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Linguistic transfer and the use of context by Spanish–English bilinguals

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ABSTRACT
In this study, Spanish-English bilinguals and English monolinguals used brief English contexts to choose among possible meanings for unfamiliar words. Two types of errors were compared: transfer errors, which were answers consistent with Spanish, but not English, syntax, and nontransfer errors, which were inconsistent with the syntax of both languages. Nontransfer errors were found to be negatively correlated with reading proficiency in both Spanish and English. Transfer errors, on the other hand, were positively correlated with reading proficiency in Spanish and were unrelated to reading proficiency in English. First language syntactic knowledge was thus found to influence guesses about the meanings of unfamiliar words in a second language context. This effect was found among bilinguals who had experienced a variety of amounts and types of exposure to English.

In this study we investigated the effects of Spanish-English bilinguals' first language syntactic knowledge on the guesses they make about the meanings of new words encountered in English contexts. Our goals were to examine a particular type of transfer and to gain a better understanding of the process of vocabulary acquisition in second language readers, a group that constitutes an increasingly large segment of the school population in the United States.

In the field of second language acquisition there has been a growing interest in vocabulary (Ard & Homburg, 1983; Carter, 1987; Carter & McCarthy, 1988; Gairns & Redman, 1986; Meara, 1987; Nation, 1990; Nation & Carter, 1989; Olshtain, 1987; Palmberg, 1987). Vocabulary knowledge is seen as including not only knowledge of individual words, but also lexical processing, which includes knowledge of strategies that allow learners to

make inferences about the meanings of new words (Dollerup, Glahn, & Rosenberg Hansen, 1989; Færch, Haastrup, & Phillipson, 1984; Haastrup, 1989, 1991). Making inferences about the meanings of new words is essential for large-scale growth in reading vocabulary (Nagy & Anderson, 1984; Nagy, Anderson, & Herman, 1987) and for negotiating texts with a high proportion of unfamiliar vocabulary, as is common in the experience of second language readers. Second language readers are able to gain significant information about new words from context (Dupuy & Krashen, 1993; Elley, 1991). But inferring the meanings of new words is a complex process (McKeown, 1985), one which can be especially difficult for readers with limited second language proficiency (Cziko, 1978; Haynes, 1993). We still know relatively little about how the process of vocabulary acquisition in a second language differs from vocabulary acquisition in one's first language.

Cziko's (1978) research on the use of context by first and second language readers suggests that second language readers are able to make some use of local (syntactic) context, but that, even at intermediate levels of second language proficiency, they have difficulty getting additional information from global (discourse) context. The results of Haynes's (1993) study support this conclusion. Second language readers were successful in guessing the meanings of words when information about the meaning was provided by local context, but they were less successful when inferring the meaning required an integrated comprehension of the passage as a whole.

These studies provide strong evidence that, for some second language readers, global context poses a greater difficulty than local context. However, it should not be assumed that the use of local context presents no problem. Cziko's intermediate-level second language readers had considerable experience in their second language; they were English-speaking seventh grade students who had received 30 to 45 minutes a day of instruction in French as a second language since first grade, and 70% of their instruction was in French by seventh grade. But their ability to use local context was still far below that of French native speakers and advanced learners of French as a second language.

The syntactic context constitutes an important component of the information provided by local context; the extraction of other types of information from the local context is also mediated by the syntactic structure (Nagy & Gentner, 1990). There are three related reasons why second language readers may have trouble using syntactic information in inferring the meanings of unfamiliar words. First, the clues to a word's meaning may involve syntactic detail known only by those who have attained a very high level of second language proficiency. Second, inferring the meaning of a word may require productive, rather than receptive, knowledge of a syntactic construction. Third, the reader's first language syntactic knowledge may influence the hypotheses made about the meaning of a new word. It is this third factor, the cross-linguistic transfer of syntactic knowledge, that is the particular focus of this study.

The role of first language knowledge in second language vocabulary acquisition

In the 1970s, studies of transfer, which up to that time had been shaped predominantly by the behaviorist paradigm, went into temporary eclipse. The subsequent rise of cognitive psychology and Chomskian linguistics led to approaches in second language acquisition research which emphasized the learners' active and creative construction (e.g., Dulay & Burt, 1974, 1975). However, since the existence of cross-linguistic influences is undeniable, the reconceptualization of transfer as a process within a cognitivist paradigm soon followed, and during the past few years cross-linguistic phenomena have received increasing attention (e.g., Gass & Selinker, 1983; Kellerman, 1979, 1986; Kellerman & Sharwood Smith, 1986; McClure & Branstine, 1990; McLaughlin, 1987; Odlin, 1989).

As Adjémian (1983) noted, one aspect of first language knowledge that may transfer to learning in a second language involves the relationships between the syntactic and semantic properties of lexical items. In any language there are at least partial regularities between the meaning of a word and its syntactic function. For example, consider the possible meanings for the verb *blented* in the sentence "John *blented* that he went into the room." The syntax of the sentence – the fact that *blented* is followed by a sentence complement with *that* as the complementizer – tells us that *blented* could be a verb of speaking, perception, or mental state, but not a verb of motion. That is, *blented* might mean something like "believed," "said," or "saw," but not "ran." In addition, the complementizer *that* gives further information about the meaning of the verb *blented,* information that depends on detailed, language-specific knowledge of the relationship between verbs and complementizers in English: the fact that *blented* might mean "expected" or "hoped," but not "forced" or "attempted."

