Pre-literacy Development: Bilinguals at Risk

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Abstract

Evidence indicates that many monolingual preschool children in the U.S. do not receive a sufficient amount of early language input needed to develop subsequent literacy skills. The situation is potentially more complex for the bilingual child whose linguistic input is split between at least two languages.

In this paper we report results from two studies. In the first, we tested 18 bilingual Polish-English speaking children (4;7-6;11) on the acquisition of three types of restricted relative clauses in Polish and English. The results indicate that the patterns of syntactic development for these relative clauses in the bilingual children differ from their monolingual counterparts in either language. In the second study, we tested 27 bilingual children (6;2-8;5) on their phonological awareness skills in both Polish and English. Results of this study indicate that certain subsets of Polish-English bilinguals tested are at risk in either or both languages for development of subsequent literacy skills.

This paper will discuss the results in terms of the development of school curricula needed to meet the literacy demands of both monolingual and bilingual children.

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Introduction

As is already known, many monolingual preschool children in the U.S. do not receive sufficient early language input thus putting them at risk for the development of subsequent literacy skills (Snow, 1983; Snow et al., 1991). In a study conducted by Hart and Risley (1995) the receptive language experience of two groups of children at opposite ends of SES (socio-economic status) spectrum were compared. Results indicated that by age 3;00 there was a 30 million word gap between the upper and lower ends of the spectrum; the low end was highly disadvantaged in comparison to the upper end. In addition, this gap was correlated with expressive vocabulary use at age 3;00 and was predictive of subsequent language skills and reading comprehension at ages 9;00-10;00.

Given the potentially more complex linguistic situation for bilingual children, we ask the following question: Are bilingual children similarly at risk with respect to the development of literacy skills in either or both languages?

This paper reports results of two cross-sectional studies from bilingual Polish-English speaking children: Study 1 investigated the acquisition of three types of relative clauses. The results of this study indicate that when matched for age, patterns for development of these structures in the bilingual children differed in each language from their monolingual counterparts, especially at age 6;0. Importantly, these results suggested that the bilingual

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1 A cross-sectional research study is one that examines the effects of development (maturation) by examining different subjects at various ages. In these studies a statistically significant sample of a population is used to estimate the relationship between an outcome of interest and population variables as they exist at one particular time (http://medical-dictionary.thefreedictionary.com/cross-sectional+study).
children’s syntactic development was not as advanced as the monolinguals’. More importantly, children at age 6;0 are usually in the first grade and at this time, their literacy skills are beginning to develop. Thus, if there is a divergence between the monolingual and bilingual in syntactic development, one needs to ask in what ways might their literacy development be impacted.

In Study 2, we tested bilingual children’s phonological awareness skills in an effort to determine whether the level of syntactic development might constrain their early literacy skills in comparison to their monolingual counterparts.

The general outline for this paper is as follows: We begin with a brief discussion of the linguistic similarities and differences between Polish and English. We then continue with a report of results from both Study 1 and Study 2. This is then followed by discussion and conclusions.

**Linguistic background**

Polish and English share many linguistic properties. As illustrated in Table 1, the basic word order for both languages is SVO (Subject-Verb-Object). Both languages are also head-initial, i.e. the head of the phrase precedes its complements. For example, in the verb phrase *likes apples* the head of the phrase *likes* precedes the noun phrase complement *apples*. The same is true for Polish in the verb phrase *lubi jablka* the verb *lubi* (likes) precedes the noun phrase complement *jabłka* (apples).
However, Polish and English diverge in certain other linguistic respects, for example with respect to scrambling, i.e. a syntactic process by which the order of words or phrases can optionally vary. In English the word order is largely fixed; however, in Polish there is significantly more word order variation, as exemplified in Table 1.

Furthermore, unlike English, Polish is a morphologically complex language instantiating seven cases (i.e. nominative, genitive, dative, accusative, instrumental, locative, and vocative) and four types of conjugations. Polish nouns are marked for gender (masculine, feminine, or neutral), number (singular or plural) and case.

The fact that Polish is morphologically more complex than English does not render it harder to acquire for children. In fact, evidence from children acquiring Polish as their first language indicate that the morphology is acquired at a very early age (Smoczyńska, 1985).
Table 1. Fundamental differences and similarities between Polish and English grammars.

