Soft skills for Mathematicians

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Preface

This book has been written when giving a PhD course at the Department of Mathematics and Stockholm University on 4 occassions between 2014 and 2026.

Thanks to ...

Chapter 3

Submission, revision and giving feedback

In the current chapter we give some advice on how to deal with the submission process including revision, and also some words on how to be a referee and to give feedback to colleagues.

3.1 Submission

In the previous chapter we described how to write a scientific manuscript of a mathematical result you have obtained. Once it has been written and revised a couple of times, possibly also from comments by colleagues, it is time to submit. Some people first make a preprint out of it and wait with the submission to a journal in order to receive possible further feedback. I discourage from this philosophy. Too many times I have seen this behaviour resulting in the manuscript never being submitted. But, you should always put up your manuscript on a pre-print server once it has been submitted after checking that the journal you submit to allow for this (close to all journals do).

You might ask yourself what the value of submitting and publishing papers are – isn't it enough to having proven a result? My answer to this is **no**. Nearly always you have received salary from your university (or similar) in order to contribute to mathematical research, and it is by publishing your

results in international peer reviewed journals (and giving scientific talks) that your results connect to the research community. So, besides making your CV look better, publishing is the main means for research to progress.

As described earlier, an important question is choose which scientific journal to submit to. This should have been discussed early on in the project, but once the manuscript is ready it makes sense to once again check if the planned journal is suitable for the manuscript. My recommendation is to aim fairly high in terms of quality and status of the journal. If you feel 100% sure to be accepted, then you should probably aim a bit higher. Another feature to consider is whether the paper will be open access, which is highly recommended as more readers then will have access to your paper.

The author taking care of the submission is called *corresponding author*. This is often the person leading the project, collecting different contributions, sending out drafts to all authors etc.

If you are the corresponding author you have to go the website of the journal to find out details about the submission procedure. Usually this involves uploading your LaTex-files and figures into the system. Quite often you have to cross in a box saying that it is not published or under consideration for another journal.

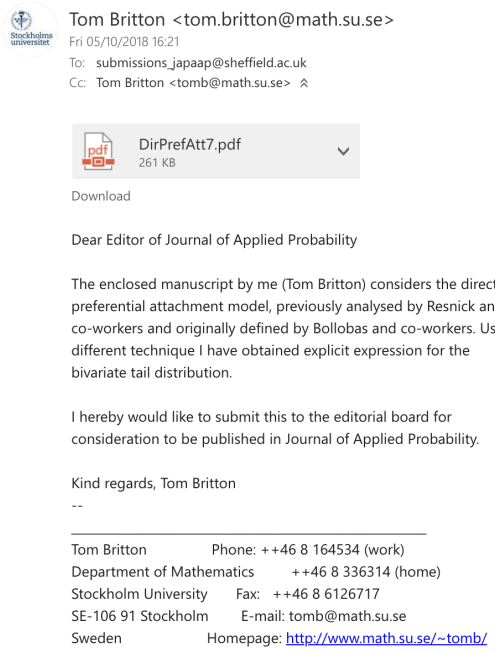
However, nearly all journals accept that the manuscript is made publicly available as a preprint. Such a preprint may be part of a preprint series of your university, but the most important preprint forum in mathematics is arXiv (www.arxiv.org). I strongly encourage you to put your manuscript up on arXiv at the time of submission. ArXiv has a very wide readership, implying that many readers will see your manuscript much earlier than if they waited to the published version. ArXiv also has the advantage of making your result public quickly. If for instance a very related result appears in a journal before your paper goes into press, then the dating of the arXiv-version will show that you had shown the result before the other publication was public, thus maintaining its value. For the same reason you must of course check what others publish on arXiv, but these publications will appear when you search for keywords just like if published in journals.

3.1.1 Cover letter

When you submit your manuscript you should include a cover letter. Their importance varies with journals, but my recommendation is to write a short letter explaining, without any formulae, what the paper is about, what you show, and why this is important. You can end the letter by explaining why you find the manuscript suitable for the chosen journal and that you would like the manuscript to be considered for publication in it (alternatively, this could appear first).

Below (Fig 3.1) is an example of a very short cover letter: my most recent publication where I am the sole author (not so frequent any more ...). At the time of submission the journal (*Journal of Applied Probability*) wanted submissions by e-mail, but much more frequent (now) is to upload the cover letter as a pdf-document, and then I recommend to include the university logo on top. If I would re-write it now I would probably explicitly write the title of the paper and add a few more sentences what it is about and why this is important, but personally I don't like long cover letters – never more than a page. The first paper I cite in the cover letter (Resnick and co-authors) is published in the journal I submit to, which is my main argument to why this journal is suitable. Perhaps I would now have written this explicitly: " ... Resnick and co-workers (published in emphJ.A.P.) ...". Sometimes people also write that it is not under consideration for any other journal, but to me this is obvious (and stated in journal's ethical guidelines) and not necessary.

