

Children's Vocabulary Acquisition in a Foreign Language Through Watching Subtitled Television Programs at Home

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Subtitled television programs seem to provide a rich context for foreign language acquisition. Moreover, viewers are generally quite motivated to understand what is shown and said on television. The present study investigated whether children in Grades 4 and 6 (N = 246) learn English words through watching a television program with an English soundtrack and Dutch subtitles. Children were randomly assigned to one of three experimental conditions: (a) watching an English television program with Dutch subtitles, (b) watching the same English program without subtitles, and (c) watching a Dutch television program (control). The study was carried out using a 15-min documentary about grizzly bears. Vocabulary acquisition and recognition of English words were highest in the subtitled condition, indicating that Dutch elementary school children can incidentally acquire vocabulary in a foreign language through watching subtitled television programs.

□ Essential to the growth and development of children's vocabulary in both first and foreign languages is voluminous experience with rich and natural language, because the extended meaning of a word cannot be fully grasped unless the word is encountered in varied semantic and syntactical contexts (Anderson & Nagy, 1991). Vocabulary learning from natural language occurs not because the learner is trying to learn words but because the learner is trying to understand what is said, sung, or written. The meaning of words is not given but inferred from the context in which they are presented. The learning of words from context may be regarded as a stepwise process in which the learner constructs the meaning of a word making use of the semantic and syntactical cues that the context provides (Beck & McKeown, 1991). In addition to verbal exchanges between persons, which the learner may observe or join, the media are possible sources of vocabulary acquisition.

In their review of research on vocabulary acquisition, Beck and McKeown (1991) note that most research on learning words from context has focused on written contexts, probably because vocabulary research has developed under the umbrella of reading research. In a number of studies, students appeared to learn word meanings while reading expository and narrative texts in an incidental way; that is, without the explicit intention to learn words (e.g., Jenkins, Stein, & Wysocki, 1984; Nagy, Herman, & Anderson, 1985; Shu, Anderson, & Zhang, 1995).

In addition to written texts, television programs provide a possible source of word learning. In two studies, 3- to 5-year-old (Rice & Woodsmall, 1988) and 6- to 8-year-old American

children (Oetting, Rice, & Swank, 1995) were shown to learn words from their first language when watching animated films with voice-over narration. In large language communities, the great majority of television programs are spoken in the first language. In small language communities, however, a considerable number of television programs are subtitled, creating the possibility of vocabulary acquisition not only in one's first language but also in foreign languages.

Subtitled Television Programs

In large European countries such as Germany and France, foreign-language programs are mostly dubbed. In smaller European countries such as the Netherlands and Belgium that import many more foreign-language programs than do larger countries, however, subtitling is common practice (Luyken, Herbst, Langham-Brown, Reid, & Spinhof, 1991). In dubbing, the original foreign-language voices of the actors are replaced by voices in the language of the targeted audience, whereas in subtitling the original soundtrack is left intact while subtitles in the target language are projected at the bottom of the screen. The most important reason why subtitling is preferred to dubbing in smaller countries is that subtitling is much cheaper than other techniques. Luyken et al. (1991) have estimated the average costs of the various techniques of transferring one hour of television program material. The average hourly costs of subtitling were estimated to be 740 European Currency Units (ECU)(about US\$820). The insertion of a voice-over was estimated to be about twice as expensive as subtitling, costing 1,500 ECU for one average hour. The average costs of dubbing one hour of television, finally, were estimated at 11,000 ECU, making dubbing about 15 times as expensive as subtitling.

