By Invitation of the Editor-in-Chief

English Scientific Communication
Part 2—Preparing for Presenting
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In a continuing series of articles on presenting science in English, this month we start at the beginning and think about how to plan a presentation to make the most effective use of existing English skills.

There are four main things we need to think about in preparing for any kind of scientific presentation: our objectives, the audience, the venue and the remit. We will consider each of these four aspects in turn; focusing on what consequences they have for presenting in English.

Objectives

Having very clear and achievable objectives for a presentation in our native language is essential, but for presenting in English, it is even more important to think clearly at the outset about what you wish to achieve with your presentation and be realistic about what is possible. Trying to do too much is seldom effective.

As giving presentations can be challenging, when obligated to do so, our natural reaction can often be to simply "get through it" without worrying too much about how successful we are at communicating our ideas. It is important to step beyond our fears and think carefully about why we are giving the presentation. For example, if the presentation is one about your recent research at a conference or symposium, then some of the following might be objectives:

・Making other scientists aware of you and your work
・Demonstrating the relevance and significance of your work
・Expanding your scientific reputation
・Getting feedback on your research work

・Sounding out new ideas before publication.

These are just a few to give you ideas. Having different objectives can mean developing quite different presentations, so knowing exactly what we want to achieve is always the most important first step.

One very important objective is that ideally after a presentation you would like the members of the audience to remember both you and your work, which can be challenging when they are watching many other presentations before and after your own. In order to do this, a focus on effective communication rather than simply cramming in as much information as possible is important. To think about how we can achieve our objectives, it is essential to consider the receivers of the information that we will transmit: the audience.

Audience

As chemists, we tend to think about chemical reactions from two important different perspectives: thermodynamics and kinetics. We can take a similar approach to thinking about the way in which an audience receives information. We will be begin with thermodynamics, and consider a simplified model of the human brain and how it processes information. This is extremely useful for thinking about how to deliver information so that the audience successfully receives it. We will return to the kinetic

model in a future article.

Figure 1 shows a very simple model of the way in which the human brain receives and processes information. There are three key elements and understanding their relationship is important if we are to communicate effectively.

As we receive information, it goes directly into our working memory. You can think of this like scratch paper or the RAM in a computer. This part of the memory is used for interpreting, rearranging and comparing information and preparing it for storage. The key thing to know about the working memory is that it is limited in size. If we try to put too much information into it, then we struggle to process it and we fail to understand or remember. Brain scientists have conducted research on the working memory and have determined that, on average, a person can store around 7 (plus or minus 2 statistically) individual ideas or concepts (we will henceforth refer to them as "slots") in the working memory at the same time. The size is determined genetically and while it grows to its final size during our youth, there is nothing we can do to change it. What we can do, is learn to use it effectively. Understanding the nature of the working memory is key if you are an educator of any kind and as a presenter, you take on this role, albeit briefly. If you require your audience to work with more than 7 pieces of information at the same time, then you will lose them. The problem is that what constitutes 1 slot differs based on existing knowledge. So if your audience is familiar with the subject, then many of the ideas being dis-
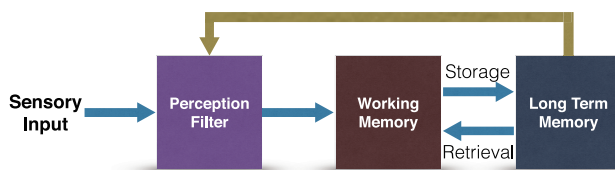

Figure 1　Simple human brain information processing model.

cussed can be "chunked" together into a single slot. However, if your audience is new to the subject, the slots can very rapidly get filled. The difference between what constitutes a slot in your own mind and that of your audience is the main reason for ineffective communication. How should we solve this problem? Simple, if you know that your audience all have good basic understanding of the subject you are presenting, you can move more quickly to new ideas, but if you are speaking to an audience with a broad range of backgrounds, it is safest to assume that every idea you mention will take up a whole slot and thus you need to carefully manage how much new information to introduce and at what pace. In some ways, using simple language (which is always a good choice for a non-native speaker) can make this easier to do and can add clarity.

