Let's Enjoy the Q&A Session!

The following are excerpts from the textbook "English for Scientists" to be published in 2012. This content is also used as teaching material in the following SOKENDAI courses:
English for Scientists (Dept. Genetics/NIG):
http://www.nig.ac.jp/jimu/soken/courses/EfS/EfS_2011/index.html
English Education Program "Presentation Course" (NINS):
http://www.nips.ac.jp/eep/curriculum.html

Part1: Tips for Asking Questions

The question and answer (Q&A) session is an essential part of scientific presentations. Good questions stimulate the audience intellectually and create an exciting atmosphere. Questions can also become an eye-opener for the presenter towards an entirely new direction of research. This unit deals with how to ask effective questions --- an essential skill for all researchers.

Let's start by thinking about the purpose of asking questions at a scientific presentation. Obviously, we ask questions when we didn't understood something. If someone didn't understand a part of a presentation, most likely some other people in the audience didn't either. Questions are thus asked **to help the comprehension of the entire audience**. Scientists also ask questions even when they are not expecting any answers. Such "questions" are often an advice for the presenter, a suggestion of an alternative hypothesis, or a problem raised to the entire audience. In other words, questions and answers serve **to deepen the understanding of all members of the audience**, and **to encourage the exchange of ideas among everyone at the venue**. No scientific presentation is complete without an active Q&A session.

Why is asking questions so important for a scientist? Asking questions is a privilege of scientists and is an essential aspect of being a scientist. All research is based upon questions and is driven by questions. Thus, the ability to be curious about anything and to come up with questions is a great asset for a scientist. A lot of experience is necessary, however, to be able to refine and articulate questions. For many young scientists, coming up with poignant and meaningful questions is a big challenge. A key is the way you listen to the talk: do not simply absorb information, but continuously compare the information being presented with what you have in your brain (including what the presenter has told you so far), and try to make connections between them. Once you develop this habit, you will find that questions begin to come up automatically. Such "active listeners" can understand and acquire much more knowledge from a presentation than passive audiences.

Another benefit of asking a question is that your question will be a trigger for people to remember you; this is very important in science where it is necessary to promote oneself to the scientific community. Scientists love to observe and analyze. If you ask a good question, many of the audience will start wondering about "you": "Who is that guy asking the question?" "What kind of research is she doing?" "What sort of scientific background does he have?"…. By asking questions that demonstrate your interests and your habit of mind, you can introduce yourself to the audience and to the scientific community.

That being said, asking questions requires a certain amount of courage. It is natural to hesitate or shy away from asking questions in public. In the book "At the Bench: A Laboratory Navigator" (2005, Cold Spring Harbor Laboratory press), Kathy Barker describes the following reasons why many people are reluctant to ask questions.

1) My question won't interest anyone else, so I'll ask the speaker after the seminar.
2) I won't be able to express my question, it is too complicated.
3) I'm probably supposed to know the answer, it is my field.
4) It is too obvious a question. Everyone else knows the answer.
5) I don't want to look stupid or unread.
6) I don't want to have a confrontation in public
7) I must have missed the slide that would explain. I can't let on that I wasn't paying attention.

While you may empathize with these excuses, they are of no benefit to anyone.
"Forget about your hang-ups and just ask questions!"

Asking questions is an essential activity of scientists' career. Aim to ask at least one question at each forum you attend. The more questions you ask, the better you will be is asking questions. Perhaps more importantly, by asking a question you will gain not only the information you requested, but also the ability to think critically, and the recognition by your peers.

Here is an advice for those who think they cannot come up with a good question: think about the following issues while listening to a talk. You will find questions flowing into your brain from a hidden fountain.

1. What is the key question of this research?
2. Predict what will come next; what kind of discussion, experiment, data, slide, etc. will follow?
3. Think about the data you are given and try to develop your own conclusions. Then compare them to the presenter's conclusions. Are they the same? If not, then why?