In discussions of the difference between subtitling and dubbing, aesthetic arguments are often raised in addition to economic reasons (Kilborn, 1993). From an aesthetic point of view, an advantage of subtitling is that the original voices of the actors are maintained. Replacing the original voice detracts from the actor's performance. In addition, the film suffers aesthetically from dubbing because its atmosphere is

partly carried by the original language. An aesthetic disadvantage of subtitling, however, is that the subtitles may distract the viewer from watching the visual images, because the titles partly cover the film, and because the reading of subtitles makes the viewer look away from the film. The latter pertains especially to viewers with poor reading skills. Poor readers, such as children, have difficulty following the film. A Dutch study showed that considerable percentages of children of primary school age indicated that the television subtitles were "often too quick" for them: 33% in Grade 4, 18% in Grade 5, and 10% in Grade 6 (van Lil, 1988). The viewers' preferences for either dubbing or subtitling do not seem to be motivated by the stated economic and aesthetic reasons but by habit, because in general the audience's preference in a certain country appears to concur with the country's common practice (Luyken et al., 1991).

An unintended advantage of subtitling as compared to dubbing is that learning effects may occur. A panel study on television's impact on children's reading skills conducted by Koolstra, van der Voort, and van der Kamp (1997), in which 828 primary school children were followed during three years, showed that the reading of subtitles on television may enhance the development of children's decoding skills, because reading subtitles provides extensive practice in decoding words. A second possible learning effect of subtitled television is the acquisition of foreign languages. Many people think that watching subtitled television programs contributes to children's and adults' proficiency in foreign languages. This is particularly true for English, as most subtitled programs in small European countries are imported from the United States or Great Britain. When asked, most Dutch children are convinced that they learn English from radio and television. In a study conducted in the Netherlands by Vinjé (1994), one fourth of the sixth graders even indicated that they learned more English from radio and television than in school, where English is taught from Grade 5 onwards.

The expectation that subtitled television programs may contribute to learning words in foreign languages seems reasonable. First, subtitled television programs seem to provide a rich con-

text for foreign language acquisition. Story information in subtitled programs is presented in various modes: spoken in the foreign language, in the subtitles in one's own language, and in the visual images. These presentation modes will generally complement or support each other. Television's multisensory presentation of information may provide viewers with auditory, visual and written cues to derive the meaning of the words that are used. Second, viewers are generally fairly well motivated to understand what is shown and said on television. Third, viewers in small European countries generally have a positive attitude toward the English language. English is considered to be a valuable language for international contacts, and young people especially find English a "cool" language because it is the language of most popular music and films.

Watching subtitled English language programs may result in various types of language acquisition. In addition to word meanings, one may learn the meaning of expressions or standard sentences ("Here's looking at you, kid"), and in which situations these sentences may be used. There may also be improvement in the ability to discern separate words in the flow of spoken language, word pronunciation, and proficiency in constructing correct sentences. Viewers may learn to discriminate between different ways of pronunciation (e.g., British, Texan) and the attached connotations (e.g., aristocratic, slang). In this study we focus on vocabulary acquisition.

Research on Foreign Language Acquisition Through Subtitled Television Programs

Research on the use of subtitled television programs in foreign-language instruction has been focused on the effect of captioning (Borrás & Lafayette, 1994). Unlike normal subtitling as applied by broadcasters in small countries, captioning is intralingual in the sense that both the soundtrack and the projected subtitles are in the same foreign language. One study on the effectiveness of captioning in foreign-language instruction investigated bilingual students' English vocabulary acquisition among Southeast Asian and Hispanic students living on the

East Coast of the United States (Neuman & Koskinen, 1992). These seventh and eighth graders were exposed to nine segments of an educational science series. For the purpose of the study, segments of 5–8 min were captioned in the subject's second language (English). Vocabulary acquisition of words used in the captions was compared between four conditions: (a) captioned television, (b) television without captions, (c) listening to and reading along with text, and (d) textbook only. The results indicated that participants who watched captioned programs learned more new words from the second language than subjects in any of the three other conditions.

