

Post-PhD Academic Career Planning

Andrew Derrington
Parker Derrington Ltd

Programme

Things you Need to Know

- [Where to get a handout](#)
- [Workshop Aims](#)
- [Strategy 101](#)
- [Job Choices](#)
- [What makes a good fellowship application](#)
- [How to exploit the decision-making process](#)
- [Talks and Interviews](#)
- [Fellowship Criteria](#)
- [Aims and Objectives](#)
- [Writing Guidelines](#)
- [Selling a Project](#)
- [Sub-projects](#)

Exercises

- [Promise Sentence Exercise](#)
- [Career Strategy](#)
- [Pairing Exercise](#)
- [Interview Question Exercise](#)

Introduction

The workshop is designed to help participants formulate realistic and ambitious plans in the early stages of an academic career. It aims to help you do the following:-

- Analyse your options
- Be aware of potentially misleading information
- Understand who makes relevant decisions and how
- Understand what questions you need to ask and answer
- Create the best possible set of choices at each career stage
- Make plans to improve your choices if necessary.
- Understand how to write grant or fellowship applications
- Understand how to prepare for short talks and interviews.

My delivery style is interactive, so feel free to ask questions throughout the day. This handout contains all the visual material to be used during the day with clickable links to the main sections in the programme (above) and to the full contents slide-by-slide (below).

Andrew Derrington

Contents

Programme	1
Introduction	1
What is a Fellowship? ***	3
Who offers Fellowships and Why? ***	3
What kind of person are they looking for? ***	4
The Sales Pitch ***	4
What Makes a Good Fellowship Application? ***	5
Fellowship Funders are looking for Four Things ***	5
How Funders Make Decisions ***	5
What information do the committee have? *** **	6
The Decision: what is the process? *** **	6
Implications of the decision process *** **	7
The Magic Formula *** **	7
The Key Sentence Technique *** **	7
Fellowship Key Sentences ***	8
Layout *** **	8
Tag Phrases *** **	9
Tag Phrases in Use *** **	9
Repetition ***	9
Resources ***	10
Implementation ***	10
Strategy ***	11
Should I use a successful application as a model? ***	11
AIMS & OBJECTIVES ***	12
Principles of short talks and interviews ***	12
Talks ***	12
Communication Basics ***	13
Slides, Handouts and Scripts ***	13
Interviews ***	14
Take Home Message ***	14
Promise Sentence Exercise *** **	14
The Perfect Promise Sentence *** **	15
The Exercise *** **	15
Interview Question Exercise ***	15
Pairing Exercise ***	16
Marie Curie Criteria ***	16
EPSRC Research Criteria (Panel) ***	16
EPSRC Applicant Criteria (Interview) ***	17
UKRI Project ***	17
UKRI Candidate ***	17
The Recipe ***	17
Implementation sentences *** **	18
Problem Sentences *** **	18
Project & 'Next' Sentences *** **	18
Elevator Pitch *** **	19
Build the Structure *** **	19
Standard Structure *** **	19
Alternative Structures *** **	20
ESRC Aims and Research Questions ***	20
EPSRC Guidance *** **	21
Composite Titles to Comply with EPSRC Guidance *** **	22
Write a Grant in 10 Steps *** **	22

What should the elevator pitch say? *** 22

Gathering information for the elevator pitch *** 23

Writing the Elevator Pitch *** 23

Writing Guidelines *** 23

Nominalisations *** ** 24

Are you Ready to Start *** 24

Workshop Aims *** 25

Strategy 101 *** 25

Post-PhD Academic Jobs *** 25

Fellowships *** ** 25

Postdocs *** ** 26

Lectureships *** ** 26

The balance between research and teaching *** ** 27

With this (numbers are £ x 10³) *** ** 27

Departments *** ** 28

Examples *** 28

Example Key Sentences *** ** 28

Example Key Sentences continued *** ** 29

Example Aims and Objectives *** ** 29

Aim, Objectives, WPs *** ** 29

Example Elevator pitch *** ** 30

Example Tag Phrases *** ** 30

Summaries, con'td 30

What is a Fellowship? ***

. . . .

