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Lifelong first language learning - an autobiography and reflective essay

Last updated 30 April 2009

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In the same way that case studies of children learning languages have provided a wealth of detail and information, this essay presents a case study of myself as an adult learner of my first language - English. The essay finishes with a summary of the main research questions raised by the essay.

1. First language learning as a lifelong process

Learning a first language is a lifelong process - it does not stop in the primary school! Every new subject studied has its vocabulary, conventions, and genres. Some science subjects are famous for the amount of new vocabulary that has to be learned. When scientists and doctors talk or write they frequently use so many technical terms that are not widely understood by the non-specialists, and the common term of abuse for this is 'jargon'. Therefore it is obvious that first language learning has taken place beyond the primary school. Why then has this not been extensively studied? When you look at books and journals on first language acquisition, they rarely go beyond the primary school. There has been some research on it by school teachers such as Cassels & Johnstone (1984,1985) and a few studies of medical English eg Bordage (1987), Bordage & Zacks (1984) . Anderson & Graham (1980) provide a crude estimate of the vocabulary load. But you will not find much material.

In addition, in the field of English for Specific Purposes (ESP) there has been a lot of study of how to teach English to scientists, business people, and so on. My expertise limits me to the language of science. In ESP it seems that the knowledge of the subject in L1 is assumed, and the question is how best to train people to function in those areas in L2, which is English. You would think that ESP would be interested in adult L1 acquisition, since a lot of the material that specialists learned, with accompanying language, was not learned until these specialists were adults. As I have explained in a separate article, a major problem of ESP is that it does not take account of diglossia and plurilingualism (www.scientificlanguage.com/provocative/cefr-diglossia-esp.pdf). My case is unusual, in world terms I was to all intents and purposes a monolingual during my school and university years. I learned my adult language in L1 rather than L2 or L3.

A study of how adults learn specialist L1 language is surely required if we are to compare like with like. Learning specialist English surely has more in common with Adult L1 acquisition than it does to child acquisition. But the whole question has been totally ignored. If we know more about how adults learn specialist L1 language, we will better be able to teach adult L2 specialist language.

In addition, very few language teachers are science trained. A few, a brave few, have recognised this, and have taken active steps to learn the subjects of their students. I know one teacher of medical students who made friends with the subject lecturers, attended lectures, laboratory practicals (including the anatomy lab) and observed operations with the clinical students. Such people are worthy exceptions. Very few language teachers have experienced the Adult language learning process of a science student. Therefore, as a first step towards that, I present my own language autobiography.

I was a science student. I went through the British system in the 1970s. I took my B.Sc in Human Biology, which turned out to be one of the most language intensive degrees that are possible. I taught Science, then did my doctorate in the language of Science before lecturing in linguistics. I hope this autobiography will give researchers ideas and raise answerable questions. I hope arts trained language teachers will by reading this have a better idea of the language demands of studying science.

2. L1 language learning at school

I know I was an unusual child. I loved reading. By the age of 9 I had ten library tickets and was using two public libraries. I was allowed into the adult section on condition that I read the classics or non-fiction. I loved anything to do with the sea. The Hornblower series by CS Forster I read many times. By the age of ten I had read the Three Musketeers and its sequel.

At school I was turned off botany (the study of plants) since it appeared to be a mass of names. Similarly, I found it difficult to learn the names of people. This is a problem I still have. I can remember the voice of someone much easier than their name or face. Therefore, from an early age I was reading widely, and was consciously struggling with vocabulary. I could not do crosswords, but was getting high marks for free writing.

My language problems also extended to understanding grammar. I well remember at the age of 10 or 11 being given an exercise on 'where' and 'were'. The teacher first tried to explain what a verb was. I was totally confused.. Later, after a year of learning French, it also became easy. In short, I learned English grammar through learning French, and later through studying Latin.

To this day I find grammatical terminology very difficult. I have taught the basics of sentence analysis, but cannot trust myself to do it - I always refer students to a colleague. This theme of language about language - metalanguage, will appear again later when I describe the study of anatomy.

Studying literature at secondary school I faced the big turnoff: the subjectivity of much of literature. Somewhere I read that a critique and interpretation had been made of an author, and when the author read the critique, he said that his story did not mean anything like what the critic thought. That finished it for me: literature was a mass of interpretations where one interpretation was as good as another. While I would sometimes enjoy literature, I would not analyse it, except for examination purposes.

The other big turnoff in literature courses was the necessity of memorising long lists of quotations. I could do the required essays as long as I had the book in front of me. Remember that in those days in Britain, English literature was examined entirely by examination - there was no coursework. Again, such a problem with memorisation continued as an adult. When I started learning Arabic, we were required to memorise dialogues. I could not. I remember on my first day the teacher set an easy dialogue, and to break the ice (as he later explained) he made us all in turn come up to the front to recite the dialogue. He expected perfection. Failure meant a second public attempt. I failed three attempts, at which point the teacher gave up on me as the worst case he had ever met. A few months later I was required to memorise the set text. I found I had to first translate it into English, then try to memorise the English, then be able to translate back to Arabic. Even this did not work, because even in English I could not remember three paragraphs faultlessly.

I could though memorise songs easily, both words and music. I had another language problem in music: I was hopeless at sight reading. This is when you are given an easy piece you have never seen before, and you are required to play it. Though I learned to read music only a year or two after learning to read and write, and I can never remember not knowing how to read music, as a teenager I had great problems with the music symbols and automating the playing of them.

I later found similar problems with the Greek alphabet in science, and with the script of Arabic - it took three years of regular exposure to the Arabic script before I became comfortable in it.

At secondary school I was required to learn Latin for two years. The justifications were that it would help me as a scientist since much of the vocabulary of science was based on Latin, and it would help my English since much of English was derived from Latin. It is possible to teach science students in a few hours all they need to know about Latin Brown (1956).

Fortunately Latin helped my English since we would spend thirty minutes each week going over a vocabulary list, and trying to see how many English words we could derive from the Latin root. This was excellent training, and without learning the metalanguage of prefixes, suffixes, roots, etc, gave me the tools and experience to look at new technical words and deduce a possible meaning through knowledge of roots and affixes. I also acquired some terminology for handling language, for instance the tense names, and words like Nominative (Subject) Accusative (Object) and Dative (Indirect Object). To this day, this is the metalanguage I most easiest use. This metalanguage was both a help and a hindrance when I came to study Arabic. A help in that I had a framework: a hindrance in that my teachers did not know my framework, and because it did not perfectly match theirs, they found it harder than usual to explain to my satisfaction. Later, in English teaching I had to change my metalanguage for the grammar of English, since the expert must change to match the terms used by the students, not the other way round, and English teaching had its own set of terms.

