

**UNIVERSITE DE LA SORBONNE NOUVELLE**

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## **SUMMARY**

# **The Semiophonic Method Applied to Learning English as a Second Language**

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In order to understand the English spoken word, a French listener must process unfamiliar sounds and rhythms. This is extremely difficult because word recognition implies an automatic process acquired from early childhood and based on the native language speech sound system. This study reviews what is currently known about language acquisition, auditory word recognition, and the fundamental differences between the French and English phonological systems. It then presents an experiment exploring automatic and controlled processing in second language learning.

In this experiment one group worked under explicit learning conditions, actively and intentionally trying to distinguish different characteristics of the English language phonological system. The other group, following the semiophonic method, received no specific instruction, but repeated English words and phrases in a relaxed atmosphere. The

semiophonic method, originally developed for dyslexic children, targets a modification of the bottom up processes used to identify words, rather than proposing a cognitive approach. The principle is to intervene directly at the automatic level of language as opposed to attempting to deal with attentional processes. The application of this method to the acquisition of the English phonological system implies that French learners repeat English sounds and rhythms.

## **1. Language Acquisition**

As native language acquisition evolves from birth to the end of childhood, linguistic perception becomes more and more firmly established until it begins to have the characteristics of an automatic processing system. To learn a language, a child must identify and construct relationships between numerous cues of different types (intonation, phonological contrasts, word order, etc.). Because the importance of these varied cues differs according to the language, listeners cannot apply the principles of their native language linguistic system to the comprehension of another language. This study outlines the different stages of first language acquisition in order to propose a system of reeducation that takes into account the relationship between the anteriority of learning and the depth of its influence.

## **2. Speech Perception**

Listeners, whether they are English or French, must be able to go from a fast, variable, continuous and ambiguous sensory input to a meaningful interpretation. Explaining how this is done raises many essential questions. Which elements of the sensory input are important for word recognition (temporally defined spectral templates, phonemes, syllables, etc.)? How important is the influence of higher-order contextual information (lexical, syntactic, semantic and pragmatic)? In other words, how important are bottom up operations compared to top down information because language comprehension depends on both automatic and voluntary processes? Recent research has led to insights on how listeners understand fluent speech seemingly efficiently and effortlessly.

## **3. Automatic Processing**

When learning a second language, listeners do not notice phonological regularities in the target language because they are using their native language automatic processing system. Because of a deficient phonological representation in the second language, adult listeners will more readily use other linguistic representations (syntactic, semantic, and pragmatic). Compensating for a deficient phonological representation will put a strain on working memory. French listeners, not having developed their capacity to encode and store English phonological representations, will have more difficulty understanding fluent speech in that language.

## **4. The English Language as compared to the French Language**

Which linguistic characteristics influence spoken word recognition of English and French? Some aspects seem more important to automatic spoken word processing than others that are traditionally taught in second language courses. For example recent research highlights the importance of temporal patterns in forming the framework which structures comprehension of spoken discourse. Even before birth, children begin developing sensitivity to prosody. This early development followed by that of other linguistic capacities such as grammatical capability and use of phonotactic contrasts leads to establishing a network of specific connections in memory.

The origin of the difficulty for French people in perceiving spoken English is found in these characteristics deeply buried in the early stages of linguistic development. Not being aware of the linguistic cues used for understanding their own language, French people cannot voluntarily modify these cues to master another language. This study reviews the characteristics of the French and English languages which are the source of these profound differences.

## 5. Experiment

Taken together, the above experimental findings led to the hypothesis that the problems of listening comprehension could better be addressed through a method that would access the automatic processing system of the subject. This method would have to take into account the fundamental differences between the French and English languages but would not explicitly teach them.

To test this hypothesis, an experiment comparing two methods was conducted during normal university second language classes over three school years (1995-1996, 1996-1997, and 1997-1998). Students had been working in the language laboratory under the explicit learning conditions of the first method since 1990. This involved work with cassettes and a book published by Ellipse in 1992 (*Entendre l'anglais pour préparer l'oral*). The second method attempted to reeducate automatic processing systems under implicit learning conditions. The subjects worked with an adaptation of the semiophonic method developed by Dr. Beller and used with dyslexic children for over 20 years. This involved repeating words or phrases while carrying out a secondary task.

This study was carried out with first year students at the Institut Universitaire de Technology of Cachan (near Paris). They were divided into two or three groups, Group E working with the book and Groups R and L repeating words and phrases.

Figure 1 : number of participants

	Group E	Group R	Group L
March 1996	80	51	10
March 1997	49	62	
March 1998	73	48	

Upon their arrival in September, subjects took an English oral comprehension test. Six months later, after participating in approximately twenty half-hour sessions in a language laboratory,

they took the same test. This test, based on the Cambridge First Certificate and the Cambridge Advanced English Tests, evaluated their capacity for understanding normal spoken English.