The knowledge that allows us to make such predictions about the meaning of *blented* is not necessary for comprehension if we already know the meanings of all the words in the sentence. A reader can understand the sentence "John said that he went into the room" without knowing the fact that English verbs of speaking often take *that* as a complementizer; the presence of both *said* and *that* in the sentence make such knowledge redundant. However, what is redundant for comprehension, when the meanings of all the words are known, can become crucial when the meaning of a new word must be inferred.

Researchers in child language have recently emphasized the importance of syntax in the acquisition of verb meanings (e.g., Gleitman, 1990; Naigles, 1990; Naigles, Gleitman, & Gleitman, in press). In these studies they focused on those aspects of syntactic structure which are common to different languages. In the research proposed here, on the other hand, we are more interested in what is not universal – that is, in syntactic differences among languages that may lead to problems for second language learners.

Our focus likewise differs from that of research on cross-linguistic trans-

fer based on the Competition Model (Gass, 1987; Koda, 1993; Sasaki, 1991). Such research investigates possible transfer of general syntactic strategies (e.g., the relative reliance placed on different sources of information, such as word order and case markings). Rather, the present study is concerned with the transfer of relatively specific syntactic knowledge.

In this study we set out to test the hypothesis that a knowledge of relationships between the lexical meanings of verbs and their syntactic behavior in a first language influences the hypotheses that readers make about the meanings of unfamiliar verbs encountered in a second language text. We also wanted to find out under what conditions of second language acquisition such transfer takes place: for example, whether the level of transfer depends on the age of initial acquisition of English or the languages spoken in the home.

In particular, we looked at how syntactic differences between English and Spanish influence the inferences that Spanish-English bilingual students make about the meanings of unfamiliar words encountered while reading. We identified a number of syntactic constructions in English and Spanish which, though superficially similar, create different expectations about the meanings of unfamiliar words occurring in these constructions. For example, in the sentence frame "The researchers____to test students individually," English syntax would allow words such as *want, expect, need,* or *hope,* but not *require.* On the other hand, in the corresponding sentence in Spanish, the translation equivalent of *require* is permissible. We call such constructions "deceptively parallel."

In pilot testing, we found that, when encountering new words in deceptively parallel constructions in English, students whose native language is Spanish made different inferences about their meanings than did native speakers of English, including some bilinguals who had achieved high levels of proficiency in English. One of the purposes of this study was therefore to see whether the effects of first language syntax on inferences about new words in second language contexts depend in any way on the conditions under which the second language has been acquired.

METHOD

Subjects

The subjects in this study included three groups of seventh and eighth graders. The first group consisted of 41 Spanish-English bilingual students who were enrolled in bilingual education classes in an urban school district. We refer to these students as the bilingual instruction group. The second group consisted of 59 students in a predominantly Hispanic urban school who were not currently enrolled in bilingual education classes. We refer to these students as the English-only instruction group. On the basis of a language background questionnaire, 14 students in the latter group reported that they spoke no Spanish and so were excluded from the analyses reported in this study. The English-only instruction group therefore con-

Table 1. *Sample item from the multiple-choice context task*

Transfer version
The teacher *obsafted* to go to the board and write the answer.
The word *obsaft* is most likely to mean:
a) prevent b) order c) start d) disappear
Nontransfer version
The teacher *obsafted* the student to go to the board and write the answer.
The word *obsaft* is most likely to mean:
a) prevent b) order c) start d) disappear

sisted of 45 self-reported bilinguals. The third group consisted of 48 seventh graders from a small town in east-central Illinois. We refer to this group as monolingual; data from students identified by teachers as nonnative speakers of English were excluded.

The main experimental task was also administered to 15 Spanish–English bilingual graduate students from Spain and several Latin American countries. The means for this group are reported, but because these international graduate students differ in age from the other subjects and constitute a highly select group in terms of verbal ability, their data were not included in the statistical analyses.

Materials

Multiple-choice context task. We began by identifying syntactic structures in English which exemplified a "deceptive parallelism" to Spanish. Deceptively parallel structures are syntactic structures for which there is roughly a one-to-one mapping between the linguistic units in English and Spanish, excluding inflectional endings and the position of adjectives relative to nouns, but in which one language allows a different range of lexical items. A multiple-choice context task was created with items reflecting a variety of such structures.

Table 1 gives a sample item from the multiple-choice context task. The task was to choose which of four possible meanings was most appropriate for a nonsense word embedded in a short English context (1–3 sentences). Two versions of each item were constructed, a transfer version and a nontransfer version. The transfer version of each item capitalized on a deceptive parallelism between Spanish and English. For example, in the transfer version of the item in Table 1, English syntax allows only option (c), *start,* as a correct answer. However, option (b), *order,* is consistent with Spanish syntax. That is, in Spanish, one can say *El maestro mandó ir al pazarrón y escribir la respuesta* (literally 'The teacher ordered to go to the board and write the answer'). On the basis of Spanish syntax, then, both (b) and (c) are possible answers. The other two choices, (a) and (d), are inappropriate in terms of the syntax of either language.