3. The language of subjects at school

I was blessed with a primary school teacher who drilled us in mental arithmetic and our tables. Bright students were treated to a 'zero tolerance' regime, where one mistake meant punishment. A 'tables test' three times a week, 20 questions in two minutes, was excellent training. I also had to learn the old Imperial Units, and the modern SI system, and the conversion factors between them.

I usually loved mathematics. I remember loving algebra, but hating matrixes, statistics, and Venn diagrams. I loved the graphical approach to solving equations. When I was eleven, I begged my father to buy me for my birthday a slide rule. I still have it. I still sometimes use it, though with failing eyesight it is much harder. I know it is the one item that my children will never borrow from my office. I played endlessly with that slide rule over the years. I discovered links between the different scales that we were never taught at school. For a fascinating introduction which almost brought tears to my eyes when I read it, see Stoll (2006). I have extremely fond memories of the slide rule. It was only the Sinclair Scientific calculator around 1974) that meant the beginning of the end for this remarkable tool.

I was fortunate to go to a grammar school, age 11-18, where difficult concepts were introduced early. So, age 12 onwards, I learned logarithms. The portable calculator had yet to be commercialised. I learned to think. I learned to estimate my answer before doing the calculation, so making sure that I got the decimal place in the right place. This role of estimation continued later in physics, where an essential part of the curriculum was in training us to estimate. For instance, "How many carbon atoms are there in the letter 'o' printed here, assuming the letter is printed only in carbon?" We would have five minutes for such an easy question. We first had to make estimations of quantities, then combine them to get the final answer. Marks were given for our reasoning.

In physics, the British system stresses the role of understanding what is going on. Mathematics is primarily a tool to help - it is not necessarily important in its own right. So we would often learn graphical methods to solve mathematical problems since graphical methods were both easier for students, and encouraged them to think about what was really going on, to visualise the calculations and to follow the reasoning and follow the reality being described. Even students who were majoring in mathematics were encouraged to use the graphical methods, because there is a tendency for those familiar with algebra to learn how to manipulate the equations without thinking hard about the underlying physical reality.

I did not major in mathematics - I never did more than AS level (half an A level). I never really understood integration and differentiation. I learned to do what was required using the formulae provided. I realised this because whenever there were new formulae for new phenomena I had problems I found I had memorised the transformations, which would go backwards and forwards, rather than understanding and applying the general rules. On the other hand, not knowing the algebra forced me to rely on graphical methods and probably helped my understanding.

In the French system, mathematics has a much greater role and importance. Part of the language of science is the language of mathematics, and I am here pointing to different cultural priorities.

In biology, I found that the more advanced the subject got, the more interesting it became. Initially I was put off by the sheer vocabulary - and this problem increased rather than decreased as I pursued my studies. A standard school technique, which I used myself later as a teacher, was to introduce a new topic such as the kidney by presenting diagrams, and labelling the parts, and then testing the knowledge of the labels at the start of the next lesson. Only when a basic set of labels were learned was I free to explain what the various parts did.

And here in science we come to a basic quandary or conundrum. **In order to understand, you need to know the words. In order to know the words, you need to understand**. So how do you begin? I will return to this later.

Advanced level biology to my delight included a lot of chemistry, and systematic understanding of how systems worked. The version of biology we studied - Nuffield Biology - placed very little emphasis on traditional memorisation of the classification of species, and placed a high emphasis on understanding. As such it was considered a high risk syllabus: excellent for the high fliers, but average and below average students were likely to do poorly, since memorisation was discouraged.

Advanced level biology also included statistics. I now teach statistics, and love the subject. At the time I found it mystifying. In particular I was put off by the Greek symbols, which in some ways was surprising since Greek symbols were used in physics and were not confusing. Therefore with retrospect I think the concepts were strange, and the Greek symbols only compounded the problem. Now this is significant for the language of science. We were receiving supplementary mathematics classes, taught by a mathematics teacher, but we did not understand statistics when he explained them. Similar statistics were included in the biology syllabus, so the biology teacher taught us statistics. I well remember how he did it. He began by putting all the formulae into words, and changing the symbols of the equations to the initial letters of the words used. Formulae can be expressed in terms of known words, and the teacher insisted that we write out formulae in words. Then he took us through a table, and insisted we fill in all the gaps without jumping.

As an example, take the formula for calculating Chi Square the formula became a table.

$$\frac{(o - e)^2}{e}$$

Example of a working table we were obliged to use so as to understand Chi Square

	observed	expected	observed minus expected	observed minus expected all squared	observed minus expected all squared, all divided by expected
value one					
value two					
value three					
value four					

As a teenager, I discovered, devoured, and put into practice, books on study skills. I also read widely. My tactic when subjects got difficult was to read as much as possible about them, since reading was easy to do, interesting, and, could give me an edge over the brilliant students. It was the policy of the science syllabuses in biology, physics, and chemistry to train students to understand and interpret so called 'unknown' or 'unseen' texts and phenomena. Time and time again I found in the examinations that these unknowns were known to me because I had read about them already.

I also came to like hard lessons. In my last two years at school I would often go to a science lesson and come out with my mind spinning, and with tremendous joy. I felt I had been stretched to the limit, I felt that the lesson had been really tough, and I knew I would need to go over it several more times until I understood. But unlike most of the students I now teach, I came to expect that, and I enjoyed it.

You might think I was good at foreign languages. I was not. In fact, the only school subjects I failed were foreign languages. I had problems at several levels: pronunciation, vocabulary, and grammar. I worked hard to little avail. Later I learned French systematically to the point where I can give speeches in French, conduct language lessons in French, and do simultaneous translation for subjects I know about. I learned French after I had learned the language of human biology. French was easy by comparison.

