

Bilingualism as Mutuality in Adult Second Language Learners

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1. Introduction

Interest in the relationship between the bilingual's two languages has had a long tradition in the field of second language acquisition. Since the days of Contrastive Analysis, researchers have acknowledged the effect of the first language (L_1) on the second language (L_2) (Ellis, 1986). Theories of language acquisition (e.g., Chomsky, 1995; Cummins, 2001) and recent research (e.g., Jarvis, 2000) have also supported the theory that L_1 influences L_2 .

If this is true, then it is logical to suppose that L_2 might also have an effect upon L_1 . In fact, there is an argument that the same theoretical suppositions that would predict L_1 influence on L_2 also predict the reverse. Findings from research into this question support such a theory of mutuality (i.e., that the bilingual's languages influence each other) (e.g., Cook, 2003; Kinberg, 2002; Kinberg & Serdyukov, 2003).

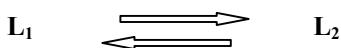
As we consider the question of language influence, it is important to keep in mind that it is not sufficient simply to claim that one language influences another. It is much more informative to look at the factors that affect such influence (Jarvis 2000). One of the factors that Jarvis argues may affect the extent to which one language may influence another is the age of the learner. If Jarvis is correct, then the influence of L_2 influence on L_1 may be different for adult learners than it is for child learners. This paper, therefore, examines the effect of L_2 on L_1 in adults.

2. What is the nature of a symmetrical, integral model of bilingualism?

What sort of model of bilingualism would allow for mutual language influence? Such a model would need to assume that the bilingual's two languages are not "compartmentalized," (i.e., the bilingual need not access only one language at a time). At first glance, this point may seem self-evident, since having access to both languages at once would appear to be a prerequisite for language influence. However, in a symmetrical, integral model of bilingualism, the bilingual's two languages are, at least to some extent, permeable. The extent to which these languages are permeable depends upon several factors such as proficiency in each language, similarity of the languages, and the language task that the bilingual needs to accomplish (Jarvis, 2000). This model would therefore also need to be flexible, so as to allow for a variety of effects upon the extent to which languages influence one another. Finally, a symmetrical, integral model of bilingualism would need to account for the many social contexts in which the bilingual might use his or her languages.

Given these parameters, let us describe a model of mutuality. Within this model, L_1 and L_2 influence each other, as in Figure 2.1

Figure 2.1 The Mutual Nature of the L_1 / L_2 Relationship



This influence is mutual, but is not static; rather, the nature and extent of the influence vary depending upon the factors discussed above and upon the social settings in which the languages are used (See Figure 3.1, below). This model would predict, for example, that for the L_1 dominant bilingual whose linguistic environments are mostly L_1 , L_2 influence would not be strong. For the balanced bilingual in

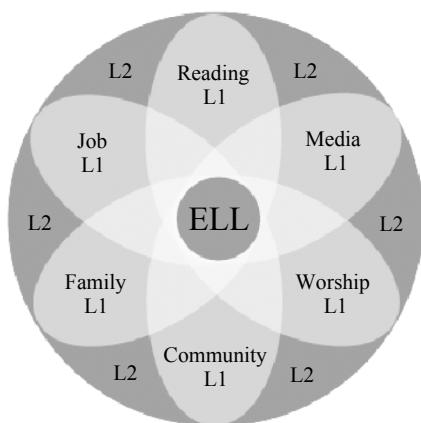
a mostly L₂ environment, L₂ might have a much greater influence on L₁. Section 3 discusses the factors affecting L₂ influence on L₁ in greater detail.

3. Factors which may affect the influence of L₂ on L₁

3.1 Language environment

It is important to note that, in a symmetrical, integral model of bilingualism, the extent to which one or both of one's languages is supported would affect the extent to which L₂ influences L₁. In Figure 3.1, we see an example of the interaction of various language environments. In this example, the learner of English interacts in several linguistic contexts. Figure 3.1 shows a situation in which the dominant linguistic environment is an L₂ - speaking environment (in this case, English), but the bilingual is exposed to the L₁ in the home, house of worship, workplace and through certain media (Kinberg & Serdykov, 2003).

