

# Scientific Communication

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# One language to rule us all

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## English

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## English

### How many native speakers here?

# Recommendation

Improve your English ASAP:

- the spoken word (ear, mouth);
- the written word (eyes, pen / keyboard).

# Homework (1/2)

- View your DVDs **in English**  
**with subtitles in English.**
- See some TV series **in full** (Firefly, ...),  
and then see the best episodes again  
**without the subtitles.**
- Read some audio books (Percy Jackson, ...).

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**with subtitles in English.**
- See some TV series **in full** (Firefly, ...),  
and then see the best episodes again  
**without the subtitles.**  
(Yes, that means: all of them for Firefly.)
- Read some audio books (Percy Jackson, ...).

# Homework (2/2)

Read books about technical writing:

- [The Elements of Style](#) (Strunk and White)
- [A Handbook for Scholars](#) (Van Leunen)
- [Towards Clarity and Grace](#) (Williams)
- [How to Write Mathematics](#) (Steenrod)
- [Lessons from a Lifetime of Writing](#) (Morrell)



# Homework (3/2)

Heck, also read books about writing from your favorite author:

- [On Cooper's Writing](#) (Twain)
- [Writing Magic](#) (Levine)
- [How to Write Science Fiction & Fantasy](#) (Card)
- [The Craft of Writing](#) (King)
- [Why I Write](#) (Orwell)

# Your overall goal

To move on with a PhD degree.

# Your intermediate goal

To acquire your PhD degree.

# Your likely milieu: a PhD school

The scientific analogue of

- a plant nursery, and
- a training ground for the Olympic Games.

# On the one hand

## Generically:

- Clear rules  
(number of ECTS points, etc.).
- Clear milestones  
(qual exam, stay abroad, etc.).

# On the other hand

## Specifically:

- Original work  
(including peer-reviewed publications).
- Specialized supervision  
(therein lies the rub).

# Your PhD supervisor and you

- He is **shaping you** (positively or negatively).
- He will **manage your discontinuity**  
**from student to researcher.**
- He will **follow your career.**

# Example: managing the discontinuity

A natural transition point: a stay abroad.

Before the stay abroad: a student.

After the stay abroad: a researcher.



# Example: following you

- Reference letters.
- Career opportunities.

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- Reference letters.
- Career opportunities.

And one day, you will outgrow him.

# In Denmark

- The person in charge of a PhD student has to be a permanent employee.
- There can be two PhD supervisors.

# In France

- PhD: habilitation to **do** research;
- and then: habilitation to **direct** research

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(though not necessarily like a GPS).

# Terminology

- PhD supervisor (or advisor)
- PhD vejleder
- Doktorvater
- Directeur de thèse

# Varieties galore

- A variety of topics.
- A variety of students.
- A variety of supervisors.

To say nothing of gender.

# The variety of topics (1/2)

- foundational
- theoretical
- applied
- experimental
- developmental
- etc.



# The variety of topics (2/2)

- Pre-determined or open-ended?
- If pre-determined:  
the 80%/20% Google model?

# The variety of students

- young / older
- local / national / international
- isolated / among others

# The variety of supervisors

- inexperienced / experienced
- local / national / international
- only expert / in a group of experts

# A common point

One day,  
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your PhD supervisor  
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(“not so long ago” is a very subjective measure)

# Communication

- How you may see your PhD supervisor.
- How he may see you.

# Communication

- How you may see your PhD supervisor.
- How he may see you.

(Yes, it sounds like whining.

But it is **sincerely felt.**)

# View from the student (yin)

- Why does he not **listen to me**?
- Why does he not **support me**?
- Why does he not **help me**?



# View from the student (yang)

- Can't he just **tell me what to do?**
- What I do is **never good enough.**
- He expects **too much of me.**
- **I would like to do more.**

More of the same

phdcomics.com

## View from the supervisor (yin)

- He **never does what I want**.
- What he does is **nowhere near perfect**, ever.
- He **never takes an initiative**.
- He **is so slow** and he **stops too soon**.

# View from the supervisor (yang)

- I managed OK without supervision,  
why can't he?

# View from the supervisor (yang)

- I managed OK without supervision,  
why can't he?