Given these differences and similarities we evaluated bilingual syntactic development in Polish and English and compared these results to their monolingual counterparts in Study 1.

Study 1

Study 1 focused on the bilingual development of subordination in young children exposed to both Polish and English. These results were in turn compared to results of monolingual acquisition for the same structures in both Polish and English.

Bilingual Polish-English speaking children
The bilingual children (n=18) ranged in age from 4;7 - 6;11, with a mean age 5;7. These participants were selected from children attending a Polish Saturday School in South Boston, MA, United States. All the bilingual children lived permanently in the United States; they had Polish-speaking parents and, in addition to attending the Polish Saturday School, they were also attending different American preschools or daycare programs four or five days a week. The majority of the bilingual children were born in the United States. The children who were not born in the United States emigrated with their parents in early infancy. Polish was spoken at home for these children. Most of the children had been to Poland, where they visited their grandparents and spent an average of one month and one week.

Polish monolingual group
In the monolingual group, the children (n=40) ranged in age from 3;00 – 6;11, with a mean age 4;9. The Polish monolingual children were enrolled at one preschool in Warsaw, Poland. All of the children in this group had Polish-speaking parents, were born in Poland and lived in Poland.

English monolingual group
The results for the monolingual English acquisition emerge from data from a previously conducted study (Flynn and Lust, 1981). In the English monolingual group (n=72) children ranged in age from 3;6-6;5, with a mean age 4;8. The children were drawn from a pre-school at Cornell University; they all had English-speaking parents, and they were born and lived in the U.S. There were no bilinguals in this group.
All groups of children were administered both an elicited imitation (EI) and comprehension task (act-out). Here we will only report the results of EI production test. The EI task has been developed as a test of language production (Lust, Flynn and Foley, 1996); it involves a request for a child to repeat a sentence uttered by an interlocutor. The assumption behind this method is that the child will only repeat the sentences whose structure he/she has already acquired. The sentences with an unfamiliar grammatical structure will not be correctly imitated (ibid.). However, what the child does produce in an attempt to map to the structure of the stimulus sentence will provide a measure of the child’s developing linguistic competence of the language in which the child is being evaluated.

The children’s responses were scored as correct or incorrect. An utterance was scored as correct when the child produced the sentence verbatim with only minor changes which did not alter the structure or the meaning of the stimulus sentence. An utterance was scored as incorrect when the child altered the meaning or structure of the stimulus sentence in any way. For example, such errors included substitution of a different verb or agent or morphological changes that did change the meaning or structure of the sentence.

In the EI design, only certain aspects of grammatical knowledge are evaluated at any one time. The stimulus sentences are precisely controlled in terms of the syntactic factors varied. In addition, all the stimuli sentences differed in terms of their lexical content which was in turn controlled through the use of a limited number of nouns and verbs.
already familiar to the children. All sentences were equated in terms of number of words and syllables. In this way, if children consistently produce certain syntactic structures more successfully than others, this would suggest that the syntax of these sentences was the source of this success in some way. This would also suggest that those structures that were consistently “easier” for the children might also be developmentally prior to those that were more difficult. In some way, this might suggest the primacy of these particular structures in linguistic development over others that were more challenging. If this were the case, we would expect to see a developmental trend emerge across the age groups tested.

The stimuli for Study 1 are illustrated in 1).

1)

English stimuli

A. Lexically headed determinate relative:
Big Bird pushes the balloon which bumps Ernie.

B. Lexically headed indeterminate relative:
Ernie pushes the thing which touches Big Bird.

C. Headless relative / Free relative:
Cookie Monster hits what pushes the Big Bird.

Polish stimuli

D. Lexically headed determinate
Wielki Ptak popycha balon, który uderza Erniego.
Big Bird pushes balloon which-MASC bumps Ernie-ACC.
‘Big Bird pushes the balloon which bumps Ernie.’

E. Lexically headed indeterminate
Ernie popycha rzecz która dotyka Wielkiego Ptaka.
Ernie pushes thing which-FEM touches Big Bird-ACC.
‘Ernie pushes the thing which touches Big Bird.’