Although the studies on captioning carried out in instructional settings show the potential effectiveness of subtitling for foreign-language learning, it is not clear whether this result may be generalized to (a) noninstructional settings such as watching television at home, and (b) television programs with normal interlingual subtitles instead of intralingual captions. A series of studies that attempted to measure foreign language acquisition resulting from watching television with normal subtitles (dialogue in the foreign language and text in the first language) in noninstructional settings was conducted at the University of Leuven in Belgium (d'Ydewalle & Pavakanun, 1995; 1997; Pavakanun & d'Ydewalle, 1992). In these studies, high school students and university students majoring in psychology were assigned to several conditions, in each of which a different version of a short (15 min) television program was shown. The versions included (a) subtitled versions of television programs (dialogue in the foreign language and subtitles in the first language), and (b) dubbed program versions (dialogue in the first language and no subtitles). After watching the television program, the participants' acquisition of the foreign language was measured basically by means of three types of tests: vocabulary, word identification, and sentence identification.

The first study was carried out using native Dutch-speaking and native English-speaking university students (Pavakanun & d'Ydewalle, 1992). In this study, only the effect on vocabulary acquisition in the foreign language was

found to be significant: Vocabulary acquisition scores in the subtitling condition were higher than scores in the control condition in which no subtitles were available. Participants in the second study (d'Ydewalle & Pavakanun, 1995) were native English-speaking university and high school students (Grade 9). Again, among the university students only acquisition of vocabulary in the foreign language—in this case Dutch—was significant, whereas no foreign vocabulary acquisition could be detected among the ninth graders. In the most recent study (d'Ydewalle & Pavakanun, 1997), the effect of the similarity between the foreign and mother languages on language acquisition was investigated. For this reason, Dutch-Belgian high school students were exposed to subtitled television programs with soundtracks in languages similar (e.g., South-African and German) or dissimilar (e.g., Chinese and Russian) to their mother language. It was found that language acquisition, including vocabulary acquisition, was highest for programs with soundtracks in languages similar to Dutch. Learning words from dissimilar languages may have been lower because it is more difficult to discriminate separate words in the flow of relatively unfamiliar sounds. To summarize, the series of studies by d'Ydewalle and Pavakanun suggests that foreign language words may be learned in a non-educational setting by adult and adolescent students through watching subtitled television programs, in particular when these programs use a foreign language that sounds familiar to the viewer.

The Present Study

Whether elementary school children can also acquire elements of a foreign language through watching subtitled television in a noneducational setting had not previously been studied. The present study investigated the extent to which Dutch children in Grades 4 and 6 learn English words through watching a television program with an English soundtrack and Dutch subtitles. It seems likely that for vocabulary acquisition from television programs to occur, the contents of the subtitled television programs should represent *comprehensible input* (Krashen, 1985). This

means that viewers should at least be able to discern the English words that are spoken. Therefore, we selected material with clearly spoken English. However, it is unknown at what age Dutch children are able to distinguish spoken English words. To investigate this issue we included two different age groups in the study, fourth graders and sixth graders. In the Netherlands, English lessons start in Grade 5. In addition to having more experience with English through television than fourth graders, Dutch sixth graders have had more than a year of English in school, whereas fourth graders have not yet had English in school.

Hypotheses

Based on previous experimental findings on children's incidental learning of words in their own language (Rice & Woodsmall, 1988; Shu, Anderson, & Zhang, 1995) and adolescents' learning of words in foreign languages (Neuman & Koskinen, 1992; Pavakanun & d'Ydewalle, 1992; d'Ydewalle & Pavakanun, 1995; 1997), we expected that for children a subtitled television program offers a rich context for vocabulary acquisition in a foreign language, provided that the children are able to discern the separate words that are spoken in that program. This expectation led to the following hypothesis.

H1: Dutch children learn English words from a subtitled English-spoken television program.

To test this hypothesis, the condition in which children were exposed to a subtitled program was compared with two other conditions: a control condition in which children watched a Dutch language program, and a second experimental condition in which children watched a version of the experimental program without subtitles.

We assumed that the subtitles would contribute to the richness of the context from which children learn English words. Therefore we expected children to learn more from an English program with subtitles than from the same program without subtitles. It may be argued, however, that children in the condition in which no subtitles are available listen more closely to the English words spoken in the program than chil-

dren in the subtitled condition, because, on the one hand, when subtitles are not available, the spoken language is the only verbal information to rely on; whereas, on the other hand, reading the subtitles might distract children from hearing the English words. To check this possibility, we also measured children's recognition of the English words spoken in the film in the two experimental conditions.

