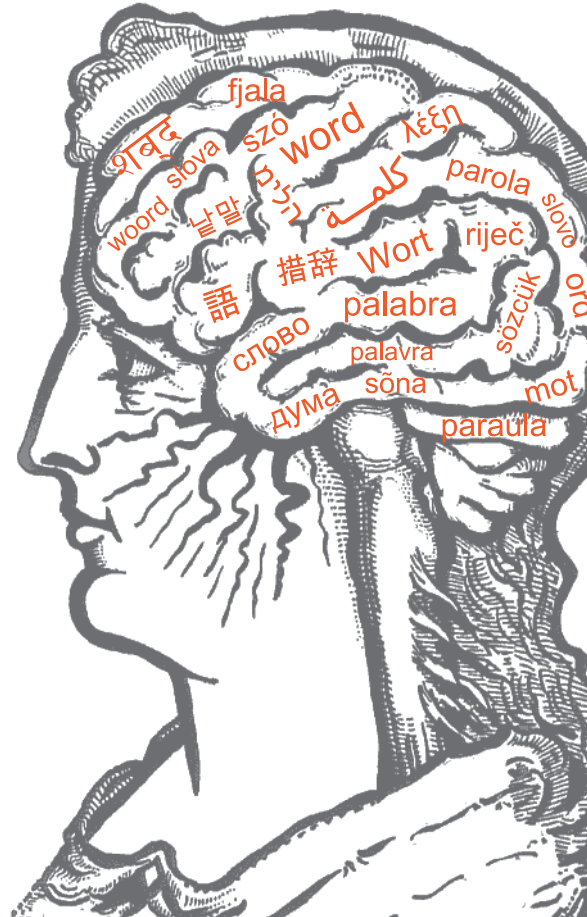*After reading* The Word Brain, *you may decide that you have no time to learn a new language - but never again will you say that you have no talent for it.*

THE
WORD
Brain

Bernd Sebastian Kamps

Flying Publisher

Bernd Sebastian Kamps

The Word Brain

To

Charlotte, Carmen, Elisa, Daniela, Chiara, Carlotta, Cristina, Lena, Caterina, Margherita, Clara, Hannah, Irene, Marie, Romy, Jeanne, Katharina, Franziska, Jenny, Alexandra, Johanna,

Colin, Oscar, Félix, Jasper, Robert, Michele, Antoine, Anton, Arnaud, Manar, Ghassan, Lorenzo, Mezian, Giovanni, Albertino, Martin, Noah, Ben, Tomaso, Elian, Julian, and Thomas.

Bernd Sebastian Kamps

The Word Brain

A Short Guide to Fast Language Learning

www.TheWordBrain.com

Flying Publisher

Bernd Sebastian Kamps

is the Director of the International Amedeo Literature Service and the founder of Flying Publisher. He edited and published Influenza Report 2006 and Hepatology 2009.

Between 2005 and 2007, BSK published *Free Medical Information: Doctor=Publisher*, launched the Amedeo Textbook Awards, and created the Amedeo Prize.

www.bsk1.com

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2006 Influenza Report
2006 Amedeo Challenge
2007 HIV Medicine
2008 Amedeo Prize
2009 Free Medical Podcasts
2009 Hepatology Textbook
2009 Multidisciplinary Journal Club
2010 Francese x Sardi
2010 The Word Coach (www.TheWordBrain.com/WordCoach)
2010 The Word Brain

Content

Introduction

Goals

Language surrounds us when we are infants, language is the predominant mode of expression at school and university, and, now that we are adults, new languages are everywhere. In a globalised world – whether we like it or not – we live in an environment of multiple languages. Modern times are polyglot times, and 'monoglot' individuals begin to realise that speaking just one language can be disadvantageous. They start asking themselves how long it takes to learn another language and if languages are within the reach of everybody. Typically, they also want to know how to choose good teachers and how to avoid bad teachers. *The Word Brain* answers these questions.

The subtitle of the present guide, *Fast Language Learning*, may be subject to misunderstanding. 'Fast' is often equated with 'easy' and, in the context of language learning, easiness could lead some readers to evoke miraculous second-language concoctions administered by charming teachers to engaging classmates. When searching for 'language learning' on the Internet, you will be informed that it is all fun, sexy and child's play. If that's the way you dream about approaching your next language, stop reading here. There is nothing snug and cosy about *The Word Brain*. On the contrary, this short guide for adults may appear harsh and rude as it is about determination, discipline, and perseverance. If these are dirty words to you, close this guide now.

The place where you will be told to learn your next language could be the second surprise. Usually, adults think of language learning in terms

of people interacting with each other, either in a beautiful city or a romantic countryside, in situations ranging from gentle and friendly meetings to tantra-inspired gatherings. Again, you will find nothing of all this in *The Word Brain*. When we later summarise how to rapidly achieve reading and comprehension skills, I will prescribe you months of lonely learning sessions with books and audio files. If you don't like the idea that fast language learning is essentially a lonely combat, you can still choose to stop reading here.

The third surprise is the route you need to take. While I set the goals and define the time frame, it is up to you to find the most promising road to achieve your goals and to develop the skills needed for an effort that is going to last months and sometimes years. You will partly invent yourself as your own teacher. If you feel scared by this perspective, consider at least reading the first chapter, *Words*. Thereafter, you may decide that you have no time to learn a new language, but never again will you say that you have no talent for it. This revelation might well be worth half an hour of reading.

So, do you still want to continue? Then let me briefly explain how *The Word* Brain came to life. It all started when, on one of those birthdays that are turning points in life, I offered myself an exclusive present most of my busy colleagues can rarely afford: Time. I would dedicate two consecutive years to learning my 7th language. Just to complicate matters, I accepted a triple challenge:

1. Learn a language at an advanced age – at 50, the memory is not what it used to be at 20.

2. Learn the language without teachers, using only books, CDs and TV.

3. Learn a difficult language: Arabic.

When I was young, I trained as a physician. After working at the University Hospitals in Bonn and Frankfurt, I published and edited a small number of books (www.HepatologyTextbook.com, www.InfluenzaReport.com, and others) and created a handful of

medical websites, one of which – www.Amedeo.com – has had the chance to become a Web Classic. Aside from medicine, I have always cherished a second passion: the acquisition of other people's languages. I was fascinated to observe how new languages gradually entered my brain; to struggle with learning and forgetting; to feel the brain becoming saturated, craving for a break; and to discover how learning sometimes makes true 'quantum leaps', when sketchy pieces of knowledge suddenly coalesce into an almost-fluent understanding. Sensing the dense fog of incomprehension that lifts over a landscape you have never seen before is an exhilarating experience.

My passion started at school where the languages I was taught – French, English, and Latin – had long lasting consequences on my life. At 17, I met a brilliant and attractive French teenager who is now my wife; English would prove useful for reading and writing in medicine; and Latin opened my eyes to the world of words. One week before my 13th birthday, I used my new Christmas voice-recorder to register word lists from our school manual: *rosa – die Rose; insula – die Insel; bestia – das Tier*. For several weeks thereafter, I would lie in bed at night and listen to the recordings in the dark. I didn't know at the time that this first experiment with languages would cast the basis for my future medical career.

Later in life, I took to the habit of learning languages by myself: Spanish in the early twenties, Italian after emigrating to Sardinia at the age of 27, Portuguese at 33 during a three-month trip to Brazil. That put the modern language count at 6. In between or thereafter, whenever there was the perspective of travel, I studied the basic grammar of other languages: Swedish, Dutch, Modern Greek, Turkish, Sardinian, Farsi (Iranian), Swahili, Hebrew, Hindi. Don't worry! With the exception of Sardinian and Kabyle, I have never spoken any of these languages and hardly remember a single word of them. But one of the consequences of repeated exposure to other languages is that, today, I read grammar as quickly and as passionately as I would read love letters.

In total, I have spent approximately 10 years of my life absorbing, playing and experimenting with language. This guide summarises some of the lessons I have learned. It is a guide for adults. To make sure that you don't waste your time, let me describe the kind of adventure you are embarking on. *The Word Brain* is not about counting ('I, too, know Arabic. I can count to 10.'), ordering a dish of Italian pastasciutta or saying *good morning* ('Buon giorno' 'Guten Morgen'), *thank you* ('danke', 'merci', grazie' 'gracias') or *excuse me* ('Excusez-moi, s'il vous plaît'; 'Mi scusi'; 'Entschuldigen Sie bitte'). Most of these conversational exploits can easily be replaced by gestures. I don't question the usefulness of teaching some language skills before going on a vacation, but this is not the scope of this guide. *The Word Brain* is about the effort adults need to undertake to speak and understand another language. I define 'speaking another language' extensively. The definition includes the ability

- to read essays or newspapers

- to understand TV news or documentary programmes

- to imagine the correct spelling of words while listening to TV news or documentaries

- to understand everyday conversation

In other words, *The Word Brain* describes the steps to metamorphose yourself from a perfect illiterate to a person who has fluent hearing and reading abilities in another language. To develop these abilities, you will ideally study on a daily basis. Depending on a number of variables that I will discuss, the time estimated to accomplish your task is between one and five years.

I have condensed *The Word Brain* as much as possible so that you can read it in a couple of hours. If you have learned other languages before, you will recognise some of your experiences and find explanations for your successes, failures or frustrations. If you have to learn another language in the future, you might find some useful hints about how to

streamline your project and save time. Young teachers will read the following chapters with particular attention. Although it is not a treaty on neuroscience, *The Word Brain* introduces basic concepts of processing and storage of information in our word brain. Suggestions on how to use modern communication technologies to facilitate language teaching indicate avenues for future activities.

The first chapter will show you how language learning can partly be quantified, thus enabling you to plan your future effort over time. In the subsequent chapters, you will hear such curious advice as 'Start listening, go on listening, continue listening – but please don't speak too early!'; you will discover some of your extraordinary reading abilities; learn how differently your brain processes spoken words and written words; see the need of sequencing speech in small slices; discover the extraordinary accomplishments of your memory; and, finally, conceive a strategic plan to crack your next language as quickly and as reliably as possible.

Reading newspapers, understanding TV – the bar is high. Let's start with the number of new words you have to feed into your brain. Be prepared for the worst.

The Word Brain

1

Words

Words are the fuel of language. The number of words you are familiar with determines your language abilities. The more words you know, the better you are. Put in numbers, this statement reads as follows:

$$15,000 > 10,000 > 5,000 > 2,000 > 1,000 > 500$$

Between 2 and 18 years, you learned 10 new words every day. Later, at work or at university, you enriched your brain vocabulary with thousands of technical words. Now, after decades, you know more than 50,000 words of your native language. Words are the hard stuff of language; in comparison, learning grammar is a finger exercise for pre-school children.

To be comfortable in another language you need roughly half of the words you possess in your native language – 25,000. As about 40 percent are variants of other words and can be easily inferred, a good estimate of truly unique words you need to start with is 15,000 words. This is a huge number and double what you are expected to learn in 8 years at school. Fortunately, you do not always have to learn them all. Take the word *evolution*. In Spanish, Italian, and French, the word translates into *evolución*, *evoluzione* and *évolution*. As you can see, many words are almost identical between some languages and come with just slight differences in packaging. Once you understand the rules that govern these differences, you have immediate access to thousands of words.

In order to understand how many truly new words are waiting on the learning table in front of you – words you have never seen before and which you cannot deduce from other languages you know – we need a short history of your linguistic abilities:

- What is your native language?

- Have you learned other languages before?

- Which level did you achieve in these languages?

- Which language do you want to learn?

Based on your answers, good teachers are able to make a reliable estimate of the number of words you must transfer into your brain. This number varies between 5,000 and 15,000. Worst-case scenarios are languages that are completely different from any of the languages you know: for Europeans, typical examples are Hindi, Arabic, or Chinese. In these languages, only a handful of words resemble European words and leave you with 15,000 words on the table.

At the other end of the spectrum you will find languages that are closely related to those you already know. If you ask a 17-year-old French student to screen an Italian dictionary, he will immediately be able to tell you the meaning of around 6,000 words without any previous exposure to Italian. Provide him with additional clues on how Latin words evolved differently, but still recognisably, into French and Italian, and he will easily increase his vocabulary to 10,000 and more. The descendants of the Roman Empire – the Italians, Spanish, Portuguese, French, and, to a lesser extent, Romanians – are therefore navigating in familiar waters when learning each other's languages.