F. Free relative
Kermit Żaba popycha to co dotyka Elmo.
Kermit Frog pushes (this) what touches Elmo-ACC.
‘Kermit the Frog pushes what touches Elmo.’
In addition to the three relative clause types, the design included two relativized positions within the relative clause: Object-Object (OO) and Object-Subject (OS). In other words, the relativized head noun (NP) inside the main clause was always in the object position, and the grammatical function of the relativized gap inside the relative clause was either in object or subject position, as examples in 2) illustrate.

2) (OS) Big Bird pushes the balloon which \( \emptyset \) bumps Ernie.

   (OO) Ernie touches the balloon which Big Bird throws \( \emptyset \).

Each sentence type was represented by two exemplars, which differed only in the lexical content of the nouns and verbs. Each exemplar was allocated to one of the two sentence batteries, A or B. Thus, each battery consisted of all six sentence types but in a different order. Half of the children received Battery A first, while the other half received Battery B first. This was to insure that the order in which the sentences were presented did not influence the children’s responses.

Within and across languages, sentences were matched for length, resulting in sentences consisting of 7 to 10 words. In both Polish and English, the subject of the main clause was animate in all cases. The main clause object was inanimate in lexically headed relatives and inanimate free relative structure was used. The NP in the relative clause (in a subject or object position) was always animate. The lexicon and pragmatics of the sentences were matched closely within and across the two languages.

Results from Study 1
Overall percentage of correct imitations

The data obtained from the elicited imitation task suggested that all of the bilingual children in the three age groups tested were dominant in English. The overall percentage of correct imitations in English ranged from 8.34% in 4-year-olds to 30.95% in 5-year-olds (and 6-year olds scoring 28.13%), while in Polish it ranged from 0.00% in 4-year-olds to 8.34% in 5-year-olds and 7.29% in 6-year-olds, as illustrated by Figure 1.

Figure 1. English and Polish of bilinguals by age, overall percentage correct, Elicited Imitation.

Figure 1. also indicates no significant development of relative clause structures in bilinguals between the ages tested (4 to 6 years old); no significant effect for age was found either overall or within any age groups, both in English (p=0.5314) and in Polish (p=0.8428). In addition, there was a great amount of individual variation among the

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However, as one reviewer suggested, this result may in part be due to the fact that the numbers within each age cell were relatively small. As shown in Figure 1, it appears that there is some development between 4 years and 5/6 years in both languages although the contrast is greater in English. Clearly, further studies are needed with more children.
bilingual participants, ranging from 0% to 83% successful imitations in English and from 0% to 42% correct responses in Polish\(^3\).

Flynn and Lust’s results (1981) indicate a significant development across the age groups tested. This result contrasts with our results for English for the bilingual children, where no such consistent development was observed. The overall percentage of correct answers given by English monolinguals ranged from 18.1% in 3-year-olds to 45.6% in 6-year-olds indicating development of the relative clauses. Bilinguals and monolinguals converge at age 5;00 in terms of their amount correct results for the relative clause structures. However, the monolingual English-speaking children continue to develop; the bilingual children’s development appears to plateau at age 6;00, as Figure 2 illustrates. Here again, continued development of these studies demands that the bilingual children be tested beyond the age of 6.00.

\(^3\) One reviewer suggested that there is a large age range in the children tested and that this alone may account for this variation. However, in response, we would argue that the difference in ages is at most two years. Moreover, as we will discuss in the conclusions, some of this variation may also be accounted for in terms of the differences in amount and kind of exposure each child received in each language rather than age per se. Ideally, we would like to group children into six-month age intervals. Subsequent development of this study will reflect this.
The results from Polish monolingual children in contrast with the results from the Polish bilingual children. Firstly, the monolinguals scored much higher than did their monolingual counterparts, ranging from 7% of correct responses in 3-year-olds to 60% of correct imitations in 6-year-olds as shown in Figure 3.