Some journals encourage, or even demand, that you include a list of potential reviewers. Here you should not include people that are very close to you, this being a conflict of interest. On the other hand, you should not list people you have a bad impression of (or even worse – the opposite), or that you suspect are working on the same problem. My advice is to select some fairly well-known mathematicians in the relevant research area that you have a good impression of, and preferably generally positive persons. It could be an advantage if you choose people that you refer to in the manuscript. This surely indicates that their work is related to yours, and one should not deny the fact that all of us are flattered when being referred to. Conversely, if you suggest a reviewer working in the same area they might get a bad impression if they are not cited.



Tom Britton <tom.britton@math.su.se>
Fri 05/10/2018 16:21
To: submissions_japaap@sheffield.ac.uk
Cc: Tom Britton <tomb@math.su.se>

DirPrefAtt7.pdf
261 KB

Download

Dear Editor of Journal of Applied Probability

The enclosed manuscript by me (Tom Britton) considers the directed preferential attachment model, previously analysed by Resnick and co-workers and originally defined by Bollobas and co-workers. Using a different technique I have obtained explicit expression for the bivariate tail distribution.

I hereby would like to submit this to the editorial board for consideration to be published in Journal of Applied Probability.

Kind regards, Tom Britton
--

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Figure 3.1: An example of a cover letter.

3.1.2 The Submission Process

Once you have pushed the submission button, you should quite soon receive a confirmation letter (directly if automatically generated, or within a few days if written individually). If you haven't received a confirmation within, say, a week, then you might want to send a query about it.

From the journal's perspective, what happens next is usually the following. First, some administrative person checks that all files are typeset correctly so that the manuscript seems complete. If not, you will be contacted for technical advice on how to correct this. Then the manuscript goes to the Main editor(s), typically one or two persons. They will first make a very rough screening to see if the manuscript is at all suitable for the journal, both in terms of area and quality. If not, you will get the manuscript back

rather quickly rejected on these general grounds.

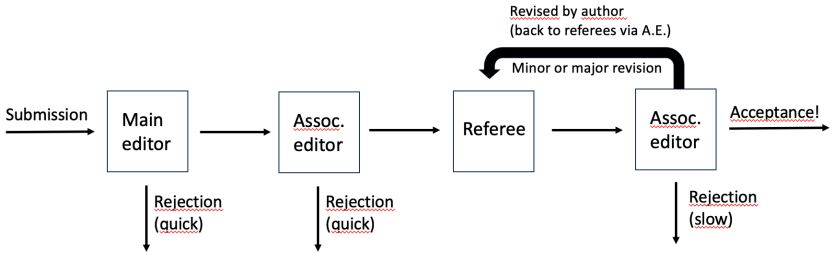


Figure 3.2: A graph illustrating a submission and its way to acceptance or rejection.

If the manuscript passes this first screening, then the Main editor sends the manuscript to an Associate editor who is selected for being familiar with the area of the manuscript. This Associate editor reads the manuscript briefly to get an impression of whether the manuscript is interesting, fits the scope of the journal, and seems mathematically correct. If these requirements are not fulfilled, then the associate editor suggests to reject the manuscript without sending the manuscript to referees, also providing a short motivation for rejection. This rejection is then formally decided upon by the main editor, and the corresponding author receives the decision including the short motivation. Such a rejection typically comes within a month. Please note that the editor and associate editors are university professors with many other duties, and do the editorship in their spare time, often without any reimbursement, so some time delay is inevitable.

If the Associate editor finds the manuscript interesting and suitable for the journal, then they send it out to 1-3 referees. Finding referees is often hard which is understandable: it is an unpaid job where they spend several hours, or even days, going through a manuscript, finding mistakes and giving suggestions on how to improve it. The referees are typically given a time

window for producing a referee report but have to accept or decline the job at the start. The time window varies between journals with a general tendency for theoretical journals to have longer windows. Between 3 weeks and 6 months is what I have experienced myself. It happens regularly that referees don't stick to the time window and the journal has to chase them for reports (most often done automatically nowadays).

Once the referee reports are received, the Associate editor goes through them and looks at the manuscript again. Based on this, they can decide on one of several options (formally the Main editor decides but in reality it is the Associate editor who decides). These options are typically:

- To Accept the manuscript without hardly any changes
- To Conditionally accept after some minor changes have been done ("Minor revision")
- To suggest a Major revision without any guarantee of acceptance, or
- To Reject the manuscript

The decision "major revision" gives no guarantee of acceptance, but the associate editor's belief is that it will be accepted if all the suggestions are taken care of in a revision. The corresponding author is then informed by this decision (formally taken by the main editor) and the referee reports are included together with an over-all motivation by the associate editor. The referees are nearly always anonymous whereas the associate editor is usually named and the main editor is always named.

Most journals have online information about where in this process your manuscript is: "with editor", "with associate editor", "with referees", "referee reports submitted". You can hence check the status of your manuscript and if seriously delayed you may send a polite letter to the editorial office asking about the delay.

3.2 Revising

Revising a manuscript after it has been submitted is not one of my favourite work tasks. By then I am often working on new exciting projects, and re-

turning to an old "finished" project is not always appealing. Still, the job has to be done and the, by far, best strategy is to dig into it right away and work intensively until you are finished.

