

## Word Spectra

Visualize word clusters to help create and apprehend new concepts.

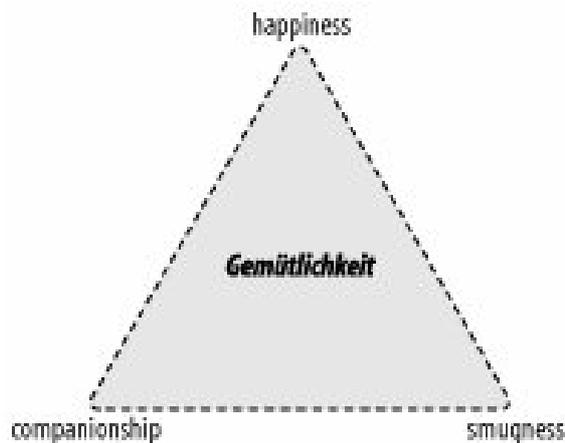
When translating text from one language to another, you might need words that seem to lie somewhere between the available words. When you apprehend new concepts, you might face a similar problem. Visualizing the spectrum of meanings that lie between two words can help you form new concepts and work with them more easily.

### **In Action**

Here are two examples of foreign words that are useful, but that are almost untranslatable. Please note that you don't need to speak German or Portuguese to appreciate the problem!

From German, we have Gemütlichkeit. It's a description of a good mood, the warm feeling of being together with good friends, and it usually also involves wine or beer. How should it be translated? Happiness? Companionship? Smugness? It's none of these and all three. [Figure 3-4](#) shows a visual way to represent the untranslatable.

**Figure 3-4. Word spectrum for the German word Gemütlichkeit**



The second example is once again a word that describes a mood, but this time from Portuguese. The word saudade is a mix of homesickness, nostalgia, and good memories, with a tinge of sadness. There simply is no direct translation into English. In one context, it might translate to nostalgia, in another to homesickness. If you visualize nostalgia and homesickness as being at two ends of a spectrum, saudade lies somewhere in between, as shown in [Figure 3-5](#).

**Figure 3-5. Word spectrum for the Portuguese word saudade**

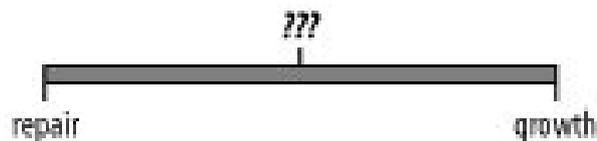


So, what about new concepts in English that don't yet have words for them? Biologists run into this problem time and again; evolution just doesn't respect the boundaries made with words.

For example, many of the components in subsystems that repair damage to the body are also part of the normal growth and development system. Repair and growth can be placed on a spectrum. The system that strengthens bones where they are under greatest stress could be classified arbitrarily as being a repair system, because it repairs microscopic damage from mechanical stress.

Alternatively, the bone strengthening could be seen as part of the normal growth process, bringing the right components to the place where they are needed most. It all depends on your point of view. As with the foreign-language examples, it looks as if there is a word missing that combines aspects of growth and aspects of repair ([Figure 3-6](#)). The hack of visualizing repair and growth as being at two ends of a spectrum makes it easier to explore the connections between those two concepts.

**Figure 3-6. Word spectrum for the English words repair and growth**



The value of finding spectra between words isn't confined to biology. In computer programming, recursion and dynamic programming are sometimes taught as if they are two entirely different techniques. In reality, dynamic programming and recursion are at different ends of a spectrum of programming techniques that break larger problems into smaller ones. This is a useful idea to have, because a recursive formulation of an algorithm may be a lot simpler than the corresponding dynamic programming formulation.

### **How It Works**

This hack works because language is inherently a process of using discrete words to cover ranges of meaning. Visualization of word positions, as in the triangle of words for Gemütlichkeit, encourages us to see the continuous range of meanings again. We can then home in on meanings that have been missed by the words available to us.

The visual position gives us a handle for a particular meaning.

The actual visualization of the words doesn't seem to be absolutely essential to the hack. The essential part is identifying that the endpoints are related and that there is some possibility between them that combines their elements. However, visualization makes the hack easier to apply, and the visualization helps map words to ranges of meaning.