Because of a superior general knowledge of English, older Dutch children might profit more from the context of spoken English than younger children. Specifically, older Dutch children might be better able to distinguish separate English words in spoken language. Additionally, older children might be better readers, so they might profit more from the Dutch subtitles. Therefore, we expected older children to learn more English words from subtitled television programs than younger children.

H2: Dutch sixth graders learn more English words from a subtitled English-spoken television program than do Dutch fourth graders.

METHOD

Participants

The study was conducted with a sample of 125 boys and 121 girls from Grades 4 ($n = 126$; M age = 9.7 years) and 6 ($n = 120$; M age = 11.7 years) from three primary schools in the urban district of Rotterdam, the Netherlands. Two age groups were included in the study to create the opportunity to compare foreign language learning in children who have no English lessons at school (fourth graders) and children who are taught English on a regular basis (sixth graders). In the Netherlands at primary schools about one hour per week is spent teaching English starting from Grade 5.

Design

A 2 (Grade 4 vs. Grade 6) \times 3 (English subtitled program vs. English nonsubtitled program vs. Dutch program) design was used. To reduce error variance, a randomized block factorial design (Kirk, 1968) was chosen. English vocabulary was used as the blocking variable. Within

each grade, children were matched in blocks of three with identical or almost equal scores on an English vocabulary matching test. Subsequently, within each block, children were randomly assigned to one of three experimental conditions: (a) watching an English television program with Dutch subtitles, (b) watching the same English program without subtitles, and (c) watching a Dutch television program (control). Within Grade 4 there were 42 blocks of three children, within Grade 6 there were 40 blocks of three children. Because each block of participants with comparable vocabulary scores was divided over conditions, condition was used in the analysis as a within-subjects factor.

Stimulus Materials

The television program in the first two conditions was a 15-min episode of the American documentary series, "The New Wilderness." The episode contained a story about how a grizzly bear mother and cub managed to survive a cold winter. In the first condition a version was shown with English soundtrack and Dutch subtitles; in the second condition children watched a nonsubtitled version (with English soundtrack). To establish a baseline level of English vocabulary knowledge, children in the third condition watched an 11-min Dutch-spoken documentary about prairie dogs. Children in this control group were not shown a dubbed version of the program about the grizzly bears, because otherwise children would be able to guess meanings of English target words on the basis of sound similarities between English and Dutch.

Procedure

About two weeks before the experiment was conducted, the children completed an English vocabulary test that was used for matching purposes (see next section) in their own classrooms. In the experiment, within each condition children participated in groups of five to eight pupils in vacant rooms in the school building. In order not to reduce the chance of finding acquisition effects in comparison to the normal viewing situation in which children watch subtitled

television programs at home for longer periods of time, the television program was shown twice in one session. At the second exposure the 3-min "trailer" (the customary introduction of the documentary series) was left out, resulting in a total exposure time of 27 min. In order to avoid that the children would pay special attention to the English language or the subtitles, all children were told to "just watch" the program and that afterwards they would be asked to give their opinion about the program. Immediately after viewing the program, all the children completed an English target vocabulary test. Subsequently, in the two conditions in which the English television program was shown, an auditory word-recognition test was administered. This word-recognition test was not used in the control condition, because children in this condition did not watch the English program. In order to be able to explore whether children's English vocabulary was related to the frequency with which they watched subtitled television programs at home, at the end of each session the children were asked to indicate how often they watched subtitled programs at home.