One of my courses I teach now is phonetics. It is a great pity that I was not taught the phonetics chart right at the beginning of learning French. I have argued this elsewhere
www.scientificlanguage.com/pronunciation/frenchvowels.pdf

In French it is the vowels which are the biggest problem for English speakers. I reckon to be able to explain the vowel chart to people in a few minutes. Vowels can be described in terms of tongue position, jaw height, and lip shape and students can be told how to accurately make new sounds. In addition, some vowels in French are nasal. As a teenager I should have been taught the International Phonetics Association chart for the vowels and the consonants, then be told what to do to make each vowel sound in French. When you think that I learned chemical formulae at the age of 12-13, and quadratic equations when I was 14, then the phonetics chart would have been easy.

Therefore I am rather saddened (dismayed and disgusted is what I wanted to say) at how few language teachers know how to explain how to say the sounds of the language they are teaching. Teachers, this really is a very elementary topic. It is no higher than basic Junior High school or lower secondary school. You say no one taught you? Shame on you for not teaching yourself.

4. University

My degree was a Bachelors in Human Biology. This meant that the first two years were rather like a traditional two years at medical school. [At the time we were not permitted to go on to study clinical medicine - we were expected to become researchers or teachers.

The system now is different]. Most of our lessons were on anatomy, physiology, biochemistry and genetics, with a few hours of soft sciences like, psychology, sociology, and anthropology.

It is difficult for a non-scientist to appreciate the high language load we had. It has been estimated that a medical student learns 5000 new words per year, which is around 200 per week. Anderson & Graham (1980) give even higher figures. They estimate that over the 2-3 years of an undergraduate (pre-clinical) medical course, there are 47,900 'facts' and 29,900 'concepts' to learn.

In anatomy, the lecturer would pick on 2-3 people each week, and as a warmup, quiz them on the previous lesson or lessons and humiliate them for the slightest hesitation or failure. We all benefited, and though we disliked this treatment I cannot recall resenting it. Then he would swing into action, and sketch rapidly, labelling and explaining, and worse, rubbing out sections and making changes without pause (which often demanded from us a complete copy of the modified sketch). We would come to class with at least five sheets of A4 per hour of lecture, and expect to fill them with notes. There was no pause or sympathy for anyone who could not keep up. At the end of the lesson, we might be asked questions which required us to use some of the new words which we had scarcely had time to write down, let alone memorise. Each lesson demanded prompt revision and re-writing with the aid of 2-3 textbooks. I remember once counting the number of new words in a lesson. There were over 50 in an hour, and we had three hours per week of this subject, and then there were the other subjects. Given the subject I rate this teacher as one of the best I have ever had.

The big problem though was not the thousands of nouns. **The big problem was the metalanguage**: words like superior, inferior, dorsal, ventral, ipsilateral, lateral, and so on. With such words we were expected to think in three dimensions. The lecturer could point to any part of the body, and point in any direction, and ask us to name the structures underneath and surrounding and to describe their positions relative to each other. I ended up making a short list of twenty or so location words (metalanguage), and keeping them on a card with my textbooks. In order to learn these words I made up and memorised phrases and reasoning sentences. Eg, I knew that dorsal meant back, therefore since ventral is the opposite of dorsal, ventral must be the front. To this day, it is this kind of vocabulary I find the most difficult. A few words, probably less than a hundred, are repeatedly used in combination with other words, and the language is used in all fields of anatomy. Such vocabulary requires mastery, so that no conscious thought is involved in the interpretation. It took me at least a year to become fluent in these terms. By fluent I mean that I no longer needed to slow down, I no longer had to consciously think about the meaning of these terms, and was able to concentrate on the other words being used.

I distinctly remember seeking out some aids. I bought a small nurses dictionary, which I still have. This gives very concise memorable explanations - just what I wanted. I reasoned that nurses were exposed to medical language all the time, and they were not the worlds best academics, therefore that matched my language needs exactly.

Physiology was in some ways even worse. While anatomy was mainly nouns, plus a few problem terms, physiology was all about how the systems and parts like the circulatory system and the heart actually worked. As such, detailed anatomical knowledge was essential, along with a sound grasp of the biochemistry and in some cases the physics. The high vocabulary load was coupled with a very high concept load. The ideas and concepts - even without the mathematics, were sometimes extremely difficult to grasp. Of all the basic medical sciences, physiology was probably the most demanding because there was a high load of vocabulary and an extremely high load of conceptual understanding, and these two strands depended on each other totally. It was hard to learn the language when you did not understand the phenomenon. It was hard to understand the phenomenon when you did not have the language. Both had to be worked on simultaneously, with a slight preference to doing the initial learning of vocabulary before trying to understand, then seeing the vocabulary fixed and understood as the concepts were understood.

Biochemistry was an extension of chemistry. It was basically a huge maze of chemical reactions, with their enzymes. Fortunately, the conventions meant there was a close correspondence between the chemical formula and the name, and one could be derived from the other by following the rules. There were several thousand reactions we had to learn, in groups, each group being like one part of a very complicated jigsaw puzzle. Eventually I broke it down into chunks, put them on cards, and practised writing them out from memory. After four terms of this the lecturers switched to teaching overviews: integrating themes. To our delight we could then follow the lecturers: the rote

memorisation of patterns and formulae resulted in sufficient familiarity to be able to follow a theme.

May I say here that biochemistry was the closest in science that I came to art. Time and time again I would feel as if I were in a church. As I studied the incredible interlinking complexity of the biochemical pathways I would be filled with feelings of awe, and beauty. I would be correspondingly disappointed by religion that did not present me with a God who is awesome, difficult to grasp, mind stretching, challenging, and beautiful in intricacy and complexity.

I regret to say there is nothing I know or have heard of that is comparable to this in the arts.

That is not to say that the workload was all joy. On the contrary. Here I was studying full time my favourite subject in all its facets - Human Biology - and I was faced with a huge amount of memorisation and a struggle to understand. When it came to the two months before the examinations, the work of memorisation just had to be done, and it became at the same time incredibly boring and carried a high load of anxiety: these examinations had a failure rate, and meant I had to discipline myself to do over 55 hours of work per week for 6-8 weeks. I know it was like this because I kept a log of the hours done. I deliberately avoided most company and set out to work three shifts of 3-4 hours each, morning, afternoon, and evening, with a cap of ten hours per day or 10pm, whichever came sooner. I stopped only for essentials, and took Sunday off completely. We had to do this - just to pass. It was followed by eight days of examinations: six written papers, one each day, followed by three practical examinations over two days. This was a British university! I remember the anxiety was almost crippling: I had to discipline myself to stop playing the game of 'if' and to concentrate on the job in hand - memorising.