In the pilot testing of this and other similar items, Spanish-dominant

bilinguals who were highly proficient in English nevertheless sometimes chose options which, like (b) in the above example, were consistent with Spanish, but not English, syntax. We would therefore categorize (b), the distractor of the transfer version, as a "transfer error."[1]

It should be noted that the choice among the four options is not a matter of idiosyncratic properties of specific lexical items, but of systematic (though complex) relationships between lexical semantics and syntax in English and Spanish. The fact that *ordered* does not fit the English context, whereas *mandó* does fit the equivalent Spanish context, reflects not just the syntactic behavior of those two particular verbs, but that of classes of verbs. In English, verbs such as *command, order,* and *require* must have a direct object before the infinitive phrase. In Spanish, on the other hand, verbs of this category allow the logical subject of the embedded clause to be deleted, even though it is not coreferential with the subject of the sentence.

There may, of course, be reasons other than cross-linguistic transfer why a subject would choose option (b) for this test item. To help determine the extent to which the choice of a transfer error option actually reflects transfer, a non-transfer version of each item was constructed, as illustrated in Table 1. The set of choices was always the same for both versions of the item. The lexical content of the item was preserved as much as possible, and the syntax was changed slightly to achieve two effects. First, the distractor, which served as the transfer error in the transfer version, became the correct answer for the nontransfer version. Second, the syntax of the nontransfer version of the item avoided deceptive parallelism. Spanish syntactic knowledge, to the extent that it was applicable, would result in a choice of the correct answer. The choice of any distractor for this type of item therefore constituted a nontransfer error.

A total of 22 transfer items were written, representing five categories of English syntactic constructions which displayed deceptive parallelism with Spanish. Two versions of the task were constructed; each one contained either the transfer or nontransfer version of a given item. The complete task consisted of 2 practice items, 11 transfer version items, 11 nontransfer version items, and 3 filler items. Examples of items illustrating each of the categories of syntactic constructions can be found in the Appendix.

Two variables were computed from the subjects' performance on the multiple-choice task. One variable was transfer errors, defined as the proportion of transfer items on which the subject made a transfer error. The other variable was nontransfer errors, defined as the proportion of nontransfer items on which the subject made any error. (Nontransfer errors for transfer items were excluded from the analysis in order to insure that the variables of transfer errors and nontransfer errors were statistically independent.)

Reading proficiency. English reading proficiency of the bilingual instruction and English-only instruction students was measured using the Reading (Vocabulary and Comprehension) subtest of the English-language Test of Adult Basic Education (TABE), Survey Form, Level M (CTB/McGraw-

Hill, 1994b). Spanish reading proficiency of the bilingual instruction subjects was measured using the TABE Español Lectura (reading) subtest (CTB/McGraw-Hill, 1994a), which is designed to be equivalent to, but not a translation of, the English-language version.

Language background questionnaire. A language background questionnaire was constructed in which students were asked about their learning and use of Spanish and English in several contexts. The items from this questionnaire, along with the percentage of students giving specific types of responses, are given in Table 2.

Procedures

All the subjects were tested in intact classroom groups in order to maximize the number of students that could be included in the study. The monolingual subjects were given only the multiple-choice context task.

The subjects in the bilingual instruction group were tested in two 45-minute sessions, one in the morning and one in the afternoon of the same day. During the first session, the subjects were given the multiple-choice context task and then the Reading subtest of the English-language TABE. During the afternoon session, the subjects took the Spanish-language version of the TABE and then completed the language background questionnaire. The subjects in the English-only instruction group were tested in a single session in which they were given the multiple-choice context task, the Reading subtest of the English-language TABE, and the language background questionnaire.

RESULTS

Language background questionnaire

Table 2 gives the percentages of students in the bilingual instruction and English-only instruction groups that responded to selected questions in the language background questionnaire. Although there was some overlap between the groups, they differed significantly for every measure of language use and language-related experiences. Students in the bilingual instruction group were mostly born outside of the continental United States. They all reported being able to read in Spanish and were more likely than students in the English-only instruction group to use Spanish with parents, siblings, and friends.