Once your teachers define the word quota you have to burn into your brain, the next question is: 'how long will it take me to learn these words?' You may be surprised to know that the total study time for wiring a new word into livelong memory is around five minutes. Children tend to have it easier because they have so-called 'fast-mapping' abilities, a fabulous fast lane for word learning after a single

exposure, which partly explains the prodigious rate at which they learn new words. As an adult, however, you will take the long road, repeating new words over and over again. Some words are easy, others are not. Among the easy words are the words of everyday life, such as *man*, *woman*, *child*, *water*, *air*, *big*, *small*, *go*, *come*, *do*. They are usually short and their meaning is unambiguous. Other words are longer and will need more frequent rounds of rehearsal: *Gerichtsvollzieher*, *jeopardy*, *abracadabrantesque*, *zanahoria*, *sgabuzzino*, *orçamentário*, *Bundesverfassungsgericht*. Still other words resist memorising because their very concept, or the difference between one word and another, remains vague and confusing even in your native language: *haughty*, *valiant*, *valorous*, *courageous*, *intrepid*, *contemptuous*. And finally, how could you easily learn *Semmelknödel* without ever seeing it, *sugo* without smelling it, or *tartiflette* without eating it?

The *Memory* chapter shows in more detail that word learning is a result of repeated exposures over weeks and months, a succession of stations, a Via Dolorosa. You will not be nailed to a cross, but don't be amazed that the stations of a typical Via Dolorosa may not suffice to nail new words permanently into your brain. Learning is a biological process that requires new connections between brain cells, and these connections are being produced from a huge number of biochemical substances. Give them time to grow.

At a conservative estimate of 10 words per hour, it will take you 500 hours to learn 5,000 words (French/Spanish) and 1,500 hours to learn 15,000 words (European/Arabic). Based on the number of hours you are prepared to invest on a daily basis, your total study time can be predicted with fairly good accuracy. Take your daily study time from the left column in Table 1.1 and pick from the appropriate column on the right side (easy language: 5,000 words; difficult language, 15,000 words) the number of months you need to complete your word training. As you can see, a quota of 5,000 or 15,000 words makes a huge difference. For highly related languages that require a basic vocabulary of 5,000 words, one hour per day is sufficient to be ready after two years. With difficult languages and a word count of 15,000, a single

daily study hour would put you on a frustratingly extended study course of 6 years.

Table 1.1: Study time (in months)*

Hours/Day	Number of words to learn		
	5,000	10,000	15,000
0.5	50	100	150
1	25	50	75
1.5	17	33	50
2	12	25	37
3	8	16	25
4	6	12	19

* At five days per week; figures are rounded

These numbers have important implications. First, language learning means daily learning. '2-hours-a-week' schedules are likely to be insufficient. Two hours a week is like saying, 'I am preparing a Mount Everest ascension. I climb two flight of stairs twice every day.' If you are not ready for daily practise, reconsider your project. Low input cannot produce high output.

Second, language learning is mostly a do-it-yourself job. The thousands of words you need to learn are currently *outside* your word brain and must get *inside*. Nobody, except you, can do this job. Be prepared to spend hundreds of hours alone with your language manuals, computer and dictionary.

Third, for adults and adolescents, language learning is a focused and persistent intellectual effort. This is in stark contrast with the seemingly easy and playful way young children learn languages. In order to learn like a child you would need to be born into a new family, with a new

mother, a new father, new brothers and sisters, to be raised with love until the age of 6 and be sent to school for another 10 years. Unfortunately – or fortunately? – there is no way of simulating being a new child in a different childhood environment.

So, who is eligible to embark on a full-scale attack on another language in the sense we defined in the introduction, that is, being fluent in reading newspapers and understanding TV documentaries and day-to-day conversation? It all depends on time. If you have little or no time – think of busy physicians – or prefer to dedicate your time to geology, neuroscience, or evolutionary biology, new languages are out of reach. Apart from these two cases, however, anyone who demonstrated the ability to learn the language of their parents are entitled to learn their next language.

The figures presented above are excellent news. Language learning is not a bottomless pit, but is as predictable and quantifiable as climbing a mountain in excellent weather conditions. You are planning the final ascent to the 4,808 m summit of Mont Blanc, starting at the Gouter Hut at 3,800 m? As you know that it takes you 30 minutes to climb 100 meters, you can expect to reach the summit in about five hours. Some of your friends may get to the summit in 4 hours, others in 6 hours, but nobody will do it in 30 minutes.

There is another piece of good news. As you will see in the coming chapters, importing 5,000 to 15,000 new words into your brain in 500 to 1,500 hours turns out to be *THE* major battlefield in language learning, representing 60 to 80 percent of your total effort. In comparison, other aspects of language learning – grammar, pronunciation, etc. – are minor construction sites. If you are motivated and still willing to follow me, my first prescription would be that you start learning words on a daily basis, at least five days a week, and that you start now. In Chapter 7, you will find a number of strategies to cope with hundreds of words every month. You will discover that you have powerful allies. One such ally is your computer, which will turn out to be a fabulous assistant to keep track of your progress, shortcomings, and successes.

What would you expect the second battlefield to be, grammar or pronunciation? It is neither! Against all expectations, grammar and pronunciation are theatres for minor skirmishes. The second major task in language learning is speech recognition. If I were your teacher, I would continue tomorrow working on sound waves and training your ears. Decoding the sound track of people who speak an unknown language is a dizzy task.

Total workload after Chapter 1

500 – 1,500 hours

2

Listening

Have you recently listened to people speaking unfamiliar languages? If you haven't, turn on your radio or TV set, select a station from another country, and within minutes you will hit a broadcast with loquacious individuals talking all the time. Alternatively, if you live in a metropolis, go down onto the streets and spot groups of animated people speaking foreign languages. Listen attentively. You will soon notice that humans produce continuous streams of uninterrupted speech. The overall impression? Phonological porridge, polenta, bouillie. For the non-initiated listener, it is hard to grasp that there is much structure to such seemingly random proliferation of sound. The reality is different, of course. Any single language you come across on Earth is as differentiated, distinguished, beautiful, and funny as your native language. Impenetrable as foreign languages appear to be, on the scale of a human lifetime, they are just around the corner – give them two or three years, and any of them is yours. It is a refreshing thought that all humans are brothers and sisters in language.

A porridge-like sense of unintelligibility prevails even after years of language classes at school. You are able to decipher a restaurant menu and order a dish of spaghetti, but comprehension vanishes as soon as the waiter starts talking. The same happens with bakers, taxi drivers, and hotel employees – again polenta and pea soup. It seems as if years of classes studying grammar and learning long lists of vocabulary produce little or no effect. You can read Goethe, Shakespeare, Sartre, Cervantes, or Dante, and yet you don't understand their descendants. Many of us

conclude that we are inept at learning other languages and never try again.

The apparent easiness with which humans learn their native language during the first years of life, is intriguing. Not only do young children readily soak up any of the thousands of possible human languages, but they also learn to understand a huge variety of radically different pronunciations – mum and dad, the neighbours, the fisherman at the street corner, people speaking other dialects, stuttering infants, and toothless grandparents. To date, there is no machine capable of this level of speech recognition.

How do young children outperform the most sophisticated machines? How do they structure linguistic input into meaningful units so rapidly? To answer these questions, look at how you spent the first 6 months of your life. As a physiological preterm primate, your interactions with the world were pretty limited – eating, digesting, looking, and listening. With such a limited repertoire of actions, every single action necessarily received an immense share of your attention. Once digestion was settled, you mutated into an ear-and-eye monster, capturing shapes and movements around you and soaking in every single sound you heard. You didn't lose a minute setting about the most important task of your life: putting structure into the sound produced by the people who inhabited your life. The first hurdle was determining the word boundaries within the language of your ancestors. Where do single words begin; where do they end?

As you see from Figure 2.1, the sound wave *per se* does not confer information about the boundaries between single words. To show the magnitude of the task you face in a new language, try to delimit the word boundaries:
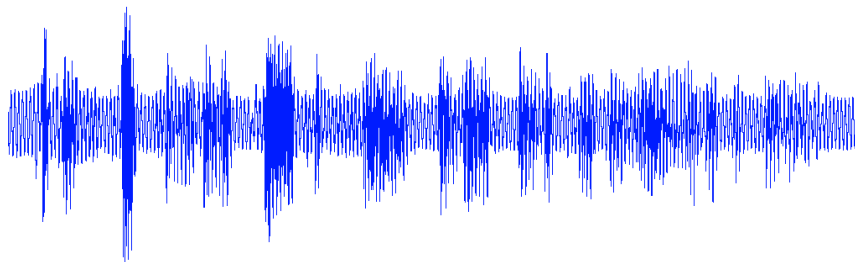
Figure 2.1: Sound wave pattern of ' Putting structure into the porridge of sound produced by the people who inhabited your life.'

Delimitingwordboundariesinaspeechstreamisnoeasierthantryingtodeter minetheminthepreviousparagraphsohowdoyounginfantscrackthesoundc odetheyperformfrequencyanalysestakeforexamplethesoundsequencewha taprettybabyyouarethroughcontinuousexposuretohumanlanguagebabblin ghumansproduce10000wordsandmoreinasinglehourinfantsprogressively understandthatsyllableswhicharepartofthesamewordtendtofollowoneano therpredictablyprettybabywhereassyllablesthatfollowoneanotherlessfreq uentlyarewordboundariesaprettyba.

Delimiting word boundaries in a speech stream is no easier than trying to determine them in the previous paragraph. So how do young infants crack the sound code? They perform frequency analyses. Take for example the sound sequence *What a pretty baby you are*. Through continuous exposure to human language – babbling humans produce 10,000 words and more in a single hour ! – infants progressively understand that syllables which are part of the same word tend to follow one another predictably (*pret-ty*, *ba-by*), whereas syllables that follow one another less frequently are word boundaries (a#pret, *ty#ba*).[1]

This type of frequency analysis is dependent on a well-functioning memory that accumulates an ever-growing number of words and, of course, extensive training. The problem is speed. As human speech can produce three and more words per second, there is little time for either childish astonishment or for adult considerations such as 'What does

that word exactly mean?', 'Is the verb in the present or past tense?', 'What the hell is that grammatical structure?', etc. At full speed, speech is unpardonable – a single instant of indecision makes you stumble and after getting onto your feet again, the sentence is gone. Speech comprehension is therefore a triple challenge: slicing human speech into digestible units, endowing them with meaning by matching the segments with thousands of existing words stored in your brain dictionary, and, finally, doing all this without giving it a second thought. Fortunately, our word brain is genetically programmed to do these mental acrobatics, and as you have already done it once – when you learned your native language – you can do it again with other languages as often as you want. To see what it looks like when your auditory brain cortex works at full-speed, put your brain into a PET scanner (Figure 2.2).[2]
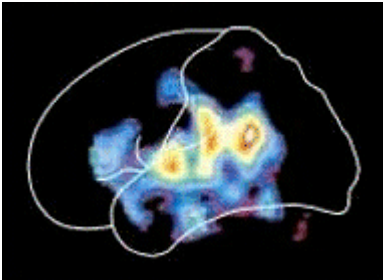

Figure 2.2 Listening to words: High activity in the auditory brain cortex. Adapted from Raichle, 1988.[3] Used with permission.

Thorough training is paramount. In my experience, it took around 1,500 to 2,000 hours of intense listening to achieve 'semi-perfect sequencing abilities', both in French and Italian. Amazingly, the results were similar for Arabic, a language so totally different from everything I had learned before. This seems counterintuitive because in Arabic, I needed to learn at least three times as many words as in Italian, and raises a couple of questions: Could the time of exposure that is needed to

achieve full sequencing abilities – 1,500 hours would translate into 6, 4, and 2 hours per day over a period of 9, 12, and 24 months, respectively) – be a human constant? Should our speech recognition abilities be independent of the type of language we learn? Perhaps even relatively immune to the effect of ageing? And are young children truly superior to adults in word segmenting or do they simply dedicate more time to listening than adults? Some of these questions will be answered by future research, but I am inclined to accept that there is a physiological threshold for human brains to get wired to the ability of dissecting the sounds of new languages. You would need a minimum of time to perform this task, but you wouldn't need much longer than that.