At the beginning of each session, Group E subjects would take their books and go to one of the language laboratory booths where *Entendre l'anglais pour préparer l'oral* was pre-recorded. They were able to work at their own speed and look at the answer key whenever they desired. Group R and L subjects would take a game, a picture book, or drawing paper and go to a language laboratory booth where they would repeat the words and phrases they heard.

### 5.1 Group E

The method used by this group was based on a systematic study of aspects of the English phonological system that are difficult for a French speaker. For example, French people have difficulty in hearing the difference between "nineteen" and "ninety". In the experiment, the subjects had to discriminate between /i/ and /i:/ in the very first exercises.

*Entendre l'anglais pour préparer l'oral* is divided into modules, each one made up of five parts :

- Sounds : The difference between two phonemes is explained and then the subjects complete a series of exercises. For example they must circle "meat" or "mitt" according to whether they heard "She threw in the meat" or "She threw in the mitt". The explicit explanations of the differences are very brief and subjects do not learn how to produce these sounds. Learning takes place only through listening.
- Rhythm : This part includes the problems of prosody, intonation, weak syllables, etc. For example, while looking at a list of words in their books, subjects circle the accentuated syllable. Again the explanations are very brief and do not include any rules that would be useful for production.
- Global Comprehension : This part attempts to help subjects develop a listening strategy exercising their top down reasoning. For example, subjects learn how to listen for key words using the English language stress system. In some exercises they are asked to ignore all the unstressed words in order to only listen for key words.
- Listening for Detail : The difficulty of understanding spoken numbers and the letters of the alphabet goes way beyond a lexical obstacle. Using radio programs and advertisements, this part is made up of number and alphabet listening exercises.
- Answer key : At the end of each part, students are asked to work from the answer key to better understand their mistakes.

### 5.2 Groups R and L

The semiophonic method never goes into explanations of the underlying rule-structure, but attempts to have students avoid the use of the top down reasoning that would imply explicit knowledge. The sequence of the cassettes used by Groups R and L was based both on the principles of universal language acquisition and on a progression taking into account the difficulty of the English prosodic system. Their content depended on the rhythm of the English language rather than on semantic or syntactic considerations. During the first sessions, subjects were asked to repeat single words. They then progressed from double words to more and more complex prosodic sequences, recreating in this way the normal evolution of

first language acquisition. The sequence of the cassettes depended directly on the fundamental differences between the English and French languages indispensable for spoken word recognition.

Groups R and L used identical cassettes, based on the principles of the semiophonic method developed for dyslexic children. For material reasons, the other essential element of this method, the lexiphone, was only used with a limited number of subjects (Group L). The lexiphone produces a so-called parametric sound to enhance the auditivo-verbal re-education of language disorders. Because only two of these devices were available for only one year, Group L was made up of only 10 subjects compared to almost 200 for Group R.

The semiophonic method is based on repetition using an audiophonatory loop. Repetition both reveals the perceptive capacities of the subjects and initiates a modification of these capacities. Numerous studies confirm the correlation between the capacity of repeating a language and its acquisition both for first and second language learning. Memory span of phonological elements determines vocabulary acquisition of four-year olds learning their native language and of older children learning a second language (studies mentioned by Ellis, 1996). As an application of Anderson's theory on the importance of training for automaticity acquisition, the repetition of regular phonological sequences should facilitate the formation of a framework or a structure that would permit the development of memory span. As the capacity for imitation of longer and longer phrases develops, second language learners dispose of more raw material from which they can construct a linguistic system. Automatic processing cannot develop unless working memory can retain units of sufficient length (Spiedel, 1989).

Group R and L subjects used headphones with built-in microphones enabling them to hear both their own voices and the words and phrases recorded on the cassettes. The use of this system allowed subjects to work under audio-phonatory feedback conditions, which was indispensable for the method. By listening to this feedback, subjects automatically modified their production to make it better correspond to the model.

### 5.3 Results

#### 5.3.1 Substantial Improvement

The overall level of all of the subjects improved substantially. Even though these subjects had been studying English since the age of eleven, attending an average of eight years of English classes, a large portion (between 20 and 30 %) understood almost no spoken English. At the end of the study, the percentage of those who understood very little went down to less than 10%.

The subjects with a more advanced English level also showed marked improvement. The percentage of those who understood almost everything (a test mark of 15/20 or above) went up by more than 10% each year.

Group L subjects, who worked with the lexiphone, showed the most improvement with a gain of 3.5 points (figure 2). It would seem that the lexiphone could be a useful tool for improving perception but further studies are needed.

