Riding the waves to academic success

Richard Ingold and **Daniel O'Sullivan** explain how understanding semantic waves can help students improve their writing.

Some educational theories are so complex that they are destined to remain nothing but esoteric curiosities. Others, despite their complexity, have such wide-ranging, practical implications that they seem to force themselves into your classroom; before you know it, you can't imagine how you ever got through a day's teaching without them.

For us, Legitimation Code Theory (LCT), and in particular its concept of semantic waves, has been one of those how-did-we-ever-teach-without-knowing-this theories. It has shifted our approach to teaching EAP, infiltrating every lesson plan and all the materials we create. And we're pretty sure that with the theory's lynchpin, Karl Maton,

giving a plenary at BALEAP 2017, its influence is set to grow and grow. So what exactly is LCT? What is a semantic wave? And how can this idea help students produce better writing?

LCT is sociological theory of knowledge (Maton, 2014). Basically, it looks at the world and asks how people in the various aspects of their lives as, for example, sci-fi geeks, mechanics, cricket fans or biologists, learn, use and teach others information. It examines the ways someone becomes an expert and how they claim legitimacy in their chosen career or hobby, or even in their daily life. To do this, LCT analyses the world from a number of different perspectives, one of which is semantics.

Semantic density & semantic gravity

Semantics, as the name suggests, is concerned with meaning. There are two key questions here: (1) How much meaning does something contain? (2) How close to a specific context do you have to be to understand something?

The answer to the first question reveals the degree of semantic density that something contains. The answer to the second question reveals how much semantic gravity there is in something. (We've used the word *something* here as meaning can be found in so many things – a symbol, an item of clothing, an action, a colour, etc. – but from now on we'll focus solely on language.)

As an example, let's take the noun *apple* in the question *Do you want this apple?* Here, *apple* conveys a really simple meaning. It refers to a particular piece of fruit being offered. So we can say it has relatively weak semantic density. However, as the determiner *this* shows, the apple in question is a specific one; you need to be there to see it to know exactly what is being talked about. This means it has strong semantic gravity. It is bound to a specific context.

In contrast, consider the noun *diet* in this example sentence: *Good health relies upon diet*. A lot of meaning is packed into the word *diet*. It contains the ideas *food, someone eats* and *regularly*. So we can say *diet* has relatively strong semantic density. Also, the meaning of this word is not dependent upon a specific context.
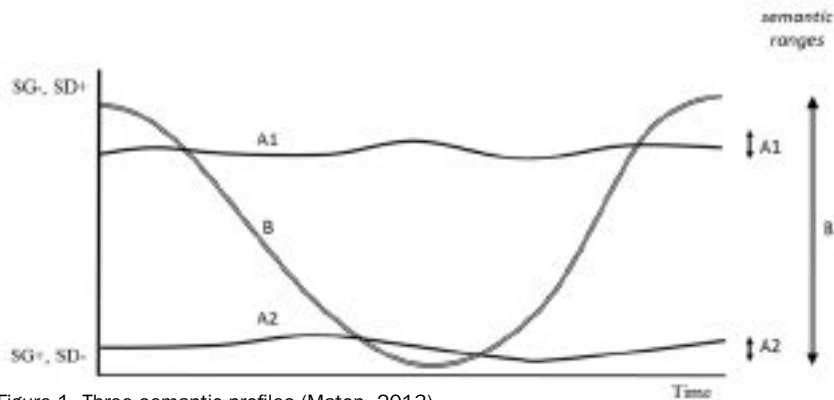
Figure 1. Three semantic profiles (Maton, 2013)

It doesn't refer to an object in time and space but to a concept and so has weak semantic gravity.

Semantic waves

If this all seems a bit too technical and far removed from teaching EAP, hang on. We're getting to the best bit now. Studies using LCT (see, for example, the special edition of *Linguistics and Education* [Martin & Maton, 2013] which is dedicated to these ideas) have found that the way in which semantic density and semantic gravity change throughout students' texts affects the marks they receive. And this brings us to semantic waves.