You are now able to solve the close-to-zero-understanding-after-years-of-school problem that we exposed at the beginning of this chapter. If teenagers are frustrated when they put their school knowledge into practise, it is because school teaching is insufficient to get you anywhere near the 1,500-hour exposure minimum. Even if your teachers teach exclusively in the foreign language, you will rarely total more than 500 hours of attentive listening in a typical 5-year course. Thus, you discover that your teachers were innocent – they simply did not have enough time to get you through your speech segmentation task.

So, if private and public schools are not in a position to provide us with sufficient exposure to human speech, where can we go to get it? The best school, of course, is life. Emigrate, either definitely or for just one study year, and take a linguistic bath in a new language environment. The younger you are, the more flexible your brain, and the easier it will be to find yourself in groups of people who never stop talking. Add an intense love affair, and your daily listening quota of 8, 10, or even 12 hours will soon be a reality. Within a year, you are a perfect speech segmenter.

If you choose to stay at home, you will need speech surrogates. With a workload of 500 to 1,500 hours from the previous chapter, you may find it demanding to accommodate another 1,500 hours of training in

your time schedule. You are lucky. As listening can easily be done in parallel to other activities – commuting, doing sport, cooking, etc. – you will manage to dissolve the bulk of your speech recognition programme in daily life (like a murderer who dissolves a corpse in an acid bath!). Thereafter, you just have to change your TV habits (more about that below), and the true extra study time can be reduced to around 100 hours. Just remember these two important pieces of advice: 1) During the first year of your training, never read a text without hearing the sound. 2) Only listen to audio sources if you have the corresponding text at hand.

The immediate consequence is that it is imperative that your first language manual comes with a CD-ROM (CD). During the 100 hours of extra study just mentioned, listen to the CD. As expected, even with the text in front of your eyes, comprehension of the audio files is not always immediate. In these cases, take single sentences or even single words, put them in an audio loop and listen to them 5, 10, or 15 times. Some audio devices come with a convenient button to define the beginning and the end of the loop. Using this sledgehammer method cracks every sentence within minutes. More importantly, don't feel uncomfortable if you listen to a language CD for the 54th time. This is all but dishonouring, and after all, you did exactly that with your favourite music when you were young.

Insomnia, too, is an excellent moment for donning your earphones. Some people will discover that the incomprehensible sounds will lull them into sleep. Finally, don't be afraid of unconventional behaviour. If you are used to having a siesta, put your earphones on and activate the loop mode. It is certainly impossible to learn words during sleep, but the sound and music of the new language will certainly enter your brain.

Once you have digested your first (and maybe second) language manual, you will discover that the Internet offers extraordinary tools for second-language acquisition: **audio files plus transcripts**! (see example at http://hiv.net/link.php?id=11). Some examples:

Language teaching – Educational material is available for English at http://hiv.net/link.php?id=8, German at http://hiv.net/link.php?id=7, and French at http://hiv.net/link.php?id=6. Many more languages are mouse-clicks away.

Podcasts – Physicians and scientists will find an amazing wealth of material at www.FreeMedicalPodcasts.com. The website presents a list of scientific and medical journals that publish podcasts at regular intervals. Half of the podcasts come with transcripts. Ranging in duration from 10 to 30 minutes, they offer top-quality audio files about progress in science and medicine. My favourite is the weekly Nature Podcast (http://hiv.net/link.php?id=15).

Audio books – As most free audio books are classics, you will generally find the free text at the Gutenberg website (see www.gutenberg.org). Check German audio books at http://hiv.net/link.php?id=12, English at http://hiv.net/link.php?id=13, French at http://hiv.net/link.php?id=14, and other languages at www.Google.com. Alternatives are more recent publications, for example *Guns, Germs, and Steel: The Fates of Human Societies*, by Jared Diamond (print edition: http://hiv.net/link.php?id=18; audio book: http://hiv.net/link.php?id=19). Google for more.

The final surrogate for speech in real life is TV. Apart from high-quality documentaries, which are rare, TV is a poor source of content, and most of us would prefer reading books or scientific journals. TV is also mostly irrelevant. Suicide attacks in remote countries; minor earthquakes, tsunamis, or volcanic eruptions; old, helpless people murdered by drug-intoxicated gangs of youths; drug-intoxicated gangs of youths slain by paramilitary troops; paramilitary groups killed in an ambush by guerrilleros, etc. – all this has little or no impact on your personal and professional life, and watching TV is basically tantamount to killing precious life time. Imperfect though it may be, some broadcasts, for example TV news programmes, have nonetheless the composition of outstanding speech trainers. The journalists talk

continuously, there is no background music to spoil the sound of the speech, the language is standardised with only a few slang words, and the images provide you with important clues for understanding what's going on. In addition, TV news provides all the ingredients of a classical soap opera: the players (politicians) and the content (political crises) are well known, and you already know half of the story, and even if you don't, it really doesn't matter.

My advice: Stop watching TV in your native language and start watching TV in your future language. The TV genres that serve your purpose most are the news and documentaries if you wish to become familiar with the language of the media and the language of science; and soap operas if you are interested in more colloquial language. Listen to your new TV programme for 15 to 60 minutes every day, starting on the very first day that you begin studying another language. Persist, even if you don't understand a single word. Remember: it is all about word boundaries, so try and discover your first words. As you will see later, identifying these boundaries is partly independent of knowing the meaning of the words.

Let us summarise:

- Human speech is a continuous sound stream. To understand the meaning, your built-in speech-recognition system cuts human speech into single words, matches them with your vast brain dictionary, and does all this more or less unconsciously at a rate of three words per second.

- To ensure extensive exposure to human speech, emigrate or find surrogates for real life: 1) Language manuals + CD's; 2) Internet audio sources + transcripts; 3) TV.

- If you cannot emigrate, dissolve your training into your daily life by listening to audio files during cooking, commuting, doing sport, etc. Change your TV habits and watch TV exclusively in your new language. Use earphones for enhanced comprehension.

- Unless you emigrate, speech recognition training is as lonely a task as word learning. No one can do the job for you. Again, teachers are of almost no help (see also the *Teachers* chapter below).

- During the first year of your training, never read a text without hearing the sound; and listen to audio sources only if you have the corresponding text at hand.

- If you are an insomniac, plug your earphones in and listen to your audio material.

- Allow 15 to 60 minutes for speech recognition every day.

Week after week, the sound pattern of words will flow into your brain. Again, your brain will be acting as a huge sponge, as cracking the code to a human language is not a reserved hunting ground for infants and young children. With time, as comprehension sets in, British porridge slowly mutates into French Cuisine. So far, so good, you might think, but you have noticed something rather curious. You have been told to learn 5,000 to 15,000 words and complete a 1,500-hour speech recognition course, but nobody has asked you to say a single word. Legitimately, you wonder if you will one day be authorised to pronounce some of the words you have learned and to communicate your precious thoughts to other people.

There are good reasons to restrain your desire to communicate. As you are a virgin – linguistically speaking – you might prefer to stay that way for a while. If you accept patience, my favourite prescription is a monastic '3-month silence'. Remember: you are not at school, there are no exams on the horizon, and you may therefore take a comfortable route when starting your new language. Concentrate on absorbing words, sounds and sentences, and, day after day, let the sound of the new language slowly sink in. Of course, you are too old for an exclusive baby approach to language learning, but for now, listen passively as young children do. Good pronunciation comes as a bonus of patient and

attentive listening. So before you open your mouth, see in the next chapter what your eyes can do.

Workload after Chapter 1–2

Speech-recognition training, typically 1,500 hours and more, can mostly be integrated into daily activities. Only about 100 hours of extra study time are needed while you become familiar with one or two language manuals. Added to the workload defined in the previous chapter, your total workload is now

600 to 1,600 hours

3

Reading

Ocne uopn a tmie trhee lived in a cietarn vlagile a lttile cnortuy gril, the prettseit crteuare who was eevr seen. Her mhteor was ecsisxevely fnod of her; and her ghrodmentar doted on her slitl mroe. Tihs good waomn had a ltilte red riidng hood.

If you are a native English speaker, you will have recognised the initial sentences of Little Red Hood. If you are not, understanding the previous paragraph is more challenging, because your deciphering skill depends on the number of years you have been reading English. The original version:

'Once upon a time there lived in a certain village a little country girl, the prettiest creature who was ever seen. Her mother was excessively fond of her; and her grandmother doted on her still more. This good woman had a little red riding hood.' The words have been modified only slightly, with the first and the last letter still in place and the others shuffled at random.

How can you read so heavily distorted prose? The answer is 'image matching'. Over decades of reading practise, your word brain has accumulated mental word-images of tens of thousands of words. When you read a text, you don't spell the words, you *see* them. Each word is a pictogram like a toilet sign in airports, and slight variations of the pictogram are irrelevant for comprehension. That is why our 'cnortuy gril' immediately evokes the correct image – and why proof-reading is so subtle.

Reading a book is like seeing a movie. Word-images pass across our brain screen at a speed of 5 and more words per second and create mental images of things and events. We were too young – 4 to 8 years old – when we acquired this skill, and our memory of this seminal event has faded away. So please sit back for a few seconds, close your eyes and realise what an extraordinary ability reading is: recognising and endowing with meaning, effortlessly and within a fraction of a second, any single subset of 50,000 and more words that inhabit your word brain. This is not a mean feat. You possess this ability because you are the owner of the most complex structure in the universe that has resulted from hundreds of millions of years of evolution: the human brain.

Being the heir of universe's top luxury product is not the entire story, though. Unconscious reading, with your eyes flying over a text at speeds of almost a line per second, cannot be acquired in a few months. Instead, it takes decades of training to tune up your brain to high-speed reading. At present, you read faster than you did at the age of 20; at 20, you read faster than at 15; at 15 faster than at 10; at 10 faster than at 8, and so on. Reading only one hour every day exposes your brain to some 20,000 words, or 7 million words per year. In people with a higher education, reading is the most trained single skill, whatever their profession.

What does that mean for language learning? Well, if reading is like seeing a movie, you certainly must absorb a huge number of new word-images, and as with listening, some segmenting is needed. Take the word *parachlorophenylalanine*. For scientists with a basic knowledge in chemistry, the meaning and pronunciation of the word is as evident as the meaning and pronunciation of *love* and *peace*. Meanwhile, non-scientists will return to first-grade spelling techniques and ask themselves where the syllables start and where they end. Every language has thousands of these complicated words. Remember the examples from the *Words* chapter (*abracadabrantesque* et al.) or take a

look at words such as *leszállópálya*, *megfélemlítõ*, *megfigyelõképesség*, *újjáépített terület*. They are from Hungarian, one of the more granitic European languages, and unequivocally signal 'I don't want you to learn me'. Does that translate into another 1,500 hours of training for your eyes? Relax, you are not in for another brain-breaking *Via Dolorosa*, this is all a false alarm. Reading is different from listening because training your reading skills comes as a bonus of the obligatory learning of the 5,000 to 15,000 words. In order to digest such a huge amount of words, you must read them – again and again – and check them – again and again. These lengthy repetitions are sufficient to create all the word images you need for super-fast reading.

Please note that even with Hungarian or Finnish or Basque, you are still on home ground. Decades of reading the Latin alphabet have conditioned your brain for high-speed deciphering of words from any language that uses this alphabet, even roadblocks such as *leszállópálya* and *megfigyelõképesség*. Exactly how familiar and how tremendously important the Latin alphabet is becomes evident if you complicate things a step further and select a language with equally unfamiliar words + a different alphabet + the irritating habit of skipping half of the vowels. The result: Arabic. In Arabic you will discover, much to your dismay, how often you need to know the function of a word within a sentence – is it a noun? is it a verb? is it the active or passive voice of a verb? – before you can infer the correct pronunciation. As a consequence, reading, which is supposed to support you during the learning process, is frequently of no help at all, because you actually need to know what you are learning before you can read it. The previous sentence sounds complicated, doesn't it? Well, that's exactly how complicated reading and learning a language is when 50 percent of the vowels are left to the beginners' guesswork. Anticipate one to three years of extra study time.