3.2.1 Being rejected

Suppose that you have just received a report back from a journal to which you submitted a manuscript. If you get a rejection from the editor or associate editor without referee-report, then you should read their motivation. Most often such a quick rejection is motivated by the manuscript being unsuitable for the journal. It could also be that they don't find the manuscript interesting enough. This is of course disappointing, but you can then consider a similar journal, perhaps of slightly lower rank. If there is more serious critique, such as something being mathematically incorrect, then you must of course look into this in detail. An advantage with such a rejection is that it comes rather quickly, implying that your publication process is not delayed much. You should consider the feedback you received and try to adjust the comments you agree upon. After this, you should consider what other journal to submit to and then do this. An alternative action, if having received critique on the manuscript not being interesting enough, is to consider adding more material. Perhaps there are related problems that can also be analysed and merged into a new manuscript containing the old result but with new interesting features added? Or you should simply put more effort into explaining why the results are interesting and important.

If your manuscript is rejected after having been sent out to referees, then this will unfortunately have delayed your publication more. The upside is that you will receive more feedback, which usually is constructive. You should go through the manuscript and try to improve it based on the comments you received. If the referees have substantial suggestions for modifications, then you don't have to modify accordingly when submitting to a new journal. However, most often such advice is relevant and the referees suggest improvements to parts of the manuscript they found weak, so my recommendation is to make some adjustment even if not exactly as suggested by the referees. Once you have done this, you should resubmit the manuscript to a new journal after having considered possible alternative journals and of course consulted with co-authors. Note that you may also have to fit the

manuscript to the new journal's format.

Keep in mind that different referees often have different impressions of a manuscript. This is why high quality journals have more than one referee. After the improvements made by you there is a good chance that it will get better reviews when submitted to a new journal. The new journal is not aware of your earlier submission (no need to tell in the cover letter that it was rejected by journal x ...). Most likely you will hence receive new referees. It could however by chance happen that there is overlap with the earlier set of referees. This is another reason why you should revise according to the reviewers comments also when being rejected.

I have on several occasions been asked to review a manuscript which I had earlier reviewed for another journal. In more than one such occasion I had given plenty of suggestions for improvement in my referee report for the first journal which rejected the manuscript, none of which were implemented in the submitted manuscript to the new journal. You can guess what my recommendation for the new journal was ...

3.2.2 Major revision

The journal response which requires most work is "Major revision" (other journals use different but related terms). My philosophy here is that if you follow all the advice they mention, then they have no other choice but to accept the manuscript. This may however require quite a lot of work. Quite often one is not agreement with all the comments. After all, you have written what you think is a well-written and interesting paper and now they have several major comments on it. However, keep in mind that editors and referees are nearly always helpful and the suggestions they give are written to improve the paper in places where they were not happy with the material.

You should look at the comments and discuss among all authors how to address the different comments. There are usually some minor issues that are dealt with rather quickly. But for the main ones you should always make some adjustment. The best is if you do as the referees/editor suggest, but second best is that you make some related modification.

You should never resubmit without having addressed all the points raised by the referees and editor. In the response letter you are nearly always asked

to clarify how you have addressed each point raised. The best way to do this is to copy in the reports in the response letter. After each of their comments you should respond how the manuscript has been revised to meet the comments. My general advice here is to be polite, brief and to refer to where text has been modified.

Some authors give long comments in the response letter. I discourage this because the suggestions are made to make the manuscript better for *all* readers, and some explanation in the response letter is only seen by the referee. A typical response on a major point could be:

The proof has been given in more detail as suggested by the referee (p14, second paragraph) and the potential extensions mentioned are discussed in the Discussion (p19, first paragraph).

It should be easy to distinguish the text of the referee report with that of your response text, so your response could for example be in italics, or have wider/narrower margins, or similar. As for the minor points raised by a referee, it suffices to write

Corrected.

The manuscript is usually sent back to the same referees upon re-submission, and referees typically want to spend minimal time on going through revised manuscripts. A response letter with very short explanations accompanied by page references to changes, gives a good impression on the referees. If permitted by the journal, a good idea, is to submit two versions of the new manuscript: one ordinary version and one version where the changes are highlighted, e.g. by different color for added text, and crossed over text for removed. Rarely should you make other changes to the manuscript than those requested (beside correcting typos). If you do you should mention this in the beginning of the response letter and motivate why. You can for example write "A colleague pointed out an inconsistent formulation of the dependence structure (p8, second paragraph) which is now corrected".

It happens that a comment by a referee might be incorrect or not a good suggestion. My recommendation is to assume this is caused by unclear writing on your side. Rather than writing "We disagree with the referee – Equation (3.2) is correct". I think it is better to write "Thanks to your comment

we realize that our explanation was misleading and have now formulated the argument much clearer (p12, second paragraph)".

On occasions I hear colleagues saying with a laugh that a referee had completely missed the main point of a submitted paper. I wouldn't laugh. Typically, the referees have been selected for being an experts in the field of the paper, *and* they clearly spend more time on the manuscript than a typical reader. So, if they don't understand the main message of the paper, then the paper clearly requires improvements.

Sometimes referees ask for quite a lot of additional analysis of some type. You should then do at least part of this. If it is very time consuming, or you don't even know how to perform all suggested improvements, then you can in the response letter describe that you have dealt with most aspects of the comment but find one or two aspects beyond the scope of the manuscript and that you instead discuss them in the Discussion for possible future work.