Reading proficiency

Students in the bilingual instruction group had a mean of 38% correct (SD = 16) on the English-language TABE. According to norms provided by the publishers, this mean is equivalent to a third grade reading level. The

Table 2. *Language background questionnaire, with percentage of students giving specific answers*

	Bilingual instruction (n = 41)	English-only instruction (n = 45)
1. What country were you born in?		
United States	27	80
Mexico	54	13
Puerto Rico	17	4
Other Latin American countries	2	2
2. How long have you lived in the U.S.?		
Less than 2 years	18	0
2–3 years	28	0
4 years	28	6
5–10 years	13	21
12 or more years	15	74
3. When did you begin to learn English?		
Preschool	18	55
Kindergarten	5	23
Grades 1 or 2	21	16
Grades 3 or 4	10	7
After grade 4	46	0
4. Can you read in Spanish?		
Yes	100	68
No	0	32
5. Which language do you read better?		
Spanish	44	0
English	10	60
Same	46	40
6. Which language do you speak better?		
Spanish	60	9
English	10	59
Same	30	32
7. Do your parents speak to you in Spanish?		
Always	85	57
Sometimes	13	39
Never	2	4
8. Do your parents speak to you in English?		
Always	13	18
Sometimes	47	68
Never	40	14
9. Which language do you use to speak with your brothers and sisters?		
Spanish	51	7
English	15	52
Both	34	41
10. Which language do you use to speak with your friends?		
Spanish	46	5
English	15	50
Both	39	45

Note: Numbers represent the percentage of students in each group giving a particular response.

Table 3. *Error rates for four groups of subjects*

	Mean (*SD*)	Range
Bilingual instruction (n = 41)		
Transfer[a]	.24 (.14)	.00–.55
Nontransfer[b]	.43 (.25)	.00–.91
English-only instruction (n = 45)		
Transfer	.26 (.15)	.00–.73
Nontransfer	.15 (.14)	.00–.55
Bilingual graduate students (n = 15)		
Transfer	.33 (.16)	.00–.55
Nontransfer	.10 (.08)	.00–.19
Monolinguals (n = 48)		
Transfer	.16 (.12)	.00–.36
Nontransfer	.08 (.12)	.00–.55

[a]Expressed as the proportion of transfer items for which the transfer error distractor was chosen.
[b]Expressed as the proportion of nontransfer items for which any incorrect distractor was chosen.

bilingual instruction group's mean for the Spanish-language TABE was 48% (*SD* = 14), which is also equivalent to a third grade reading level.

Students in the English-only instruction group had a mean of 70% correct (*SD* = 20) on the English-language TABE, equivalent to about a fifth grade reading level. The difference in English reading proficiency between the bilingual instruction and English-only instruction groups was significant, $F(1, 85) = 72.0, p < .001$.

Multiple-choice context task

Table 3 gives the proportion of transfer and nontransfer errors made by the four groups of subjects on the multiple-choice context task. An analysis of variance for the transfer errors (excluding data from the graduate student group) revealed a significant effect of group, $F(2, 133) = 6.4$, $p < .01$. Scheffé post-hoc tests showed that the means for monolingual students were significantly different from those of both the bilingual instruction and English-only instruction students. A parallel analysis for nontransfer errors gave similar results. There was a main effect of group, $F(2, 133) = 46.5$, $p < .01$. Again, the means for the monolingual students were different from those of both the bilingual instruction and English-only instruction students. Analyses using the item as the unit of analysis found that there were significant differences by group (bilingual instruction, English-only instruction, and monolingual) for transfer errors, $F(2, 42) = 3.78$, $p = .031$, and for nontransfer errors, $F(2, 46) = 62.52, p < .001$.

These results are consistent with the hypothesis that transfer errors represent the use of first language syntactic knowledge in using context to make

guesses about the meanings of unfamiliar words. However, the subjects in the monolingual group, like those in the English-only instruction group and the Spanish graduate students, made more transfer errors than nontransfer errors. Furthermore, one might expect the bilingual instruction group to be the most prone to transfer errors, but in fact this is the only group that made more nontransfer than transfer errors. Hence, at first glance, the results also appear to be consistent with the hypothesis that transfer errors are simply more seductive as distractors than nontransfer errors. A closer examination of the data is therefore necessary to see whether there is convincing evidence for transfer.

A comparison of the means of the four groups shows that transfer and nontransfer errors appear to behave differently. The bilingual graduate students made almost as few nontransfer errors as the monolinguals, but they made the greatest number of transfer errors. Likewise, the English-only instruction students made far fewer nontransfer errors than the bilingual instruction students, but slightly more transfer errors.

Correlations between transfer and nontransfer errors

Correlations between transfer and nontransfer errors indicate that the relationship between the two error types is different for the three groups. For the monolingual students, there is a significant positive correlation between the two ($r = .41, p < .01$). For the English-only instruction students, the two types of errors are not correlated ($r = .11$). For the bilingual instruction students, there is a significant negative correlation between the two types of errors ($r = -.34, p < .05$).

A similar pattern is found when data for the students in the bilingual instruction and English-only instruction groups are redivided on the basis of length of residence in the United States. For the students who have been in the United States for more than 10 years ($n = 45$), there is no correlation ($r = -.01$). For the students who have been in the United States for 4 to 9 years ($n = 25$), the correlation is nonsignificant, but negative ($r = -.25$). But for the students who have been in the United States for less than 4 years ($n = 18$), there is a strong negative relationship between transfer and nontransfer errors ($r = -.63$).

Among the monolingual students, then, the two error types function similarly; those who make more of one type of error are likely to make more of the other as well. This does not hold for bilingual students. The negative correlation between the two error types for the students with the least exposure to English may indicate that students who are not able to process the English text sufficiently well are also not seduced by the deceptive parallelisms between English and Spanish.