**Figure 2.** English of monolinguals and bilinguals by age, overall percentage correct, Elicited Imitation.

**Figure 3.** Polish of monolinguals and bilinguals by age, overall percentage correct, Elicited Imitation.
Secondly, there was a statistically significant effect for age overall (p=0.0007), and between the ages 3;00 and 4;00 years as well as between 5;00 and 6;00 years suggesting the development of the syntax of relative clauses at these ages in Polish monolinguals. The difference between 3;00 and 6;00 year olds was statistically significant (p<0.0001); this was also the case between the ages of 4;00 and 6;00 (p=0.0335). These results contrast with those of the bilinguals; for the bilingual group there was no statistically significant difference in results of amount correct between 4;00 and 6;00 year olds of age for either for English (p=0.3366) or for Polish (p=0.6376).
Development of the three types of relative clauses

The patterns of development of the three types of relative clauses were similar between English monolinguals and bilinguals, as illustrated in Figure 4. The English results for the bilingual children indicate no significant difference in amount correct for the two lexically headed structures (with and without semantic content) (p=0.4827) tested. However, there was a statistically significant difference between the lexically headed relatives with semantic context and free relatives (p=0.0393) as well as between lexically headed relatives with no semantic content and free relatives (p=0.0247).

These results are the same for the English monolinguals; Flynn and Lust (1981) reported no significant difference between the two types of lexically headed relatives (p=0.196) in production and a statistically significant difference between the rates of successful imitation of free relatives and lexically headed clauses (for headed relatives with semantic context and free relatives p=0.000; for lexically headed relatives with no semantic content and free relatives p=0.020).
Figure 4. English of monolinguals and bilinguals by syntactic type, percentage of correct responses, Elicited Imitation.

However, in contrast to the similarities in patterns of acquisition between the monolingual English speaking children and the English of the bilingual Polish-English speaking children, the Polish monolingual and bilingual patterns did not converge as Figure 5 illustrates. In Polish, the bilingual children results indicate no significant difference in successful imitation for the three syntactic type (p>0.42), either overall or within any age groups. In contrast, the Polish monolingual children’s results revealed a statistically significant difference between lexically headed relatives with semantic content and lexically headed relatives with no semantic content (p=0.0005), as well as between lexically headed relatives with semantic content and free relatives (p=0.0004).
Qualitative analysis

In order to obtain more detailed comparison between monolinguals and bilinguals, we performed a qualitative analysis of errors. Here we report conversions of ‘which’ to ‘what’ (exemplified in 3a) as well as the conversion of a lexically headed relative clauses to a free relative (exemplified in 3b). The former ones were errors where ‘which’ was converted to ‘what’ with no other structural changes (such a structure is grammatical in Polish but not in English; nevertheless, it appeared quite often in both languages). Such a conversion was also reported by Flynn and Lust in which this conversion occurred in 20.5% of all headed relatives. In the English of the bilinguals, this conversion appeared even more frequently in 34% of all headed relatives; in Polish of bilinguals 22% of the time; finally, in the Polish of monolinguals there was only a 1% conversion rate and this appeared only in the youngest age group. The results are depicted in Figure 6.
Conversions of a lexically headed relative clause to a free relative accounted for 6% of the errors for the lexically headed constructions for the English monolingual group. However, no such changes were recorded in the English results for the bilinguals. In monolingual Polish, 5% of all headed relatives were converted to free relatives, but in Polish of bilinguals there were 22% of such conversions, as Figure 6 illustrates.

3) Examples of errors:

a) Conversions of *which* to *what*

English Stimulus: Ernie pushes the thing which touches Big Bird.
Response: Ernie pushes the thing what touches Big Bird.

Polish Stimulus: Elmo chwyta cukierek, który je Miś Fozzie.
Elmo grabs candy which eats Bear Fozzie
‘Elmo grabs the candy which Fozzie Bear eats.’
Response: Elmo chwyta cukierek, co je Miś Fozzie.
Elmo catches candy what eats Bear-NOM Fozzie
‘Elmo catches the candy what Fozzie Bear eats.’

b) Conversions from lexically headed relative clause to a free relative.

English Stimulus: Kermit Frog pushes the thing which touches Elmo.
Response: Kermit the Frog pushes what touches Elmo.

Polish Stimulus: Elmo chwyta cukierek który je Miś Fozzie.
Elmo grabs candy which eats Bear-NOM Fozzie
‘Elmo grabs the candy which Fozzie Bear eats.’
Response: Elmo chwyta co je Miś Fozzie.
Elmo grabs what eats Bear-NOM Fozzie
‘Elmo grabs what Fozzie Bear eats.’
Figure 6. Conversions from which to what and from lexically headed forms to free relatives across the tested groups.