(sigh)

# Heard at a seminar for supervisors

“He only comes to see me at 16h00  
when I have to leave to get my kid  
at the day care.”

# Heard at a seminar for supervisors

“He only comes to see me at 16h00  
when I have to leave to get my kid  
at the day care.”

But a PhD student should not be supernumerary  
in the PhD supervisor's calendar.

# The essence of the problem

- **Egos get in the way** (“me, me, me”).



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- Ask not what you can do for the other  
either.

# Antoine de Saint-Exupéry in 'Citadel'

Look in the same direction.

# Learn to know each other

## Criteria:

- respect;
- esteem.

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Criteria:

- respect;
- esteem.

Empathy helps too.

# Empathy

Example:

The sight of a PhD supervisor  
attending a talk  
given by his PhD student.

# Empathy

Example:

The sight of a PhD supervisor  
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given by his PhD student.

- From reading his e-mail

# Empathy

Example:

The sight of a PhD supervisor  
attending a talk  
given by his PhD student.

- From reading his e-mail
- to taking notes.



Understand why he is weird

Your PhD supervisor is subjected to:

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- management duties,

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- management duties,
- funding pressure,

# Understand why he is weird

Your PhD supervisor is subjected to:

- management duties,
- funding pressure, and
- peer reviewing.

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- Share the same culture  
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(Communion helps communication.)



# Empathy test

- Can he be happy for you?
- Can you be happy for him?

# So, you and your PhD supervisor

- Learn to know each other.
- Learn to cooperate.
- Remember that in the end,  
the message is more important  
than the messenger(s).

# PhD studies: a transmogrification

From studying known things...

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From studying known things...

...to researching new things.

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Your first research paper will mobilize  
all your intellectual resources.

It will be exhausting.

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And you will make it.

PhD studies: a genuine mind expansion.



# About this mind expansion

An expanded mind  
is precisely what is expected  
from someone with a PhD degree.

# Things are different doing research

- A researcher is more on his/her own than a student.
- New results are not presented like known ones.

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The issue is

- not to “show that you know” as in an exam;
- but to genuinely explain something new.

# Handling questions at the end of a talk

- Most PhD students rush to answer, as if they were passing an exam.
- But **you are not passing an exam.**

# Questions at an exam

- The questions are **standard**.
- The answers **are standard too**.

# Questions at the end of a research talk

- The questions are **open**.
- The answers **are open too**.

# The problem with questions

- They are rarely clear.
- Not everybody in the room hears them.  
(The bigger the room, the more so.)

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- They are rarely clear.  
So how can their answer be clear?
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# The problem with questions

- They are rarely clear.  
So how can their answer be clear?
- Not everybody in the room hears them.  
(The bigger the room, the more so.)  
So how can their answer be useful to all?

# The real problem about questions

It is harder to ask a sensible question  
than to supply a sensible answer.

(Persian proverb)

Concrete example:  
Tim Powers's acknowledgments  
in "On Stranger Tides"

To [...]

for clear answers to unclear questions.

# How to handle a question

The goal is **to communicate.**

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- **Only** answer it once you **both agree about it**.



# How to handle a question

The goal is **to communicate**.

- Show that you **understand the question**.
- Are you able to **repeat the question**?
- You may even need to **restate it**.
- **Only** answer it once you **both agree about it**.

Then you will be able to **truly communicate**.

# Elementary reminder

A communication involves:

- a sender,
- a receiver (or several receivers), and
- the transmitted information.

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A communication involves:

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Whether you are the sender **or a receiver**,  
your goal is to **maximize the throughput**.

# Transcripting questions

Questions are **the salt of your research talk.**

# Transcribing questions

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So give them **your complete attention**.

By force, you will forget the previous question to concentrate on the current one.

So **have someone else transcript them**  
(as well as your answers).

NB. Two transcribers are better than one.

# Transcripted questions and answers

Identify **who** asks each question.

Afterward, **revisit the transcripts**,  
and don't hesitate to **get back**  
**to the person who asked a question.**



# Handling questions

The golden rule still applies:

**ALWAYS** repeat the question.

It gives you time to **identify its nature**.