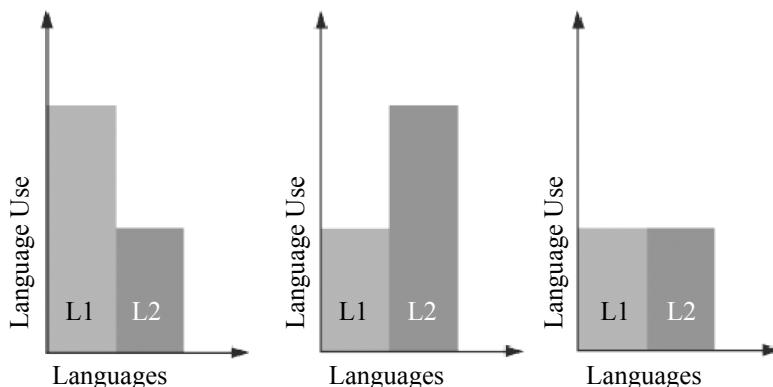
Figure 3.1 L₁/L₂ Language Use Contexts



If Figure 3.1 accurately depicts some of the language environments in which the bilingual functions, it is logical to suppose that L₂'s influence on L₁ would be stronger in cases where L₂ is the dominant language; this prediction is supported by recent findings. For instance, Verhoeven and Boeschoten (1986) found that the L₁ development of Turkish children living in The Netherlands lagged significantly behind that of their peers who were living in Turkey. In a phonological study of native speakers of English who moved to Brazil, Major (1992) found that his respondents' proficiency in Portuguese corresponded directly with their loss of English proficiency. If these findings are accurate, then we may argue that L₂ is more likely to influence L₁ if L₂ is the dominant language. Moreover, if this model of language use is correct, it is reasonable to suppose that the more linguistic environments that support L₁ maintenance, the more likely it is that bilingualism will be additive in nature, rather than subtractive.

Figure 3.2 shows three possible types of bilingualism, which, it is argued, depend upon the languages used in the bilingual's environments. In the first case, L₁ is the dominant language. Here, the bilingual's L₁ will be maintained, but his or her L₂ may not be as strong. We see the reverse in the second case. Here, the bilingual operates in a mostly L₂ environment. In this situation, we would predict that the bilingual's L₁ would be less likely to be maintained, although his or her L₂ would be strong. The third case represents the balanced bilingual, who functions equally well in both languages. A symmetrical, integral model of mutuality would predict that balanced bilingualism would result if the bilingual functions within a roughly equal number of L₁ and L₂ language contexts.

Figure 3.2 The Use of L₁ vs L₂



If Figures 3.1 and 3.2 is an accurate portrayal of the bilingual's patterns of language use, then we may predict that in cases where L₁ is dominant, L₂ would have less affect on L₁. Where L₂ is dominant, the reverse would be predicted. In the balanced case, a model of mutuality would predict that the two languages would influence each other equally.

3.2 Family/Home/Community

If it is true that L₂'s influence on L₁ is greater if L₂ is the dominant language, then what can we conclude from findings where L₁ is relatively unaffected by a dominant L₂? Abu-Rabia (1999) reported just such a finding in his study of Russian-speaking high school students living in Israel. He found that these young people maintained their Russian despite what they perceived as a great deal of social and pragmatic pressure to use Hebrew. It is possible that these findings demonstrate the strength of the influence of the family and cultural community.

Richards and Yamada-Yamamoto (1998), who interviewed Japanese families living and working in the UK, also found strong evidence for the effect of family on language influence. These interviewees maintained their Japanese and encouraged their children to do so as well. These families socialized more often with other speakers of Japanese than with their English-speaking colleagues and acquaintances. Their children, too, were more likely to select Japanese-speaking playmates than English-speaking playmates. Richards and Yamada-Yamamoto concluded that this case of L₁ maintenance was due to parental concerns about their children's ability to compete successfully with their peers who had remained in Japan. If this is true, then we may argue that these findings show the influence that family and cultural community may have on the degree to which L₂ affects L₁.