The challenge of different writing systems is indeed immense. (Chinese is another example, but not Russian as this modifies only some characters.) Imagine painting the façade of a building while standing on a solid scaffold – the Latin alphabet is exactly this solid scaffold. Now

imagine painting the same building without a scaffold, just attached to a rope fixed to the chimney. The second procedure is clearly more exhausting and agonisingly time-consuming. Just to make sure that you are not left with any false delusions, add the following facts: a) written Arabic is spoken nowhere except on TV and at meetings or presentations; b) in order to speak everyday Arabic you have to learn additional country dialects which in practise amounts to learning another language (like learning Italian once you have learned Spanish); c) in Arabic-speaking countries, few provinces and cities have the fascination and vibrations to inspire dreams of fabulous 6-month full-immersion experiences such as Tuscany, Dordogne, Seville, Berlin, Edinburgh, Freiburg, Orgosolo, Amsterdam, Stockholm, or Lisbon – and you swiftly realise that you need to have pretty good reasons to start learning Arabic. In any case don't wait until you are 50.

Let's get back to your reading abilities and define the learning material you will use. I recommend that you start studying classical language manuals. Among the dozens of existing manuals, only a few are outstanding, and selecting good manuals is like crossing a minefield. Ask your teacher for help. In particular, make sure that the manual has word lists and comes with a CD-ROM. Personally, I prefer books without pictures and drawings because words are all you need (check www.TheWordBrain.com/BookRecommendations.php). Neither the Bible nor the Torah nor the Koran comes with pictures.

As with audio files, be prepared for repetitive learning cycles. Read the chapters of your manual 5, 10, or 15 times, until you feel comfortable with every sentence and every word. You will soon find out that reading is easier than listening, because it does not require high-speed processing of several words per second. Instead, while deciphering a text, you can take all the time you need until you understand everything – lingering on single words, going back and forth through a sentence, leaping between paragraphs. Remember that in educated people, most words enter the brain via the eyes; they are not the result of babbling,

chattering, gossiping, or palavering, but of intense reading at school, at university or during professional occupation.

After the first manual, you may consider studying a second one, but then you should change strategy. An appropriate strategy for adults is to read what they usually read in their native language. If you are a philosopher, read books about philosophy, if you are a scientist, read books about science. Stick to what motivates you most. Later, you will discover that words can be divided into three great areas: 1) Language of science, documentaries, and media; 2) Language of prose; 3) Colloquial language (comic strips, etc.). These areas certainly overlap, but only to a certain degree. So even if you understand 99 percent of the words presented in a collection of newspaper articles, this percentage will substantially drop when you start reading novels or sources that contain colloquial language. Diversify your text sources.
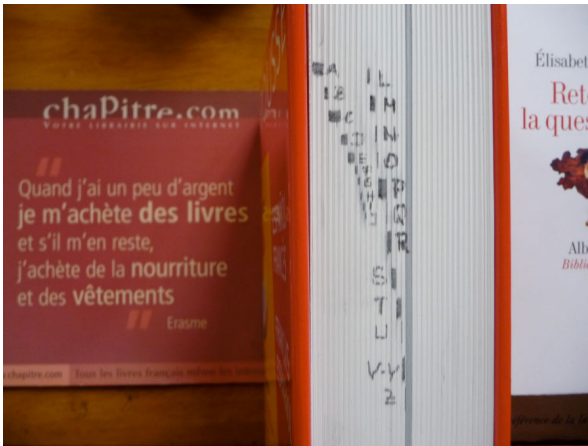

Figure 3.1: Preparing your dictionary for fast word-finding.
Spanish dictionary, 2250 g.

Whatever source you start with – science, novels, or comic strips – you will need a good dictionary to look up new words. A good dictionary is a heavy book that weighs at least one kilogram and has a minimum of 1000 pages. Over the years, you will see that it is the single most important book of your language project. Buy it soon and mark the pages that correspond to the individual letters (see Figure 3.1). This simple manipulation will save you precious time; after just days of training, you will find single words in less than 10 seconds.

Now take a text of your choice, underline the new words, search for them in your dictionary, write them down in a neat, hand-written list or in a computer document, and learn them. Don't forget to mark the words you have looked up (Figure 3.2). Even if you are not going to learn a whole dictionary by heart, you may decide one day to repeat the words that you are supposed to know.
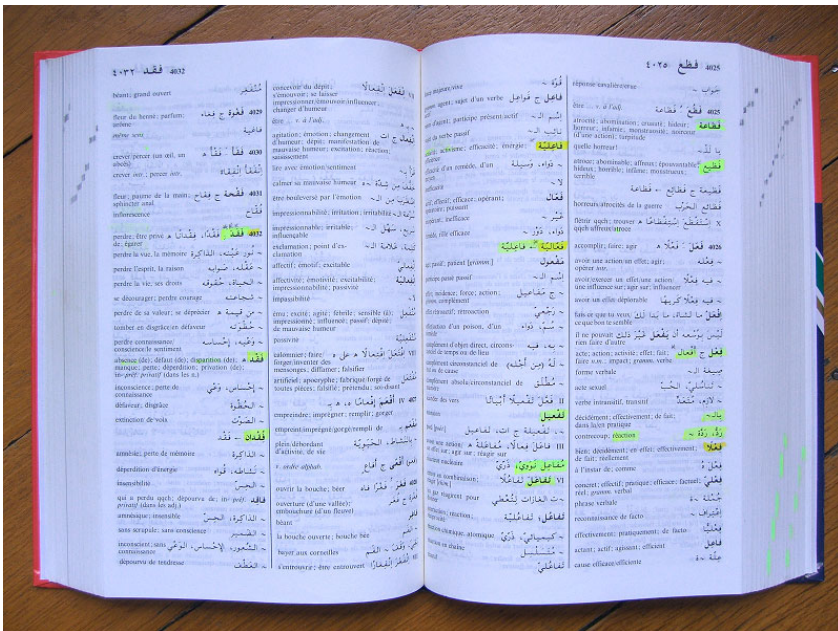

Figure 3.2: Working with dictionaries, highlighting consulted words.

Now read, read, and read. But... don't neglect the daily listening training prescribed in the previous chapter! Be careful: over several years, steady reading practise can lead to a strange syndrome that is highly prevalent among academics. These people are fluent at reading the scientific literature about medicine, philosophy, music, or philology, but don't understand a person talking about the very same topics and using the very same words. Their eyes work, but their ears don't.

The diagnosis? Eye-ear dissociation. The cause? Inappropriate training of the auditory brain cortex (see the previous *Listening* chapter). People can be perfect readers, but, at the same time, poor listeners. (The contrary – the ears understand, but the eyes cannot read – exists too: illiteracy.) To neuroscientists, this is not surprising; eyes and ears are different entry ports for distinct elaboration and storage sites in the brain. Training the visual brain areas at the back of the head (see Figure 3.3) has little influence on the performance of the auditory brain areas. Surprise: what seemed to be a single task – learning a new language – turns out to be a multi-task project for your word brain. In the *Speaking* chapter below, you will find yet another construction site.
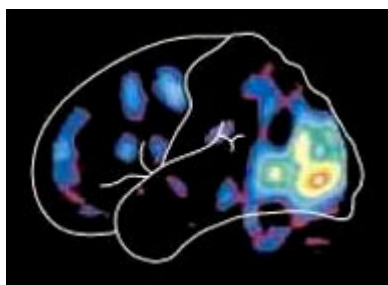

Figure 3.3: Reading words: High activity in the visual brain cortex.
Adapted from Raichle, 1988. Used with permission.

Let's summarise:

- After decades of exercise, you have developed amazing reading skills. At full speed, reading compares 5 and more words per second with a huge library of word-images stored in our brain.

- These skills are of no use for languages with different writing systems such as Arabic or Chinese.

- After finishing your first language manuals, start reading articles or books that you would normally read in your native language.

- Over the years, your dictionary will become your single most important language book.

- Beware of eye-ear dissociation.

The last three chapters – Words, Listening, Reading – may suggest that language learning can be done without teachers. As a matter of fact, for the most time-intensive tasks, such as word learning and speech recognition, teachers are of little help. However, words alone don't make up human language. You need rules to arrange them in sentences, and, in the process, some words will be modified. Grammar is the collection of these rules. Fortunately, the number of grammar rules is limited, and if you have some experience with grammar, you could also decide to go on your own. If you haven't, you need good language teachers. Finding them can be a nightmare.

Workload after Chapter 1–3

Due to the heavy exposure to written words during vocabulary learning, no extra time is needed to develop fast-reading abilities. For the present chapter, we just need to book 100 hours for the text study of one or two language manuals. Your total workload is now

700 to 1,700 hours

4

Teachers

Everyone agrees that there are good physicians and bad physicians. To make that difference can be vital – your health is at stake, and sometimes your life. With languages, the stakes are evidently more humble, but still considerable. Learning languages is time-consuming, and we are reluctant to put our precious time and motivation into the hands of bad teachers.

It is beyond the purpose of this short introduction to shed an unfavourable light on deficient language teachers, but let me nonetheless warn you about two types you might wish to avoid. The first group comprises teachers who do not really know what they do, as language teaching is one of the rare professional activities where people are allowed to teach a process which they haven't experienced themselves. When a surgeon teaches a colleague how to perform a cardiac bypass operation, he has done this type of operation hundreds of times. See one, do one, teach one – this rule is sacrosanct in most disciplines, but not in language teaching. If you book a vacation to attend English classes in private schools in London or French classes in Paris or Spanish classes in Seville, the odds are substantial that your teachers will have a perfect knowledge of one, but only one language – their own – and will themselves never have been through the cumbersome process of mastering another language. The risk of encountering such 'monoglot' teachers is particularly high in English-speaking countries. Spontaneously, a series of questions come to mind: Do these teachers know what it means to absorb 5,000 to 15,000 words? Can they imagine how it feels to nail 20 to 50 new words into your

brain every day? Do they have the faintest idea of how demanding it is to penetrate the dense thicket of high-speed human speech? Do they simply presage the thrill of discovering a new language? In summary, do they have an appropriate comprehension of the complications and implications of language learning? They probably don't. So if your language classes in Paris, London, Berlin, or Seville, are meant to be more than meeting and mingling opportunities with people from all over the world, make sure that your teachers are polyglots. You wouldn't want to learn sex with nuns and priests.

The second group of teachers you should avoid are those who do their job because they didn't get the job they wanted. Their first choice was perhaps to be a musician, a philosopher, or a writer. But life is unpredictable, dreams don't always materialise, and in order to make a living, some people accept the role of a language teacher. After a short period of frustration, most of these 'against-their-will' teachers will settle into their new life and excel in their profession. However, a minority do not, and will lack the essential skills for teaching a language: energy and enthusiasm. While in other professionals, for example real estate agent, woodcutter, or mortician, a lack of enthusiasm may be irrelevant; in teaching it is not. Don't agree to content yourself with anything less than passionate and wholehearted teachers. You have decided to become fluent in another language, you are ready to invest years, and your desire is to achieve the top. Frustrated teachers are infectious individuals who could contaminate what is one of your most valuable resources: motivation. Protect it.

In order to get a clearer picture of language teaching and, consequently, of how to avoid bored and boring teachers, let's address a list of the services teachers should provide. Traditionally, language teachers trained and checked six core competences: vocabulary, understanding of speech, production of speech, reading, writing, and grammar. As we have seen in the *Words* chapter, vocabulary training is inherently a lonely job because nobody except yourself can transfer thousands of words into your brain. In what is the most important single task of language learning, teachers can do nothing for you.

The second most important task is speech recognition. Until relatively recently, language teachers were often the only individuals at hand to produce human speech in another language. That has changed radically. In modern times, human speech is ubiquitous, at every corner of your life and in any language you want. As a consequence, audio CDs, audio books, Internet news, and TV, have supplanted teachers as prime speech sources.

The impact of teachers on the third, fourth and fifth tasks – speaking, reading, and writing – is equally limited. Writing comes as a bonus of reading, reading as a bonus of word learning, and as you will see in the *Speaking* chapter, correct pronunciation comes as a bonus of hundreds of hours of listening. Grammar is therefore the only domain where language teachers will continue to play a certain role in the future.