For American readers, I should explain that Human Biology was a package - there were no options, no modules passed mainly on coursework. Most coursework was lab-reports, 2-3 per week. Some soft sciences had essays with them. As a delightful change, the course in child development had a project of studying a young child over the year in their home environment. But the major emphasis was on cramming for the pass or fail examinations at the end of the second year which tested a whole two year's work and a question require material from other courses.

In the third year the university lectures changed. Bulk memorisation of labels and chemicals was firmly in the past. Our lecturers could recall any part of it without notes and without notice. They would begin by saying that they did not expect us to remember the details, so here was a reminder. Sure enough, material learned the previous years was speedily re-activated, and we were able to go further.

5. Why then were we compelled to learn so much, given that we speedily forgot it?

I cannot remember asking that question, since the answer was obvious. We had to learn the mass of detail, because it could be speedily refreshed and recalled as needed when we went further. The memorisation was also essential for understanding, and the understanding stayed - or could be quickly refreshed.

In the first two years then, we struggled to cope with courses high in content, often abstract and most with high language demands. In comparison, the psychology, sociology, and anthropology courses were a welcome relief. The sociology course was so easy, so much a stating of the obvious, that many of us skipped the lectures and passed the examinations just by reading the lecture notes. A common practice was for one person to attend lectures, and to go with several sets of paper with carbon paper already attached. In this way one person could take the notes for three people. We students of Human Biology delighted to cross subject boundaries with indifference and impunity. In one lecture we might be considering the latest detection methods for drugs used by athletes, and in the next considering the sociology of minority groups in the inner city.

Now probably not all science degrees as heavy on language as the degree I took. Not all attempt to cover so much ground in so much depth. We were above average University students willing to submit to a very broad and intensive suite of studies. But this account does highlight some of the language problems we faced in our own first language.

6. Another language area I faced was essay writing.

I had been good at English at school. I had learned to write reasonably well, and even had a few articles published in small newspapers and magazines. I was unprepared for University, and no one took the time to explain. Complain yes, explain no. For some reason I had not learned much about essays from the books on study skills. I speedily mastered lab reports. I had been

trained in the Introduction, Methods, Results, Conclusions format since I was twelve. I had also been drilled to the point of mastery of how to summarise. The social sciences though required 2000 word essays. In my second year I took one twenty hour course in writing a book review. For the first time I was introduced to ideas like readership, level of language, appropriate content for the readership, etc. These ideas were very useful later, as a teacher, and as a researcher. In my second year I discovered the five headings essay format. I would research the material on a Friday night when I was too tired to do anything else. I would identify up to five headings. I would find 3-5 sources and paraphrase their material under my headings. Then the next day, when fresh, I would write the required 8-10 pages in 3-4 hours, in effect just synthesising and linking the points together. This was a speedy plan and produced good results - never enough for a top mark, but good enough to get it off my agenda.

Now as a lecturer I wonder if the seeming inability of my students to write essays which are concise and to the point is related to a lack of mastery of summary and synthesis.

In 1995, for a few years I lectured (without a computer) a course called 'An introduction to Computers'. This was about the time of Windows 3.1 and computers were not at all widely available. In fact, I swiftly found that many of my students had never even used a keyboard, let alone used a computer. Initially, I lectured without handouts, expecting students to learn the vocabulary each week so that I could use it in subsequent lessons. I found to my horror that these third year English Language students could not cope with the vocabulary load. My rough guess was that ten new words in a lesson was a high number for them. Now these were university students, studying language, therefore could reasonably be expected to be experts at learning new words. Sadly, they were not, and it turns out I was one of the first lecturers to teach at even this mediocre vocabulary load of ten new words per week. I ended up giving handouts, and even with that many had problems.

It seems that my arts students were not used to struggling with courses that demanded the learning of new words and new concepts. My students expected to understand all the new material straight away, and they were frustrated when they could not. In particular, they could not cope with even a small number of new words in a lesson, and they were extremely unhappy when there were new words. This is in complete contrast to my experience of studying science at university. In science, I developed a tolerance for words I did not immediately recognise or know. I accepted that learning a new subject meant struggling with the language.

I have observed that my students are often strong on rote memorisation of paragraphs, yet repeatedly stumble on memorising definitions of words. For instance, "phonetics is the study of speech sounds. Phonology is the study of sounds (called phonemes) in a named language (ie the sounds specific to the named language). An allophone is an acceptable variant of a phoneme.". I ask you. What is complicated about that? I remember explaining this in 5-10 minutes with examples to my trilingual children before they were teenagers. Why do my linguistics students have problems with new words when science students learn hundreds of small definitions like this and think nothing of it?

7. Linkers

I think it is generally agreed that the problem words are not usually the nouns, plentiful though they be. The problem words are the linkers. (Dawe 1983)

My personal experience in L1 is rather mixed. I cannot remember linkers being a problem until my final year at university when I chose to specialise in psycho-physiology. I studied how the brain works. I chose this because I was fascinated: it was my one chance in my life to study something in great detail because of the interest level, not because of examinations. I knew I was taking a risk. I could have chosen an easier subject such as education. In the end I did not get as good a final grade as I know I could have done in another speciality. But for once in my life I got an opportunity to do research at the cutting edge of science. For a few months I did some experiments that had never been done before. I discovered some details about how the brain worked and was the first person in the world to do that. For that short time, in that tiny area of research I with my supervisor was the pioneer. The thrill of it even now as I write comes back to me. There is nothing in arts I have ever experienced that is comparable to it.

Part of that research project involved reading papers assigned to me by my supervisor. I well remember being given two short papers to digest, and reporting back that I had only read one of them - to the great surprise and perhaps annoyance of my supervisor who expected better. I had logged my time, worked out that I was expected to spend ten hours a week studying under the direction of my project supervisor, and when

I had done my ten hours I had stopped - even though only one paper had been studied. The problem was the language of the papers was dense. The concepts – which in science tend to be summarised in single words or multi-word terms – had to be understood and linked together. So a sentence would have in it several concepts I was supposed to fully understand and be able to link together logically. **The density of the language along with the linkers defeated me.**

In later years sometimes people would bring to me journal articles they did not understand. My common tactic is to read the abstract, and then if I do not understand part of it, to seek the expansion in the relevant part of the paper. I used to do this long before I had studied 'discourse analysis' which makes these patterns which exist in the text explicit . I had learned subconsciously, simply through reading papers, where to look in the paper for the relevant part of the abstract.