There is also evidence that the influence of L₂ on L₁ may be affected by one's religious community. For example, there are some community-based activities that are conducted in two languages (e.g., an Orthodox Church in San Diego, CA, where the religious service is alternatively delivered in English and in Russian) (Kinberg & Serdyukov, 2003). In cases such as these, a model of mutuality would predict that L₂ would have less effect on L₁ if community and religious activities are conducted in L₁. On the other hand, there are some religious and community activities that are conducted in L₂ (e.g., Jewish services in the US, which are often conducted in Hebrew, the L₂ of most participants). In such cases, a model of mutuality would predict less influence of L₂ on L₁, since the religious environment would be the only L₂ environment.

3.2 Age of acquisition

The extent to which age of acquisition affects the learner's ultimate proficiency has been a matter of debate for years. There is certainly evidence (e.g., Bialystok, 1997) that younger L₂ learners seem to acquire a new language more easily than do older learners. However, this does not necessarily

mean that L_2 's influence on L_1 is affected by age of acquisition. There is little evidence comparing the effect of L_2 on L_1 in children with the effect of L_2 on L_1 in adults. However, Saville-Troike, Pan and Dutovka (1995) found that certain aspects of children's L_1 were affected by their L_2 , where the component of L_1 was not fully developed or consistent across the language. As will be mentioned later in this paper, if this is correct, then it is logical to suppose that were these learners older, their L_1 s would have been more fully developed. In this case, L_1 might have been less influenced by L_2 . In an analysis of the language issues particular to Russian immigrant families in the US, Kinberg and Serdyukov (2003) reported that the older adults were when they came to the USA without English knowledge, the more difficulty they experienced in mastering the language. However, in the case of children arriving in the US at 5-8 years of age after having been born and lived in Russia, Kinberg and Serdyukov (2003) reported that these children had acquired native proficiency in Russian. Yet, after being immersed in the English language environment in US schools and communicating with native speakers of English, many of these young people seem to have lost their Russian; in fact, their parents can no longer communicate with them in Russian. Certainly more research examining the effects of age of acquisition on L_2 's influence on L_1 is needed. At this point, though, we may argue that existing evidence seems to hint that there are indeed age affects on this influence.

3.3 Workplace influence

One final factor that may influence the effect of L_2 on L_1 is the influence of one's place of employment. If L_1 is the language spoken in the workplace, even if it is not the dominant language of the community, this influence would lessen the effect of L_2 on L_1 . One can notice this situation in, for instance, many ethnic restaurants where the personnel is usually composed of representatives of one culture. Commonly, they speak their language among themselves and with the majority of their customers belonging to the same ethnic group. When they are addressed in English, they are at a loss. When asked how long they have lived in the USA, many state they had been in the country for many years already.

On the other hand, we see a different pattern if the workplace language environment is English. In this case, if a non-native speaker is willing and able to perform his or her job adequately, he or she usually is able to master it to perfection with or without any external support (Kinberg & Serdyukov, 2003).

4. What is the evidence for a symmetrical, integral model of bilingualism?

The model presented in Section 3 shows a flexible, integral model of bilingualism in which the bilingual's languages influence each other. What is the empirical basis for such a model? What is the evidence that the bilingual's languages affect one another? As we consider how we might substantiate this model, we must first examine the support for it.

4.1 Does L_1 influence L_2 ?

Before taking up the topic of L_2 's influence on L_1 , let us briefly consider the question of L_1 's effect on L_2 . It is intuitive to believe that one's first language should somehow affect the acquisition of another language; there is also theoretical support for this position.

4.1.1 Theoretical support

Chomsky (e.g., 1995) has argued that all languages are governed by a set of universal principles and that children come to the language-learning process equipped with access to these principles. Researchers such as Martoharjono, Epstein and Flynn (1998) argue that the process of second language acquisition is much the same as it is for first language acquisition in that the learner has access to the principles of Universal Grammar (UG). If it is true that L_2 learners have access to UG

principles, then it is logical to suppose that L_2 might influence L_1 , if both languages respect UG principles, and these principles are available to the L_2 learner.