3.2.3 Minor revision

If you get the journal decision "Minor revision" you do more or less the same as for "Major revision" except that you usually have to do much fewer adjustments. You should still copy in the reports and give short explanation and page references for the main points.

Quite often referees also suggest that you add some specified references and discuss your work in relation to those publications. You should of course do this when suggested – have in mind that a referee who suggests several references with a common author might very well be that author.

It is suitable to begin the response letter by thanking the referees and editors for their comments which helped improve the manuscript. You should also write that "all comments raised by the referees and editors have been adressed as explained below". If you think the manuscript has improved substantially from the comments of the referees, you may in the acknowledgement add a comment that you "thank two anonymous referees for suggestions which greatly improved the manuscript".

When you revise the manuscript it is wise to regularly save a version and continue updating a new copy. Dating the different version is helpful if you change your mind and want to retrieve an earlier formulation. Needless to

say, you should always save each submitted version of a manuscript.

The best journal response is of course that they accept the manuscript without any further corrections, or possibly just a couple of typos. In that case, you should quickly make the necessary edits before sending the files to production as described in the letter. Unfortunately, this is not a very common decision from the first submitted version of a manuscript ...

3.3 Giving feedback and being referee

In academia, but also in many other working areas for mathematicians, you are often asked to give feedback on written material; here we focus on manuscripts aimed for publication in mathematics journals. For example, you are regularly asked to be referee for a manuscript in your research field, to give feedback on manuscripts of (PhD) students or other colleagues. In fact, in the beginning of your career I encourage you to team up with some colleagues to read and give comments to each others' manuscripts. The best is to team up with people who are close to your own subject. You will learn both mathematics as well as good and bad examples of writing styles, and you will receive feedback on your own work, which hopefully will improve your manuscript.

So how should one give feedback? There are some differences (but also many similarities!) between being an anonymous referee and giving feedback to a colleague, so I distinguish between the two below.

In both cases when writing feedback you can refer to a specific part of the paper as "5^{12}" and 10_9 meaning row 12 on page 5 and row 9 from bottom on page 10.

3.3.1 Giving feedback to colleagues

If you are asked to give feedback on a manuscript of a colleague, then you should first of all find out who is the intended reader. Ideally you belong to this group, but otherwise you have to use a bit of imagination and try to read the text having the intended reader in mind.

A common mistake when giving feedback is to focus too much on details.

When you read the manuscript you should try to think about the main questions first:

- Do I understand what the problem and main results are?
- Do I understand the logic order?
- Is the paper well structured and does it flow?
- Is the mathematical level suitable for the audience
- Is the reader reminded how sub-results connect to the main results?
- Is the notation well chosen?

Another important task is to identify parts which are mathematically unclear, or even wrong. Only after that comes details like typos and suggested reformulation of small parts. When you read the manuscript you should also make notes of positive things – giving only negative feedback is not the best way for the author to improve in the future!

How you give the feedback to a colleague is a matter of taste, but having a chat together with some type of written comments (e.g. an annotated printout or using the commentary option in Adobe or similar) is probably the best.

When you give your feedback, my recommendation is to start by writing a very short summary of the paper. If the author is not happy with your content summary, then this indicates that the focus of the manuscript needs rewriting to better agree with the intention of the author. After the short summary I recommend that you start your feedback with the positive comments. You can then go onto parts where improvements are possible, perhaps first saying that this part will require more time since you need to explain in more detail what you mean. Here you should focus on the main questions where you see potential for improvement. You should focus on the most important potential improvements rather than discussing lots of details. There is no point to discuss minor comments, simply give them in print or electronically.

At the end of the chat, you should return to the positive comments by summarizing what you mentioned in the beginning. We are all humans and

it is always easier to digest criticism on a manuscript if it is blended with positive comments. It is also important that you show your good intentions. You give the feedback for the manuscript to be improved – not to illuminate the many deficiencies of the manuscript.

If the feedback is to be given in writing, then you can write in a similar way to the description above. Start with a short summary of the paper as you interpreted it. Then state the general comments where you were happy with the manuscript, followed by some general issues where there is potential for improvement. This might be a suggestion for restructuring, requesting a more detailed derivation, removing an illustration which was not illuminating, or a suggestion on how to better connect different parts of the manuscript. It is good to point out what you found problematic but preferably also some suggestion on how to come across the problem. You can then, as an attachment, send detailed comments. End the text with a short summary of your positive impressions and how the improvement could make the manuscript even stronger.

3.3.2 Reviewing a manuscript for a journal

Being a referee for a journal is different from giving feedback on the manuscript of a colleague for two main reasons. First, you are typically anonymous and rarely know the author(s). Secondly, you are also expected to give a recommendation of whether the manuscript should be accepted, request revision or if it should be rejected.