Take a look at this example text from some classroom materials for a low-level EAP class (IELTS 4.5) that Richard's been working with.

Example paragraph 1
People who run can become healthier. When people run, their hearts beat faster and so their heart and blood vessels become stronger. Also, running makes people's bones and muscles become stronger. In addition, people who run can lose weight. The energy people get from their food is used up when they run and, importantly, the fat in their bodies, which can make them unhealthy, is burned. This is why running makes people healthy.

This example has the basic elements of a stand-alone paragraph that most of us ask of our students; it fits 'the hamburger model' of paragraph structure. It has a topic sentence indicating the main idea of the paragraph. It has supporting sentences that explain and give more

details about the topic sentence. And it has a concluding sentence that returns to the main idea. Compare it to example paragraph 2, however.

Example paragraph 2
A balanced diet makes a major contribution to good health. This is because it provides essential nutrients for the human body. For example, the micronutrients, vitamins and minerals, are needed for the body's cells to function well. Different types of food contain different amounts of these nutrients and so it is vital for people to eat a wide variety of foods, such as rice and bread, fish and eggs, and vegetables and fruit, every day. The human body extracts nutrients from these foods and uses them to grow and repair itself. Therefore, consumption of this diverse range of foods will result in the nutrient-rich, balanced diet which is essential for the maintenance of human health.

It's pretty clear that the second paragraph is better than the first. But why? The reason can be explained through the idea of the semantic wave.

While the semantic density and semantic gravity of the words throughout the first paragraph are relatively uniform – *people, run, heart, bones, stronger, lose weight, food, fat, healthy* – the semantic density and semantic gravity of those in the second paragraph change as the paragraph develops – *diet, contribution, nutrients, vitamins, cells, people, eggs, consumption, diet, maintenance*. This development creates a distinct wave pattern.

If you take a look at the diagram in Figure 1, you can see three of the

many possible semantic profiles. The low flat line matches the first example paragraph. The wave matches the second, better example. The high flat line represents another possible paragraph profile in which there is a lot of dense, abstract language, but no clear explanation or exemplification. On the right of the diagram, you can see the semantic range of each profile and this is the key. To be successful, students have to be able to use meaning-packed, non-context-dependent language and prove that they understand it by unpacking it and grounding it in the real world. They have to demonstrate a wide semantic range.

Using semantics in the classroom

As EAP teachers, our aim is help students to make waves. The first step in this process is to make them aware that waves exist. Although the terminology and concepts surrounding semantic waves may seem a bit technical for classroom use, there are many ways to translate these into more friendly terms. With a language focus, you could use the terms meaning-packed—simple, academic—everyday or Power+—Power-, where Power+ refers to meaning-dense language like *diet*, *mitosis* and *neo-liberalism* as well as nominalisations like *contribution*, *consumption* and *maintenance*, and Power- refers to simpler, more everyday language (McNaught *et al*, 2013). With an ideas focus, you could use general—specific, theory—experience or ideas—explanation.

To raise students' awareness of waves, we do a couple of things. We give them example texts like the two paragraphs above and, after focusing on either the ideas or the language in these texts, we show students a selection of diagrams that could represent the structure of the paragraphs (see Figure 2) and ask them to find one that best matches the paragraphs they are looking at.

For a guided discovery activity introducing the wave to students, we cut out key noun groups from example paragraphs and ask students to place them on graph axes. As they do this,

students carefully consider the language and ideas contained in the excerpts from the text and compare their relative semantic strengths. As they construct the wave, students begin to see that while good supporting sentences explain and give details, as the hamburger model emphasises, they also need to have a logical development and flow which comes from changes in the semantic density and semantic gravity of the ideas expressed and the language used.