My experience at University of the soft sciences was rather different. We despised the **wordiness.** We despised the triviality. We despised the way the material was so easy - hardly degree standard compared to the difficult work done elsewhere. We disliked the way there was a lot of unsupported subjective opinion.

The wordiness, banality, subjectivity, and non-difficulty of the soft sciences was sometimes a problem. This was not helped by the way some (though not all) textbooks did not use a well developed sequence of headings. Sometimes whole chapters, in fine print, existed without a single heading in sight! This made the job of the reader much harder. The first thing I had to do was to outline these chapters, to the usual four or five sub-levels, and only then could I see the structure of the argument, the evidence presented, and so on.

In the end, wordiness was probably less of a problem than dense texts. But **I was more irritated by wordiness in a text than I was by denseness.**

I learned as a teenager to write headings and subheadings in my essays. I did so because my handwriting was below average, and I discovered that clear headings improved my marks. I suspected that overworked lecturers merely read my headings, and checked that the content of them matched the headings. I use a similar marking method now, though my arts students are strangely reluctant to use this presentation style. But while science lecturers accepted my headings, the soft science lecturers disliked them: I was even told by one of them to rewrite the essay without the headings as a way of improving my marks. What nonsense, but there you are.

We were also obliged at university to do two hours general studies. The theory was that science students were very narrow people, therefore needed some non-science subject as token compensation. When you consider the wide range of subjects within Human Biology, this was a hard prejudice to take. As scientists we could grasp any other subject we wanted (except perhaps foreign languages). I have yet to see an English major also volunteering for classes in statistics or anatomy. I know many scientists who are also skilled musicians and skilled in other arts subjects. So clearly it is the arts students who are too narrow, not the science students. But we all accepted general studies with good grace as an easy extra two hours class time.

8. Applying Adult L1 learning methods to L2 acquisition

When I came to learn French and Arabic as an adult, I naturally tried to apply the methods of learning in L1 to L2. They partly worked for French, but not for Arabic. Let me explain.

My schoolboy French had at least given me the basics, and also a terrible accent that took a lot of work to change to anything like reasonable. Within a few months of going to France I had though covered the basics, and was ready for massive language expansion. This I achieved by several methods. Firstly, I enrolled in a University language programme, and given the choice between level C which I could do and level B which I would probably fail, I took level B classes since I liked being stretched, and I did not need certification. The main teacher would give us a magazine article each week to summarise. The subject varied each week, and was so designed that we covered most major vocabulary areas in 20 weeks. I found that to summarise I had to understand every word and every sentence. When I looked up a word, I also took care to note down the cognates and phrases. I established bilingual lists, which I spent up to an hour a day revising. In this way I could learn over 100 words a week, and, by being forced to write summaries, I was forced to be accurate.

In many ways, this L2 style which I loved reflected the ways I had coped with the high language demands of anatomy. Once out of the anatomy lecture, ideally the same day I would re-read my notes and annotate them and make clear anything that was likely not to be clear

when I next looked. Then I would open 2-3 textbooks, and I would do a quality synthesis of notes and textbooks. With practice, one hour of lectures led to two hours of synthesis. The synthesis included diagrams and drawings. I would look up words and sometimes would look up prefixes and suffixes. Necessity taught me to do this - not any formal instruction.

In a similar way, the first thing I did when summarising an L2 text was to look up any words I did not know. Each word led to opposites, nouns, adjectives, verbs, related words and phrases etc. I would then work sentence by sentence and make sure I understood each sentence. Sometimes I would know the meaning of each word but struggle to understand the sentence. This would be worked on by considering alternative meanings of words, and by considering the wider context. I would spend over half my time just doing the work of word expansion and study of meaning. Finally, I would write the summary. I can never remember struggling with what to say. I can never remember having problems deciding what content to include and what to exclude.

Another consequence of the summary (which would take a day to do) was a long bilingual list of words and phrases. Sometimes the list would be over 100 terms long. I would aim to learn most of them within a week, and I did so by daily practice. I would first read a page slowly. Then I would cover up one side - usually the French side. I would try to remember the French. Over several days I would learn most on the list, and those that could not be learned were re-written on a priority list of tough words - the very act of rewriting helping me to learn them.

My experiences learning to write French have influenced my views of how to teach advanced writing for L2 learners at university. I also instinctively dislike analysing text structure, preferring to learn a style by reading good examples of it and consciously trying to mimic it.
Because I liked L1 and L2 summary writing, and because I view the summary and the synthesis as the core writing skills, and because I wanted students to mimic good style, I introduced a variety of texts where the content was interesting and provocative and taught the students to identify and assess the line of argument and summarise accordingly. The best texts for this included editorials, provocative commentaries, and longish book reviews.

The art and craft of writing good summaries, of doing 'precis' as it is poetically known in English, is at the heart of all academic writing. It is a highly transferable skill. It crosses subjects, and crosses languages. It is probably linked to good habits of academic reasoning. I cannot remember how it was taught to me, except that I learned it at school, and I enjoyed doing it. The basic skills were extended when I studied books on how to study, and learned for instance the rule of fives for revision. Read your notes five times, shorten by one fifth. Study your shortened notes five times and a few days before the examination shorten them by one fifth. In this way, 125 pages became 25 pages then became 5 pages and the day before the examination became one page.

Once precis is mastered, then evaluative comments can follow, and other more advanced discourse genres can be learned such as the 'synthèse' - that delightful French genre where you are given three or more sources of information and argument, which sometimes conflict, and you have to summarise several arguments and arrange them in a coherent order.

So in writing classes I concentrate on precis. I begin the classes by making small speeches about some aspect of study skills. Students take notes, then summarise them for me in a coherent paragraph or a linking series of points and sub-points. I then correct their work and type up for class discussion examples of their work. In later lessons I like to take editorials, provocative articles, and full length book reviews. Sometimes I use an article, with subsequent letters to the editor, or, increasingly, choose such material from the internet where the site has provided an opportunity for reader comment. These reader comments give ample opportunity for students to synthesise different viewpoints. The genres I have chosen I believe are the closest real world examples to the essay format beloved of certain lecturers. Because the essay format exists mainly in some branches of academia, and mainly for the purposes of passing examinations, I see little point in teaching it. I would much prefer to teach students to write real world material. But faced with the reality of helping them to learn this rather artificial genre, plus the demand for students for lots of good examples of the genre instead of formal instruction in it, I believe in giving them editorials and book reviews - the nearest real world genres I can find.