- Personal support for an individual (The Fellow)
 - How much?
 - For how long?
 - To do what?

. . . .

- Research expenses
 - Travel?
 - Slush?
 - Project Funding
 - * Equipment?
 - * Staff?
 - * Research Costs

Who offers Fellowships and Why? ***

Who?

- Universities
- Research Institutions
- Funding agencies
- Charities

. . . .

Why?

...

- To develop talent
 - MSCA, Research Councils, Wellcome Trust

...

- To attract talent
 - Institutions

...

- To steer talent
 - MSCA
 - Discipline-hopping
 - Industry -> Academia

...

- To reward & showcase talent
 - Superstar Fellowships

What kind of person are they looking for? ***

Exceptional research talent

- Achievements
- Skills
 - Discipline-hopping?
 - MSCA 2-way transfer?
- Check requirements before you apply
 - Criteria
 - Previous winners
 - * UKRI
 - * ERC
 - * Google

The Sales Pitch ***

The Sales Pitch for a Project has Two Components: Importance and Success

1. Global Sales Pitch: (Elevator Pitch) **“The Project is Important”**

...

- Make a convincing promise about what the project will deliver
- Say what makes it important (to the funder).

...

2. The Detailed Sales Pitch **“The Project will be Successful”**

...

- Describe three important **problems** the project has to solve to deliver its promise
 - make solving the problems the criteria for success (Background)
 - problems can be expressed as RESEARCH QUESTIONS, AIMS or HYPOTHESES

...

- **Implementation** (Methods/Research Plan)

- Describe the research in each of 3 [sub-projects](#)
- Make it clear that the sub-projects will solve the problems.
- Sub-projects can be referred to as “OBJECTIVES” or “WORK PACKAGES”.

...

What Makes a Good Fellowship Application? ***

Why you need a magic formula.

A good case for support is designed for the decision process.

1. [What do funders want to know?](#)
2. [How do funders make decisions](#)
 - [What are the implications?](#)
 - [The Case for Support as Sales Pitch](#)
 - [The Magic Formula](#)

Fellowship Funders are looking for Four Things ***

1. A good PERSON
 - Fellows are future research stars.
 - Potential
 - Achievements
 - Creativity
- ...
- Which of your achievements make you look like a future star?
 - What could you change to make yourself appear more stellar?
- ...

2. A suitable PROJECT
 - As a vehicle for your development
 - As a flagship for the funder.
- ...

3. A suitable PLACE
 - Facilities
 - Mentors
 - Support
- ...

4. A good PROGRAMME
 - New Techniques & Skills for the Fellow (and the Host)
 - Experience
 - Connections

How Funders Make Decisions ***

- Who decides?
- Committee of successful researchers

- Very busy people
- Very successful
 - * Have their own grants
 - * And research groups
 - * And jobs
- Not knowledgeable about your particular research area.
- Fellowships committees are usually broader than grants committees
- Often it's a 2 stage process
 - Paper then interview
 - Project then person

What information do the committee have? *** **

- Applications
 - Usually a set of 50-100 per meeting.
 - Arrive 3-6 weeks before meeting.
 - Everybody delays reading them as long as possible.

...

- Expert referees' reports
 - Written reports with evaluation and score.
 - Usually 2-5 per application
 - Usually arrive before the meeting but often after the applications
 - Often conflicting

...

- Designated members' reports
 - Oral report by 2 or 3 members who have read the application.
 - Usually lasts < 5 minutes

The Decision: what is the process? *** **

- Designated members report on the proposal
 - Usually less than 5 minutes
 - Who, what, why, how, strengths, weaknesses, summary of referees, conclusion, suggested score
 - One person may have to do this for 10 or more grants in a day.
 - Probably based on 30-60 minutes preparation.