We've found that our students grasp the concept of the semantic wave really easily. The visual representation of idea and language development is simple and memorable. But, as always, it's not enough to say 'This is how successful students write. Now you do it.' Students need support to produce good writing on their own. With this in mind, we've put together a template for students to use when writing stand-alone paragraphs and the body paragraphs of opinion texts. You can see the template in Table 1 with the text of the good example paragraph added.

We use this template for in-class practice and encourage students to use it when writing their take-home assignments.

For a further challenge, we combine these activities by asking students to work in groups and, using the template, produce a paragraph on a given topic. We then ask them to cut out the key noun groups and give these to another group to see if they can place them on the axes to create a wave. This fun activity can cause some heated discussion, but the real point is to get students to think carefully about the language they are using in their academic writing and to consider ways to improve their vocabulary and grammar use as well as how they structure paragraphs.

Semantic waves in whole texts

The semantic wave is not just a feature of academic paragraphs; it can be seem throughout whole texts. This is an area that Daniel has been focusing on with EAP students enrolled in university bridging courses. These students usually
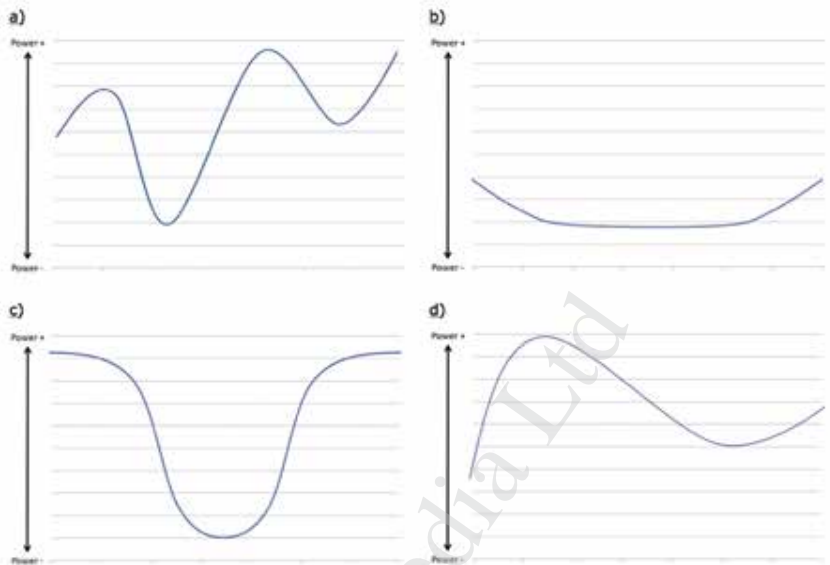

Figure 2. Choice of four semantic profiles for students to match to example paragraphs

Topic sentence: Tell the reader what this paragraph will be about. Topic NG and main idea of the paragraph. Power +. Ideas and (nominalised) things.
A balanced diet makes a major contribution to good health.
Supporting sentences: Give more details and explain the main idea of the paragraph. Power ⬇. More specific ideas and (nominalised) things.
This is because it provides essential nutrients for the human body.
Example: Include a real example of the main idea. Power -. People and actions.
For example, the micronutrients, vitamins and minerals, are needed for the body's cells to function well. Different types of food contain different amounts of these nutrients and so it is vital for people to eat a wide variety of foods, such as rice and bread, fish and eggs, and vegetables and fruit, every day.
Supporting sentences: What is the effect of the examples like this? What can be learnt from this example? Why is this example important? Power ⬆. More specific ideas and (nominalised) things.
The human body extracts nutrients from these foods and uses them to grow and repair itself.
Concluding sentence: Remind the reader of the paragraph's main idea. Topic NG + main idea of the paragraph. Power +. Ideas and (nominalised) things.
Therefore, consumption of this diverse range of foods will result in the nutrient-rich, balanced diet which is essential for the maintenance of human health.