Error types and reading proficiency

To look at the relationship between English reading proficiency and errors on the multiple-choice context task, we combined the data from the two

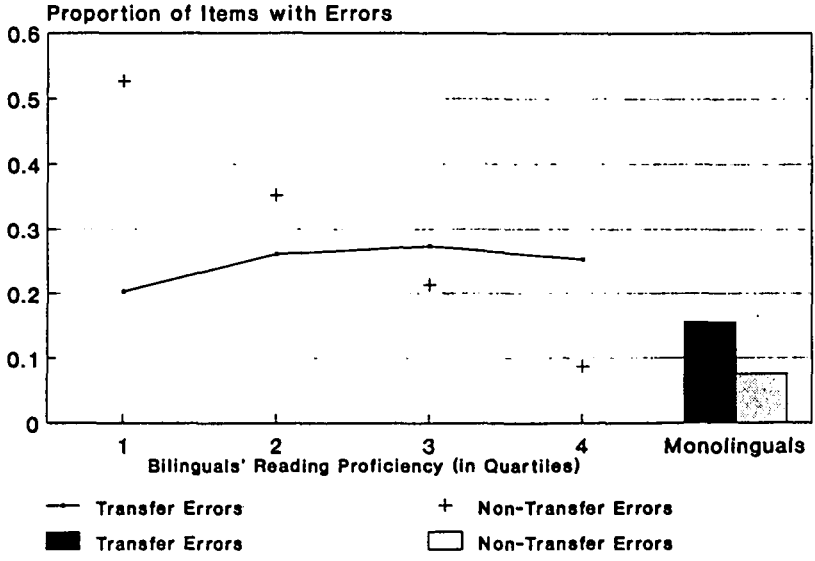

Figure 1. Transfer and nontransfer error rates by English reading proficiency.

groups of bilingual students, bilingual instruction and English-only instruction, to examine the relationship over the broadest possible range of English reading proficiency levels. English reading proficiency is significantly negatively correlated with nontransfer errors ($r = -.65$, $p < .001$), but not with transfer errors ($r = .05$). Figure 1 portrays the relationship between English reading proficiency and the two error types, with students from the combined bilingual instruction and English-only instruction groups divided into quartiles on the basis of their English reading proficiency. (For the purpose of comparison, bars representing the means for the monolingual group are given at the right.) The figure and the correlations show the same picture: there is a strong negative relationship between English reading proficiency and nontransfer errors, whereas transfer errors are present to the same degree at all levels of English reading proficiency.

For students in the bilingual instruction group, we had measures of reading proficiency in both English and Spanish. The correlations between the measures of reading proficiency in the two languages was high ($r = .69$, $p = .01$). Nontransfer errors were negatively related both to Spanish reading proficiency ($r = -.43$, $p < .01$) and to English reading proficiency ($r = -.47$, $p < .01$). As in the analysis with the combined groups, transfer errors were not related to English reading proficiency ($r = .15$, $p = .18$). However, there was a significant positive relationship between transfer errors and Spanish reading proficiency ($r = .35$, $p = .012$). This relationship remained significant when English reading proficiency was controlled for.

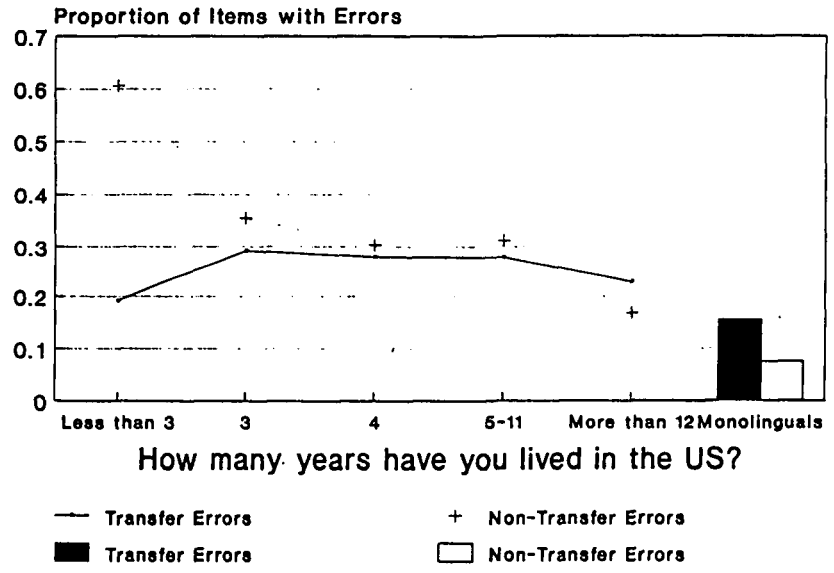

Figure 2. Transfer and nontransfer error rates by length of residence in the United States.

Error types and language background

Data from the bilingual instruction and English-only instruction groups were combined to examine the relationship between the students' performance on the multiple-choice context task and their responses on the language background questionnaire. One-way analyses of variance were used, with the proportion of transfer errors and nontransfer errors as independent variables and response categories as dependent variables.