I also teach students to avoid long introductions. An essay asking for the main problems of pronunciation of English experienced by Arabs could well begin with: "The main problems of English pronunciation experienced by Arabs are: " Then I would expect a

numbered series of paragraphs, each one introducing the problem, offering a commentary and an example. There is no need for a conclusion when answering this question.

But while my abilities in precis worked well in French, my attitude towards essay writing did not. I remember having tedious lessons in essay writing. Tedious, because I thought I knew what an essay was: I was a graduate and a qualified and experienced teacher. It was to be many years later that I realised there was a culture clash. At the time I did not understand, and no one thought to explain, that the essay genre in French is very specific and very stylised, with extreme attention to form and the balance of phrases in a paragraph. I was therefore a miserable failure because I attempted to write French essays using the loose styles and forms I knew so well in English.

I am trying not to be prejudiced, but this French attention to form not just content and clear precise language seems to me even today to be a form of wordiness that is vague and unreal and says very little. It is hard to put your finger on it. But even today when I read articles and conference proposals in English from someone heavily influenced by French I sense, and revolt against this form of art with words. When learning French, with my very strong pragmatic prejudice, even if I had been alerted to the problem I probably could not and would not have changed. But at least I would have known that the problem was one of cultural expectations, not one of French language per se. Of course, this flowery French is not everywhere. Something like it probably exists in English -and if it does I will equally revolt against it.

While learning French I attended lectures in several subjects. Most of them were history, literature and philosophy. I was willing to learn something new, but the lecturers assumed we were all arts students and knew these subjects in our own languages, and taught accordingly. I well remember hotly disagreeing with the philosophy lecturer who announced at the beginning that philosophy was literature! If you count the books of Karl Popper as literature I would agree with him in part. My essay for him involved logic equations and references to philosophy textbooks which summarised the views of several philosophers using lists of main points without a single quotation - as you can imagine it was not well received. And this lecturer had barely heard of Popper, probably one of the most significant philosopher in the 20th century, and whom I had read. I as a student could be excused for not knowing the traditional French philosophers. As a lecturer in philosophy who had apparently not even read Popper he should have been sacked.

But we did have a lecturer who taught us the demography of France. I had studied demography as part of my degree, and in this fascinating course of French demography I learned the most French. I knew the demography of Britain in detail, and the basic concepts of the discipline. Now I heard the concepts again, in French, and applied to France. This was ESP at its best. My background expertise was called upon, and I was invited to apply it and learn in fascinating detail applied to the situation of France. In addition, the lecturer was an immigrant who had lived in France for over 20 years, and thus was capable of highlighting and explaining France as someone who was an insider and understood the questions of outsiders. His two hours consisted of one hour of presentation and one hour answering questions. How we loved him, and he evidently loved explaining. I repeat, this was ESP at its best. Or perhaps I should say FSP - French for Specific Purposes.

My language learning methods failed miserably when it came to Arabic. They failed because my methods were applicable to an advanced level of language learning, when the basic language patterns are well established. On the other hand, I achieved a better accent in Arabic because I was exposed to Arabic in an arab country, and drilled in pronunciation from the beginning by native speakers of Arabic.

I failed in Arabic because I applied the advanced methods too soon. The result was I swiftly had a large vocabulary, but could not put sentences together. Therefore later I had to go back and re-learn, so wasting a lot of time. Even now I think my fluency problems are due to lack of vocabulary which causes me to make clumsy phrases. The hearer though thinks I have a problem with grammatical structures.

Another reason Arabic was harder is that I was cut off from a major source of language - reading. Firstly there is the problem of the script, which took me over two years of continuous use until I was at the point of recognising whole words rather than reading letter by letter. Secondly, there is the way that Arabic is diglossic, therefore the vocabulary of the written text tends to differ a lot from the spoken dialect which I learned. A major input into my French was my reading. Books and articles in Arabic dialect scarcely exist - they exist almost exclusively in Classical Arabic. In addition, simple books in Classical Arabic which are interesting are also hard to find. Therefore my spoken -

dialect - Arabic was deprived of a major language mode of input.

I should explain that the genres of adventure and thriller, such as Alistair Maclean, John Buchan etc scarcely exist, and where they do they have been translated. I once challenged a Tunisian colleague to find for me some interesting books in (Classical) Arabic for my children to read - as gripping as Agatha Christie. He had to admit defeat. Fortunately, special interest magazines do exist in Classical, as well as extensive news reportage. But the Classical is so far away from the language I use from day to day that it would take a major effort to learn it, whereas in French, the interest magazines provided welcome input into my French program. Twenty years later, I am picking up some Classical Arabic because all the notices and documents at work are in Classical. In the true sense and spirit of Plurilingualism I am learning administration Classical, particularly that used in the world of education.

Some L1 skills have transferred. As a teenager I borrowed a book and taught myself speed reading. With that came learning to be selective. A lot of the communication of official letters to me is in Arabic. I often get invited to meetings, thesis defences, etc. As I delight to show my students, I actually need very little Arabic to be able to read such letters. First I check to see if the letter has been correctly addressed to me. Then I check who it is from - and the institution names are memorable. Then I look for an Arabic number, which usually precedes the month name (in Arabic) and a time (usually in words). I ignore the place, (the room) since I know from experience that such information is usually unreliable, and when I arrive I routinely check with the administration as to where the meeting is. I then look briefly at the agenda, and ignore all the rest. If unsure I will check what I have understood.

Arabs in North Africa really are in a language quandary. There is a large difference between the high and low forms of their language, and the gap is much greater than that which exists in English. The gap is so great, that it is like asking a French person to do their academic work in Italian. Students are faced with learning what they simply call Arabic (since dialect is not usually regarded as a language), and learning French, and now also learning English. In the battle for priorities, all seem to suffer. The foundations for advanced learning are weak: students find that to learn Classical Arabic well is as difficult as learning any other foreign language. Lectures in Science subjects are usually in French at University, but sometimes are in Classical Arabic. Neither are usually known at the C1 mastery level. Teaching ESP in a diglossic multilingual society faces the fact that the students may well be struggling with the basics of the main language of the science content, over and above the language demands of the subject itself.