Table 1: A template to scaffold students' paragraph writing, including example text from model paragraph

Figure 3. Examples of theories and real-world contexts covered on the course

have IELTS scores of 6–6.5 in some skill areas but 5.5 in writing.

One of the major assignments on the course involves reflective writing, in which students demonstrate the practical application of theoretical concepts by linking them to real-world situations (see Figure 3). In this reflective writing task, the students have to describe a theory, such as Packard's hidden needs of advertising, and apply it to a specific real-world context, such as advertisements.

The theoretical concepts have weaker semantic gravity and stronger semantic density, while real-world contexts have stronger semantic gravity and weaker semantic density. These ideas from LCT are used to demonstrate the semantic profile of a text in which the language and ideas of theory and real-world contexts are woven together in semantic waves (see Figure 4).

Figure 4. Using the wave to illustrate how meanings of lesser and greater context-dependence are woven together

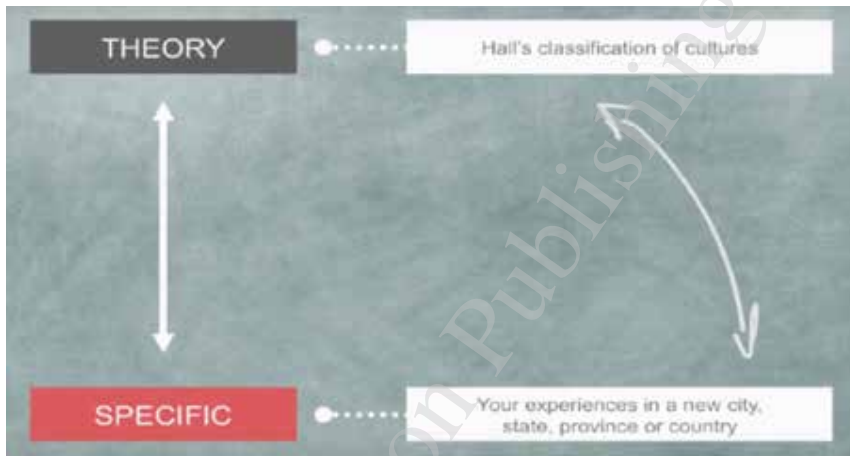

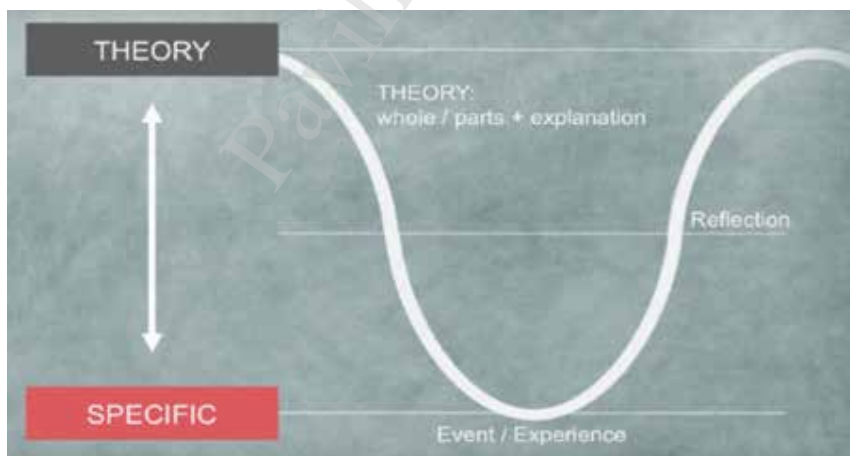Figure 5. The video shows how theory and specific can be linked

Figure 6. A semantic wave weaving together theory, 'specific' and reflection

Flipped classroom presentation

To introduce these ideas, Daniel created two instructional videos which students can access online while preparing their assignments. In these videos, to simplify the terminology, weaker semantic gravity and stronger semantic density is called 'theory' and stronger semantic gravity and weaker semantic density is called 'specific'. For example, Hall's classification of cultures is a theory that can be connected to students' specific experiences in a new city or country (see Figure 5).