4. What is the most important data in this research? Is it solid? (Are there any holes in it?)
5. Do the experimental results have a direct and meaningful connection with the key question?
6. Can you think of any other ways to interpret or explain the data and experimental results?
7. Is there some important point no one seems to be picking up on or some missing explanations or data you feel are necessary?
8. Do any of the data or conclusions contradict each other?
9. Do the presenter's results or interpretations contradict what you know to be fact?
10. Is there any common ground between this research and your own personal interests or work?
11. Can you find any interesting point in any data to which the presenter seemed to pay little attention?
12. If you were doing this study, what would be your plans for continued or future research?

g

To help you think about questions we have classified questions into several types. These are the questions that are most frequently encountered at the Q&A session of scientific presentations. Examples of each question type are also included; feel free to adopt them for your own use.

A) To request detailed explanations for contents you didn't understand or would like to hear further explanation about:

・I could not follow how you reached that conclusion. Could you elaborate on that?
・Perhaps I have missed something from your talk. Would you please explain how you found...?
・I am not familiar with this field and would like to ask why you can assume...?
・Could you tell me a little more about...? I am not quite sure why the mutation caused....
・You mentioned.... How did you find it?

B) To ask about the results of experiments that you suspect they may have performed:

・Did you do the same experiment using a different material?
・When that phenomenon happens, how long does it last?
・Did you find any difference in appearance between the two groups?
・Were there any exceptions that did not follow the rule?

C) To ask about previously known facts and information in order to inquire about any connection with other research:

・Is the rate constant calculated in your study similar to the estimate in previous studies?
・Is the hippocampus the only known region associated with memory and learning?
・If I remember correctly, Drosophila can develop without centrosomes. How are these results related to yours?

・Do you know...? There might be some preceding study that examined that.
・Are there any other methods that you can use to test...?

D) To challenge the presenter's interpretations or to suggest other possibilities:
・Other than..., is there any other proof of your conclusion?
・I am wondering how you can be so sure that.... Could you explain the reasons to me?
・You mentioned that other conditions did not change the results. Could it be because...?
・There seem to be other possible explanations for the results. Do you have an alternative hypothesis?

E) To ask for opinions or interpretations about results – especially if some unusual results were left uninterpreted:
・I noticed some low outliers in your results. What does that mean?
・There are thousands of different species. Do you have any idea how they have evolved?
・In your data, A group seemed slightly larger than B group. Is that difference significant? If so, how do you explain the difference?

F) To pose hypothetical questions about experiments the presenter is not likely to have tried:
・If there were the same mutation in humans, what symptoms would you expect to develop?
・What do you think would happen if you did...?
・If you could reverse the conditions, what would you predict the results to be?
・Is it possible for you to test the causal relationship more directly?

G) To suggest a new direction for the presenter's research:
・Do you think it's possible that...?
・Have you considered investigating...?
・Researchers in biophysics have been eagerly looking for a cell expansion technique. I think your gene might open some possibilities for that.

H) To ask about something not directly tied to the main point of the results:
・This is probably not your focus, but I am interested in....
・Well, this is just out of curiosity, but...?
・Would you tell me more about the techniques that.... I am wondering if I could use the same techniques in my research about....

When asking a question it is important to first **specify the theme** of your question. When a

presentation contains multiple topics, it is particularly important to start your question by specifying the topic that your question will be addressing. The following expressions can be used to restrict the topic: “You mentioned …”, “You showed…”, “I have a question about…”, “About the first part of your talk…”, etc.

Another important strategy in asking questions is to **express the motivation** of your question. Even if the presenter understands the meaning of the question itself, they will not be able to satisfy the questioner unless they understand the intention behind the question. If fail to express your motivation, the answer that you receive will be only at the surface value of the question without touching upon what you really wanted to know. Here is a tip to provide your motivation: rather than starting your question with a long introduction of your motivation, first briefly state the question and then follow up with the motivation. This way, the presenter can start answering the question as soon as they realize the questioner’s intent. When the presenter grasps your motivation you will likely recognize it --- so you can stop your explanation then.

Specific questions are easier to answer than vague, unfocused ones. Presenters will likely be confused with questions such as “How do you feel?” or “What do you think about this?”, and won’t know how to answer. Even when you are simply asking for an opinion (rather than a specific answer), restrict the topic using expressions such as “Do you have any idea why this happens?” ”Please interpret your unexpected results for us,” “How can you explain the conflicting data?”, etc.

Part 2: Tips for Answering Questions

This unit will examine how to answer questions. While you can prepare and practice your presentation ahead of time, a perfect preparation is not possible for Q&A, in which the kind of questions you will receive is unpredictable. This is the reason why the Q&A session is a dreaded and is a nerve-wracking experience for many presenters. But recall that Q&A is an integral part of the scientific presentation. Please practice so that you can confidently handle any questions from the audience.