- **Technical question**: give a technical answer.
- **Friendly question**:  
use it to make your point even better.
- **Challenging question**: be upfront.

# Example question #1

**Q.** Wouldn't it have been simpler to use co-induction?

**A, Version 1:** The question is: “Wouldn't it have been simpler to use co-induction?”

That's a very good point. No. I tried, and it is actually simpler to use induction.

**A, Version 2:** The question is: “Wouldn’t it have been simpler to use co-induction?”

That’s a very good point. Perhaps. That’s worth looking into.

## Example question #2

**Q.** Wasn't this known already?

**A.** The question is:

“Wasn't this known already?”

To the best of my knowledge, no,  
it was not known already.

## Example question #3

**Q.** Isn't your main theorem a corollary of Erdős's theorem?

**A.** The question is: "Isn't my main theorem a corollary of Erdős's theorem?"

Good question.

Which theorem do you have in mind?

## Example question #4

**Q.** Blah blah blah. Blah blah. Blah blah blah  
blah blah. Blah blah blah blah blah blah blah  
blah blah blah blah blah blah?

**A.** The question I believe is “Blah blah?”  
...(and then for an appropriate answer)...

## Example question #4 (Tony Hey)

**Q.** Blah blah blah. Blah blah. Blah blah blah  
blah blah. Blah blah blah blah blah blah blah  
blah blah blah blah blah blah?

**A.** Could you crystallize what you said  
into a question?

## Example question #5

**Q.** ...unparseable... ...unparseable...  
...unparseable... ...unparseable...  
(unparsed)

**A.** I am sorry. Could you repeat your question?



## Example question #6

**Q.** I don't like your approach at all.  
(Blah blah blah.)

**A.** I am sorry. What was your question?

# Example question #7

**Q.** I don't believe you.

# Example question #7

**Q.** I don't believe you.

**A.** And you don't need to!

# Example question #7

**Q.** I don't believe you.

**A.** And you don't need to!

It is formalized in Coq.

## Example question #8

**Q.** More than a question,  
I want to make a comment. Blah blah blah.

**A.** Thank you very much.

# Do

Make sure that  
all the terms of the question are defined.

When you speak, be careful with idioms  
when you are not a native speaker.

# Don't

**Don't use slang,**

especially if you are not a native speaker.

Slang terms mean something else

than what you think it means.

(cf. “Inconceivable!” in *The Princess Bride*)

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If the question is “What is X?”,  
don't say: “X, it's when ...”

It reveals **muddled thinking**.



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especially if you are not a native speaker.

Slang terms mean something else than what you think it means.

(cf. “Inconceivable!” in *The Princess Bride*)

If the question is “What is X?”,  
don't say: “X, it's when ...”

It reveals **muddled thinking**.

At an oral exam, don't say

“I knew you would ask this question.”

# And if there are no questions?

- Say “thank you” again, and pack up.

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- If you have a computer demo,  
now is a good time to remind the audience.

## And if there are no questions?

- Say “thank you” again, and pack up.
- If you have a computer demo,  
now is a good time to remind the audience.
- (seen at TLCA’01)  
“Good! Then  
let me show you a couple more slides.”

# Refereeing a paper

What: the cornerstone of quality control.

How: peer review.

Reference: Parberry's guide for new referees.

# The actors in presence

- The author(s).
- The editor / program chairman.
- The reviewers.

# The point of refereeing a paper

Quality control by peer review.

# The timeline for conferences

- A paper is submitted.
- It is allocated to PC members and often subcontracted to external reviewers.
- Reviews are collected.
- A decision is taken at the PC meeting.
- Reviews are sent to the author(s).



# The timeline for journals

- A paper is submitted.
- It is allocated to external reviewers.
- Reviews are collected.
- An editorial decision is taken:  
accept / reject / revise.
- Reviews are sent to the author(s).

# Conferences: one-way communication

- Would the paper help making the conference a success?
- If not accepted, try another conference.

# Journal: two-way communication

- Is the paper in archival form?
- If not, revise it and try again.

# The point of view of the author

The idea is to try to give all the information

to help others to judge your contribution;

not just

the information that leads to judging it

in one particular direction or another.

