



NEUROLOGICAL FRONTIERS

By Mario Rinvoluceri

For 25 years I have worked as a modern language methodologist and now, suddenly, in mid-career, I see a whole new horizon opening before me. For 25 years, in the excellent company of people like Alan Maley, Bernard Dufeu, Andrew Wright, Paul Davis, John Morgan, Jean Marc Care, Herbert Puchta, Luke Prodromou, Donald Freeman, Tessa Woodward, Seth Lindstromberg, and Peter Grundy, I have beavered away at exercises that have certainly made the language classroom much less tedious than it was in the early 70s, a time when I greeted the poverty-stricken bag of activities proposed by Robert O'Neill (1971) in *Kernel Intermediate* with rapture - they were so much better than what we had had before. We now have available a powerful edifice of techniques to use in the EFL classroom, and it is the methodologists who have borrowed them, adapted them, and created them. The fact that maybe not more than 10,000 of the 400,000 colleagues who teach EFL in China's Secondary Schools know anything about these techniques is a sad one. The fact that you can do a Master's in ELT in the US or the UK and learn very little about the sizeable toolbox now available is a sad fact, too. However, the knowledge and experience are there and available in 200 or 300 teachers' handbooks, from where they gradually filter into the internationally produced coursebooks.

The snag in the methodologists' work

Our main problem over the past 25 years is that we have devised exercises with very little knowledge of how people learn language. We have had to work with little or no scientifically validated knowledge. We have had to follow our hunches and work artistically. Having devised an exercise, we have been able to watch students using the scenario in question and then been able to think analytically about how the exercise appears to be helping (or not helping) the learner. In this area, sadly, the writings of most of the applied linguists have been of little help.

The neurologists of the brain, people like A. Damasio, have recently started publishing material that begins to describe how learning may take place, and which areas of the human brain are involved. With the growth of these neurological studies we are gradually building up a physiological picture of how learning happens. If this continues, then language methodologists will have some basis for favouring Activity A over Activity B in terms of the brain activity provoked by each.

Let me illustrate the way discoveries in neuro-science can suddenly throw light onto an area of language teaching where before what we did was little more than psychological guessing.

Correction as an example of an area illuminated by neuro-science

When I first came into teaching 35 years back, correction was not an area of worry or concern. The student made a mistake and I said: "Not *'teburu,'* Hiroi, say *'table'.*" Was that not what teachers were there for?

The next step, for me, was to observe students as I corrected them and to wonder what they were really doing with the correction. I began to notice that the Hirois went on saying *'table'* wrong, despite my best correction effort. I noticed that oceans of scrupulous red ink did not much improve my students' writing.

After doing some psychological reading and after working with some master teachers, like Gattegno, I realised that the acceptability of correction, like the acceptability of any advice, depends on who is giving it, when, and where. By looking at behaviour correction in the family, it has become clear that there is a big difference between parental correction and sibling correction, parallel to teacher and peer correction in the classroom. This brought greater clarity into my thinking; and, since then, I have devised a variety of parental correction techniques and sibling ones.

When I began writing letters to students, I realised that I did not want to correct the letters they sent me. It seemed to run against the grain of the communication to give them their letters back with marks all over them. As I corresponded more with students, I realised how right my instinctive refusal to correct had been. By not focusing on the negative, I helped students open their wings and fly across the page, take risks and try to say things they really could not yet say. I then added principled zero correction to parental correction and sibling correction.

All this thinking about correction up to this point had been 'teacherish' and psychological. I had only dealt with correction from the outside, social correction. But what about self-correction? Why do second language speakers correct oral mistakes they make a second after making them? How do they do this? Using some of the tools offered by Neuro Linguistic Programming (NLP), I set out to find out how. I discovered that people are very different in the way they self-correct, at least according to the accounts they are able to give of the process. Here is one native English speaker's reflections on this matter:

"When I am speaking Russian or German and waiting for a speaking turn in a conversation, I will suddenly get an abstract picture of the shape of the grammar I intend to



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use ... When this happens my sentence usually comes out correct ... My visual monitor serves me well, when it is activated before I speak. However, if it switches on while I am in mid-sentence and allows me to see I am making a mistake, then I go to pieces ... I pause and stumble ... This is a very bad feeling." (As cited in Brown, 1999, pp. 39 - 41).

This speaker seems to see grammar as a visual entity. This is not always the case. Here, another English speaker describes what happens when she is speaking Spanish:

"If I am in mid-sentence and I make a mistake I am aware of, I hear one of two voices in my head. One is on the left side and it comes up from below, curls round the left side of my head and then goes out in front of me. This voice is kind, soft and low and it is very easy to accept correction from it. The other moves in a directionally similar way but on my right side. It is harsh, loud and accusatory and I hate accepting correction from it. I fear it." (As cited in Brown, 1999, pp. 39 - 41).

Accurate, self-reported information about students' inner processes of self-correction is of immediate practical use to the teacher. If I were teaching Russian to the first English speaker, it would never make sense to interrupt his conversational flow to correct anything: why imitate the dysfunctional side of his inner monitor? If I were teaching Spanish to the second English speaker, I could do great harm by offering correction in a voice that seemed loud or harsh to her.

Self-correction also fascinates the neurologists. They want to know what exactly happens in the brain when someone self-corrects. They have used brain scanning to discover that during error correction there is intense activity in a curve of gray matter just under the frontal lobes, an area known as the anterior cingulate cortex, or ACC. Researchers from Pittsburgh University report that the ACC, when monitored with magnetic resonance imaging, seems to activate whenever its owner gets a simple task wrong (Carter et al, 1990). In their experiment, the subjects were asked to distinguish between different letter sequences. As a language teacher, I am amazed to learn that a discrete set of cells are activating the first English speaker's abstract pictures about Russian grammar and setting off one or the other of the second English speaker's correctional voices. The anterior cingulate cortex is the actual location of the internal process that students have described to me in conscious words.

If only I were competent to read and evaluate what most neurologists are producing, week by week, month by month. Knowledge of what the brain does when we self-correct, when we are corrected by a teacher, when we do

not notice our mistakes is central to how EFL teachers should go about teaching. In my view, brain neurology, already has offered and will increasingly offer language teachers answers to questions we have not yet had the wit to ask but which, unknowingly, we need answers to.

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ACKNOWLEDGEMENT

This article was first published in *The Language Teacher* JALT in June 1999. Reproduced with permission.

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