Whether you can handle the questions well is extraordinarily important for your scientific career. Be it at a conference, a job seminar, or a research grant interview, the audience will scrutinize the way in which the presenter deals with questions. This is because the response to questions is a direct reflection of the person's scientific knowledge, attitude, as well as vision, whereas publications and the presentation proper may include contributions from other people. People will judge you by examining how you handle questions; Q&A session is something that you cannot afford to fail. Make a habit of thinking about potential questions; this is the best preparation for the Q&A session.

Many people ask questions without seeking specific answers (see Part 1). Obviously you cannot provide a definite answer to questions on future directions or hypothetical questions, and you need not be embarrassed about saying "We don't know yet" or "That's a challenge for the future". You need to realize, however, that the audience is interested in how you respond to such questions. Even if you don't have any scientific results to present, a simple "I don't know" is not a satisfying response. You may start your answer by "I don't know yet", but follow it up by adding more information: "I am expecting … result", "We are planning …experiment", "In future we would like to try…". You can exploit this opportunity to introduce your own opinions, your vision and your dream; this is the key to upgrade your answer to an "effective response".

In contrast to questions on the future, "I don't know" is a forbidden answer to questions directed toward results of the past. Questions on your previous reports and background information fall into this category. Because you are at the forefront of your field, you should know everything about your own research, and are expected to be more familiar with the research background than anyone else. If a person with such a capacity fails to provide an satisfactory answer, audience will be immensely disappointed. Do your homework and make a concrete foundation of your research and its background, so that you can provide an adequate explanation even under the stressful environment at the Q&A session.

The following are some advice for successfully answering questions.

1) When you don't understand a question – confirm it!

An answer that is off the mark or is incoherent with the questioner's intent leaves a very bad impression. If you are not confident that you have fully grasped the question, do not hesitate to confirm it before offering an answer. It is often difficult to infer the motivation behind a question; in fact, people who haven't taken the "English for Scientists" course may not recognize that questioners should express their motivation! State clearly that you didn't understand the question and ask for them to repeat it. For example, you could use the following expressions:

・I am not sure I understand your question. Could you please rephrase your question?
・I am afraid I didn't quite catch what you're asking.

When you have some idea about what the questioner is asking, a better strategy is to rephrase the question in your own words (paraphrasing) and confirm it with the questioner. This is much more effective than having the questioner repeat the question in exactly the same way or in another similarly confusing rewording. It will also give the audience the impression that you are rather experienced in fielding questions. You can try using something like this:

・You are asking about [paraphrase]?
・You'd like to know [paraphrase]?

2) When you need time to answer a question – ask for it.

Have you ever witnessed a presenter who enters a long meditation phase upon encountering a difficult question? You must remember that the time allocated for each Q&A session is limited. When you receive an unexpected question that requires some time to compose a response, give an indication that you have understood the question but need a moment to think about the answer --- rather than going directly into silent deliberation. If you just go silent, the audience has no idea how to interpret your silence. They may assume that you have not understood the question, and the questioner is likely to begin rewording and repeating the question. The longer you remain silent, the more uncomfortable are the entire audience. To avoid this very undesirable situation, use one of the following expressions to buy yourself a little time and set the audience at ease:

・That's a really difficult question to answer. Let me think about that for a second.
・I hadn't actually thought of that before. I'm going to need a minute to think about that.

3) When you feel that the audience may not understand a question – give them some background.

This advice is for slightly more advanced presenters. During the Q&A session someone in a field closely related to the presenter may raise a very specific issue that is unfamiliar to most of the audience. What is likely to follow is an intense dialogue between the questioner and the presenter – leaving the rest of the audience in the dark. While such a discussion is a part of the objective of giving

a presentation, you must remember that the Q&A is for the entire audience, and respond in such a way that everyone can benefit from your answer. If you receive a very technical question that is unlikely to be understood by the most of the audience, restate the question in simpler terms and add background information to aid the audience's comprehension.

For example, let's imagine that someone who listened to a presentation on "Osmotic regulation of saltwater frog in Philippines" asked the following question.