Conclusions from Study 1

A comparison of the results for correct imitations between monolingual and bilingual groups revealed certain similarities between the English monolinguals and the English of the bilinguals. Important to note, however, that though there were similarities the patterns of acquisition were not identical as noted above.

In addition, a comparison of the results for the monolingual Polish speaking children and the Polish bilingual children indicate even fewer similarities than those noted for English. This may result from the fact that all the bilingual children were dominant in English; thus their patterns of acquisition in English language might resemble those of the monolinguals in certain ways as a result of this dominance. These same children were not as dominant in Polish at the time of testing⁴.

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⁴ Continued development of this research program demands that the bilingual children be evaluated in contrast to their MLU (mean length of utterance) counterparts in each language rather than to their
Also notable is the fact both quantitative and qualitative analyses reveal that the patterns of development in Polish and English in the bilingual children are distinct. These results suggest that these children have represented two distinct grammars, one for each language. Furthermore, the rate of development in each language appeared to be “slower” when compared to their monolingual counterparts in either language.

One of the reasons for such divergence of patterns and rates of linguistic development may be the uniqueness of bilingualism: the process of constructing two language-specific grammars leads to differences in the patterns and rates of development for each language. These in turn are related to, though distinct from, the monolingual patterns. This hypothesis also supports Grosjean’s claim that “the bilingual is not two monolinguals in one person” (Grosjean, 1989).

However, another reason for the differences in patterns and rates of acquisition between monolingual and bilingual children may reflect the fact that the children did not receive sufficient linguistic input in either language. One result that seems to support this latter hypothesis is the fact that our participants were dominant in English and their patterns of development were closer to English monolinguals than to their Polish counterparts. However, as the error analysis for English revealed, patterns of development in English

chronological age cohorts in the two languages tested. In this way, we would be able to determine more precisely whether the patterns of acquisition noted in each language for each language group reflected a developmental pattern universal for each language or whether the results reflect the fact that the children were bilingual. This would support the claim articulated by Grosjean (1989) that bilingual language development does not consist of the development of two monolingual speakers within one individual.
by the bilingual children still did not match those for English-speaking monolingual children.

Thus, the following question emerges: Are the differences in the patterns and rate of acquisition due to the uniqueness of bilingual development – “not two monolinguals in one brain”, or insufficient input in either language or perhaps other factors? In order to begin to answer this question we developed the following study.

Study 2

In this study we evaluated the phonological awareness skills of bilingual Polish-English speaking children. We chose to investigate the phonological awareness skills as they have been proved to be a good predictor of future reading skills (Adams, 1994; Ehri and Wilce, 1980).

We tested phonological awareness skills of 28 bilingual Polish-English speaking children (age range 6;2-9;2) using two standardized tests: the phonological part of the Comprehensive Test of Phonological Processing (CTOPP) (R. Wagner, J. Torgesen & C. Rashotte, 1999) in English and Skala F in Polish (Kozniewska and Matuszewski, 2003). The English test consisted of three sub-tests: i) elision (‘‘Say cup with saying /k/’’), (ii) blending (‘‘What word do these sounds make? m-a-d’’), and (iii) sound matching (‘‘Which word starts/ends with the same sound as pan? Pig, hat, or cone?’’).

The Polish phonological test involved three main sub-tests: (i) blending (‘‘What word do these sounds make? m-r-o-k’’), (ii) phoneme segmentation (‘‘What sounds does mapa
consist of?”), and (iii) phoneme differentiation. The latter sub-test was further divided into 4 more sub-tests: (1) adding (“Are these two words the same? rok-mrok.” If the child says NO, we asked: What sound has been added in mrok?); (2) exchanging (“Are these two words the same? pal-bal.” If the child says NO, we ask: What sounds have been exchanged?); (3) reordering (“Are these two words the same? puls-plus.” If the child says NO, we ask: What sounds have been reordered?); (4) name the difference (“Are these two words the same? por-port.” If the child says NO, we ask: What sounds are different? Why are they different?”).