...

- Discussion by all members of the committee.
 - Even though some of them may be reading it for the first time during the discussion.
 - * They will probably have read the summary beforehand.

...

- All members in the discussion vote on the score.
 - No matter how little they know.
 - And how little time they have spent reading your proposal.

. . .

- At the end of the day they adjust the ranking
 - Non-presenters are more influential than presenters

Implications of the decision process *** **

. . .

Referees will analyse your case for support in detail but:-

- They will do it better if you make it easy
- Most of the committee won't read it.
- The ones who do read it probably won't understand it.
- There will be about 100 other applications.

. . .

This imposes certain requirements on the case for support.

. . .

- The first sentence must create a clear impression
 - that the project is important,
 - and will be successful

. . .

- The remainder of the document must:-
 - Create a clear picture in the first few sentences (Committee Member).
 - Support the picture with detailed evidence (Referee).
 - Make it easy to remember the picture (Designated Member).
 - * Use the rest of the application to convince.

. . .

Perhaps you need a [Magic Formula](#)

The Magic Formula *** **

Components

1. [The Key Sentence Technique](#)
2. [Layout](#)
3. [Tag Phrases](#)
4. [Repetition](#)

The Key Sentence Technique *** **

Sketch out your case for support

- What does your project **P**romise? (the case in one sentence)
- What makes that promise **I**important,
- What **P**roblems do you have to solve (there will be 3)
- One sentence version of your **P**roject
- **I**mplementation (3 sub-projects that solve the 3 problems)

- What happens **Next**
- **Examples of Project Key Sentences**
- **PIPPIN** “An excellent person or thing” *Oxford English Dictionary*
- **Use the key sentences as a framework for writing the Case for Support**
 - Each key sentence starts a section of the Case for Support
 - Rest of the section develops the point
- Use the key sentences as the **Summary**
- and as the **Introduction**
- Every Reader gets the same picture, no matter what they read
- And referees know where to look for detail
- Create your own key sentences if the case for support has to make other points
 - Track Record
 - Other kinds of application (fellowships, networks, training grants).

Fellowship Key Sentences ***

Fellowship Key Statements Cover Topics Beyond the Project

- Career Outcome
- Institution’s Strengths
- Fellow’s Strengths
- Individual Skills
- Dissemination / Impact
- Developmental Programme (How many parts?)
- Developmental value of Project

...

- Start every section with a key statement that summarises it
 - Follow it with supporting evidence/detail
 - Re-use Key Sentences in summaries
- Use Key Sentence approach in answering questions
 - On Application Forms
 - In Interviews

Layout * ****

Text layout allows skimmers and speed-readers to pick up extra detail.

...

1. Message on first line of paragraph (ASSERT then JUSTIFY)
 - First sentence of para ASSERTS (topic sentence)
 - Remainder of para JUSTIFIES
 - This is where you cite literature
 - This is how you avoid citing too much literature.
2. White space above each paragraph

...

- Readers’ eye movements land on blank lines.
 - Speed-readers will read first line of every paragraph.
 - Browsers will only read first lines.
 - Detail readers will know what to expect in each para

Tag Phrases *** **

- Tag phrases establishes the success proposition - the sub-project solves the problem
 - Teach your terminology
 - Create slogans
- Use exactly the same words at the end of the **implementation** key sentence and the beginning of the **problem** key sentence

. . .

. . .

Problem Key Sentence

We need to know **the relationship between the performance of single neurons and the performance of the whole visual system** in order to establish the likely contribution of single neurons to perception.

. . .

Implementation Key Sentence

We will record single neurons during perceptual tasks and calculate sensitivity functions for neural responses and for task performance in order to characterise **the relationship between the performance of single neurons and the performance of the whole visual system**.

. . .

- Key sentences and tag phrases start off messy and long-winded, like these.
 - You have to edit them to make them effective.

Examples.

Tag Phrases in Use *** **

- Start of a **Problem** sub-section in the background.