This theoretical position begs the question of whether access to UG principles is related to age; i.e., whether adult L_2 learners have access to UG principles in the same way that children do. There is evidence for UG-access in adults. For instance, Young-Scholten (1994) presents a review of research that suggests that the principles of UG are indeed available to the adult. Kanno's (1996) study of adult L_2 learners of Japanese also suggests that these learners have access to UG. It is important to note, however, that the theoretical position that adults have access to UG is not uncontroversial. Several researchers (e.g., Clahsen, 1990) argue that the process of second language acquisition is different for adults than it is for children; i.e., adults do not have access to the principles of Universal Grammar as children do.

Given that UG may operate differently for adults than it does for children, we must look to other L_2 theories as a basis for a model of mutuality. One such theory is Cummins' model of Common Underlying Proficiency (Cummins, 1994). This model presumes that, rather than relying on separate underlying proficiencies for each language, learners are equipped with one underlying language proficiency that informs any language the learner speaks. If Cummins is correct, then one's knowledge of L_1 informs one's understanding of L_2 , since the same proficiency informs both languages.

4.1.2 Research evidence

Not only do theoretical models of L_2 acquisition support L_1 influence on L_2 , but also evidence from research into this area supports such influence. For instance, Juffs (1998) conducted a study of speakers of Chinese, Korean and Romance languages who were learning English. Juffs found that speakers of Romance languages found it easier to parse English argument structure than did the other participants. Since the argument structure of Romance languages resembles that of English more closely than does the argument structure of Chinese or Korean, Juffs took this finding as evidence that these respondents were relying on information from their L_1 as they performed tasks in the L_2 .

In another study of L_1 influence on L_2 , Jarvis (2000) focused on English-language synopses of video clips written by Swedish and Finnish learners of English who had viewed these videos. He found that Swedish learners of English resembled each other in their responses more closely than they resembled their Finnish-speaking counterparts. Likewise, the responses of speakers of Finnish resembled those of other speakers of Finnish more than they did their Swedish counterparts. Jarvis took these findings as evidence that these participants were being influenced by their respective L_1 s. If Jarvis and Juffs are correct, then L_1 has an effect on L_2 . The question then becomes, "What, if any, effect does L_2 have on L_1 ?"

4.2 Does L_2 influence L_1 ?

It seems clear that L_1 influences L_2 . If the model described in Figure 2.1 and Figure 3.1 is correct, then L_2 also affects L_1 . Let us now examine the support for this supposition.

4.2.1 Theoretical support

The same theoretical models that predict an influence of L_1 on L_2 also predict the reverse. If researchers such as Epstein, Flynn and Martohardjono (1996) are correct in claiming that adults have access to UG, then it is logical to suppose that L_2 learners rely on UG principles regardless of the language they are using. If this is the case, then it is reasonable to suppose that L_2 might influence L_1 , since they are governed by the same underlying principles, to which the learner has access.

It will be recalled that to claim adults have access to the principles of UG is not uncontroversial; therefore, we must look to other theories of L_2 acquisition to support the claim that L_2 influences L_1 . Here again, we find such support in Cummins' (1994) model of Common Underlying Proficiency. It

will be recalled that Cummins claims that L_1 and L_2 are both informed by the same underlying language proficiency. If this is the case, then it is reasonable that L_2 would influence L_1 .

4.2.2 Research evidence

There is evidence that supports L_2 influence on L_1 , at least in the case of child L_2 learners. Saville-Troike, Pan and Dutovka (1995) studied the first language development of children from several different language backgrounds who were learning English. These researchers found that, where elements of the first language grammar were fully developed, stable across the language and not in conflict with English, there was no effect of English on these children's L_1 . On the other hand, where elements of the L_1 were not fully developed, not stable across the language, and/or were in conflict with English, there was an effect of English on the L_1 grammars of the participants.

In another example of the influence of languages other than the L_1 , Sikogukira (1993) also studied children who were learning English; in this case, they were native speakers of Kirundi, an African language, and L_2 speakers of French. Sikogukira presented these learners with an English-language sentence completion task designed to elicit English-French cognates, and found that his participants were more likely to use French lexical items than English lexical items. Sikogukira took this as evidence that these children's L_2 (French) was influencing their L_3 (English).