Using the wave shows students in a clear, visual way how the links between 'theory' and 'specific' can be consolidated in reflection, which makes connections explicit—an upward movement on the wave (see Figure 6).

Again, it's not enough to simply demonstrate the semantic wave; students need help developing the language required to successfully complete the task. The second video (see Figure 7) deconstructs a model answer, identifying how the text answers the question, uses language and connects theory to specific using the wave.

Students are shown how the text starts by using reporting verbs (*concludes* and *states*) to describe the purpose of Packard's theory of hidden needs. Vocabulary choices include nominalisations such as *advertisements, basic needs, persuasion* and *safety*, which have more semantic density and less semantic gravity – they're 'higher' on the wave. It then moves to a description and evaluation of a specific advertisement, which use determiners (*this, the* and *her*) and adjectives (*attractive, comfortable* and *safe*). This vocabulary is closer to everyday language – it's 'lower' on the

wave. Finally, the text moves from the specific description back to the theory (*the hidden need for security plays to*), identifying symbolism (*bare feet – shows she feels safe and relaxed*) – it's 'higher' on the wave again.

Students are shown how a successful reflective text moves from theory to a specific example and then back to theory. It doesn't have to end here, of course. The second video ends by demonstrating that throughout a longer text these up and down movements of ideas connecting theory and the real world, expressed through academic and everyday language, can continue (see Figure 8). The wave rolls on.

For follow-up, in-class activities, students analyse additional example texts. They identify movements between theory and specific by connecting three examples to diagrams of the wave, similar to the activity shown in Figure 2. They then discuss the relative strengths and weaknesses of each example, before working on their own practice texts.

Although the ideas behind it may at first feel challenging, LCT is an incredibly practical theory (see Maton *et al*, 2016, for even more examples of this). We've found the semantic wave to be one of the most useful teaching tools we've ever come across. It's a vital concept, revealing the 'rules of the game' for successful academic writing. The semantic wave elucidates model texts, and as such helps students with reading comprehension and critical thinking. It represents a vital piece of scaffolding for students' academic writing, helping them to link ideas and evidence, theory and practice, the abstract and concrete. For us, it's a can't-teach-academic-writing-without-this notion and we're certain it will be for you too.

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Figure 7. Section of model answer applying theory to specific
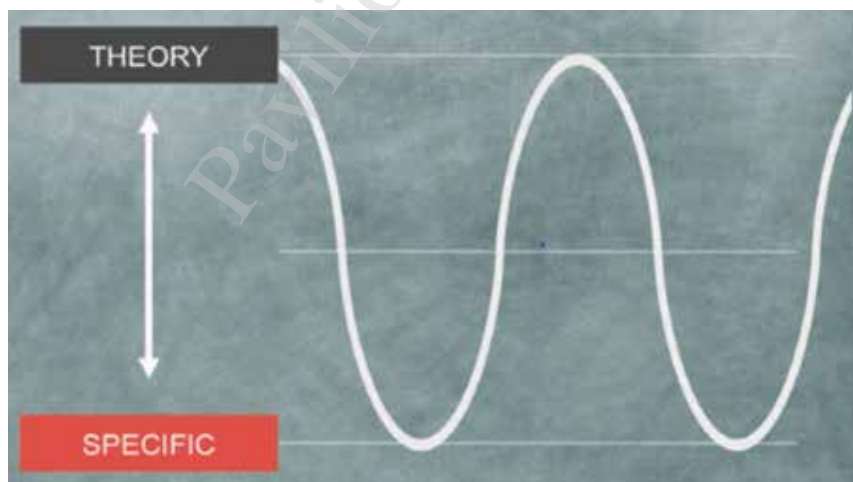

Figure 8. Waving through the model answer

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