Measures

English vocabulary matching test. To reduce error variance due to initial differences in English vocabulary among participants, the children were matched according to their performance on a vocabulary test. This vocabulary matching test was presented to the children by playing an audio tape on which a native (American) speaker spoke 45 English words. The first part, which consisted of 33 items, was a test developed by Edelenbos (1990) to assess English vocabulary level of Dutch primary school children. For each English word, three pictures were arrayed on a page and children were asked to select the picture depicting the word named (an action, object, animal, or body part). The second part consisted of 12 items selected from the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981). In this part, children had to choose the English word spoken from four pictures (an object, animal, or action). Cronbach's alpha for the whole test was .82.

English target vocabulary test. English vocabulary acquisition was assessed by means of a multiple-choice test asking for the Dutch translation of 35 English target words that were used in the program. Each of the English target words was spoken in the soundtrack of the film whereas its translation appeared in the subtitles. As with the vocabulary matching test, the target vocabulary test was presented to the children by playing an audio tape on which the words were spoken by an American native speaker. Children had to choose the right Dutch translation of the English word from four written alternatives. To prevent children (in the subtitled condition) from choosing the right answer simply on the basis of recognition, all alternatives given were words that appeared in the subtitles. In addition, the four alternatives connected with each English target word had, as much as possible, equal frequencies of appearance in the subtitles. To prevent children from getting demoralized when completing the English target vocabulary test—especially the children in the control condition who had not seen the English television program—the test was extended with 5 easy items that all subjects were expected to answer correctly. These extra items were excluded from the analysis. Item analysis showed that 7 of the 35 target items lowered the internal consistency of the vocabulary acquisition test; these 7 items had item-test correlations lower than .10 and were therefore removed. Cronbach's alpha of the scale with the remaining 28 items that were used in the analyses was .82. The items included in the English target vocabulary test were: fear, close, fences, powerful, dangerous, springtime, hibernation, aggressive, teacher, hungry, cubs, range, important, garbage dumps, tranquilizer, space, people, tired, constantly, antlers, strong, nature, again, opponent, escape, exhausted, hollow, and play.

Word recognition. The children in the two conditions in which the English television program was shown (subtitled and unsubtitled) were presented with a 30-item auditory word recognition test consisting of 20 English words that could be heard in the soundtrack of the program and 10 words that were not used in the soundtrack. The words not used in the program

were chosen as if they could have been used in the program. The word *tree*, for instance, was not used in the soundtrack, but trees were shown in the film footage. Again, the English words were presented to the children by playing an audio tape on which the words were recorded. To raise the internal consistency of the test, 10 items with item-test correlations lower than .10 were removed from the scale on which the subsequent analyses were performed, resulting in a 20-item scale of 13 words that were used and 7 words that were not used in the program. Cronbach's alpha was .67.

Watching subtitled television programs at home. At the end of each session, children were asked to indicate how often they watched subtitled television programs at home, using a 5-point scale ranging from *very often*, *often*, *sometimes*, *seldom*, to *never*. For this question, the five frequency levels were recoded into three levels of high, medium, and low frequency consisting of (almost) equal-sized groups of children.

RESULTS

A 3 (subtitled vs. nonsubtitled vs. control condition) \times 2 (Grade 4 vs. Grade 6) analysis of variance was performed on the vocabulary acquisition scores, with condition as a within-

subjects factor and grade as a between-subjects factor. The main effect of condition was statistically significant, $F(2, 160) = 12.06, p < .001$; t tests indicated that vocabulary scores in the subtitled condition were higher than in the nonsubtitled condition, $t = 2.32, p = .023$, and scores in the nonsubtitled condition were higher than in the control group, $t = 2.61, p = .011$ (see Table 1). The analysis also yielded a statistically significant main effect of grade, $F(1, 80) = 57.11, p < .001$, indicating that sixth graders performed better than fourth graders. None of the interaction effects were statistically significant.

Word recognition was analyzed using a 2 (subtitled vs. nonsubtitled program) \times 2 (Grade 4 vs. Grade 6) analysis of variance, with condition as a within-subjects factor and grade as a between-subjects factor. Main effects of condition, $F(1, 80) = 4.45, p = .038$, and grade, $F(1, 80) = 20.87, p < .001$, were statistically significant, indicating that more English words were recognized after watching the subtitled television program than after watching the nonsubtitled program, and sixth graders outperformed fourth graders (see Table 2). There were no statistically significant interaction effects.