9. L1 language attrition

This subject has largely been studied from the point of view of:

1. losing the first language, especially in immigrant children,
2. the minimum time in a language needed for it to be permanent. Thus for instance, bilingual children who leave a country can lose that language, unless they are 12-14 years old, and unless some active steps are taken to keep that language alive.
3. The way some adults stop learning L2, and then even go backwards in L2.

But what of **monolingual L1 attrition**? Practically everyone who goes to university rapidly forgets a large part of the studies. It is well known among subject teachers at school and university. It is so well known that there is a joke in medical education that within twenty years, half of what is taught will be out of date, but the trouble is, knowing in advance which half, and modifying the curriculum accordingly. But where are the systematic studies of it? Why does some specialised language remain and not everything is forgotten? Is this idiosyncratic, or are there patterns? What is the relationship to language loss and knowledge loss?

It is said that it is easier to re-learn a language than to learn it. How true is this? Under what circumstances? How easy is it to relearn adult domains of language/knowledge, as for instance in anatomy, physiology, or biochemistry?

And how does this bear upon ESP? **It is time that ESP grappled with the transient nature of much of specialised vocabulary in L1, and how this can affect L2.** Part of the transience is that recognition will always be higher than production. My recognition and production levels were similar when I did my examinations. I lost the production within a year. The recognition loss took maybe 2-3 years to go. What is left though is an emotional fondness for the subject and the language, and no fear whatsoever of reading technical subjects, particularly those related to the subjects I once studied in detail. What has also stayed

is a tolerance for difficult material and a great confidence that I can understand if I want to, a confidence that may be misplaced.

My experience is that people are often overconfident of their language recognition abilities. What patterns are there in this match or mismatch between confidence and ability?

Take your average doctor. All doctors will have a huge residual knowledge of areas they have not used much in their professional life. In particular, doctors have a huge residual recognition (passive) vocabulary and passive knowledge. What bearing does this L1 situation have upon doctors who learn their subject through L2 not L1?

Of course, it depends on what kind of doctors. Specialist researchers are different to doctors wanting to work as GPs in Britain.

In ESP, what are we training people to do? We are not usually repeating the whole content courses in English. But sometimes we are. Doctors and others coming to Britain are sometimes required to resit their subject examinations in English. Other times, doctors just want more help in reading, writing, and making conference speeches. How can we best help L2 doctors to cope? What shortcuts are there?

I maintain that only by systematic comparison of language pairs, with a look for patterns and traps can we begin to provide the tools. And this language comparison work is generally not being done. In addition, ESP has failed to study adult L1 gain and loss, in the context of diglossia and plurilingualism.

10. New Scientist

After graduation, for years I kept the language of science alive through reading the New Scientist. It was not cheap. I did not always understand. In particular, in my own subject area of Human Biology I sometimes struggled. But for many years the arrival of the New Scientist meant an excuse for a one hour break. Sheer pleasure. After over 15 years of it I stopped the subscription. Partly it was the arrival of the internet. Partly it was an economy measure. Partly it was frustration with the rabid anti-creation views. (And yes, I did write and tell them). Partly it was a desire for more medical content.

Living abroad, we had to take more responsibility for organising and choosing our health care. Therefore we invested in two books: the Merck Manual, and the British National Formulary. The former is a summary of medicine for the medical profession and is now available free of charge on the internet. The formulary gives drug dosage information. For ourselves, and for our friends who sometimes phone us and ask us to check medicines for them, we have found these books to be invaluable.

The challenge in the Merck manual is that I studied pre-clinical medicine - never clinical medicine, and this book is full of clinical medicine terminology. Hence I still use the Nurses dictionary.

There are big linguistic challenges with prescription medicines. Firstly, the brand names are often widely different in different countries. Secondly, even when you can get hold of the so called 'systematic' name, it is not always international. I documented this phenomenon for chemicals discussed in schools in my doctoral studies. Fortunately, the British National Formulary groups medicines very nicely. Sometimes I have identified a medicine by going to the class and subclass and looking at the dosages and descriptions for the different medicines.

Linguists: this ought not to be. Linguists should have dived in years ago and made order out of chaos and published their findings.

Fortunately the internet is now a help. By looking at the manufacturer of a medicine you will sometimes see the alternative names provided.

One of my frustrations with popular and semi-popular science writing that comes out of America is that they are still using extensively units that feel like they belong to the dark ages. And I write, proud to belong to the generation in Britain who were obliged to learn the old and the new system, and learn the conversion factors between them. My problem is that I have forgotten a lot of the old units, and with that the conversion factors. It is even worse for people ten years younger than me who never learned the old system. Since American Scientists must know the SI system, they could at least provide measurements in both systems when they write.

11. My joy in reading Cystic Fibrosis journals

In 2003 Cystic Fibrosis was definitively confirmed in my daughter. In 2005, I finally got 24 hour slow broadband internet access, and my university provided me with some access codes to journals. I signed up for the Pubmed journal update service. Almost all my knowledge of CF has come from genuine medical

journals. I routinely print them off, then study them looking for specific points of interest to me and my daughter. Thus for instance, while I keep an eye on the issue of lung transplants, since this is we hope a long way in the future for my daughter I pay little attention to it. On the other hand, physiotherapy, nutrition, antibiotic regimes, and the status of new medicines and treatments - the so called horizon products - interest me greatly. Also, because my daughter is under threat of needing intravenous antibiotics, I am keen to study all aspects of that.

Do I understand all I read? It depends on the journal. I have observed that since CF is a multi-disciplinary disease, that material often repeats itself. Reviews are often easier to read than the original research, and reviews put the research in perspective. Sometimes the reviews are for a general medical audience rather than a specialist medical audience, and as such are easier to follow. Does it matter that I understand everything? No not at all. Reading medical journals is a real pleasure - especially after reading some linguistics articles. I can extract the information I want, with some extra work if needed. Again, this is exactly what plurilingualism is getting at - adults acquire and maintain the language they need, in whichever of the languages they know, be it L1, L2, L3 or other language.

12. Fear in L1 and L2 learning

Some current research focuses on anxiety in the L2 classroom. The basic assumption seems to be that those who are anxious will not learn as well as those who are less anxious.