If you are asked to review a manuscript, then it usually means that you know the area and hence belong to the intended readership. If this is not the case then you should probably decline to be a referee, unless you are asked as a specialist of a specific part of the manuscript. Another thing to reflect upon before accepting to review the manuscript is whether you have any conflict of interests. This is clearly the case if you are an author of the manuscript (I have once accidentally invited an author (out of 8) to review their own manuscript ...), but it may also apply if an author is a close collaborator with you, or similar. Usually you can explain the situation to the editorial board and ask whether they think it is a conflict of interest or not.

Whether you accept to be a referee or not is up to you. The main downside is the time consumption. The upside is that you will learn a new and

hopefully interesting result, which you perhaps can make use of in your own research. It will also make you reflect upon writing which probably helps improving your own writing. Besides, the whole scientific community is based on peer reviewing, so everyone that submits papers to be reviewed by others should review themselves.

There might also be some more tactical reasons for accepting to be a referee. A CV usually contains information about referee duties, and having high profile journals there gives a good impression. And, if you meet the time restriction and write a clear referee report to a journal, then the editorial board will probably have a good impression of you if you submit there at a later state. Beside these general remarks, other factors should affect if you accept or decline to review: your current situation regarding other commitments (including other referee assignments), how closely related the work seem to be to your area of expertise, and how interesting the manuscript seems to be. My belief is that obtaining referee experience will improve your own future writing by reflecting on others' writing and seeing both good and bad examples, so my general advice is to accept review offers if the area seems interesting and you are not blogged down with too many other things.

If you have accepted to be a referee you should make a note of the deadline and stick to it. You should make a serious effort of reading and understand all the contents of the manuscript, but my personal opinion is that it is better to submit a report in time rather than being late, even if you would have preferred to spend some more time on reading the manuscript. If you have specific reasons for not having finished reviewing the manuscript in time, then you can also ask for a week extension.

You should read the manuscript in a similar way as described in the previous subsection. Look at the main questions first: do you understand the studied problem, are the main results stated clearly, is it logically structured, does the math seem correct, is the language satisfactory? If the answer is "no" to several of these questions, then you can stop reading the manuscript and recommend rejection based on these general aspects. However, if the paper treats a relevant problem and has a solution to the problem which seems mathematically sound, then you should read the manuscript in more detail. Try to identify parts which are not clearly written, and think about possible general suggestions for improvement. These could include adding or removing some mathematical parts or illustration, to restructure the manuscript in

some way, or to modify/correct some derivation. You should include minor comments that you note as well, but it is not your main task as referee to find typos. In the response letter you can very well write that the manuscript needs a thorough spelling, grammar or language check without pointing out all such errors. If you are willing to also write a lot of detailed comments that is of course highly appreciated, but it is not your main task. My message is simply that I think many referees spend relatively too much time on details and too little time on the main general questions.

Your main task as referee is to try to judge if the manuscript has potential to become an interesting paper for the journal at hand. If the problem is not relevant, there is no correct solution to at least part of the problem, or it is impossible to follow the mathematical arguments of the manuscript, then the answer is probably "no", meaning that you should recommend rejection. But if the manuscript may become an interesting paper without too much revision, then the answer should probably be "yes". Depending on how much work you think is needed you should recommend minor or major revision, the latter if you are not convinced that the authors are capable of doing these revisions. As for proofs you should definitely read them and try to understand them, in particular those that play a central role. However, you need not check every detail when there are many proofs - also here it is better to zoom out and see if you understand the main ideas in the proof and if you are convinced that the authors have dealt correctly with all details. As referee you are not responsible for the proof.

Once you have decided your recommended verdict, and either have some suggestions for improvements or arguments to why you don't think there is scope for improvement, it is then time to write the referee report. A referee duty often consist of two components. First, there is nearly always an online part where you tick-respond to some questions such as: overall recommendation, quality of mathematics, presentation and English. Second, there is your referee report, which in itself consists of two separate texts: *Comments to the editors*, and *Comments to the authors*. These texts can often be attached as pdf-documents or pasted into the online system.

In the *Comments to the editor* you can be very short and honest. This part will not be seen by the authors. You can write what you like and don't like in the paper as a short motivation to your recommendation. Write only about the main general questions: relevant problem, good mathematical

treatment, well structured. There is no need to write something longer since the editorial board also has access to your *Comments to the authors* which typically gives more detail.

In certain cases you you can also bring up more sensitive things in the *Comments to the editor*. This could for example be suspected plagiarism, that you don't trust the mathematical contents in the manuscript, or similar. Another thing worth writing to the editors is if you don't feel confident to evaluate certain parts of the manuscript. If for example a section of the manuscript covers mathematical theory that you are unfamiliar with then you should inform the editors.

The *Comments to the author* should be a bit longer, and it should be written in a polite way, even in the situation where you recommend rejection. It is customary *not* to explicitly state if you recommend acceptance, rejection or revision in the *Comments to the authors*, even if what you write might of course give hints to this. It is for the editors to decide on the outcome and they often have more than one referee report and their own opinion to combine into one decision. If, for example, two referees both suggest major revision but for different reasons, then the editor might find the suggested revisions unlikely to be manageable to perform for the authors and decide to reject the manuscript. The authors may then become upset with the editor rejecting the manuscript when seeing that both referees were happy with major revision, so better not to explicitly write your recommendation in the *Comments to the author*.