In order to explore whether children's English vocabulary was related to the frequency with which they watched subtitled television programs at home, a 2 (Grade 4 vs. Grade 6) \times 3

Table 1 \square Vocabulary Acquisition (percentages) in Three Conditions (N = 246)

	Subtitled TV	Non-subtitled TV	Control	Subtotals
Grade 4 (n = 126)	61.42 (17.85)	58.50 (13.05)	56.46 (14.26)	58.79 (13.09)
Grade 6 (n = 120)	82.29 (9.91)	78.53 (12.17)	73.48 (13.55)	78.10 (9.70)
Subtotals	71.60 (17.85)	68.27 (16.10)	64.77 (16.27)	68.21 (15.04)

Note: Standard deviations are enclosed by parentheses

Table 2 \square Word Recognition (percentages) in Two Conditions (N = 164)

	Subtitled TV	Non-subtitled TV	Subtotals
Grade 4 (n = 84)	64.05 (15.23)	60.95 (14.91)	62.50 (11.28)
Grade 6 (n = 80)	76.12 (10.89)	71.00 (14.68)	73.56 (10.62)
Subtotals	69.94 (14.54)	65.85 (15.55)	67.90 (12.23)

Note: Standard deviations are enclosed by parentheses

(low, medium and high frequency of watching subtitled television programs) between-subjects analysis of variance was performed on the matching test vocabulary scores. Because of missing values on the frequency question, the analysis was performed with 222 children. Both main effects were statistically significant: grade, $F(1, 216) = 165.57, p < .001$, and watching subtitled television programs, $F(2, 216) = 6.04, p = .003$. *T* tests indicated that children with a high frequency of watching subtitled television programs had statistically significant higher English vocabulary scores ($M = 30.85; SD = 5.74$) than children with a low frequency ($M = 27.73; SD = 6.19; t = 3.00, p = .003$) and medium frequency ($M = 28.63; SD = 6.50; t = 2.13, p = .035$) of watching subtitled programs. There was no statistically significant interaction effect.

DISCUSSION

The findings indicate that young children can acquire elements of a foreign language through watching subtitled television programs. In accordance with H1, children who watched the subtitled television program had higher English vocabulary scores than children who watched the Dutch television program. Therefore, it may be concluded that story information in subtitled English-spoken television programs consisting of (a) English words that can be heard, (b) the Dutch translations of these words that can be read, and (c) the word meanings supported by the visual images in the television program, constitute a context from which Dutch children are able to pick up the meaning of some of the English words.

Although language learning was stronger in the condition in which children watched the subtitled English-spoken program, vocabulary acquisition was also found in the condition in which children watched the nonsubtitled English-spoken television program. Apparently, children learned some English words from watching the English-spoken film, even though the words were not translated into Dutch. In practical terms, this means that vocabulary acquisition may occur when, for instance, Dutch children are watching television programs broadcast by the BBC.

It was suggested that reading the subtitles might distract children from hearing the English words. Therefore, children's recognition of English words was compared between the condition in which children watched the subtitled television program and the condition in which children watched the nonsubtitled version of the television program. The results indicate that word recognition in the nonsubtitled condition was not superior to word recognition in the subtitled condition. Therefore, it may be concluded that reading the subtitles did not distract children from hearing the English words. Eye-movement research suggests that Dutch-speaking viewers are able to switch effortlessly between the visual image and the subtitle (d'Ydewalle, Praet, Verfaillie, & van Rensbergen, 1991). Our study is consistent with these findings and suggests that Dutch children have no problem with switching between reading subtitles and listening to the English words spoken in the soundtrack. In fact, the results of our experiment indicate that word recognition is even better in the subtitled than in the nonsubtitled condition. It may be the case that English words are better recognized when their translations can be read in the subtitles because recognition of words on the basis of a two-channel input (listening and reading) is easier than on the basis of a one-channel input (listening).

