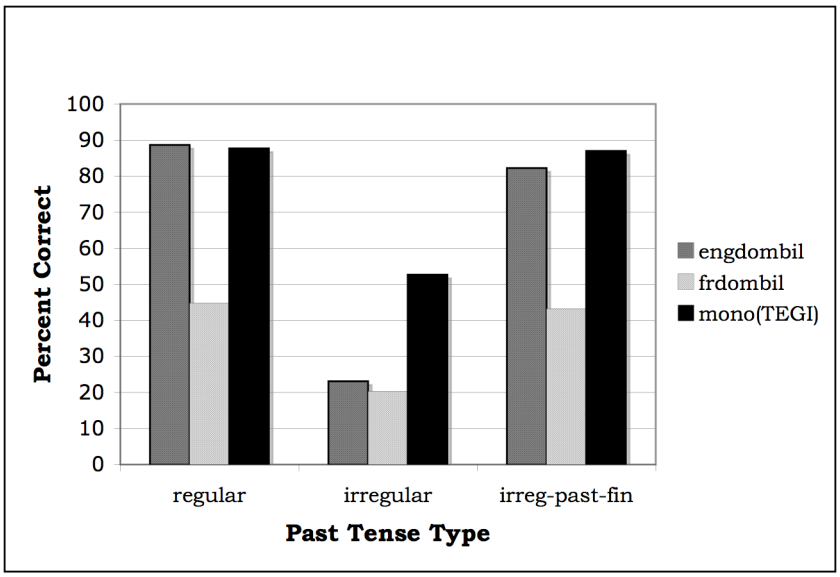

Figure 1. Percent Correct for English Past Tense

language group ($F(2,34) = 4.09$, $p = .026$) and past tense type ($F(1,34) = 52.86$, $p = .000$, G-G adjustment), but no significant interaction ($F(2,34) = 0.359$, $p = .701$, G-G adjustment). Thus, as with English, children were more accurate with regular than irregular verbs. Post hoc LSD pairwise comparisons on the language group main effect showed that the French dominant bilinguals scored higher than the English dominant bilinguals (Mean Difference = -34.06, p = .008), but there were no significant differences between the monolinguals and either bilingual group (Mean Differences with English dominant = -19.08, $p = .113$; Mean Difference with French dominant = 14.98, $p = .237$). Considering the irregular past finite calculation, a one-way independent groups ANOVA showed no significant between-group differences ($F(2,34) = 2.24$, $p = .122$).

4. Discussion

The results of our analyses revealed that bilinguals showed the same acquisition sequences and patterns as monolinguals overall. In both English and French, children were more accurate with regular than irregular verbs and they produced over-regularization errors, as shown by the irregular past finite calculation, in both languages. In terms of rate of acquisition, bilinguals were as accurate as monolinguals in their dominant language for both regular and irregular past finite forms in English and French. Differences between

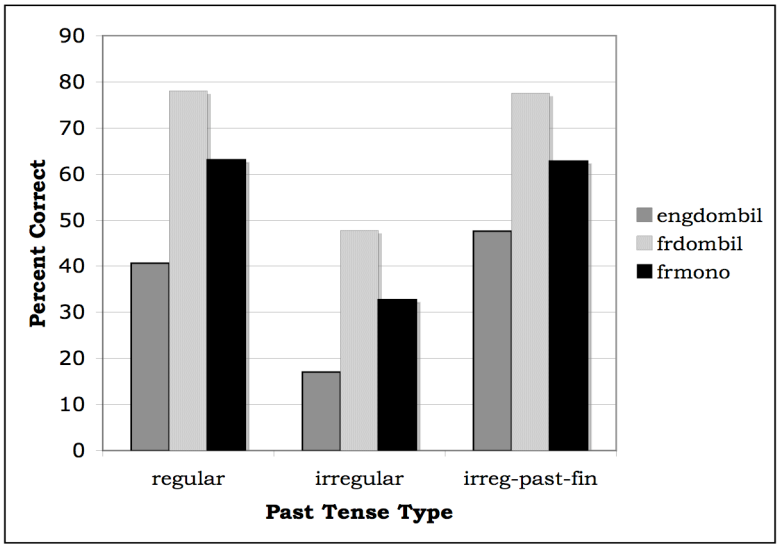

Figure 2. Percent Correct for French Past Tense

bilinguals and monolinguals were apparent for irregular verbs in English, regardless of dominance.