If researchers such as Saville-Troike, Pan and Dutovka (1995) and Sikogukira (1993) are correct, then bilingualism and multilingualism are not simply a matter of L_1 influencing other languages; rather, the languages influence each other. Our model of bilingualism must then allow for this mutuality. In short, our model of bilingualism should be a symmetrical, integral model (Kinberg & Serdyukov, 2003).

A symmetrical, integral model of bilingualism would predict that the bilingual's languages would influence each other, and the evidence described above bears this prediction out. However, most of the research on L_2 influence on L_1 has been conducted with children. As mentioned earlier, the case of adult L_2 learners might be quite different from that of child L_2 learners. In order to determine whether bilingualism truly is a matter of mutual language influence, it is important to establish whether adult L_2 learners also show evidence of L_2 affecting L_1 . If bilingualism can be described with a symmetrical, integrative model, then the L_2 s of adult learners should influence their L_1 s.

Little research is available on the effect of L_2 on L_1 in adult learners; however, there is some evidence for L_2 on L_1 . For instance, Tokumaru (2002) conducted a study of adult Japanese/English bilinguals, to whom she presented Japanese words that had been borrowed from English. Tokumaru found that, after seeing these loanwords, her participants were more likely to recognize the original English source words of these borrowed words than they were Japanese words of similar spelling and pronunciation. Tokumaru took this as evidence of the kind of cross-linguistic influence predicted by a model of mutuality. This finding supports an effect of L_2 on L_1 in adult learners.

Based on the above discussion, there is support for a model of mutuality. If this is true, then L_2 influences L_1 . The study presented here, a pilot study for a larger project, was designed to extend the examination of L_2 influence on L_1 in adults. This study examines whether adult L_1 grammars (specifically, conceptions of L_1 structure) are influenced by L_2 .

5. The present study

5.1 Hypotheses

Based on the research discussed above, it was hypothesized that the L_1 of adult bilinguals would be influenced by their L_2 . This being the case, it was also hypothesized that adults would rely at least partly on their L_2 if they were asked to make judgments about the acceptability of sentences in their L_1 .

5.2 Subjects

Subjects were adult native speakers of English who were also L₂ speakers of Spanish. These individuals were graduate students or faculty at three universities in the Midwest and in California. These participants had acquired Spanish as adults, either through formal study, living in a Spanish-speaking country or having a spouse/partner whose first language was Spanish. All reported that they spoke English most frequently in the home, and used English most frequently in their daily work lives. Adult monolingual speakers of English also participated in this study as controls.

5.3 Procedures

All participants were asked to complete an acceptability judgment task that consisted of 60 English sentences. Of these sentences, 20 were structurally sound in both English and Spanish. That is, their structures would be permitted in both languages; (1) serves as an example of this type of item.

- (1) Which restaurant do you prefer?
¿Cuál restaurante prefieres?

The task also included 20 sentences that would be ruled out in both Spanish and English, as in (2).

- (2) * Here is the room that the secretary heard the idea that the President needs.
**Aquí está la oficina que la secretaria oyó la idea que el
Presidente necesita.*

In order to address the question of whether these participants were relying on their L₂ to make their acceptability judgments, the task also contained 20 items that would be structurally sound in Spanish, but not necessarily acceptable in English (See (3)).

- (3) Which book did you ask if I've read?
¿Cuál libro me preguntaste si he leído?

Participants were asked to rate each item as completely grammatical, moderately grammatical, marginal, moderately ungrammatical or completely ungrammatical. It was predicted that subjects would accept as grammatical or moderately grammatical those sentences that obeyed both Spanish and English rules of structure, as in (1), and that they would reject as unacceptable (moderately or completely ungrammatical) sentences that violated the rules of structure in both languages (See (2)). It was also predicted that, because subjects were relying on their L₂ for information, they would also rule in (accept as completely or moderately grammatical) sentences such as (3) that are not necessarily acceptable in English but are grammatical in Spanish.

6. Results

6.1 Results for bilingual participants

After the participants in this study had completed the judgment task, their responses were scored and results were compiled. Table 1 shows the mean correct responses of these respondents.