No questionnaire items were found to be significantly related to the proportion of transfer errors. However, the proportion of nontransfer errors was related to a number of items on the questionnaire. More nontransfer errors were made by students who were born outside of the continental United States, who had lived in the United States for fewer years, who reported beginning to learn English at a later point in life, who said they could read better in Spanish than in English, and who reported using Spanish more often than English with siblings and friends.

Figure 2 depicts the relationship between the two error types and the students' length of residence in the United States. The picture is substantially the same as that in Figure 1. Transfer errors appear to be found more or less uniformly across levels of English proficiency and length of residence in the United States.

An examination of individual items showed that, for 14 of the 22 items, differences in means were in the expected directions; students in the bilingual groups (bilingual instruction and English-only instruction) made more

transfer errors than monolinguals. For another three items, the English-only instruction group, but not the bilingual instruction group, behaved as predicted, making more transfer errors than monolinguals. The bilingual instruction students' errors were evenly distributed among all three incorrect responses. This more random response pattern suggests that the low level of transfer errors for these three items represents a failure by some students to process the items completely. In the case of another two items, the students in the bilingual instruction group made more transfer errors than those in the monolingual group, as would be expected. However, the students in the English-only instruction group made no transfer errors at all. Perhaps the lack of transfer errors for these two items reflects a ceiling effect, since 93% and 96% of the responses for these two items were correct.

Three items behaved anomalously. The students in the monolingual group made a large number of transfer errors (44%, 59%, and 63%, respectively), more than either of the bilingual groups. In these cases, the monolingual students' choice of the transfer distractor appears to be a matter of semantics overriding syntactic context. For example, for the context "It was the first day of school and the principal wanted to know how much English the students knew. The principal had the students *frolge* in English," 59% of the monolingual students chose the transfer response *test* as the meaning for *frolge,* and only 37% chose the grammatically correct *read.* Although *read* fits the local syntactic context better than *test,* the larger context – and the fact that schools universally use tests to determine what students know – make the latter choice an especially seductive distractor. It may also be that, for some speakers of English, *test* is a syntactically acceptable choice in that context.

We also examined subcategories of transfer items to see if transfer was more likely to occur for particular types of contexts, or whether particular types of syntactic contexts differentially affected the two groups of bilingual students. No discernible patterns were found.

DISCUSSION

To summarize the results, Spanish-English bilinguals made significantly more transfer errors and nontransfer errors than did monolingual English students. However, nontransfer errors were negatively related to reading proficiency in both English and Spanish, whereas transfer errors were not related to English reading proficiency and were positively related to reading proficiency in Spanish. Transfer and nontransfer errors were positively correlated for English-speaking monolinguals, but negatively correlated for Spanish-English bilinguals who have spent the least amount of time living in the continental United States.

Do transfer errors really reflect transfer? An alternative hypothesis is that the transfer error choices are simply more plausible than other types of wrong answers. On this basis, one would predict that all students would make more transfer errors than nontransfer errors, except for those who

read so poorly that their responses appear to become random. This hypothesis would account for the fact that monolingual English speakers made more transfer errors than nontransfer errors, and it is consistent with the means for the bilingual instruction and English-only instruction groups.

This hypothesis, however, does not account for the fact that transfer errors were related positively to Spanish reading proficiency and were unrelated to English reading proficiency. Nor does it explain why there should be a positive correlation between transfer and nontransfer errors for monolinguals and a negative correlation for bilinguals. Finally, it does not explain why the Spanish-dominant bilingual graduate students, who were highly proficient at reading in English (as evidenced by their low rate of nontransfer errors), had the highest rate of transfer errors. The combination of results, therefore, supports the hypothesis that Spanish–English bilinguals are influenced by their first language syntactic knowledge when they make guesses about the meanings of unfamiliar words in English.

It is somewhat surprising that transfer errors were not significantly related to English proficiency or to any of the variables from the language background questionnaire. One might have expected that students who were less proficient in reading English or who used English less often with family and friends would be more prone to make transfer errors. There are several possible reasons for this lack of relationship between transfer errors and other variables. One is that transfer errors of the sort measured in this study persist at even high levels of second language proficiency. This is consistent with the high rate of errors made by Spanish graduate students. Some of these graduate students appeared to have reached near-native fluency in English, and yet they still made many transfer errors. Another explanation is based on the assumption that some level of English proficiency is necessary before transfer becomes possible: the syntactic context must be understood to some degree before bilingual students can be misled by it. The students with the lowest proficiency in English, who might otherwise be expected to make many transfer errors, may not be processing the English syntactic contexts in this study thoroughly enough to be led astray by their deceptive similarity to Spanish.

It should also be recognized that among the bilingual students the best readers of English were not necessarily those students who knew the least Spanish. On the contrary, there was a strong correlation between the measures of reading proficiency in the two languages; thus, the best readers in English may be those who capitalize on the relationship between the two languages (Jiménez, García, & Pearson, 1995).