Previous research has suggested that children's ability to acquire vocabulary through context is influenced by their level of linguistic competence (e.g., Neuman & Koskinen, 1992). Therefore, we hypothesized that older Dutch children, owing to both a superior general knowledge of English and better reading skills, would benefit more from the context of English-spoken language than would younger children. Although vocabulary acquisition scores were higher for sixth graders than for fourth graders—a finding that indeed supports the assumption that sixth graders are better in English than are fourth graders—H2 was not supported in our study, as no interaction effect between condition and age was found. It may be that in both age groups the level of linguistic competence in English was above a threshold at which subtitled television constituted comprehensible input, through which new vocabulary could be

acquired not only by older children (Grade 6), but also by younger children (Grade 4). This explanation is supported by the finding that vocabulary matching test scores of fourth graders ($M = 55\%$) were higher than chance level (31%). In addition, target vocabulary test scores of fourth graders in the control condition ($M = 56\%$) were also above chance level (25%). Apparently, Dutch fourth graders do have some knowledge of the English language, although they are not taught English at school. This basic knowledge of English might have been acquired through their experience with watching subtitled television programs at home, as illustrated by the additional evidence found in this study that English vocabulary was positively related to the frequency with which children watch English subtitled television programs at home.

As the differences in vocabulary acquisition scores between the three conditions were small, one may question the external validity of the experiment. It may be argued that the vocabulary acquisition found in our study occurred because, owing to the experimental situation, children paid closer attention to the television program than they would have done watching the same program at home. However, the children in our study were instructed to "just watch the program because we would ask their opinions afterwards." Moreover, children may even pay *more* attention to subtitled television programs that they watch at home because, generally, they may be more motivated to understand these self-chosen programs than the program we showed them during the experiment.

A second argument in defense of the study's external validity is related to the duration of the television program that we used. Strong effects of watching one short television program on language acquisition could not have been expected in the experiment. In real life, however, Dutch children spend about half of their viewing time watching subtitled programs, which means that, through television, they are confronted with the English language day in, day out. Therefore, the effect of watching subtitled television programs at home may well be strong and cumulative. Elementary school children may even be right when they claim to learn more English from television than in school (Vinjé, 1994).

The present study supports the notion that children's acquisition of a foreign language is stimulated through watching subtitled television programs. It is not known at what age children start to learn words from foreign languages spoken on television. One important question is how much of a foreign language children must know before they are capable of acquiring elements of this language through watching television programs. In addition it is not known whether foreign language television, with or without subtitles, teaches children only vocabulary or also other elements of foreign languages, such as pronunciation, or a feeling for correct sentences. Experimental research similar to that reported in this article may provide answers to some of these questions.

In addition, investigation of the benefits derived from the use of foreign television programs in language instruction would seem an appropriate avenue for further research. Recent studies suggest that there is a growing interest among foreign language teachers to use videotaped television broadcasts such as news programs (e.g., Fröhlich, 1996; Vann, 1996), soaps (Grant, 1996), and music programs (Mason, 1997) for educational purposes. Until now, only nonsubtitled foreign television programs have been used as an instructional tool. As our study suggests, in the case of young pupils in extracurricular settings, more is learned from watching subtitled television programs than from nonsubtitled programs. Therefore, the use of foreign television programs with interlingual subtitles may also be considered in instructional settings. In a language class situation, when children watch subtitled television programs that have been selected by their teacher on the basis of clear and grammatically correct language, visual aids for comprehension of word meanings, and subjects that kindle the children's interest, the effects on foreign language acquisition may be stronger than the effects observed in our experiment. In addition, instead of "just watching" the television program as the children in our experiment did, learning effects may be stronger when teachers play the broadcasts repeatedly and analyze with the children parts of the material being viewed. When used correctly, subtitled television programs, through

their unique combination of multisensory presentation of information, may add to the variety and effectiveness of educational activities when learning a foreign language. □

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