Here are some other pieces of advice that come from considering the limitations of working memory:

· We need to be very careful when presenting new ideas and complex arguments that we don't exceed the working memory of our audience.
· The use of visual material can help along with appropriately constructed arguments with guides.
· Unfamiliar equations can use up memory spots rapidly—be careful when using them!
· Remember that if one explanation in a talk builds on a previous one, the audience will a) have to recall the previous argument—losing at least one memory place and b) have to have understood the original argument.
· 'Losing the thread' in a lecture is a guaranteed way to lose interest and switch off, so consider carefully the audience perspective when designing presentations.
· Don't make the audience multi-task.

After the brain has digested the incoming information in the working memory, it then transfers it to the long-term memory for storage. It may be stored as individual fragments or linked to other existing information. It is believed that one of the very important things our brains do when we sleep is to file all the new ideas into long term memory and make connections with existing ideas.

(Therefore sleep is extremely important, especially before giving a presentation in English!)

What the long-term memory does that is critical from our perspective, is to provide information to the Perception Filter. This is a filter that processes all incoming information and decides what to pay attention to and what to ignore. We are continuously bombarded with information from our senses and our perception filter removes most of this information so that we can concentrate on what it important. However, the perception filter is one of the main reasons that sometimes what we say is not what others hear. Clearly, we can't take a look at someone's perception filter and see what will get through, but we can do certain things to help our ideas pass through successfully. One key idea when presenting, is that we should highlight to the audience to the things that are important and what they should be paying attention to. We can do this using a number of techniques including volume, pitch and tone of voice, body language, effective use of PowerPoint slides—colours, capital letters, large fonts, etc. We will discuss this idea in more detail in future articles. Another thing we can do is be aware that this filtering process is taking place and do what we can to stop the audience from missing key ideas. This can be achieved, through repetition and also by pointing out to the audience what we are going to tell them before we do so. This is known as "signposting" and we will also refer to it again in the future.

Time spent on carefully considering how to arrange and deliver the necessary information in a presentation can have a very significant effect on how the audience perceives, responds to and remembers it and often it is useful to think more about this than to worry too much about small errors in language use.

Venue

When preparing a presentation, we should think to some extent about where the presentation will take place. As we will discuss later, the ability of the audience to hear the presenter clearly is of utmost importance when presenting in a non-native language (and indeed when listening in one). When native

speakers communicate with one another, if words are misheard then the brain is very effective at autocorrecting and can extract the correct meaning in most cases. This means it is possible for native speakers to communicate even in noisy environments (for example in a nightclub with very loud music). For non-native speakers and listeners, the brain's ability to "fill in the gaps" is hugely reduced and ability to understand drops off rapidly with volume level. Therefore making sure your audience can hear you clearly is absolutely essential if you wish to be understood. It also helps considerably if they can see your face when you are speaking. Consider the venue carefully—will you be using a microphone? If you have not much experience of this, some practice can really help. One challenge arises if you have to use a hand-held microphone as this can interrupt your concentration and your body language and force you to multitask when you really would prefer not to.

Clearly there are other aspects of the venue you should consider when preparing a presentation, such as the mood, audio-visual equipment, etc., but from the perspective of communicating in English, being heard loud and clearly should be number 1 on the agenda.

Remit

When giving a presentation, there are often many aspects that are beyond your control, such as the length of the presentation, the maximum number of slides or space on a poster, the size and background knowledge of the audience and of course the topic you need to present. You should consider these things carefully from the outset rather than trying to adjust to them after preparing your presentation. Careful planning of all aspects of a talk including how to make the best use of your language skill is an important part of successful presenting. A well-prepared talk is always easy to spot and leaves a very good impression on the audience so this should always be your starting point.

Next month, we will begin to take a look at how we can use more than just words to communicate!