An important limitation of this study is that, although it documents the existence of a certain type of cross-linguistic transfer, it does not provide a basis for determining the extent of such transfer in second language reading. There are at least four points at which more research is necessary to determine the extent to which transfer errors of the sort examined in this study have an impact on the acquisition of reading vocabulary by second language readers.

First, we do not know how common deceptive parallelism is in natural

text. Our search for instances of deceptive parallelism between English and Spanish was not exhaustive. However, it left the impression that such constructions, although by no means rare, constitute a minority of English syntactic patterns.

Second, we examined cross-linguistic transfer only in the context of Spanish–English bilingualism. It remains to be seen how much deceptive parallelism would be found for other pairs of languages.

Third, it is possible that the multiple-choice format used in this study may have influenced the proportion of transfer errors. Specifically, it could be that having transfer errors as one type of distractor might have acted as a form of entrapment. To address this issue, we administered an open-ended version of the task to 24 students from the same population as the bilingual instruction group. For transfer items, 17% of their interpretable responses were transfer errors; for nontransfer items, 28% of their interpretable responses were nontransfer errors. These numbers, although lower than the 24% transfer errors and 43% nontransfer errors made by the students in the bilingual instruction group on the multiple-choice version of the task, clearly show that a substantial number of transfer errors also occur in an open-ended format.

Fourth, local syntactic context is only one of the sources of information about an unfamiliar word. It is possible that had we used longer, more authentic contexts, other discourse information might have overridden the effects of deceptive parallelism. On the other hand, of course, the work of Cziko (1978) and Haynes (1993) suggests that, relatively speaking, second language readers are more reliant on local context than on more global context.

Whatever the extent to which the effects of first language syntactic knowledge might be found in longer contexts and more authentic reading situations, the findings of this study underline the need for caution concerning the informativeness of linguistic context for second language readers. The strong negative correlation between English reading proficiency and nontransfer errors confirms Cziko's (1978) findings that high levels of second language proficiency are necessary before local context can be used effectively. Only the top 25% of the bilingual subjects in the study had a nontransfer error rate as low as that of the monolinguals (see Figure 1).

What implication do our findings have for the instruction of second language readers? Second language readers encounter large numbers of new words while reading; there is no question that they must develop strategies for dealing with these words. Any such help must recognize both the strengths and weaknesses of second language readers and, moreover, the strengths and weaknesses of different potential sources of information about new words.

Research on the usefulness of context conveys a somewhat paradoxical picture. On the one hand, there is some evidence that first language learners acquire large amounts of their vocabulary from written context (Krashen, 1989; Nagy et al., 1987; Nagy, Herman, & Anderson, 1985), and that the benefits of extensive exposure to print are even greater for second language

readers than for first language readers (Elley, 1991). On the other hand, there are also demonstrations of the ineffectiveness of context for first language readers (e.g., Schatz & Baldwin, 1986) and of the second language readers' relative disadvantage in using context to infer the meanings of new words.

This paradox can be resolved, at least to some extent, by specifying more clearly what is covered by the term "context." A single exposure to a new word in a two- or three-sentence context is unlikely to provide much helpful information about that word's meaning (Schatz & Baldwin, 1986). However, repeated exposure to words in extended contexts can, over a period of time, lead to substantial gains in vocabulary knowledge (Nagy et al., 1987).

Local linguistic context, of questionable value even for first language readers, is an even less reliable source of information for second language readers. However, there are other points at which second language readers may be on an equal footing or even have an advantage with respect to some first language readers. One such point concerns the difference between learning new concepts and learning new labels. First language research has shown that it is more difficult for a reader to infer the meaning of a word from context if that word represents an unfamiliar concept (Nagy et al., 1987; Sheffelbine, 1990; Shu, Anderson, & Zhang, 1995). Older second language readers are often in the position of having to learn a new label for a familiar concept rather than a completely new concept.

Along similar lines, extensive topical knowledge can help to compensate for the lack of help from the local linguistic context. Parry's (1993) study of a Japanese university student's acquisition of English vocabulary illustrates the point. This student was far more successful at acquiring vocabulary in a particular domain than would be expected on the basis of other research on inferring word meanings from context. Parry attributed this student's success to two factors: the student's strategic capability as an adult learner and the fact that the context involved consisted of multiple, extended texts on a topic in which the student was developing rich and extensive knowledge. It is interesting to note, however, that Parry's student still experienced difficulty in using local syntactic and morphological context.

We would also like to stress the fact that, although this study focused in particular on negative transfer, such transfer is only one part of the picture. The strong correlation between reading proficiency measures in English and Spanish and the strong negative relationship between Spanish reading proficiency and nontransfer errors support the view that some components of reading ability are not language-specific, and that knowledge about reading gained in one language can transfer to reading in another (Langer, Bartolomé, Vásquez, & Lucas, 1990).

CONCLUSION

The findings from this study confirm earlier research, which indicated that a high level of proficiency in a second language is necessary before the reader can make guesses about the meanings of unfamiliar words with

native-like accuracy. However, they also show that a distinction must be made between errors resulting simply from lack of proficiency in the second language and those resulting from syntactic differences between the readers' first and second languages. Transfer errors, reflecting the use of first language syntactic knowledge in making guesses about the meanings of words encountered in second language contexts, were made at rates significantly greater than those of monolinguals by bilinguals over a range of amounts and types of exposure to their second language.