Table 1 – Bilinguals’ Mean Percent Responses to Each Category of Item

| Type of Item | Judged as Completely or Moderately Grammatical | Judged as Completely or Moderately Ungrammatical | Judged as Marginal |
|--|--|--|--------------------|
| Items grammatical in both Spanish and English | 93 | 4.62 | 1.95 |
| Items ruled out in both Spanish and English | 6.32 | 79.6 | 13.5 |
| Items ruled out in English but not in Spanish | 42.9 | 39.4 | 15.3 |

As can be seen in Table 1, respondents overwhelmingly accepted as grammatical or moderately grammatical those sentences allowed in both Spanish and English; an analysis of variance performed on this data showed a statistically significant difference between the mean percent of these items that were ruled in and the mean percent that were ruled out ($\alpha=.05$, $F=1508$, $p<.0001$).

Participants also showed a strong tendency to rule out sentences that violate both English and Spanish rules of structure. Here, too, there was a statistically significant difference between items of this type that were ruled in and those that were ruled out ($\alpha=.05$, $F=226.8$, $p<.0001$).

The same results did not obtain for sentences that are ruled out in English but not in Spanish. Subjects did not show a statistically significant preference for ruling in or ruling out these items ($\alpha=.05$, $F=.177$, $p=.68$).

Participants were, however, more likely to rule out sentences that violate both Spanish and English rules of grammar than they were items allowed in Spanish but not in English ($\alpha=.05$, $F=30.96$, $p<.0001$). They were also more likely to allow sentences that are acceptable in both Spanish and English than sentences that are only allowed in Spanish ($\alpha=.05$, $F=67.84$, $p<.0001$).

Subjects were more likely to judge as marginal those sentences which are ruled out in both Spanish and English than those allowed in both languages ($\alpha=.05$, $F=13.20$, $p=.0008$). They were also more likely to judge as marginal items allowed in both languages than items ruled out in English but allowed in Spanish ($\alpha=.05$, $F=11.74$, $p=.0015$). However, respondents did not judge as marginal sentences ruled out in both Spanish and English more often than items unacceptable in English but ruled in for Spanish ($\alpha=.05$, $F=.13$, $p=.72$).

6.2 Results for monolingual participants

As mentioned previously, the acceptability judgment task was also administered to monolingual speakers of English who served as controls for the study. As can be seen in Table 2, patterns of responses for monolingual speakers of English differed greatly from those of the bilingual participants.

Table 2 – Monolinguals’ Mean Percent Responses to Each Category of Item

| Type of Item | Judged as Completely or Moderately Grammatical | Judged as Completely or Moderately Ungrammatical | Judged as Marginal |
|--|--|--|--------------------|
| Items grammatical in both Spanish and English | 87.7 | 1.6 | 10.5 |
| Items ruled out in both Spanish and English | 2.47 | 93.15 | 4.21 |
| Items ruled out in English but not in Spanish | 14.75 | 69.6 | 14.65 |

Like their bilingual counterparts, monolingual speakers of English overwhelmingly accepted as grammatical or moderately grammatical those items ruled in for both languages ($F=655$, $p<.001$, $a=.05$). They also tended to reject those items ruled out in both Spanish and English ($F=755.4$, $p<.001$, $a=.05$). Moreover, there was no statistically significant difference between monolingual speakers of English and bilingual participants on items judged as marginal, whether those items were grammatical in both languages ($F=7.41$, $p=.009$, $a=.05$), ruled out in English but not in Spanish ($F=1.73$, $p=.09$, $a=.05$), or ungrammatical in both languages ($F=7.71$, $p=.008$, $a=.05$).

However, some of the monolingual participants’ responses to items ruled out in English but allowed in Spanish were quite different from those of the bilingual participants in this study. Monolingual speakers of English were far more likely to reject than to accept as grammatical items ruled out in English ($F=79.64$, $p<.0001$, $a=.05$). They were also more likely to reject these items than were their bilingual counterparts ($F=15.59$, $p=.0003$, $a=.05$). Bilingual respondents accepted as grammatical or moderately grammatical items ruled out in English more often than their monolingual peers ($F=15.78$, $p=.0003$, $a=.05$).