4.1 Theoretical implications

These data indicate that acquisition milestones for bilinguals are vulnerable to these children's reduced input on a selective basis only. Bilingual children do not lag behind in their use of past tense marking in their dominant language, execept for producing the correct form of irregular verbs in English. Therefore, a strong claim based on usage-based theory that bilinguals would lag behind across-the-board in acquisition milestones is not upheld by these data. Note that if the strong prediction were correct, bilingual children would have lagged behind in their dominant language as well, because even in their dominant language they would have received less input than their monolingual peers. In short, while this study indicates that input frequency plays a role in bilingual acquisition, factors other than input frequency must also play a role in determining the course of morphosyntactic acquisition in children, since no global delay was observed between bilinguals and monolinguals.

The predictions of usage-based theory and the age of these children bears further consideration. The bilingual children in this study ranged in age from 4;0-5;5, with a mean age of 4;9. Children, both monolingual and bilingual, begin producing verbal inflections before this age, which raises the question of whether bilinguals would ever lag behind monolinguals in their dominant language. Perhaps by four-and-a half years of age, bilingual children would

have received sufficient input to have caught up to their monolingual peers in their dominant language. But for three-year-olds, bilingual-monolingual differences might be apparent even in bilinguals' dominant language. Future research is needed to address this question, but we would like to point out that if differences were to be found at three years of age, it would be important to point out that they must be short-lived, and that bilingual children can catch up in the dominant language before school entry.

Another residual question from our results concerns what underlies the crosslinguistic differences. In French, the only difference we found was between the French and English dominant groups, and not between English dominant bilinguals and French monolinguals. While children were less accurate with irregulars than regulars in French, there was no interaction with dominance as there was in English, and moreover, an examination of the absolute scores indicates that the differential accuracy rates between regulars and irregulars were smaller in French than in English, regardless of language dominance group. We would like to suggest that this difference could be caused by crosslinguistic differences in the type and token frequencies of regular and irregular verbs between the languages. Nicoladis et al. (in press) found the following: In French, regular verb forms have both high type and token frequency and irregulars have high type frequency, but lower token frequencies than regular verbs, as a group. In English, regular past tense forms have low token frequency but high type frequency, and irregular verb forms show the opposite pattern of high token frequency but low type frequency. Overall, in French, the distinction between regular and irregular verb forms is more gradient because so-called irregular forms are comprised of reasonably-sized families of verb schemata, so that type frequencies for most irregulars are not very low or non-existent like they are in English. This distinction in type/token frequency could underlie the crosslinguistic differences for the irregular verbs in these data, favouring their acquisition in French. For example, we could hypothesize that bilingual acquisition is more resilient against reduced input for the irregular past tense in a language like French because irregular forms have high type frequency, and so even though absolute number of exposures to forms would be less for bilingual children than for monolinguals, they could be potentially sufficient to build schemata. Put differently, morphological forms that rely solely on token frequency for acquisition, like irregular verbs in English, may be more vulnerable to delay in the bilingual acquisition context. This hypothesis needs to be tested in future research.

4.2 Applied implications

The age of the children in this study was chosen because it is just before or at school entry in the Canadian provinces the children in this study resided in. This is an age at which children are often assessed for language development in particular, for school readiness in general, since parents often have the choice of entering their children into kindergarten when they are 4;5 in September, or

waiting until they are 5;5 the following September. How would the children in this study fare if assessed using the TEGI past tense probe? If the assessment was adapted to take into account language dominance and target structure type, would there be different results? If the TEGI past tense probe were given to all the bilinguals in this study, paying no attention to dominance, and calculating the overall score including both regulars and irregulars, then 39% of these bilingual children would have scored below the criterion score for typical language development; in effect, they would have scored as children with language impairment. However, if dominance were taken into account, only 13% of the English dominant bilinguals scored below the criterion. If both dominance and transparency/opacity of target structure were taken into account, so that only scores for regulars were compared to monolingual norms, then 0% of the English-dominant bilinguals scored below the criterion for typical language development. Since none of the bilingual children in this study had language impairment, and the purpose of administering this kind of test would be to detect those children who did, this brief illustration shows that adaptations taking into account dominance and target structure might be necessary in the case of bilingual children when using standardized assessment tools. If appropriate adaptations are not made, misdiagnosis of language impairment for bilingual children could result.

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