– Richard Feynman

# The point of view of the reviewer

One never notices **what has been done**;  
one can only see **what remains to be done**.

– Marie Curie

# Writing a review

Canonical reference: Parberry.

- Is it correct, worthwhile, readable, etc.?
- Which kind of paper is this:  
groundbreaking, improving, fixing,  
surveying, etc.?

# The curse of novelty (flip side)

It's got to be new!

It's got to be relevant!

# The curse of novelty (flop side)

...but it's not new!



# The curse of relevance

“In the Late Cretaceous”

Connie Willis, 1992

A must-read.

# Some elements for a review

1. Convey your understanding of the paper with a summary.
2. Double up with an analysis.
3. Sum up with an assessment and a recommendation.
4. Add a list of remarks, if any.

# Context of the review

- Be objective.
- Be fair.
- Don't delay.
- Be courteous.
- Remain confidential.

## To summarize

- Reviews should be as **comprehensive** as possible.
- Reviews should be as **courteous** as possible.
- Reviews should be as **selfless** as possible.

# The job of a program chairman

Assemble the best possible program  
(at the cost of rejecting good papers).

# The job of a journal editor

Make the journal as good as possible.

# The job of an author

To cooperate with the reviewing process.

# The job of a reviewer

To provide impulse in the reviewing process.



# Choosing reviewers

- Competence.
- Availability.
- Depth / breadth.

# You, reviewer

- One among several others.
- Your anonymity.

# Extracting reviews from reviewers

- It may take persistence.
- The more competent, the more busy.

# Synthesizing the reviews

- Accept / revise / reject.
- Editors sometimes moderate the reviewers by coming back at them.
- Get back to the author(s).

# Receiving a review

- Rod Burstall's take: a review is an **offering**.
- The Dilbert syndrome.

# Receiving reviews

From my close observation of writers, they fall into two groups:

1. those who bleed copiously and **visibly** at any bad review, and
2. those who bleed copiously and **secretly** at any bad review.

– Isaac Asimov

# Facts

Nobody likes a bad review.

Most reviews are critical.

# Take a holistic approach

- Distinguish between your work and your ego.
- Identify the cause of the criticisms and fix it.
- Rearrange the rest of the paper to fit.
- Persist: “If you don’t fight for your ideas, nobody will.” – John Reynolds



# Take a holistic approach

- Distinguish between your work and your ego.
- Identify the cause of the criticisms and fix it.
- Rearrange the rest of the paper to fit.
- Persist: “If you don’t fight for your ideas, nobody will.” – John Reynolds  
(Corollary: “and will take credit for it.”)

# Together with the revision

- Comment the reviews pointwise:  
the reviewers will appreciate to see  
each of their points addressed upfront.
- Thank the reviewers for their time:  
they are actually your best allies.
- Finally, consider using [latexdiff](#):  
it is surprisingly useful.

# Sending the revision

- Expect an acknowledgment.
- Be prepared to be moderated.
- Think of pinging the editor after 3 months.

# Choose your editor wisely

- Rare are papers that don't need any help.
- An indifferent editor is rarely of help.

# Reviews and the paranormal

Feynman's advice about the paranormal:  
keep track of presentiments,  
for you only remember them selectively.

Here: keep track of both good and bad reviews,  
for you also only remember them selectively.

# Good reviewing experiments

- The submission is speedily reviewed.
- It is accepted (with minor changes).

# Good reviewing experiments

- The submission is speedily reviewed.
- It needs to be revised,  
but with very useful reviews.
- It is accepted.

# Not so good experiments

- The submission needs a lot of pinging.
- The reviews are lousy.
- You give up.



# Not so good experiments

- The submission needs a lot of pinging.
- The reviews are lousy.
- You persist.
- The revision needs a lot of pinging.
- etc.

# Yet reviews can be useful

Some reviewers are amazingly good,  
and they lead you to a better paper.

# Why you should review

You expect reviews on your own work,  
don't you?

## All in all

- Peer reviews: The means of quality control.
- We should all contribute to this quality control.
- We all try to survive them, even though they do make us a little weird.

# Exercise

Find a good review and a bad review  
on [amazon.com](http://amazon.com)