

5. The Effect of Reading on L2 Listening and Speaking

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Abstract

Course books are full of very interesting reading texts that are supposed to be helping our students to learn how to speak English. Unfortunately they are probably doing just the opposite because they are deepening the filter through which French people listen to English. Adult learners depend on the written word and this is their downfall when they want to learn to speak and listen to a foreign language. This paper describes the three independent systems involved in producing language: semantic, lexical and phonological processes, linking them to the effects of second language acquisition through reading.

Can our ability to understand and speak a foreign language be considered part of our culture? By emphasizing an acquired skill that is permanently integrated into a person's deepest inner self, the definition of "culture" found in *Le Petit Robert* makes it seem so:

"D veloppement de certaines facult s de l'esprit par des exercices intellectuels appropri s. Par ext. Ensemble des connaissances acquises qui permettent de d velopper le sens critique, le go t, le jugement. V. .../..."La culture, c'est ce qui reste quand on a tout oubli " (*Herriot*)." *Le Petit Robert* (The development of certain mental faculties through appropriate intellectual exercises. By extension, all of the acquired knowledge that allows the development of critical thought, taste, judgement. .../.... "Culture is what is left over when everything else has been forgotten" [*Herriot*]).

Our ability to read, to speak and to listen to our native language is truly "what is left over when everything else has been forgotten." This, unfortunately is what makes learning a second language as an adult so difficult.

It seems that although methods of teaching English are constantly improving, we do not yet take into consideration all of the advances in language acquisition

research. The latest publications do include what are called "word partnerships" "useful phrases", or "words in context", and they are emphasizing more pronunciation work, insisting on accentuation. However, they seem to totally ignore the fact that most adults learn through the written word. Course books are full of printed words that students can read and record in their memories. Unfortunately they do this with a wildly inaccurate phonological code, "fossilizing" their perception of this second language.

Since most adults are constantly reading in their own language, they are unaware of how this activity reinforces all of the phonetic principles of a native language and even modifies perception. Reading influences how people pronounce words, what sounds people think are in words, how well words are remembered, and how rapidly pronunciations of words change over time. (Ehri, et al., 1988)

"Fossilizing" the first language: early development

By learning our native language we have established a mental filter that eliminates non-relevant sounds and assimilates any even slightly relevant sounds to a pre-established prototype. When native speakers hear English pronounced with a strong Texan accent that deforms the sounds they are used to, they can still understand by automatically assimilating these sounds to ones they know. This ability is precisely what prevents a native speaker from being able to comprehend the sounds of a foreign language. We all have firmly established mental filters that automatically go to work even when we would be better off if they didn't.

This mental filter started developing before we were born as shown by experiments with one-day old infants. In these studies, one-day old infants were already more interested in the language they had heard in their mother's womb than a foreign language (Locke, 1993). During their first year, infants go from an interest in native language sounds to defining categories for these sounds that give them a strong foundation for understanding language. Once formed, these categories or prototypes act as a perceptual magnet shrinking the distances for sounds near a category and stretching the distance between categories (Kuhl, 1994). For example, I am using the categories I developed as a child when I cannot distinguish between the French words "dessous" and "dessus" because I assimilate both of these "u" sounds to the English "you". The French mental filter works in the same way when a French person cannot hear the difference between the English words "sit" and "seat".

As our mental filters become more and more efficient we can even totally ignore non-significant sounds. In a study with Japanese speakers and English speakers, no brain activity was recorded for the Japanese speakers with the sound stimulus of /r/ and /l/ whereas all of the English speakers did react.

Learning to read

This mental filter continues to develop after the first year, becoming more firmly established over the years, but the finishing touch comes when a child learns how to read. To learn how to read, we must be able to phonologically analyze a word. Of course no one asks children to actually analyze a word, but nursery rhymes automatically develop this phonological analysis. Children are then asked

One, two, buckle my --?--;
 Three, four, knock at the --?--;
 Five, six, pick up --?--;
 Seven, eight, lay them --?--;
 Nine, ten, a big fat --?--.

Studies have shown that the 5-year-olds who cannot supply the word “shoe” to rhyme with “two” will later have difficulties reading. We are largely unaware that this ability to rhyme is part of a phonological analysis that is indispensable to reading.