Subjects
The subjects were drawn from the same school as in Study 1. We tested 27 bilingual Polish-English-speaking children ranging in age from 6;2 to 8;5. All the children had Polish-speaking parents, had been in the U.S. since their early childhood, were attending different American elementary schools during the week and the Polish Saturday School once a week. All the children were tested on both tests; however, we were only able to examine the results from children aged 6;2 – 7;11 in English (n=25) and children aged 6;11 – 8;5 in Polish (n=16) due to the limited age range on the scaled scores for the standardized tests.

Results from Study 2
The results for the English phonological awareness tests are presented in Figure 7. Overall, with respect to elision and sound matching bilingual children’s English skills are in the 50th percentile range for their age. In addition, overall their sound blending skills
were in the 90th percentile. However, this result may be an artifact of the test presentation.

**Figure 7.** English of bilinguals, percentiles of correct responses, phonological awareness test.

In Polish, we analyzed the results from 16 children aged 6;11 – 8;5 and compared them to the standardized results provided by Kozniewska and Matuszewski (2003). The results are presented in **Figure 8.** Overall, bilinguals performed much below the average for Polish monolinguals in blending and separating, scoring the mean of 2.4 and 3.9 points, while the averages for monolingual children were 8.3 and 8.1 respectively⁵. However, on all sub-tests of phoneme differentiation part, bilingual children performed as monolinguals or even slightly better.

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⁵ On the assumption that phonological awareness emerges partly as a result of literacy instruction, one reviewer suggested that “differences in literacy instruction received by participants in the two languages (both in terms of quantity and nature) may explain some of the differences in results – especially as the children are attending American elementary school during the week, but Polish school only once a week”. This may be a factor for lower phonological awareness skills in Polish overall. However, there were four bilinguals whose Polish phonological skills were much higher than others which may indicate that the amount of formal instruction at school is not the only factor.
In addition, we observed that bilingual children whose Polish phonological skills were at above average or superior levels had also English phonological skills at above average or superior levels. In contrast, children whose Polish phonological awareness skills were much lower than their monolingual counterparts scored inconsistently on the English phonological test.

Conclusions from Study 1 and Study 2

From Study 2, it seems that blending and separating demand specific linguistic knowledge of the target language which these bilingual children do not have in Polish. Both of these skills are reported to play a critical role in reading; thus, measuring children’s abilities in these areas can provide reliable information about children’s reading readiness in a specific language (Adams, 1994). Other phonological awareness
tasks, like phoneme recognition and differentiation (i.e. adding, exchanging, reordering and name the difference tasks) appear to require metalinguistic knowledge that is not linguistically specific.

Moreover, results from Study 2 suggest that the nature and kind of input a child receives in either or both languages is a significant factor in this development. We observed that bilingual children whose Polish phonological skills were at above average or superior levels had also English phonological skills at above average or superior levels. Thus, it seems that highly developed skills in the children’s home language can enhance learning of the dominant language. In other words, balanced bilingualism does have an additive effect on the development of both languages. Moreover, the presence of balanced bilinguals implies that at least in some cases there is sufficient input for both languages to achieve the same level of competence as their monolingual counterparts. Unfortunately, for the majority of the tested bilingual children, there was not enough linguistic input in their environment to develop both languages to a sufficient level.

In both Study 1 and Study 2, we collected questionnaires from the bilingual children’s parents in order to understand what are specific factors enhancing children’s bilingual skills. Since the high level of home language correlated with high levels of dominant language we concentrated on Polish, the home language. The questionnaires revealed that the children who scored higher on Polish tests had the continuous need to communicate with a non-English speaking person on everyday basis (e.g. child’s grandmother living with the family), or took regular vacation in the home language country, i.e. at least every
year for 2 months (2-week-long vacation once or twice in the child’s life did not have such positive correlation).

Two factors negatively influenced Polish speaking abilities: 1) younger children with older siblings in general obtained lower Polish scores in both studies as it appeared that the older siblings increased the number of interactions in English with their younger siblings; 2) in a home environment in which children were allowed to mix English and Polish or to answer in English even when addressed in Polish these children’s scores were lower than those from a home environment in which this code mixing was not reported.

Thus these results suggest that the source of different patterns of development is due to the amount and kind of input received in either language. Intensive input exposure in the target language as well as continuous need to use the target language is critical to develop such skills.
Bibliography