I disagree.

Their views may be valid for some people some of the time.

What I will say now is only anecdotal. I fully realise the implications of that. I realise that I could be in a very tiny minority. But since I have never seen fear defended as a motivating factor which enhances learning, let me give an alternative point of view. What I write now could give ideas for extending the research into anxiety in language learning.

In my primary school, years six and seven, I had a fearsome compassionate and brilliant teacher. She managed a class of 46. She handled a huge variety of ability. She did it by putting the six brightest students together on the same table, and arranging a progression of tables down to the least ability. She would divide and rule for teaching. She would introduce a lesson by having the whole class concentrate on the exposition. Then she would give the best table some exercises to do while giving more teaching to the less able**.**

Her weakness in teaching English was that she lacked an emphasis on formal teaching, especially spelling. She encouraged free expression. She did not repeat that mistake with mathematics. She trained us in mental arithmetic. Nearly every morning would begin with a 'tables test' - she would put two numbers on the board, for instance x5 and x11, then a series of ten numbers in random order from two to thirteen. We were expected to write down twenty answers in two minutes, then 90 seconds - she timed us. After a few weeks of this incessant daily drilling, she implemented a policy of zero tolerance on the top students. Shame on us (and it was a public shaming or worse) if we made one mistake. Lower ability children received more tolerance, at least initially. This fear motivated us to learn well our multiplication tables. At the time it was not a paralysing fear: it was a big help - even a thrill! These tables have proved so useful to me all my life.

In the secondary school, I eventually had a teacher of English who had almost zero tolerance for spelling mistakes. Each week we had a piece of writing homework which was marked in detail. Every single mistake was noted and meant a penalty mark of minus two out of twenty. All of us had our mistakes announced to the class, and we had to write out a list of mistakes at the back of the book. The same mistake twice merited a public scolding - and her quiet words had the force of the cane. One day she gave us that inestimable piece of advice: if you cannot spell a word in an examination, find another word of similar meaning that you know how to spell. Under her smiling fearsome tuition my spelling improved dramatically - and so did my writing, since I was more confident of the words. I came to love that teacher, and she loved us and loved her job.

In my third year of French, I faced a similar gifted teacher. For two years I had struggled to learn French. I just could not remember the vocabulary let alone pronounce French words. This teacher changed all that. Most of the time he was very genial and interesting. He did not require us to learn long lists of vocabulary. He did not ask us to memorise paragraphs - both methods that had totally failed on me. He would take a text and ask us to translate it into English. Then he would pick on us all in turn, and we had to translate a few lines. Two mistakes due to lack of preparation meant an

explosion of damning words coupled with the shame of an hour's detention (which in my case meant missing my bus and getting home two hours later than usual). One day, unusually, he gave us a list of twenty key phrases to memorise, with the smiling remark, "When I test you in a few weeks time you will know them all perfectly, won't you?" Before each lesson for the next few weeks we made sure we knew those phrases. We did, and we never were tested.

I remember that we loved this teacher as well as feared him. We feared his explosions and rebukes. He was a man of extremes - genial and encouraging, but fearsome and damning when crossed. We knew his wrath was for our own good, and deeply respected - even liked him.

We loved him because we found French difficult, and we wanted to learn it, and we understood that the fearsome side to his teaching was an incredibly effective help to us. Unfortunately I only had him for six months: I moved schools, and went on to fail my French examinations. I only learned French later, as an adult.

As an adult I remember learning French from real French teachers. These teachers sometimes made remarks that the Americans resented but which us Brits found to be totally acceptable. For instance "you have made the same mistake three times this week". Even as adults we expected teachers to be firm with us - but the Americans had a different viewpoint. Now I am 50 I would expect the language teacher to be slightly more polite to me, but as teenagers in our 20s some firm caustic stinging remarks were incredibly effective in helping us to learn a language.

It is very interesting to me that business people, who require cost-effective learning, sometimes deliberately put themselves under similar pressure. For instance, to fail a course can mean a fine or loss of pay or loss of promotion. For instance, doing intensive courses where the students promise to read write and speak only in the language they are learning, with some fearful consequence for instance of expulsion if they broke this rule.

13. Research questions

1. How general is the metalanguage problem in L1? Is this a matter of learning styles? (another dangerously inconclusive area of research). Is it more of a problem in some subjects than in others? What does it correlate with? (eg inability to remember names).

2. There has been a lot of research on the passive learning of L2 language, for instance, passive vocabulary acquisition. What research has been done for L1? (children and adults).

3. What methods are used in L1 to cope with high language subjects? A good area for research would be pharmacy. I remember deliberately avoiding this subject as a degree because of my known problem with names, and the evidently high level of names in that subject.

4. What marks the successful L1 language learner of specialist subjects?

5. How does the picture change once diglossia is involved?

6. How can L2 specialised language learning be made more efficient that one way is by careful comparison of languages, with classified lists, marked as similar, be careful, and different.

14. Why I wrote this essay

1. Little work has been done on adult first language acquisition. This case study is an initial step towards exploring this field. As such it suffers and gains from all the normal limitations and advantages of this kind of research.

2. This study aims to tell it as it is, or was for one person, for the benefit of researchers and teachers of adults.

3. The study raises a lot of questions, some of which could be turned into testable hypotheses.

4. Adult first language acquisition is almost completely undocumented (unless I have missed something, in which case I hope someone will inform me). This is a first step towards opening up this field of research, and a challenge to do the research.

5. The study concerns L1 adult language learning, and also L2 learning. In particular, I am concerned that ESP has not compared Like With Like. Medical students for instance are learning the language of medicine in L1 or even L2, and are wanting English to be able to work in medicine in L3. In what ways is L1 acquisition of a speciality similar and different to L2 or L3 acquisition?

6. When considering ESP, plurilingualism and diglossia are rarely considered. I regard this as shameful and in urgent need of correction.

7. One use of this study would be to give it, or parts of it, to students of science, and test out to what extent my experience is replicated in their experience. Even when there is little common ground, the ensuing discussion should be very informative for the ESP teacher.

8. Because science specialities often have an extremely high language load, much higher than in the arts, and because most language teachers are arts trained, there is a huge language learning gap between science students of English and their arts trained teachers. This study attempts to tell English teachers what it is really like, linguistically, to study such subjects.

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