After rhyming, children are asked to manipulate sounds and words. For example they are asked to eliminate the first sound of a word and replace it with another. (e.g. Take the “m” sound off “mat” and put an “h” sound in its place. [hat]) or manipulate the last sound (e.g. Take the “t” sound off “mat” and replace it with a “p” sound [map]). This simple exercise is very revealing because the children who are incapable of doing it will have trouble learning how to read. It is not something that just comes naturally. Studies with adult illiterates and preliterates show that they too are generally unable to manipulate words in this way and to thus analyze speech at the phonic level.

This is because reading and phonological development are interactive; each one influencing the other. Once someone learns how to read, their listening strategy changes and they lose their capacity to perceive some phonological differences.

They automatically begin to take into consideration how a word is spelled when they are listening to spoken language (Morais et al. 1991). For example, only a literate person could think that a word pronounced [evri] (“every”) contains three syllables (Barton, 1992). Experiments have shown that even when a misperception is clearly pointed out, people maintain their first interpretation. American subjects hearing an American pronounce the word “water” as “wader” said that they clearly heard a “t” sound and wouldn’t believe that they had heard a “d” sound.

Reading as an adult

As we have seen, once adults learn how to read, the written word influences their listening without them being aware of it. This influence does not simply include individual letters but includes groups of letters, whole words and grammatical interpretations.

Our reading system works in two main ways: phonologically and orthographically. Phonological reading basically means sounding out words and orthographical means immediate recognition of familiar words. Adults can read very rapidly because they do not have to sound out everything (phonological reading) but process the most familiar words as a whole (e.g. HAVE as opposed to H + A + V + E). However longer words or infrequently used words that have to be read phonologically do not slow adults down very much because they do not read each letter. An adult automatically groups letters into graphemes (written representations of phonemes [EA in BREAD is a grapheme representing one phoneme]). A recent experiment with French and English speaking subjects showed that French speakers took longer to detect the letter “A” in “taupe” than in “casse” or the letter I in “beige” than in “tripe”. English speakers took longer to detect A in “peach” than in “class” and I in “joint” than in “shift” (Rey et al. 2000). They simply did not notice the individual letters because they had automatically processed the graphemes. The English people had automatically read the “ea” of “peach” as the same sound as “ee” in “see” and the French people had automatically read the “au” of “taupe” as the same sound as “pot”. This grouping of letters that we do unconsciously is one of the automatic processes operating when we read and is unwantedly carried over into reading in a second language.

Several studies have investigated whether bilinguals activate phonological representation from both of their languages when reading words in just one. In one

study (Jared, Debra and Szucs, 2001) French-English bilingual subjects were asked to read words such as “pain” which of course is a high frequency French word meaning “bread” and a rather low frequency English word meaning “suffering”. The study showed that when the subjects read in a target language, their unwanted language was interfering. For example when French bilinguals were asked to read in English and saw the word “pain”, they had a moment of hesitation or made a mistake by saying the French word for bread. Another study (Von Studnitz and Green, 2002) with German-English bilinguals showed similar interference with words such as “tag” which means “day” in German. One conclusion of these studies was that the activation of the non-target language depended on whether the bilinguals were naming words in their dominant or less dominant language. My students are far from bilingual and the notion of dominant or less dominant language does not apply. I think that I can safely say that at least for cognates, they are constantly automatically activating the French language when reading in English.

This automatic processing includes grammatical analysis. Of course, grammatical analysis here does not refer to the ability to determine whether a word is a direct object or an indirect object. In this context, grammatical analysis means understanding the necessary grammar in order to understand a sentence. Frenck-Mestre and Prince (1997) asked American and French subjects to read simple sentences while recording their eye movements. These recordings showed where a reader would hesitate on a word or go back over a part of a sentence. Subjects from both countries automatically applied grammar rules from their native languages to reading in their second language even when this meant that it would be more difficult to understand the text. For example Americans had more trouble reading “Jean mange souvent du chocolat.” because that sentence does not have the classical word order of English.

The influence of visual information

Our adult French ESL learners have therefore firmly established their mental filters and have been integrating orthographic information into their listening strategies long before we have had any contact with them. Besides, they have been reading for so long in French that they are no longer aware of their automatic French reading processes, so they inadvertently apply them to English. This alone would be worrisome for English teachers, but studies have shown that the influence of reading is much more widespread. Adults who have been learning through read-

ing are less sensitive to sounds, developing their visual capacities and minimising their auditory capacities.