The *Comments to the authors* typically starts with a paragraph where you describe the contents of the manuscript. This shows you have read the manuscript and hopefully understood it – if the authors disagree with your description of the contents then this clearly manifests that the manuscript is not well written. In the same paragraph you can write some positive and negative impressions as well, such as "The studied problem is highly relevant and they manage to make substantial progress. It would however have been interesting with a further discussion on the implications of the results."

After this initial paragraph, you might have a headline called "Major comments". Here you bring up things needing improvement, focusing on the over-all mathematical style and writing: Is it well structured?, Does some mathematical result need more details?, or if something has been overlooked. If the text is poorly written, you can write that the manuscript needs a serious

professional language control.

After the "Major comments" you can have a section called "Minor comments". Here you write comments on specific parts which need clarification/correction, e.g. a part of a proof which you did not follow, or some references you suggest to be read, added and referred to. Small mathematical mistakes and typos can also be listed, but you should not spend too much efforts on this.

What do you do if the manuscript you are reviewing is really weak? Clearly you should then recommend rejection, and you should write this in the response to the editors. However, in the *Comments to the referees* you should not write too negatively. Write about the contents, followed by comments on weaknesses of the manuscript and important things not contained in the manuscript. You may spend less effort on giving specific suggestions for improvement, but don't rub in your negative impression more than necessary.

Once you have submitted your response, you are done. You will often receive confirmation that your report has been received, and some time later you may be informed about the decision made by the editor. If the journal recommends (major or minor) revision you may at a later state receive a revised version of the manuscript to review again. You will then also receive the response letter, where the authors explain how they have dealt with your earlier comments. If you experience this you will understand my recommendation in Section 3.2 to just write short responses referring to the manuscript where the text has been changed. Then it is quick and easy to see if you are satisfied with the changes made.

My suggestion is to spend much less time on this revision task, and to focus mainly on how the authors have dealt with your earlier comments. If you are not happy with this, then you should report this back. It is, however, my recommendation not to bring up new issues where you suggest improvements in the second report. An exception is of course if you discover a serious mathematical flaw, or if the revision itself makes other parts of the manuscript redundant, then such things must be pointed out. Your report on the revision need not discuss the general contents of the paper, but can right away treat the revised parts motivated by your earlier suggestions.

If you write a report as outlined above, providing constructive ideas for

improvement, and submit the report in time, then you have fulfilled your duties as a referee.

A negative aspect with writing good referee reports and turning them in before the deadline, is that you are likely to receive more referee requests in the future. Remember that you don't have to accept each time you are asked to be a referee, in particular if asked many times by the same journal. Here too, whether the manuscript seems interesting or not should affect your action. But remember that taking on a referee assignment keeps you updated in the area and probably improves your own writing skills.

Chapter 4

Oral presentations

Giving talks about your research is the second most important way to spread information about your research results, writing scientific papers being the first. In the current chapter we give some advice on how to give talks. This should not be mixed up with teaching mathematics, the latter being outside the scope of the current text. When teaching in higher education, focus should be on the students and that they are active and learn. Giving a scientific talk is more of one-way communication (even if some interaction may be desirable), where you have a result you want to present.

Giving presentations at conferences, workshops and departments is an important way to spread the information about your results, but also about you. The networking aspect of giving presentations should not be underestimated. Another important reason for giving presentations is that you may get valuable feedback on your work which might improve it, lead to new research questions and/or initiate new collaborations. I therefore strongly encourage you to always give oral presentations when attending conferences or visiting departments of your colleagues. You don't have to give a new presentation each time you give a talk. If you have a nice result in a paper it is perfectly fine to give the same talk several times (or at least similar - the audience and time limits may differ!). If there are one or two attendants who have heard it before, they can just choose not to attend, and if they do attend they will probably learn more of the contents in the presentation after hearing it a second time.

An alternative to giving talks at conferences is to have a poster. I have

no personal experience of presenting a poster, so even if this is another important presentation technique to learn I refrain from giving advice on presenting posters due to lack of experience. I however have some experience from viewing posters. Usually there is a specific time for poster viewing at conferences, often combined with drinks and snacks to attract more people. From a viewers perspective I think it is very important to have a clearly visible and informative title, and not to cover this with your head or body when you are present at the poster session. If there are many posters I typically only want to hear more about a fraction of the posters, and seeing the title from a distance helps viewers decide which poster-presenters to approach and which not to approach.

4.1 Preparation

There are different forms for giving a scientific talk: a seminar in a department, a presentation in a smaller research group, a contributed talk at workshop, or a plenar talk at a major conference. The smaller the audience the bigger possibilities for some interactions, but I would still say that the type of presentation can be quite similar in all these situations.