Grammar – the climax of excruciatingly boring language lessons, and a torture for teens? As an adult, please consider grammar rehabilitation. Grammar consists of a fairly limited number of rules that tell you how to modify words and how to arrange them to form correct and beautiful sentences. More importantly, a big chunk of grammar – verbs such as *to talk*, *to love*, *to play*, etc. – can be outsourced to pure memory exercises, which reduces the duration of pure grammar lessons even further. As these verbs are immensely important in many languages, let's dedicate a couple of pages to it.

Verbs usually denote action (learn, listen, read), occurrence (forget, decompose), or a state of being (love, exist). To English native-speakers, they do not seem impressive because, with the exception of a small number of irregular verbs such as go-went-gone, write-wrote-written, etc., the English verb system is disarmingly simple. All we can press out of *to want* are two variations, *wants* and *wanted*. Just put a few auxiliaries around them – *have*, *shall*, and *will* – and you will have created all the tenses and moods you need.

Other languages are more complicated. The Italian equivalent, *volere*, needs 6 different forms... just for the present tense:

I want	voglio
you want	vuoi
he/she/it wants	vuole
we want	vogliamo
you want	volete
they want	vogliono

And this is only the beginning. Dig deeper into *volere*, and you rapidly discover a whole nest of descendants: *volevo, volevi, voleva, volevamo, volevate, volevano, volli, volesti, volle, volemmo, voleste, vollero, vorrò, vorrai, vorra, vorremo, vorrete, vorranno, vorrei, vorresti, vorrebbe, vorremmo, vorreste, vorrebbero, voglia, vogliano, volessi, volesse, volessimo, voleste, volessero*. Surprise: verbs are icebergs, and what you see in dictionaries, for example 'baciare – to kiss', 'volere – to want', 'fare' – to do', 'andare – to go', are just the tips. Fortunately, there are strict rules which govern verbs (a discipline which grammarians call 'conjugation'); and with the exception of some irregular verbs, all variations of a verb can be easily deduced. Unfortunately, easily does not mean fast, and lack of speed is disastrous for fluent understanding and fluent speaking. The solution? The same repetitive training as in word training: repeated exposure, and heavy nailing. With an additional 'word load' of generally below 1,000, this will not demand more than 50 hours of extra training. Search the Internet for free software. Free verb training for German, Spanish, Italian, Portuguese, and French is available at http://poliglottus.com/verbs.htm.

Now that you have outsourced the study of verb forms to autonomous learning, grammar *per se* shrinks to a set of about 30 problems to settle. If you followed my prescriptions in the first chapters – 1) Learn 20 or more new words per day; 2) Listen to human speech for at least one hour per day – all I would ask you at this point is to rapidly assemble the knowledge that is needed to **recognise** the most frequent

grammatical structures. Just recognising grammar requires 10 times less training than producing grammar. Even allowing for a few tricky rules, you will be electrified to acquire these passive skills in a few weeks and to discover that grammar is a fairly manageable thing. You will be happy to learn:

- how to use nouns (boy, girl), adjectives (tall, small, pretty), verb tenses (I go, I went, I have gone, I shall go, etc.), and a limited number of pronouns (I, you, he, she, me, him, her, my, your, his; to name only a few);

- the order in which to arrange the words in a sentence;

- how to count and to ask questions;

- how to localise things in time and space.

Important advice: Make sure that you receive grammar lessons in your native language. Reject all 'monoglot' proposals such as being taught Spanish grammar by a Spanish teacher who exclusively speaks Spanish. Don't complicate your life. Your native language is by far the best tool for grasping and understanding new concepts.

Let me narrate an episode that most clearly gives the tone of future grammar teaching. The star of the tale is T. K., a friend from medical school who is now a professor of immunology at a German university. A couple of decades ago, T. came to visit me in Sardinia and prepare part of his final medical exams. After studying surgery textbooks for five hours per day, he accepted the challenge of adding another three hours of intensive Italian lessons. As I had just developed a small piece of software on the mythical Commodore 64 (see the subsequent Internet release at www.Poliglottus.com), I was happy to test it on a complaisant guinea pig. As T. had a history of learning French and Latin at school, the prescription for the 3-week course went as follows: 1,300 words + 10 tenses for 16 verbs + a 10 hour grammar overview on two subsequent days. The grammar lessons were focused on simple recognition of the most relevant grammatical structures.

As expected, T. produced only rudimentary Italian sentences at the end of his learning vacation; however, he was now able to decipher a newspaper. The experiment nicely showed the feasibility of a fast introduction to grammar, and also opened the perspective of reading newspapers or magazines, which is clearly more enjoyable and motivating than reading language manuals.

Now that grammar teaching will slowly shift away from snail-pace speed to repetitive rounds of ultra-fast overviews, let us try and redefine the part that teachers can play in your language project. In today's environment, the best role for a language teacher is probably that of a coach. Depending on your previous exposure to your native and subsequent languages, your coach will prepare an individual time schedule for your project; recommend books, podcasts, audio books, and broadcasts; provide the first round of grammar; advise you on how to manage your daily word quota; teach you how to check that new words have arrived in your long-term memory; and demonstrate common pronunciation pitfalls. For the first few weeks, you should plan daily encounters or two or three lessons per week. Thereafter, reduce to weekly encounters. Finally, after the third or fourth month, one or two meetings per month will be sufficient. During the entire course, check the motivating power of your coach. If you have the feeling that he doesn't motivate you or, worse, makes you feel like a donkey, fire him.

Finding good coaches can be more difficult than finding good doctors, because the reputation of teachers is less transparent: doctors operate occluded heart vessels in hours and treat syphilis within weeks. Hence, successes and failures are rapidly visible, which is not the case for language teachers. But doctors and teachers have a common trait: overmedication. Many doctors will prescribe antihypertensives, statins, or antibiotics – to name just a few – even in situations where reduction of weight, diet change, or bed rest, would be equally appropriate. Most doctors neglect prevention. Instead of insisting on banning tobacco, soft drinks, or heavily salted prepared meals, they again prescribe drugs. The reason is simple: as a doctor, you earn more money prescribing drugs than advocating a healthy lifestyle. In terms of the

workload:income ratio, the best patients are asymptomatic and relatively healthy patients with a chronic condition (diabetes, high cholesterol, hypertension) who need to renew their prescription every month for the rest of their life.

Do you see the parallel with language teachers? In any case, reject 'overteaching'.

Let us summarise:

1. Avoid bored and boring teachers.

2. Insist on an initial quick grammar overview. Grammar is not a black hole. The number of problems you need to resolve is finite.

3. Opt for the coach model and limit the number of lessons. First month: 10-20 lessons; second and third month: 4 lessons; fourth month and later: 1 to 2 lessons.

4. Make sure that your coach explains the grammar in your native language.

After leaving behind the complex topic of language teachers, you will cautiously approach your next step: producing intelligible sounds in your new language. Learning, listening, reading – hundreds of hours, thousands of words. If you followed my advice to study in silence, time has passed. Now the day has come where you want to express yourself. Speaking is fundamental to humans. Do it.

Workload after Chapter 1–4

The verb training and the first rounds of grammar will not take more than 100 hours. Your total workload is now

800 to 1,800 hours

The Word Brain

5

Speaking

The day you utter your first words in a new language is not always a happy day. Most languages have unfamiliar sounds, and to reproduce them faithfully takes time, sometimes years. If you have more than one new sound in a single word, the probability to get it right approaches zero. Take the one-second sequence صـــباح الخـــير – *good morning* (pronounce SabaH el-khair). In a single second, you are supposed to produce three sounds that are totally unfamiliar to most people from Western Europe. The odds are against you.

Let's return to your childhood again. How did you circumnavigate the obstacles that visibly impede fluent speech in adults? From what we saw in the *Listening* chapter, part of the solution was to postpone speech, and to just listen to the sounds of the world. It took approximately 5 to 7 months before you started to babble and utter meaningless sounds such as 'ba-ba-ba-ba-ba', 'ka-bu-ba-da-mi'; and only when you reached the age of 12 months were you ready to experiment with real words and two-word sentences, generally in order to express desire: 'More juice', 'Want cookie'. You took your time before wrapping your baby thoughts in chunks of language.

Anatomy and physiology conspired. They made it easier to let sounds come into your brain than to let them out. To let human speech in, all you need is an eardrum, three tiny bones in your middle ear, and the so-called cochlea. These structures amplify the sounds, and transduce them to electrical signals for the brain where speech segmentation and interpretation immediately ensue. This is a straightforward process, and

apart from your ears and your brain, nothing else is involved. In comparison, speaking requires sophisticated mechanics. To proclaim the resolutions of your brain to the world, you have to co-ordinate dozens of muscles in your larynx, pharynx, neck, cheeks, mouth, and tongue. Putting all these pieces into the perfect position in a minimum amount of time is a remarkable acrobatic performance, and even children need years of exercise. In fact, only at around the age of ten do they start speaking like adults (Figure 5.1).
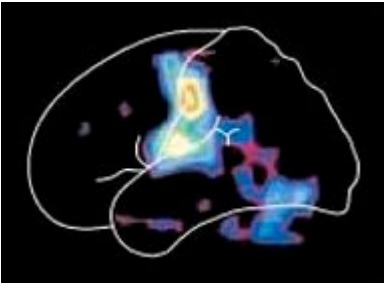
Figure 5.1: Pronouncing words: High activity in the precentral motor cortex. Adapted from Raichle, 1988. Used with permission.

From the very beginning, comprehension has a head start over speech production – when you stutter your first barely intelligible sounds, you already possess a vast passive repertoire of hundreds of words. The disparity between good language comprehension and poor language production usually persists throughout a lifetime. Many people may one day read Thomas Mann, Hemingway, or Voltaire, but only a few will develop their writing skills.

Speaking skills have another disturbing characteristic: they are subject to heavy erosion. Stop speaking a second language for a decade or more, and even simple words such as 'Goodbye' are suddenly irretrievable. At the same time, listening and reading skills are hardly impaired. It seems as if once you acquire the ability to *understand* with native-like proficiency, you have acquired it for life, like riding a

bicycle. The speaking abilities, on the contrary, would need continuous stimulation to be maintained.

There are two explanations for this phenomenon. The first is quantity. Unless you are incorrigibly logorrheic, listening is the predominant function mode of your word brain. As soon as you find yourself in a group of at least three people, the odds are that you will listen rather than speak. The bigger the group, the smaller your contribution. In some situations – at school, university, or during meetings at work – you could listen for hours, and nobody would expect you to contribute more than a word or two. As a result of years of listening, the part of your word brain that processes sounds is better trained than the part that produces speech.

The second reason is diversity. The words put into your brain are more diverse than the words coming out of it. You have only one life to tell – your own – while your co-humans make you listen to hundreds of different lives in different places and in different circumstances. You know words annunciated by fascists, fundamentalists and populists that you wouldn't want to ever pass your lips. You know hundreds or thousands of words from listening to priests, rabbis, and imams, but, again, you would not want to use them yourself because, as a scientist, you feel that God and the gods exist because our ancestors had the wisdom to create them. This list can go on and on, including people from different professions, geographical regions, age groups, etc. Because of the huge variability of human biographies – sometimes disgustingly ugly, but most often creative, stimulating, and refreshing – you know thousands of words you will never utter. What you know of the world is more than what you can say about it.

(Do we need other explanations such as brain-specific mechanisms developed over evolutionary time, which make sound memories more lasting than speech-producing skills? Imagine living the life of a distant ancestor 100,000 years ago. How would you value listening skills with respect to speaking skills? What could be more useful for survival, the correct interpretation of the sounds around you – 'Is that a wolf? A

tiger? A lion? A bear?' – or the production of philosophically inspired sounds? But this discussion is beyond the frame of a short language guide.)

In the *Listening* chapter, I recommended that you observe a few months of mystical silence. I promised you that you would partly avoid producing stuttering and ungraceful speech. Now the moment has come to step out into the arena. If you are abroad, every day presents hundreds of opportunities to speak to friends and strangers. If, instead, you are at home, listen to your favourite language CDs and repeat the now familiar words and sentences. Imitate the sounds, in particular the length of the vowels and the melody of the sentences. Later, repeat the sentences in real-time, with an interval of just one second. You will be amazed at how the sounds soon start to come out of your mouth.

Repeating the lessons of your language manuals will take you some weeks. Again, don't feel uncomfortable repeating a language CD for the 14th time. Thereafter, use the same procedure – listening to and reproducing speech with a one-second interval – with sentences from other sources such as podcasts, audio books, or TV. In the beginning, real-life speech will be so fast that you will reproduce only fragments of sentences. Persist. With time, the fragments will become longer.