School systems promote learning through copying notes taken from the board and studying textbooks and reference books. From an early age, children learn that just listening in class is not enough and that they must get used to studying the written word. Little by little, adults have been trained to learn through what they see, relying on what they read, often ignoring what they hear.

The importance of visual information for adults was dramatically shown in an experiment carried out in the 1970s by McGurk and MacDonald. Onto a film of a young woman's talking head, these scientists dubbed repeated utterances of the syllable "ba", whereas the lip movements were for "ga". Adults watching and listening to this videotape heard "da". After observing this phenomenon, these scientists tested both children and adults. When asked what they had heard after seeing conflictual auditory and visual information, preschoolers responded incorrectly 52% of the time whereas for adults 92% of their responses were incorrect. This clearly shows that adult subjects are more influenced by visual input than younger people. This audio-visual illusion, now known as the McGurk effect, demonstrates that visual speech syllable information can override contradictory auditory information, causing perceivers to report hearing what they actually see.

Another strong influence of visual information is illustrated with the Stroop Effect. In 1935, Stroop carried out his now famous experiment where he timed subjects reading the names of colors. When these names were printed in another color (e.g. the word "blue" was written in red ink or the word "red" was written in green ink) it took the subjects much longer to read the names of the colors because the information was conflictual. Since then many different Stroop effect type experiments have been developed. People were tested with cards on which the words "up" "down" "left" or "right" were printed. When the word "up", for example, was printed in the lower right-hand corner of the card, it took people longer to read the word. It has taken researchers over fifty years to understand exactly how the Stroop effect works and to apply it to how people process a second language.

Processing information in the brain

Recent research has shown that understanding and producing language involves

several separate processes. Semantic, lexical, or phonological information is represented in the brain in independent systems. This means that when we work on vocabulary acquisition, for example, we are building up the lexical system, but we are not necessarily building up phonological connections. French people reading a text in English probably access their semantic and lexical systems, but since they are not reading with an English accent, they do not develop their English phonological system. This is why, when our students speak in English, they will often use the correct word, but their pronunciation is incomprehensible. Whether we are speaking in our native language or in a foreign language, “production begins with conceptualization processes that involve activation of semantic information and then selection of a syntactically specified lexical representation, followed by retrieval of corresponding phonological components of the word.” (James and Burke, 2000)

The semantic representation is not as affected by speaking in a foreign language because research has shown that it is not language dependent. As Stroop saw in his original experiment with naming colors, contradictory semantically related words (the semantic field of “color” with the word “green” printed in red ink) will slow down access to a target word. Numerous studies involve this same experiment with a second language. For example, subjects are asked to ignore any words printed on a page. They are then asked to say names of pictures in English. Studies have shown that there is interference when subjects see a picture of an object with a distractor word next to it. However if the picture and the object correspond, the subjects will be able to produce the word much faster. For example in Experiment 1 a French person would be asked to name objects in English and would see a picture of a book with the word “stylo” printed next to it. The student would take a longer time because of the contradictory information. In Experiment 2 the French student, seeing a picture of a book with the word “livre” printed next to it, would be able to say “book” very quickly. This shows that both languages are activating a common semantic source (see Lee and Williams, 2001 for similar experiments).

This may seem perfectly logical, but it is only recently that most psycholinguists have come to agree on how our brains access language. A recent study using functional magnetic resonance imaging on bilingual Spanish and English subjects showed that “the two languages of a bilingual person access a common semantic system. .../... These results demonstrate a shared frontal lobe system for semantic

analysis of the languages and are consistent with cognitive research on bilingualism indicating that the two languages of a bilingual person access a common semantic system.” (Illes et al., 1999).

The lexical representation, unlike the semantic representation, is language specific. At the present time, however, researchers do not agree on how this system works. Some have found that when a bilingual wants to speak in one language, the unwanted language is inhibited while others have found that both languages compete until final production of the word. For example if French speakers want to say “dog” in English, “chien” would also be activated in their brains. It would seem that if the word that a bilingual wants to say is a cognate such as “table”, the activation is even stronger. A. Costa et al. (2000) studied both English-Spanish bilinguals and Spanish-Catalan bilinguals and have concluded that bilinguals possess a flexible language specific selection mechanism which allows only the words of the wanted language to compete with each other during word production but other researchers do not necessarily agree with their findings.