4.1.1 What and for whom?

As when writing, the mathematical contents is of course the start when preparing for a talk. Here we assume that you want to present the results of a paper you have just finished and submitted, but other contents would be structured similarly. Secondly, just like when writing, you should consider whom you are talking to. Nearly always this will be a more disperse audience than the readership of a paper. For example, at a department seminar there are often PhD students, Post Docs and professors, some working in areas rather different from your area, and others closer to you. Finally, there is often one ar a few real experts in the area, e.g. the person who invited you. The situation is similar when you talk at conferences. Your ambition should therefore be to devote some time to all these categories. As Halmos (1974) puts it: the first 25% of the talk should be directed to a general math-educated student, the next 25% of the presentation should be directed to a

PhD student not familiar with your field, the following 25% to faculty non-specialists, and the final 25% to specialist of your research area. Even if this should be the typical progression of a talk it is still important to consider who will make up the audience. If they share some common interest, e.g. through a theme of the conference, this could affect what you want to put focus on, what you spend additional time on explaining and what parts that require less attention. Keep in mind when preparing the slides that the audience is heterogeneous so also non-specialists should be able to follow the first part of the talk. And remember that even the specialists know less than you about your particular result, and that typically no one has read your paper (if someone has they will be happy with a layman summary anyway). If you think back on recent presentations you have heard: is it more common that they were too simple or too technical? For me it is clearly the latter. Have this in mind when you produce the slides!

4.1.2 Duration and presentation style

Another related very important thing to have in mind is to lower your ambition. The written paper can take anything between a couple of hours to several weeks to read and understand. Your presentation will perhaps last for 30 minutes, so clearly you cannot expect to explain more than a small fraction of the contents of the paper. If you manage to make listeners interested, those who want to learn more will read your paper.

More things to find out in the preparation phase is how long time you are expected to talk, and which facilities you have access to. Clearly, you will have access to a screen for your computer, but do you also have access to a black/white board, is there sound system for the computer in case you want, will you be using a microphone or just your regular voice, do you have a laser pointer or a traditional pointer? At less formal occasions it is also possible to give a presentation only using black- or white-board. In fact, there is a big advantage with the a blackboard when you describe proofs and other derivations in that it will not be too quick. The downside with presentations using the blackboard is that you will have time to cover much less material. So, when deciding whether using blackboard or computer, you should determine whether you want to present more material sketchy, or if you want to really explain the ideas behind a mathematical derivation. The

most common choice, and always at conferences, is to use computer slides.

If you have access to a blackboard on the side you might very well explain some part using the blackboard. I think such "side-steps" make the presentation more lively and interesting. But remember that using blackboard is time-consuming. As for pointer it is convenient to have a laser pointer that also allows you to change slides without approaching the computer. However, make sure that the light from the laser pointer is strong enough. It is very frustrating to attend talks where the speaker continuously points with a laser pointer to different parts on the slides, but where the laser point is so small that you can't see it. In that case I much prefer a traditional pointer stick.

When talking at a conference the time slot for you is typically very fixed, whereas in a departmental talk it might be a bit more flexible. In the latter case I strongly recommend you to ask in advance for a recommended duration of your talk. In either situation, you should *never* (!) speak longer than you are asked to – if you do you are not showing respect to the audience. If you talk beyond your allocated time the majority of the audience will then: have stopped listening, have become frustrated to why you have not finished, and wonder when you will finish. The remaining impression of you and your presentation will not be the contents of it but the fact that you talked too long.

When you prepare the talk you should hence have the duration in mind. In fact, beside the mathematical contents and the audience, the time limit is the third most important factor when preparing your slides. Once you have produced the slides it is good to give the presentation out loud and to time it, to make sure the amount of contents is suitable. Giving the talk silently inside your head is always quicker so make sure to give it out loud. Even if you have done so, your presentation can take longer when you give it at the seminar/conference, perhaps due to some question during the talk, so check regularly how you are doing with time during the presentation. For this reason, in case you are short on time, you should have a few slides towards the end of the talk which you can skip without loosing the main messages.

4.1.3 Presentation structure

As described above, you should have a lower your ambition in terms what to expect the listener to learn from your presentation as compared to readers of a manuscript. The most important piece of content that you should convey is to explain the question you are addressing, preferably with a short indication to why it is relevant. My impression is that many speakers spend too little time on this and instead rush to the solution of the problem. However, if some or even many listeners don't understand the problem you are addressing and why, they will certainly not be interested in your solution to the problem! So, put quite a bit of effort on explaining the problem and why you want to solve it. Listeners who understand this but not your solution will still have gained from hearing your presentation.

Once you have presented the problem with some background motivation you should then move on to the results. What have you shown/proven, and also what your results imply within or outside of mathematics. It is also highly recommended to state what you have *not* proven. What interesting questions remain open, and do you have any guess on what the answers are? Describing open problems is a very efficient method to attract listeners' interest. Only after these parts have been presented, and time-permitting, you can give some hints to how the results are proven. Being towards the end of the presentation you can be more advanced here. Still you should focus on the main ideas of the proofs and leave out technical details. Here you can also explain obstacles when trying to solve the open problems.

Some slides towards the end, for example containing proof methodology, some extension or application, can be skipped in case of short time remaining. The last couple of slides should however be shown, and they should end with a summary of the main results and their consequences. Some speakers end with a slide thanking all collaborators and financial sponsors, others by giving some references (both the publication but also a couple of references to related work - don't include all references you have in your paper). I think either of those ways, or to simply end with the last summary slide, is fine. If you don't mention collaborators in the final slide they should appear on the first slide (e.g. "Joint work with x and y"). It is very important that they are mentioned somewhere on the slides.