Have you noticed that I have again limited free expression? I suggested that you *repeat* the sentences of language manuals, TV, and audio books. In other words, I recommended that you do *not translate* from your native language. The reason? Translations are risky for a language novice because they generate a huge number of errors. You might get accustomed to these errors and end up being unable to say what is right and what is wrong. Whenever possible, it is thus preferable that you use words and sentences that you have already heard being said by other people. At this early stage, don't be ashamed to be a parrot.

While transmuting into a parrot is generally feasible, another fundamental conversion may be out of reach for some individuals. Imagine that you step into one of the Paris boulevard restaurants and order an overprized micro-bottle of mineral water and a dish of

spaghetti bolognese. (Fatal error, by the way. The art of al-dente cooking hasn't arrived in France yet.) What do you think you looked like when you ordered your meal? To be honest, you didn't look like a weathered adult, in control of life, family and career, but rather like a clumsy and gawky creature or bungling adolescent, struggling to find your way in the world. Alas! That's the way it is: during your first steps in a new language, at best, you regress to a kind of cutesy childhood, at worst, you are a weirdo, a nobody, an untouchable.

Some people perceive this as a high price for familiarising themselves with other languages and decide that they are not willing to pay the price. They don't want, at any cost, to look clumsy, awkward, or inept. That is, of course, the end of the dream of speaking another language. Without going through the baby/stranger/klutzy stage, nobody will ever learn to speak another language. All of a sudden, we realise that discipline, dedication and perseverance alone are not enough. To pierce the walls of other languages, you need more extensive qualities. They vary from individual to individual and comprise a certain sense of comedy and self mockery; or, in some cases, the determination to break with suffocating families and to betray the 'family language'; or simply semi-schizophrenic prospecting of imaginary variants of yourself. We begin to understand that the true reasons for 'not having talent for foreign languages' may not be related to memory or grammar or laziness, but might well be psychological in nature.

I assume that you are willing to pay the price, so that your speaking skills will gradually improve and accelerate. Speak slowly and articulate. You will notice that over the years (yes, we are now talking about years and not about weeks or months), speech production will become increasingly unconscious. Even your foreign accent will eventually soften, although probably never disappear. Don't consider this a problem. If you choose the right words and fold them in perfect grammar, nobody will ever dare blame you. As in other areas, content is more important than packaging,. As long as you speak fluently, an accent is not debilitating, on the contrary. In today's world, especially in times of peace, some accents are truly charming.

We have almost reached the end of your inventory. To go through the process of language acquisition, you will

1. learn 5,000 to 15,000 words in about 500 to 1,500 study hours;

2. train your ear and associated brain regions to perform real-time speech processing;

3. train your eyes and associated brain regions to perform fast reading;

4. train your vocal tract and associated brain regions to produce intelligible speech;

5. train your grammar sense during successive fast overviews.

With so much information to be crammed into your brain, you might wonder how memory works. Knowing the operating mode of a machine can be helpful before turning it on. And another question surely springs to mind: Is there some sort of talent involved in language learning? Do some people do better than others? Before summarizing the learning strategies for the monumental task of absorbing thousands of words, let's dig into your memory.

Workload after Chapter 1–5

Due to heavy exposure to human speech during your CD and/or TV training (see chapter 2), once you start speaking, progress will be fast. For your initial training sessions, we generously allocate 50 extra hours. Your total workload is now

850 to 1,850 hours

6

Memory

In your native language, your brain recognises – and endows with meaning – any conceivable subset of 50,000+ words within fractions of a second. That is in stark contrast to what you will experience with subsequent languages where initially nothing ever happens in milliseconds. Imagine that, during your first trip to Paris, a friendly local takes you on a one-hour stroll from Notre Dame to the Louvre, then northwards up to the Sacré-Cœur hill, and, finally, down to Pigalle. If I put you back at Notre Dame a few months later, you would probably find your way to Pigalle alone, recalling places, streets, crossroads, shops, and buildings. It is hard to believe that this wealth of information is approximately equivalent to learning 10 miserable words. Why does it take adults so long to learn languages while young children seem to do so whilst playing, laughing and having a great time? Do we all, shortly after infancy, suffer a subtle form of partial Alzheimer's disease? Or are adult brains tuned to find their way in urban jungles rather than in word jungles?

Let's take a glass. Imagine that I put my finger on it and ask you what it is. You would answer 'glass', instantly, without hesitating. The word pours out of your mouth as water pours out of a spring. It does so because 'glass' is woven into your brain in many different ways: you have a mental image of a glass; you have a memory trace for the spoken word; you have a memory trace for the written word; you know that the word has 5 letters, that it starts with a *g* and ends with an *s*; you have a motor recipe for pronouncing the word; and, on demand, you can recall hundreds of memories associated with the word – glasses raised to

celebrate births, marriages, and anniversaries, or a glass smashed against a wall. 'Glass' is embedded in a dense web of events and things in time and space. Figure 6.1 shows one such web. Any single of your 50,000+ native words is intertwined in multiple locations of your brain, floating in a sea of meanings, facts, and emotions. As soon as you wake up in the morning, all brain words go into stand-by mode, waiting to jump into consciousness as soon as their equivalents – written or spoken words – enter the brain via your eyes or ears. Grown over decades, this vast network of word webs is the most precious asset of your life.
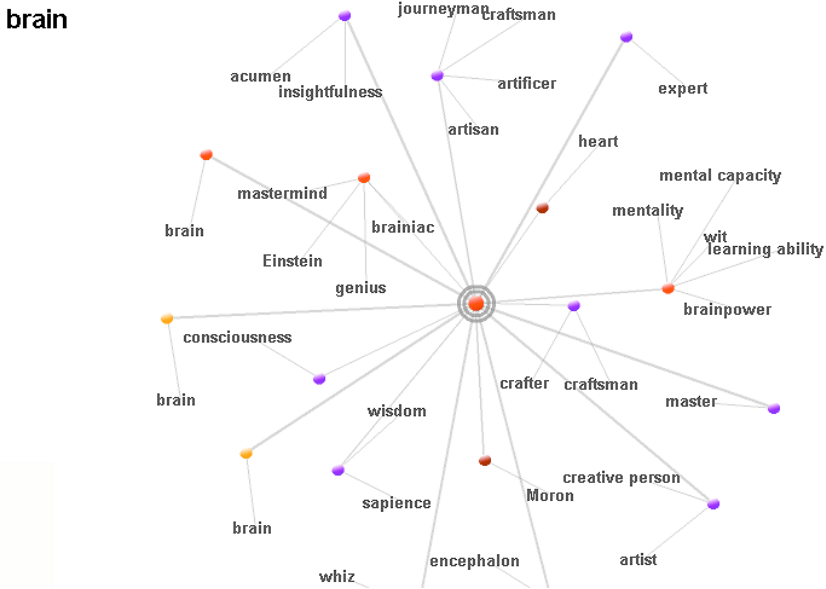
Figure 6.1. A tiny part of a single word web. Adapted from www.lexipedia.com/english/brain. Used with permission.

To manage word webs – and other tasks, of course – your brain relies on complex and compact machinery. First, it contains between 10–100 (10^{11}) billion neurones, which are the main information-processing

cells. Second, these neurones are connected to neurones in the vicinity or to distant neurones. In young adults, the long distance fibre tracts total around 176,000 km in length – that is roughly half way to the moon. Third, each of the 10^{10} to 10^{11} neurones is linked to other neurones by up to 10,000 so-called synapses. These are highly specialised interfaces where information is passed from axons – slim extensions that carry the electric signals generated by the neurones – to dendrites, which are highly branched tree-like structures that receive the signals originated in other neurones (Figure 6.2). The resulting picture is majestic: one billion synaptic connections in a single cubic millimetre of specialised brain tissue, up to 1000 trillion (10^{15}) in a human brain. One thousand TeraSynapses – that is the number of stars in ten thousand Milky Ways.
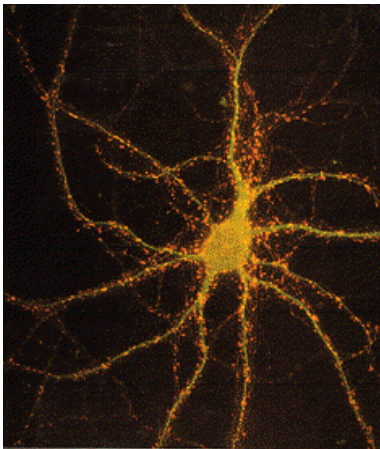
Figure 6.2. A single neurone, its dendrites and its multiple synapses (orange dots).

Yet the most surprising detail is still to come: synapses are not carved in stone. They come and go as their support, dendritic spines, appear and disappear. These spines are tiny protrusions from a neurone's dendrite. If you teach a mouse to reach out with its forelimb to a single seed (see movie at http://hiv.net/link.php?id=20), dendritic spines form as rapidly

as within one hour.[4] Most of these new spines will regress again, but some are preserved and, when stabilised during subsequent training, leave minute but permanent marks on cortical connections.[5] The resulting change in circuitry is most likely the anatomical substrate for long-term memory storage. The resulting plasticity of the brain can even be observed macroscopically, for example in London taxi drivers from pre-GPS times, who developed a hypertrophy of the brain region that is involved in spatial orientation[6], or in violin players who have an enlargement of the left hand representation in the sensorimotor cortex.[7]

The rate of spine erosion is astonishing. In one study, 96–98 percent of newly formed spines vanished within days, and less than 1 percent persisted for months.[8] Using 20 percent of all the oxygen you breathe, your brain is constantly sorting out newly received information, enforcing what is important and discarding what is irrelevant.[9] The extent of the deconstruction going on in your brain was nicely shown by 19th century experiments that measured the time of learning – and subsequent forgetting – of chains of 2,300 nonsense consonant-vowel-consonant syllables such as KOJ, BOK, and YAT. The results were sobering. After 24 hours, 70 percent was gone (Figure 6.3). Happily, you will learn meaningful word pairs rather than nonsense syllables, for example, agua–eau, vino–vin, queso–fromage, and should therefore obtain better results after 24 hours. However, at Day 31, you might not perform much better than the memory pioneers more than 100 years ago. Brain physiology isn't prone to instant word learning. In word jungles, progress is slow.

In order to protect young spines from erosion, schedule multiple training sessions. You will note that, before getting fixed into lifelong memory, words pass *subsequent degrees of knowing*. At the weakest stage, you don't even remember that you have seen a word; however, you would recognise it when presented in a list of words. Later, you would say that you once knew a word, but cannot remember it. At a subsequent stage, a word would be on the tip of your tongue, yet decline to come out. Finally, you remember it, first after seconds and then milliseconds.
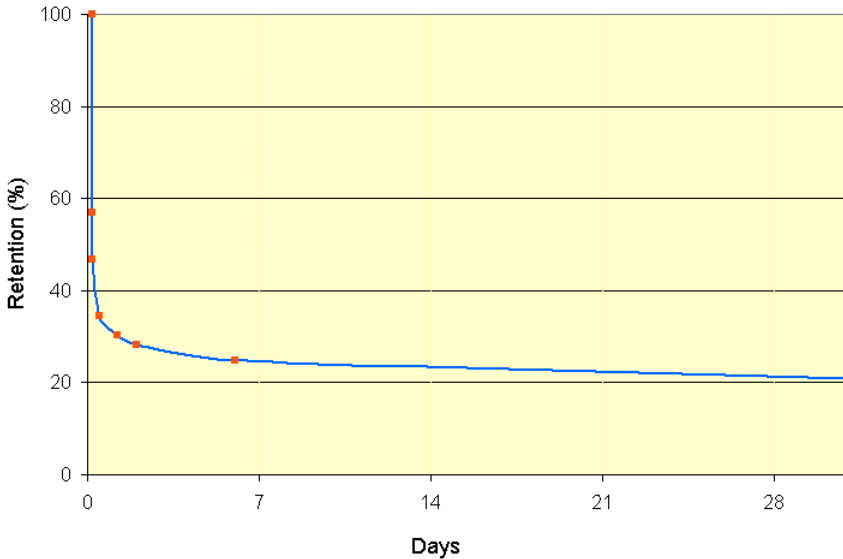
Figure 6.3. Forgetting curve. Adapted from Hermann Ebbinghaus, *Memory: a contribution to experimental psychology*, 1885/1913.