7 Discussion

It was predicted that participants in this study would accept sentences ruled in for both Spanish and English; the results shown in Tables 1 and 2 bear this prediction out. Both groups of respondents had a tendency to accept as grammatical or moderately grammatical those sentences which are allowed in both English and Spanish. It was also predicted that respondents would reject sentences that violate the structures of both Spanish and English; this finding also obtained (See Tables 1 and 2).

The third prediction made, that bilingual participants would accept sentences ruled out in English but not in Spanish, was not overwhelmingly borne out by the data shown in Table 1. In fact, statistically there was no difference between the mean percent of subjects who ruled these items in and those who ruled them out. At first glance, then, it seems that these subjects did not rely on their L_2 in this task, since they did not show a strong tendency to accept these items as completely or moderately grammatical. A closer look at the data, however, suggests a different possibility. It will be recalled that participants in this study were more likely to reject sentences ruled out in both Spanish and English than those that are ruled out only in English. It is possible that these respondents looked to their L_2 as one source of information about whether these items were acceptable. When information from the L_2 was consistent with information from the L_1 (in this case, when sentences were unacceptable in both Spanish and English), subjects had little difficulty in rejecting ungrammatical

items. On the other hand, when information from the L₂ conflicted with information from the L₁ (i.e., when an item was ruled out in English but acceptable in Spanish), participants found it more difficult to reject items.

This account would explain the difference between rejection rates for items ruled out in both Spanish and English and items ruled out only in English. It would also explain the difference in acceptance rates between items that were grammatical in both Spanish and English and items that were ruled out in English but not in Spanish. Finally, this account would explain why monolingual speakers of English were more likely to reject items ruled out in English than were their bilingual peers (See above). Since these individuals could not rely on an L₂ for information about the grammaticality of these items, they relied on their L₁. Since these items are ruled out in English, monolingual participants tended to reject them as ungrammatical.

Interestingly, this account is also consistent in part with Saville-Troike, Pan and Dutovka's (1995) finding that children's L₁ did not seem to be affected by their L₂ except in cases where the element of L₁ was not fully developed, was not consistent across the language or was in conflict with the L₂.

If this explanation is correct, it raises an important question: Does this set of findings mean that L₂ affects L₁ in the same way for adults as it does for children? This is an attractive possibility, especially given the research (See above) that suggests that adult L₂ acquisition resembles child L₂ acquisition. However, it will be recalled that this theoretical position is not universally held; there is evidence (See above) that adult L₂ acquisition is not similar to child L₂ acquisition. If this is true, then L₂ may not affect L₁ in the same way for adults as it does for children.

As an example, one way in which L₂ effects might be different for adults than for children is in the elements of grammar that are affected. For instance, Saville-Troike, Pan and Dutovka (1995) found that the level of development of the element of grammar being studied affected the extent to which L₂ influenced L₁. In the case of normally functioning adults, we may presume that the L₁ would be fully developed; this factor would therefore be less likely to affect L₂'s influence on L₁ for adults than for children.

It is possible that L₂ affects L₁ differently in adults than in children. Nonetheless, the above data suggests that these adults were relying on their L₂ as they completed this L₁ task. These data thus support a symmetrical, integral model of bilingualism in which L₂ and L₁ influence each other (e.g., Cook, 2003; Kinberg & Serdyukov, 2003).

7. Conclusions

As Jarvis (2000) points out, methodological rigor is an important consideration in the study of language effects. Such factors as age, differences between languages, and social and educational background may have important effects on the extent to which L₂ influences L₁. The possibility of adult/child differences in L₂'s effects on L₁ highlights the need for careful study of the factors that affect language influence. As our model of bilingualism is expanded and enhanced to better reflect the true nature of the L₂/L₁ relationship, these factors will no doubt be isolated and examined.

As we look closely at the factors which affect L₂'s influence on L₁, it is important to note that the more contexts in which we find that L₂ influences L₁, the stronger will be the argument for a symmetrical, integral model of bilingualism in which L₂ and L₁ influence each other. Previous studies of children (e.g., Saville-Troike, Pan & Dutovka, 1995) and of adult performance (Tokumaru, 2003) support such a model. Results of the present study also support this model. Future research with different structures, different language tasks and different groups of learners will be useful as the model of mutuality is further developed.

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