### 5.3.2. Improvement in different ways

The performance of the three groups (figure 2), practically identical over the three years, does not show the means the subjects used to understand spoken English and does not reflect individual differences. Because of the large number of subjects, an average does not show individual personalities and origins and does not take into account the source of improvement of each group.

Figure 2

Performance of each group : number of points gained (marks out of 20)

	1996	1997	1998
Group E	3.1	2.6	2.3
Group R	3.1	2.6	2.9
Group L	3.5		

Both methods led to improved listening comprehension but we feel that the improvement is based on totally different processing strategies. The implicit learning groups (Groups R and L) enhanced their comprehension through a more efficient bottom up processing of phonetic and temporal cues. They also seemed to extend their short-term memory capacity for English words and phrases. When these subjects repeated a list of words, their syllable accentuation and phonemic production were superior to their usual performance.

However, many subjects remained very aware of the semantic context especially when this context did not seem to correspond to the target word. For example, they would often transform a sentence in order to make it significant (e.g. "*That's the first thing you've said right*" would become "*That's the first thing last night*" or "*That's all you have to do*" could become "*Perhaps to do.*"). Observations of individual subjects showed that the context effect is inversely related to performance for the implicit learning groups.

On the other hand, Group E was explicitly taught to use the context to better understand spoken discourse. This group learned to use systems other than phonological processing and to compensate for deficient sensory input perception through cognitive and linguistic means.

It is impossible to know how a subject managed to understand spoken discourse, but we have the impression that the processes used by Group E were intentional and inferential. This interpretation was confirmed by the reaction of the subjects who said that the global comprehension work was very profitable but that the exercises on the sounds were not very interesting. At the end of the study they claimed to have benefited from being taught how to look for key words but said that they had not progressed in discriminating individual phonemes. They enjoyed learning about suprasegmentals and the English system of accentuation but did not believe that this knowledge would improve their listening comprehension in real time.

For all the groups, individual results are far from homogeneous. Some subjects did not progress at all whereas others doubled their score, going from 7/20 to 14/20 for example. This could easily be explained by analyzing the listening strategy used. Subjects in Group E who studied the differences between English and French, using the top down reasoning method proposed, benefited from the method. On the other hand, subjects in the implicit learning groups who repeated with pleasure, allowing themselves to follow the music of the language profited from a bottom up approach. During this study those who did not progress used the method that was in contradiction with their personality.

## 6. Conclusion

These results show an overall improvement in listening comprehension. However, they do not take into account the reasons for this improvement. Group E subjects progressed through the use of explicit learning processes whereas Group R and L subjects improved through their implicit learning processes.

On a long-term basis, it would seem that these two processes would not lead to the same results. The ideal situation would be to reeducate the automatic processing system. Having to compensate for a deficiency in this system by using attentional processes inevitably leads to a slower and often erroneous interpretation of oral discourse. In spoken word recognition, it is necessary to differentiate between representations computed from the sensory input and those constructed from the context using higher order sources of knowledge. Every listener uses context in the later stages of interpretation, but the dependency and the efficiency of this use hinge on the first stage of processing. Impaired phonological encoding increases the risk of error because the listener has only a partial representation of the sensory input to confront with higher order contextual information.

Even if listeners are able to use explicit knowledge of the phonetic characteristics of the language, allowing them a better interpretation of the representation computed from the sensory input, without automatisation, performance will still deteriorate. Processes that should have been carried out automatically, by requiring attention, will slow down the system and overload working memory. During this study, Groups R and L improved their memory spans. At the beginning of the experiment, these subjects were incapable of repeating English phonological sequences indicating that their short-term memories were operating in a French phonological system. For most of the subjects, the repetition of double words and of standard English rhythms that was difficult at the beginning was effortless at the end. By the final weeks of the experiment, quite a few subjects could remember long sentences without any difficulty. It would seem that the more cognitive resources are overloaded, the more use is made of contextual cues and the less phonological aspects are taken into consideration. Observations of the performances of Group R and L subjects indicate that it is possible to obtain an evolution in the opposite direction.

Any activity that could help to lighten memory load by favorising automatic processing should be developed and integrated into academic programs. We feel that because of the complexity of both the phonological system and the cognitive and linguistic resources necessary for oral comprehension, explicitly teaching difficult points will lead to failure. It is not sufficient to work on the symptoms or the apparent difficulties of second language acquisition because this does not access the source of the problem. We are convinced that certain phonological information is only accessible through progressively introducing English temporal patterns. Procedures that lead to avoiding the use of higher order reasoning and implicit learning strategies, allowing more receptivity to a novel phonological system should be developed. This is what we have attempted to do in this study.