For our immediate purposes, we will define *knowing a word* as successful recall after one month of non-exposure. Only occasional words will get there after the first encounter. The vast majority – alas! – will have to be subjected to the long process of multiple rehearsals through reading, hearing, or conscious repetitions. Never forget: baby memory traces are volatile. Imagine your word brain as a castle protected by high walls and ruled by the lord of the castle, who has issued unambiguous instructions to the sentries at the gate: no entry without multiple petitions and repetitions! Memory's suspicious gatekeepers want convincing evidence that a word deserves residence in lifelong memory. Be prepared to come back as many as 5, 10, or even 20 times, to plead the cause for every single word. Take comfort from the idea that subsequent learning rounds require less time and produce

better results, allowing the learning sessions to be spaced out. If you meet a word for the first time on Day 0, repeat it on Day 1, 3, 6, 10, 17, and 31. Figure 6.4 illustrates these 'spaced repetitions' and where they will take you. Be prepared that the sum of all the repetitions may total around 4 to 6 minutes per word.
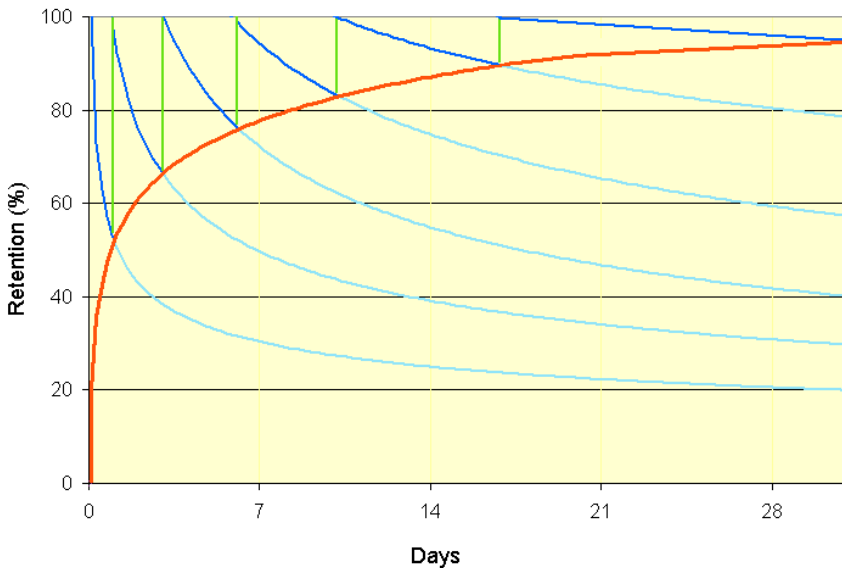

Figure 6.4. Learning curve (red), constructed from truncated forgetting curves.
Dark blue: Initial decline in memory performance.
Light blue: Long-term result without further repetition.
Green: Repetition putting the retention rate back to 100 percent.

We realise that the word *learning* is hopelessly inadequate to describe what you are going to do. First, *learning* does not reflect the subsequent degrees of knowing. Second, *learning* implicitly suggests forgetting. How many things did we once know and have since forgotten? What is fine for physics and higher mathematics, most of which is irrelevant in ordinary life, is intolerable for languages where you need every bit of information for the rest of your life. I am therefore reluctant to tell you that you *learn* words when, in fact, I mean that you need to store them

in your word brain in a fairly definitive way. You must etch new words and carve and pound and burn and nail them. The alternative for *learning* should express that a word will stay in your brain for decades: it may corrode and slowly become weaker, but it will nonetheless resist and surrender only to arteriosclerosis. Let's abandon *learning,* which is too cushy, and adopt something more physical. Let's say *nailing*. The definition of *nailing* includes the three steps of learning, repeating and controlling.

How to nail words is an individual affair. If speed is critical, rely on the tens of thousands of webs that are already firmly anchored in your word brain (Figure 6.1). All you need to do is to add two pieces of information to an existing word web: first, how you write a new word and, second, how to pronounce it. Everything else – knowledge and memories – is already in place. In practise, you will have to dress a two-column list, putting your new and your native language face to face (see an example in Table 6.1). Word lists are not perfect – German *Brot* is different from French *pain*, it looks different, it smells different, and it tastes better – but with 5,000 to 15,000 words to nail, you cannot afford to lose time with subtleties. The pre-existing webs of your word brain are a unique support for nailing new words. Use them. If your teacher tells you that you can do without word lists, fire him.

Table 6.1 Example of a word list for Germans wanting to nail Italian words

Italian	German
amare	lieben
la pace	der Frieden
odiare	hassen
la corruzione	die Korruption
la morte	der Tod
il cavaliere	der Reiter
la gioia	die Freude
la gente	die Leute

* * *

The nailing curve in Figure 6.4 is an approximation, because memory performance varies between individuals. Every human brain is as unique as a human face, and differences in brain structure due to genetic variation, intrauterine conditions (exposure to tobacco, drugs, and alcohol), or environmental factors after birth, can affect learning abilities. Fortunately, most people with a comparable educational background show differences in memory efficiency that usually vary from the simple to the double. If your memory is better than mine, it might only take you 30 minutes to nail what I could do in an hour. Does that mean that there are differences in talent? Probably yes, like in other domains. Are these differences prohibitive? Certainly not!

Instead of comparing yourself to other people, focus on yourself. With thousands of words in the waiting loop, you certainly wonder if there are ways to improve your memory performance. Putting it bluntly, the margins of manoeuvrability are narrow. As a central function of sleep is to consolidate newly acquired memories for long-term storage, chronic excellent sleep is probably a good memory enhancer. Physical activity such as running also appears to improve learning, at least in mice.[10] Even alcohol, if ingested in moderate dosages, improved memory in rats.[11] We will await further research before making recommendations on the subject.

Far more promising are measures directed at avoiding adverse circumstances and protecting the gradual build-up of billions of spines and synapses. One such circumstance is higher age. The younger you are, the easier new languages flow into your brain so that the teens and twenties are clearly the most suitable moments in life. After years of formal education, the native language is consolidated and young people realise that discipline helps to acquire new skills. So if you are under 30 and dream about learning another language, do it now! Never again will the conditions be so favourable.

Later in life, job and family reduce available study time. Stupidly, memory performance declines too, first imperceptibly, and after 50, undeniably. Now, words need more frequent repetitions to crawl into lifelong memory. In addition, multitasking abilities decrease, leaving little space for silent rehearsing of new words while simultaneously following an ongoing conversation. At some moment in life, memory impairment is such that the goals we defined earlier – reading essays or newspapers, understanding TV documentaries, and following day-to-day conversation – are beyond reach.

You will avoid drugs and alcohol at high dosage. Building up valuable spines during sweaty days just to blow them out of your brain during vaporous nights is not what you would want to do. Acute alcohol intoxication ('black-out') is fatal for memory, not to speak of chronic abuse ('alcohol dementia'). Even episodes of heavy drinking such as a bottle of wine impair memory performance during the hangover period.[12]

Alcohol, though, is a minor problem compared to a more widespread abuse: distraction. If you repeatedly subtract a single-digit number from a larger number directly after one of your nailing sessions, you will see that your memory is impaired for the 3 to 5 most recently nailed words. Certain episodes of life are therefore inherently incompatible with robust learning: death of relatives and friends, illness or hypochondrial fears, separation or divorce, job loss or financial disaster. Yet even more dangerous, because it occurs more frequently, is seemingly innocuous distraction, for example extended surfing tours on the Internet. Opening social network accounts, reading incoherent information from disparate sources, writing short messages, participating in nonsense quizzes, listening simultaneously to music, downloading videos or doing whatever else you can imagine – such acrobatic multitasking is heavy stuff for delicate infant spines. Is excessive networking inappropriate for the gentle formation of lasting memory traces? Do precious bits of memory get lost in the cold spaces of the endlessly anonymous Internet? Future studies might show that

participation in 'social' networks is inversely correlated with success at school and university.

Psychostimulant drugs have been used by a certain number of students on university campuses around the world. Promoters of these drugs trivialise this practise as 'memory-enhancing' or 'cognitive-enhancing'. I prefer to use the name that is more appropriate: brain doping. Over a short period, brain doping appears to be effective. Several studies have shown that dexamphetamine 10 mg on 5 consecutive days, enhanced both the rate of learning and the retention of the words one hour, one week and one month later.[13] Not unexpectedly, brain doping was reported to be highest among men, Whites, and fraternity/sorority members. Brain-doping subjects also had higher levels of cigarette smoking, heavy drinking, risky driving, and abuse of marijuana, MDMA (Ecstasy), and cocaine.[14] The most commonly cited motives for illicit use are to enhance concentration, get higher grades, and increase alertness.[15]

Brain doping is not altogether new in academia. A few years ago I learned that at least one of my colleagues had been using cocaine to work the long night hours typical for big projects. In 2008, a scientific magazine published the results of an informal survey into the use of brain-doping drugs among its readers.[16] About 20 percent indicated that they had used drugs to stimulate concentration or memory. Methylphenidate was the most popular drug (62% of the participants who reported taking these drugs), followed by modafinil (44%), beta blockers such as propanolol (15%) and adderall. These figures may overstate the phenomenon because people who dope their brain are more likely to participate in this kind of survey. Nevertheless, the numbers suggest that among some academics, drug taking is not a taboo.

Some people are trying to make the very idea of brain doping fashionable and socially acceptable. The line of reasoning is as follows: 'We are ready to give brain-doping drugs to adults with

neuropsychiatric disorders and severe memory and concentration problems. We – physicians and pharmaceutical companies – would also welcome that these drugs be prescribed more widely for other psychiatric disorders. We might even be tempted to apply the same considerations to children and adolescents with hyperactivity disorders. After all, why boost the brainpower of other people and not your own? You already take Italian espresso and caffeine-containing soft drinks. If children at school took these drugs, would you be able to withstand the pressure to give them to your children?'

Yes, we most certainly would. What's more, we don't appreciate visions of brain doping 'benefitting society or extending our work productivity'. Clearly, the future discussion on this topic needs some regulation. It is too simple for researchers just to declare competing interests when they are consultants for pharmaceutical companies that develop or produce brain-doping drugs. It is also too simple for editors of scientific journals to content themselves with publishing these conflicts of interest in a footnote. We are not happy that people who might be biased in their convictions fashion the discussion about brain doping. Scientific journals should carefully select the contributors of articles on this subject. The potential market for brain-doping drugs is immense – bigger than that of any antidiabetics, anticholesterols, antihypertensives, antipsychotics and other anti-XXL drugs combined. Stakes are high, temptations are great, and way too many researchers are for sale.

If your friends yield to the temptation of using brain-doping drugs, don't follow them! Most drugs have adverse effects – *a fortiori* when used chronically – and I predict that after decades of use, brain-doping drugs will be shown to produce devastating effects on the brains of those who wanted to – in brain-doping parlance – 'perform better and enjoy more achievements and success'. By then, editors of prestigious international journals of science will have issued a public *Mea Culpa* for having invited the wrong people to shape the discussion. Some researchers will face criminal charges. Pharmaceutical firms will be struggling with expensive action suits.

Let us return to the initial question. Why does it take adults so much longer than young children to learn new words? We will never be able to answer this question because stating that 'children learn languages faster than adults' is wrong. If 18-year old young adults know 30,000 to 50,000 words, where did they get them from? Walking in the open air, listening to birds and enjoying the dance of butterflies? No, they did so at school, from early in the morning until the afternoon, 9 months a year, 12 years in a row. Even if education at school and university is about facts and concepts, word learning is a huge burden of formal education. Remember those failed oral examinations because the words were on the tip of your tongue but wouldn't proceed any further. Part of your failure? Insufficient word training. You would not become a physician, a philosopher, or an engineer without acquiring thousands of new words. How many words did I learn at medical school? Anatomy, physiology, and biochemistry alone were good for a few thousands, and the total word count may well have been in excess of 10,000. Word brains fashion our career.