Q. You showed the membrane expansion allowed the Philippines saltwater to survive in fresh water. Is the same true for "Rana muscavora"?

Rana muscavora is a technical term that was not mentioned during this presentation, and therefore it requires specialist knowledge to realize that it is a name of another frog species. Most audience will not be to grasp the questioner's intention for asking such a question. When faced with a question like this, you can remedy the situation by including some background information in the response. For example:

A. That's an interesting question. As some of you may know Rana muscavora is another frog species that lives in saltwater in Africa. It lives in a salt level similar to the Philippines saltwater, but it isn't an osmoconformer and uses a totally different mechanism to adapt to the salty environment. Although we haven't examined Rana muscavora, we believe that …, because …

In this way the entire audience can benefit from even the most specialized questions. Many will acknowledge your professional handling of the situation.

4) Give a short, direct answer before going into detailed explanations.

"Presenting the conclusion first" is an effective strategy in structuring a presentation. This is also true for your response to a question. Because you have to compose your answer on the spot, often people end up giving a long-winded and seemingly rambling response, or the story shifts during the answer. To avoid such mishaps, provide a short, direct answer at the beginning, and then follow it up with a more detailed explanation.

For "yes/no" questions, you can start off with something like this:

- Yes, it is possible.
- That's right.
- No, unfortunately that is not known.

After such short, "straight" answers, you can go on to provide the detailed reasons and explanations.

Often questions cannot be answered with a simple “yes” or “no”. For example, the majority of the data indicate a “yes” answer, while some aren’t solid yet, so a conclusive “yes” can’t be given until further experiments are carried out. In such a case you can open your response by the following expression:

・The short answer to your question is “yes”.

This expression will raise an “expectation” that a “but clause” will follow and you will be explaining why the answer isn’t a simple “yes”. By creating expectations and fulfilling them you can guide the audience through your ongoing story.

There are also many questions that cannot be answered by a binary choice. In such a case you can use the following expressions:

・I cannot provide a simple answer to your question.

・Well, yes and no.

Although these expressions don’t seem to contain a lot of useful information, they act as an important topic sentence and will establish a clear framework of the entire response. The audience will learn from the outset that the situation is not simple, and will be prepared to hear the complicated story that follows.

5) When you don’t know the answer – be honest and say you don’t know!

”I don’t know” is not necessarily an embarrassing answer to a question; many questions are made without expecting direct answers anyway. After indicating that you have understood the motivation behind the question, candidly tell the audience that you don’t have an answer. Whenever possible, explain the reason you are unable to answer:

・That’s a good question, but at this point we don’t have enough data to conclusively answer that.

・That’s a big question. As far as I know, nobody has answered it yet.

・I wish I knew the answer, but a major obstacle to answering that is .....

6) Don’t miss a chance to introduce your opinion!

Sometimes people ask questions that there is no way of providing a direct answer, e.g. results of experiments that take years to perform or require techniques that are not yet invented. You may feel that the questioner is a mean person and is trying to give you a hard time. The reason why people ask such questions is because they would like to know the presenter view of the future research. If such a question is raised, don’t miss the chance of sharing your thoughts and opinions with the audience. You can introduce ideas that are too speculative or preliminary to be included in the talk proper. After explaining that you cannot offer a direct answer, provide them with your opinion using expressions like the following:

・If I had to offer an educated guess, I would say that.....

・I don't have any experimental data to support, so this is just my opinion...
・The most likely possibility in my mind is ....
・Among many potential scenarios, my favorite is .....

7) When you understand the questioner's motivation – try to touch upon it in your answer.
When people ask a question there is usually a reason or a "motivation" behind the question. While some people may describe their motivation before raising a specific question, this is often not the case. If you perceived the questioner's motivation behind the question, then try to indicate that you have understood the motivation. The following expressions are useful to show your empathy and appreciation to the question:
・That's a really good question.
・That's exactly what I would like to know next.
・I hadn't thought about the possibility, but thank you, that seems very important.

When you proceed to answer the question, do not merely state the direct answer to the face value of the question, but try to provide the information in accord with the questioner's motivation. Strive to provide the information that the audience or questioner truly needs.

Let's imagine that the presenter has found a substance that induces a fear response to mouse from its predator's urine. After the presentation, someone asks the following question:
Q. Do you know the threshold concentration of this substance that is needed to induce the avoidance behavior in mice?