One educational implication of our findings is the importance of not overestimating the informativeness of linguistic (and especially syntactic) context for second language readers. Some of the information that makes the meaning of a new word obvious to the first language reader may be conveyed by syntactic detail that a second language reader cannot yet utilize. We would also stress, however, that syntactic context is only one aspect of the contextual information that allows a reader to make inferences about the meaning of a new word.

APPENDIX

SAMPLE ITEMS REPRESENTING THE DIFFERENT TYPES OF SYNTACTIC STRUCTURES TESTED

Each item is given first in the transfer version and then in the nontransfer version. The transfer error distractor is marked with an asterisk; the correct answer is marked with a plus sign. After each choice is listed the percentage of subjects choosing that option in the four groups of subjects, B (bilingual), E (English-only instruction), G (bilingual graduate students), and M (monolingual).

1. Target word: Main verb
   Critical context: Verb complement

Transfer Version

The teacher hopes that by now the students have learned from her example to appreciate the importance of reading. She *furates* that they read at least one book every week.

The word *furates* is most likely to mean:

	B	E	G	M
a) replaces	8	0	0	0
*b) tries	28	26	60	0
c) disappoints	16	0	0	0
+d) thinks	48	74	40	100

Nontransfer Version

The teacher hopes that by now the students have learned from her example to appreciate the importance of reading. She *furates* to read at least one book every week.

The word *furates* is most likely to mean:

	B	E	G	M
a) replaces	13	4	0	0
+b) tries	69	92	100	93
c) disappoints	6	0	0	4
d) thinks	12	4	0	4

2. Target word: Verb after *have* in causative sense
   Critical context: Verb complement

Transfer Version
The patient arrived at the hospital complaining of chest pains and shortness of breath. The doctor had the patient *lerate* immediately.
The word *lerate* is most likely to mean:

	B	E	G	M
a) give	22	0	0	0
b) resemble	11	0	0	0
*c) bring in	33	32	12	4
+d) lie down	33	68	88	96

Nontransfer Version
The patient arrived at the hospital complaining of chest pains and shortness of breath. The doctor had the nurse *lerate* the patient immediately.
The word *lerate* is most likely to mean:

	B	E	G	M
a) give	24	0	0	0
b) resemble	12	7	0	0
+c) bring in	52	74	40	71
d) lie down	12	19	60	29

3. Target word: Adjective
   Critical context: Preceding adverb (too/very)

Transfer Version
John was very *fleard* to do well on the test.
The word *fleard* is most likely to mean:

	B	E	G	M
a) awake	6	8	0	4
+b) eager	28	72	88	89
c) different	11	0	0	0
*d) nervous	56	20	12	7

Nontransfer Version
John was too *fleard* to do well on the test.
The word *fleard* is most likely to mean:

	B	E	G	M
a) awake	16	7	0	0
b) eager	4	15	40	0
c) different	12	0	0	0
+d) nervous	68	78	60	100

4. Target word: Noun
   Critical context: Article

Transfer Version

After the accident, Mary decided to keep a diary. Now she spends a lot of time writing about the *crind*.

The word *crind* is most likely to mean:

	B	E	G	M
*a) life	19	8	12	0
b) finger	0	0	0	0
+c) past	75	88	88	96
d) distance	6	4	0	4

Nontransfer Version

After the accident, Mary decided to keep a diary. Now she spends a lot of time writing about *crind*.

The word *crind* is most likely to mean:

	B	E	G	M
+a) life	58	85	100	95
b) finger	13	0	0	0
c) past	21	15	0	5
d) distance	8	0	0	0

5. Target word: Noun/adjective
   Critical context: Following noun

Transfer Version

It was the first day of school. Everybody but one boy had been in the chemistry lab last year and knew how to use the equipment. Mrs. Smith, the teacher, showed the *troap* what equipment they would be using that day.

The word *troap* is most likely to mean:

	B	E	G	M
+a) boy	44	93	100	95
b) principal	20	0	0	5
c) book	28	7	0	0
*d) new	8	0	0	0

Nontransfer Version

It was the first day of school. Everybody but one boy had been in the chemistry lab last year and knew how to use the equipment. Mrs. Smith, the teacher, showed the *troap* student what equipment they would be using that day.

The word *troap* is most likely to mean:

	B	E	G	M
a) boy	22	8	0	4
b) principal	6	4	0	0
c) book	17	0	0	0
+d) new	56	88	100	96

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NOTE

1. Since both choices (b) and (c) are consistent with Spanish syntax, the number of transfer errors made by a subject would not necessarily reflect the full extent of his or her reliance on first language knowledge. In this respect, items in which Spanish and English syntax required completely different choices would have been preferable. However, the constraints of Spanish and English syntax and the multiple-choice format made it necessary to use the format found in Table 1 to cover the broadest possible range of syntactic patterns.

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