Young children are language machines because they have time. Italian is exhilaratingly concise when it translates this idea into 'Non hanno un cazzo da fare!!', saying, in essence, that children have pretty few things to care about except listening and talking. If we, adults, add time to our language-learning recipe, children immediately lose their head start. Adults possess vast brain webs of meanings, fact, and events. What's more, we are capable of focused working for 4, 6, or 8 hours a day and are terrifyingly effective when we do so. In comparison, young children stand no chance of competing. In other words: start a four-year language training course today, and in four years, I expect you to have language skills that are clearly superior to those of a 6-year-old child.

Let's summarise.

1. Motivated adults learn languages faster than young children.

2. Exploit the word webs in your brain and nail words with bilingual lists. Learn new words on day 0 and repeat them on day 1, 3, 6, 10, 17, and 31.

3. After your nailing sessions, relax and don't engage in multitasking activities.

4. Avoid excessive drinking or taking drugs.

5. Avoid brain doping.

6. Teach your children and grandchildren the following motto, by Eric Kandel, Nobel Laureate: 'Studying well is, without a doubt, the best cognitive enhancer for those capable of learning'.[17]

You are now ready to proceed to the last chapter. *Nailing* is about strategies to cope with the huge number of words you have to burn into your brain. You are at the beginning of your private Via Dolorosa. Hoping for a miracle, a golden avenue, or a royal highway? I am sorry, but you won't find any of these. However, some pieces of advice will make the route less thorny and painful. Let's go for it!

Workload after Chapter 1–6

Your total workload is still

850 to 1,850 hours

The Word Brain

7

Nailing

You are now ready for take off. Depending on the language you are going to learn, 5,000 to 15,000 words are waiting to be nailed into your brain. The sheer volume of this task – 500 to 1,500 hours – may surprise those who had a naïve or romantic perception of speaking other people's tongues. Realistic minds find it encouraging that the time frame of language learning is predictable.

If you are learning 'just for fun' and want to limit daily learning to one hour a day, avoid languages with heavy 'word loads'. For people from Western Europe these are, for example, Russian, Turkish, Arabic, Chinese, or other African and Asian languages. Instead, choose languages with a more familiar vocabulary. Please don't consider anything less than daily work; alternatively, you could try 'pulse treatments' of three hours twice a week.

If you learn languages at university and, *a fortiori*, if you contemplate becoming a language teacher, things are different. Every language is within your reach because your daily work schedule includes 3 hours of word nailing plus hours of listening to audio sources. Don't even envisage a more modest approach. Nobody wants language teachers who are not in command of what they teach, and anything less than 5 hours of daily study is unacceptable. Those not willing to fulfil these requirements should reconsider their professional choices.

Let's get to work! First, find out how many new words you can nail every day. In extraordinary circumstances – you are abroad, start at 7 o'clock in the morning, and continue until noon before spending the

rest of the day with native speakers – you can nail 50 or even more words every day. (I happened once to be in such a situation. It was my first trip to Sardinia, and every night I clearly felt the progress I had made during the day.) However, in everyday life, and in particular over periods of months, nailing 50 words per day is a terrific challenge. For a start, we will consider 20 truly new words a feasible and respectable long-term goal. 'New' means that you cannot guess the meaning of the word. For English native speakers, words such as *Sicherungsverwahrung*, *Grundsatzurteil* and *Bundesgerichtshof* are new, whereas *evolución*, *democracia* and *economia* are not.

At 400 new words per month, progress is evident week after week. Rapid word accumulation is paramount for two reasons. First, you need to recognise the words that your auditory brain cortex will soon be able to 'cut out' from spoken language (see chapter *Listening*). Second, word nailing accelerates your transition from an illiterate to a literate person and brings you closer to the most pressing short-term objective: **reading!** As soon as possible, you must move into territory where you are able to read everything... because reading is the best conceivable language training! At first, the process is slow, like deciphering hieroglyphics, but if you persist, your reading abilities will soon speed up. Reading is total immersion *par excellence* and will soon trigger quantum leaps in understanding. In one hour, it exposes you to as much as 20,000 words. For word brains, reading is paradise.

Just to make sure that we understand each other: I don't find word nailing thrilling and I can immediately name a hundred activities I would prefer to do. However, in the early stages of language learning, there isn't any alternative for people who like it fast and efficient. Remember chapter 1: The number of words you are familiar with determines your language abilities. The more words you know, the better you are.

Nailing can be divided into three distinct activities: learning words, repeating words, and controlling words. Beginners need two-column lists that put new and native words face to face. At first, read the words

attentively one after the other. Check the spelling, imagine the sound of the word and make a guess at the resistance a word is likely to oppose: easy to learn or not? Four-syllable words such as *perseverance* will demand more time than monosyllabics such as *and*, *or*, and *but*. Go through the list a second and third time, either line by line or leaping at random from word to word. Push the words around in your mind, squeeze them, press them, and stretch them. Finally, test yourself by covering first the right column and then the left column. 100 percent correct answers is a good score.

As brilliant as 100 percent results are, the first learning session is only the starting point for a weeklong consolidation process. Remember the forgetting curve of the *Memory* chapter. After one day, the percentage of correct answers is dramatically down, and after one month, recall may be 20 percent or less. As learning is nothing and recalling is everything, the second pillar of word nailing is repetition. Find out which strategy fits you best, either daily repetitions or repetitions on day 1, 3, 6, 10, 17, and 31, or any other regime. You will soon notice that after every re-exposure, memory traces are easier to reactivate.

The third pillar of nailing is control. Determine that every single word has safely arrived in lifelong memory. Very young children ask their family for help, and a grandmother might interrogate her grandson, 'Young boy, please tell me what *açúcar* means.' But what is practical at an artisan level is impractical for the mass digestion of 5,000 to 15,000 words, and you wouldn't want to bother your grandmother, mother, wife, daughter or granddaughter for months or years on end. To check progress, develop your own system. Revisiting the word lists frequently and marking 'difficult' words for further revision is one such system. Alternatively, you can use index cards or word trainers on electrical devices. For an overview on this topic, please see www.TheWordBrain.com/NailingSystems.php.

Soon, you will face two problems. The first is saturation. At a rate of 20, 30, or 40 new words a day, the time will come when you will feel like a force-fed French goose. The diagnosis: an acute attack of

indigestion. The prevention: nail words five days a week and stop nailing at weekends. If saturation develops nonetheless, pause for an entire week.

The second problem is more severe: lack of words. Good language manuals usually present around 2,000 words – that is far short of your final word score of 5–15,000. This is a miserable situation, because you are too good to continue working with manuals, but not good enough for reading essays, newspapers or novels. At this early stage, not even dictionaries are helpful – deciphering a text where half of the words are unknown is achingly slow.

There is one acceptable solution: nailing carefully selected word compilations that are grouped by topic and divided into basic and advanced vocabulary. Good compilations present around 7,000 words and offer free pronunciation audio files (see www.TheWordBrain.com/BookRecommendations.php). Define the number of pages you will nail every day and start ploughing your way through them. People who have never used these books sometimes observe that learning hundreds of pages of words out of context is not an exciting perspective. I agree, but I wonder if the alternative – searching 10,000 words in a dictionary – is more sexy. Anticipate at least two rounds and possibly another round after 6 to 12 months.

While pioneering the world of words, you will one day have the curiosity to open a 200-page grammar book. To your satisfaction, you will realise that daily listening to your audio sources (remember the manual CDs, TV programmes and audio books of the *Listening* chapter) has paved the way to understanding grammar. In fact, humans have an innate ability to grasp grammar, and this ability doesn't disappear with adult age. Don't be afraid of the technical terms of grammar, the *nouns*, *pronouns*, *adverbs*, *tenses*, *modes*, etc. Their number is limited. Think of the parts that you know from your car – gear box, headlights, battery, brakes, suspension, chassis, radiator, dipstick, cylinder, driveshaft, exhaust pipe, jack, lug nuts, spark plug, hubcap, etc. In comparison, becoming familiar with a handful of grammar terms is a bagatelle.

Working through compilations of frequent words is like working on an assembly line. To break the boring rhythm, try and read real-world texts from time to time. As your word repertoire increases and the number of missing words diminishes, you will one day discover how exciting it is to work on essays, newspapers or novels. Underline new words, search for them in the dictionary, and write them down in a notebook. At this point, you can even slow down your nailing rhythm, but only on one condition: that you extract from your reading sources double the number of words that is on your nailing schedule. For example, if you nailed 20 words every day, look up at least 40 words in the dictionary. At this double-strength dosage, searching the words and writing them down will suffice and dispense you of nailing them *in sensu strictu*.

Final Workload

Allow for an additional 150 hours to explore your dictionary in more detail. Your final workload is between

1,000 and 2,000 hours

The Word Brain

Epilogue

We have reached the end of our journey. After visiting your colossal lifelong memory, your breathtaking speech segmentation skills, your frantic reading speed, and your pronunciation acrobatics – all unique on Earth – let's sit down for a moment.

Two hours of reading have changed the way you see languages and language learning. Not all languages are equal because, depending on who you are and which languages you speak, some languages are easier than others. However, all languages are equally beautiful. The Germans will appreciate that Turkish is as beautiful as German; the French will be delighted that Arabic is as expressive and gentle as French; and the Italians will be pleased to discover that Albanian is as subtle and amusing as Italian. Even more importantly, we have seen that languages are within the reach of everybody. Please pass this knowledge on to your children, grandchildren, and friends.

Although language learning is predictable, there are no miracles. Success is determined by the number of hours people are ready to invest. Fortunately, there are potent catalysts, for example life and love. Just imagine yourself in an intense love affair, spending weeks and months in close symbiosis, exposed to a single linguistic 'source', discussing the world from dusk to dawn, and all this submerged in memory-stimulating emotions, supplemented with memory-boosting physical activity. The progress people make in these conditions is remarkable – sometimes dangerously remarkable. I once unmasked a

cheating husband. While talking about Italy and Italian, I noticed that his language skills were quite honourable, so I asked him,

– How long have you been studying Italian?

– Oh, not that long. Three years, during my summer seminaries.

– And how long did those seminaries last?

– Two weeks each.

– Oh, really? I didn't know that you had a girlfriend in Italy.

– Who told you?

Nobody told me. The gentleman was simply too erudite. You don't acquire certain words and a certain ease with language in 6 weeks of canonical summer-school teaching. Cherchez la femme...

I have already recommended extensive travel for those who are in their late teens or early twenties. Youth, high levels of sex hormones, and the desire to find mates, are mighty communication catalysers. However, love and sex are not always practical. Later in life, you wouldn't want to get divorced just because you needed extra-marital language courses. For more composed people, there are entertaining alternatives, such as organised travel tours. I once went to Brazil and booked a 12-day tour in a local tourist agency. All other travellers being Brazilian, the 5,000 km bus trip (yes, Brazil is a vast country) turned out to be second among the most intensive languages courses I have ever had. (Number 1 was the French teenager, of course.)

You will have noticed that I have a special relationship with languages. In fact, they have shaped my life through an uninterrupted chain of 40 years that links my early Latin experiments to *The Word Brain*. An A grade in Latin helped me enter medical school. After medical school, I worked in a department of infectious diseases and started writing a textbook on HIV (www.hiv.net/aids1991.jpg) that was to be published into the 16th edition. The textbook triggered the construction of www.Amedeo.com which, in turn, would provide the funding for a 24-

month Arabic sabbatical. And struggling with Arabic taught me fundamental lessons for writing this guide.

I am well aware that some of my advice is demanding and that I have set the bar high. However, the bar is no higher than we can all reach. The most satisfying insight of the last two hours is that language learning is a mere variable of time: you may decide that you have no time, but never again will you have to say that you have no talent for it. If, instead, you find the time to learn a new language, I wish you the very best. Languages are formidable windows to the beauties and mysteries of the human odyssey. Pushing them wide open is among the most gratifying moments in life.

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Bernd Sebastian Kamps

How long does it take to learn another language? How many words do you need to learn? Are languages within the reach of everybody? Which teachers would you choose and which teachers should you avoid? These are some of the questions you ask yourself when you start learning a new language. The Word Brain provides the answers.

If you have learned foreign languages in the past, consider reading it. If you or your children need to learn languages in the future, you must read it. What you will discover in two hours will change for ever the way you see languages and language learning. The principles of The Word Brain are timeless. Our children's grandchildren will follow them when they discover the people of our planet.