A direct answer to this question might be:
A1. Yes, the threshold concentration is about 10 pM.

Although the question asks for quantitative information, it is likely that what the questioner wanted to know is whether or not the actual urine can indeed elicit a response from a long distance. If the presenter can guess this motivation one could supplement this numerical value with a response to the motivation, in the following way:
A2. Yes, the threshold concentration is about 10 pM. On the other hand, the concentration of this substance in predator's urine is more than 1000 times higher than this detection threshold. So, mice are able to detect and avoid the smell of predator's urine from pretty long distances, as you are probably wondering.

It is an important skill to be able to read the true motivation behind the question, and then adjust the answer to match the motivation. The questioner will be happy to hear that you have understood their intention and gave an answer they were truly hoping for. The rest of the audience will also be able to

get more out of the exchange, since they can now understand the questioner's intention and the "big question" behind the superficial question. An adequate response thus involves fulfilling the needs of both the questioner and the entire audience.

8) If you have any additional information to support your claims – provide it.

Many questions are intended to challenge the conclusions and interpretations proposed by the presenter. Pointing out logical gaps or suggesting alternative interpretations falls into this category. Such questions sounds aggressive; but you must realize that the aggressiveness is directed not to you, but towards the science you presented for the entire community activity. What you should bear in mind is that the questioner wants to know how concrete is the new result or idea that you are presenting. This means that you don't have to limit your answer to the point that has been asked directly by the questioner; any additional results that support your claim can be a valid response to the question. This can include your own preliminary results, results of related work by others, or seemingly unrelated information that requires a mind of a genius (i.e. you) to find a connection to your work. The following are examples of expressions that can be used to introduce the supportive information; these signposts tells the audience the nature of the information that follows these phrases:

- These ideas are also supported by data from a study by....
- We actually did another experiment to test..., and got preliminary results showing that....
- Actually, other groups show similar results using different materials....
- There is another line of evidence from clinical studies....

An additional advice for presenting supportive information: If you have a piece of information that is determining your way of thinking, present it at an early phase of your response. If this information were a solid piece of results, obviously you would have included it in the main talk. You must have held onto it because it is a speculative idea, or is too preliminary to talk about. However preliminary, you should tell the audience about it if that element is driving you to a particular model or a future direction. Without this piece of information the audience cannot understand your scientific integrity; they may regard you as a strange, illogical person. While such preliminary results will not prove that you are a genius, it can make people realize that you are candidate for a rising star.

9) If the questioner misunderstood or failed to catch some information – offer a better explanation.

If the questioner has misunderstood something or failed to recognize some data from your presentation, then there's a good possibility that some others in the audience have misunderstood as well. It's quite likely that something about your explanation was difficult to understand or not well enough emphasized. Politely point out the misunderstanding and explain the necessary information again. If some data was misread or not noticed, you can simply returning to that slide and show the

data again. Upon the second explanation do not just repeat the same words you used the first time, but apply paraphrasing to aid comprehension and to avoid the same misunderstanding to happen again. Try an expression like one of the following:

・I am sorry. I think my original explanation was too confusing. Let me try to explain that again.
・I think you may have misunderstood me when I said….
・Let me show the data once again. Although it may appear insignificant at first glance, these results actually indicate that….

10) When discussing a hypothetical situation, make sure the audience realize that it is hypothetical!

When responding to questions it is quite common to discuss hypothetical situations or hypothetical results. A frequent problem encountered by the audience is that they cannot tell whether the situation is hypothetical or real. Use signposts to make this distinction very clear.

・If we used Rana muscavora in our experiment, I would predict that they would survive at a higher rate.
・One potential outcome is that the rats might fall asleep instantaneously.

11) When you do not want to answer a question at the moment – explain why and offer to provide the answer later.

At times you may receive questions that are not appropriate for the Q&A session for the entire audience. Questions on specific technical points, detailed methods, or those that require some time to prepare an answer are examples of such questions. In such situations you should tell the audience that you would like to respond to the question personally at a later time:

・I think that question deserves a very detailed answer. Would it be OK to discuss with you after the presentation?
・ Unfortunately, I don't have the information I need to answer that right now, but if you give me your contact information after this session, I'd be happy to send it to you.