Another recommendation when presenting is not to treat the most general

case of your paper, but to consider some special simpler case. You can explain this orally: "In the paper we consider a more general form of functional but here treat this simpler case for clarity".

4.1.4 Structure of slides

When you prepare the slides it is wise not to include too much information into one slide. The first slide should show the title of the presentation, your name and affiliation and also names of co-authors and possibly financial support if not mentioned at the end. You can then show the outline of the talk, but quite often this is shown at the top or bottom of each slide, also showing where in the talk the current slide belongs, together with your university heading, using suitable LaTex package for presentations.

Figure 4.1: A slide from a presentation. My name, affiliation, the title and sections of the presentation are shown, the current section being bold.

Each slide can have a header describing the contents of the slide, but this may also be skipped. Either way, the slides should use big enough font and not have too much text or formulae. Don't write complete sentences – just the important words. You may for example use "itemize":

- Not complete sentences
- mathematical symbols rather than text: $f_\alpha(\cdot) \in C^\infty,\ \forall \alpha \in (0,1)$
- Leave out details

Keep in mind not to have too much information in any slide, and also not to have too many slides (one per minute could be a good goal). These restrictions agree with earlier statements that you should only present part of the content of the paper and no details about the proof. Another way

to reduce complexity in the presentation is to consider some simpler special case when you heuristically explain the ideas of a proof.

When preparing the slides you should only include things you plan to say – it is not recommended to put up additional information (that you don't discuss) on the slides. Sometimes people even use a page from their paper as a slide in their presentation, often saying "you don't have to look at all this, all I want you to study is equation (4)". It is of course much better to produce a slide only containing this equation, and possibly some comments about it! If you have some graphs or figures on some slide this usually makes the presentation more varied, or if you break with a blackboard derivation or a "live" computer simulation producing a figure as the simulations evolve.

Once you have produced the slides you should let them rest for a while and go through them again keeping in mind not to be too technical and not having too much information on each separate slide. It is strongly recommended to give the presentation out loud for yourself. This will indicate the duration of the presentation, but it is also a good way to discover unclear explanations and parts needing better connections.

4.2 Giving the talk

When it is time to present the talk you should of course be there well in time. Make sure that your talk is up on the screen and check that the microphone is working in case you use it. In a large lecture room I recommend using a microphone (assuming the audio system is at least descent). If a speaker talks too silently during a presentation those in the back will quickly loose interest. Asking "Can you here me in the back" (often done with very loud voice) is not very meaningful - very few would raise their voice saying they would prefer the use of a microphone.

When you start the talk you are often presented by a chairman. It is customary to thank him or her (e.g. for the opportunity to present), and thank for the invitation to speak when relevant. You can also state some general comment, like "What a beautiful campus you have", or something making people laugh a bit to make the atmosphere more relaxed. If you are nervous you might also memorize the first few sentences you plan to say in your talk. But, I discourage you to have the whole presentation printed out

like a manuscript to read out loud. Reading a text word by word often make listeners become bored. Nor should you read the exact words as they appear on the screen. What you can have is a speakers note (on your screen or on a paper) where you have some key points to mention on specific slides. This could for example be to acknowledge the co-authors on the first slide, that a simulation program can be downloaded from your webpage on the slide where simulations are presented, or similar.

When you speak you should aim for speaking loud and clear. No whispering of end of sentences or of less relevant parts! Don't speak too fast, and when you have stated an important result or observation it is effective to make a small pause for the audience to really capture what you just said.

It is important to try to catch the interest of as many listeners as possible. This can be achieved by presenting an interesting problem, state something counter-intuitive, or to ask the audience to guess the answer to some question. During the presentation you should also try to get eye contact with as many listeners as possible. You should definetely not only direct your attention to some small group of listeners, such as your friends, the experts in the field, or those in front. Try to spread you attention equally to the whole audience.

During the presentation it is important to keep track of time. If you come behind schedule you will have to skip some slides towards the end, but make sure you have time for the very last slides giving the summary, conclusions and open problems. *Never* talk too long, at least not at conferences and situations where the speaking time is fixed. Speaking a few minutes shorter than your allocated time is however not a problem. Hopefully you will then get som questions from the auditorium.

Make sure you look out in to the audience frequently, and not only at the screen or blackboard. This allows you to follow the audience to see parts where they look interested or puzzled. Some individuals have hang-ups like looking into their hands, scratching a leg regularly, frequently clearing the throat etcetera. Such hang-ups tend to distract listeners and should be avoided. An efficient way to find out if you have any hang-ups is to film a presentation of yours, and afterwards studying how you move and speak. This you can for example do when training for a presentation. Another piece of advice is to ask for feedback on your talk, preferably you should do this prior to the talk so the person hears your presentation when having feedback on it in mind. Just like when writing a manuscript you can team up with

a colleague and give feedback to each other. If you are a PhD or Post Doc student you can also ask your supervisor to give feedback. Just like with writing, practicing giving talks, getting feedback (and making observations yourself) and modifying in future talks, is the best process for giving better and better talks.

To be included

Comments from Tobias

What is most common: too simple or too complicated talks? Juniors tend to give more complicated talks

Literature

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