The next stage in the process is accessing the phonological representation. In an experiment carried out in Dutch, Hermans, Bongaerts, de Bot & Schreuder (1998) found that bilingual speakers cannot prevent interference from their dominant language when speaking in their second language. They replicated a Stroop-type experiment on a phonological level. Instead of conducting their experiment with a distractor word related by meaning (the word red written in green ink or the word “stylo” printed next to a picture of a book), the distractor word was phonologically related. In their experiment, when naming the picture of a mountain in English, the Dutch distractor word was “berm”. The sound of “berm” is close to the sound of the Dutch word for mountain (“berg”) but it means “verge”. If subjects saw a picture of a mountain with a word that was totally unrelated (“kaars” in this experiment), they had no problem naming the picture. However they were much slower when the word was phonologically related. This study shows the extent of the influence of an unwanted language with the authors stating, “We conclude that bilingual speakers cannot suppress activation from their first language while naming pictures in a foreign language.”

The First Step Towards a Solution

Psycholinguists agree that fluent adult readers process the written word auto-

matically and involuntarily. Sounding out words is only a safety mechanism that is rarely used. I have observed my French students reading English texts using their French automatic processing system. If you stop them in the middle of the text to ask them a question, their pronunciation and even retention of the words that they have just read will have nothing to do with the English language. They will have accessed the semantic process, they might have accessed the lexical process, but there is very little chance that they have accessed the phonological process.

Course books lead us to believe that we are teaching our students how to speak in English by having them read. I believe that our learners have learned many skills and that we have taught them vocabulary and even grammatical structures. However I am not at all sure if we haven't been keeping them from learning how to speak and understand. Reading texts could be counterproductive when the goal is speaking.

Because French people have either avoided storing a phonological component or have stored an erroneous one, it is impossible for them to access the correct pronunciation of an English word. I can easily see the effect reading has on making my American accent in French stronger and I have found blatant errors in the writing of my students. This year one of my students who was writing about skin diving kept mentioning "itch". I know that diving suits are uncomfortable but not "itchy". It wasn't until the third "itch" that I understood he meant "each". When proofreading a fascinating article for publication by a French writer, I found almost no mistakes until I came to the sentence "five-year old Spanish children appear to rich a higher level than 7 year-old French children".

How would our ESL learners do with the nursery rhyme activity used to assess the future reading ability of five-year-olds? If they were given:

One, two, buckle my --?--;
Three, four, knock at the --?--;
Five, six, pick up --?--;
Seven, eight, lay them --?--;
Nine, ten, a big fat --?--.

Would they be able to rhyme "two" with "shoe" or would they be influenced by the written word and consider that these wildly different spellings couldn't possibly

rhyme? For seven years I taught a group of children in a French public school as these children progressed from the age of 3 (*moyen section en maternelle*) to the age of 10 (CM1). They all learned the above nursery rhyme with no difficulty at the age of 4 and their pronunciation was absolutely perfect. After learning to read, at the age of 6, they could no longer retain all of the verses in memory and the lines they did remember were pronounced with a strong French accent.

The situation looks hopeless. Our adults have been speaking and reading in their native language for years fossilizing their native pronunciation system and shutting out perception of the targeted English pronunciation system. They have no control over what they are doing because all of this is part of an automatic processing system that they are unaware of. "There are aspects of second language acquisition where learners seem impervious to aspects of the language, where input fails to become intake: failing to notice cues because they are not salient; failing to notice that a feature needs to be processed in a different way from that relevant to L1.../..." (Ellis, 2003) By reading a text, our adults do not implicitly acquire the phonological system that goes along with it; quite the opposite.

Should we force students to stop reading? Should we only allow them to read if they absolutely promise to pronounce every word in English? This would be impossible. When we do not use an automatic process to read, we use attentional processing that uses up much more brainpower. This leaves fewer remaining cognitive resources for understanding and retaining the text. It would be as if we had to analyse each muscular movement every time we tried to walk instead of letting our automatic process that governs walking take over. This means that if a French person tries to read using the English pronunciation system, at best it would take much longer to read the text and at worst the concentration power used for pronunciation would thwart attempts at comprehension. The reader would get to the end of the text without having understood the meaning.

In my opinion the first step towards a solution is awareness. As teachers we should not work under the illusion that reading is leading to fluent speaking. We should be more aware of the processes at work when our students are carrying out the various activities that we propose. Our students too should be made aware of these mechanisms. From there we should constantly be on the lookout for ways to help students acquire that all too difficult sound system of English.

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