The perceptual capabilities of single neurons in cortical area V1

We need to know **the perceptual capabilities of single neurons in cortical area V1** in order to establish the potential contribution of V1 to perception. The potential contribution can be assessed using a range of perceptual tasks, such as visual pattern discrimination, object discrimination, and motion-detection. For any such task, we can infer the contribution of cortical area V1 to that task from the relationship between the perceptual capabilities of single neurons and the perceptual capabilities of the individual.

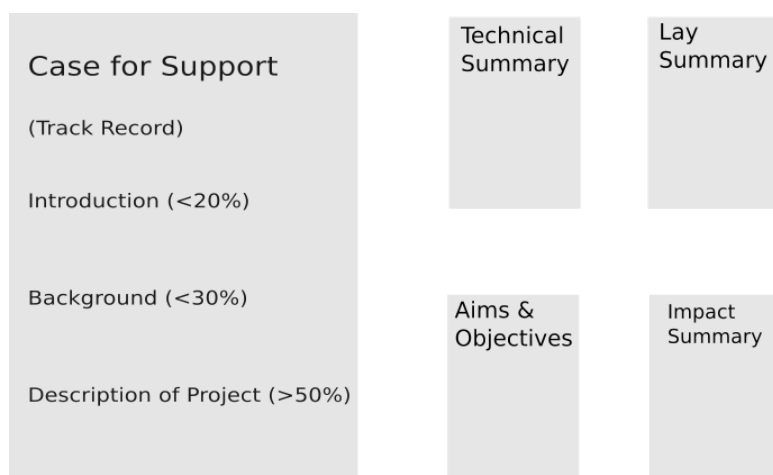
- Description of corresponding **Implementation** Sub-project

Measuring the perceptual capabilities of single neurons in cortical area V1

We will measure neural responses as functions of stimulus strength during perceptual tasks in order to calculate **the perceptual capabilities of single neurons in cortical area V1**. Stimuli from a set that covers a range of strengths will be presented repeatedly in random sequences under computer control. The computer will record responses during the presentations, and during equivalent periods when no stimulus is presented, for off-line spike sorting and analysis.....

Repetition ***

Re-cycle Text From Case for Support



- Repeat key sentences and tag phrases
 - to provide common structure, and
 - to link
- Maintain structure and order

Resources ***

What's been funded?

- [Research Council Project Summaries](#)
- [ERC Summaries](#)
- [Leverhulme Awards 2016](#)

Advice on writing:- www.parkerderrington.com/blog

- [How to construct a project](#)
- [The key sentences](#)
- [Catalogue](#)

Implementation ***

Sub-projects

Break your project into components (sub-projects) to make it easier to explain.

- Sub-projects can be sequential
- Or parallel

...

Each sub-project solves a problem

- Easier if you design the problems after the sub-projects

...

Background explains the problems

- Background comes before project description
 - It defines the criteria for success - solving the problems

- It convinces the reader that the project will be successful

...

- 3 is the perfect number of sub-projects, but 4 is OK.

...

- Don't create a hostage situation.
 - A sub-project that cannot be done unless a previous sub-project produces a result that it is not certain to produce.

Strategy ***

Your strategy must accommodate rejection

- Most well-written grant applications get rejected.
- Rejection can be a devastating experience

...

Minimise the pain: write 5 or 6 applications

- Never get down to your last rejection.
- If you get 6 rejections, it's time to develop a new set of ideas.

...

How to turn a small number of ideas into a large number of grant applications

- Different Outcomes? (Derrington method)
- Different Datasets? (Dr Pig method)
- Different collaborators/consortia/industrial partners
 - Your central skill contributes to different questions.
 - Check collaborators before you commit
- Different Approaches to Answer the same Question?
- Different Combinations of Sub-Projects

Should I use a successful application as a model? ***

- Most successful applications are very badly written
 - Especially those from senior academics.

...

Before you follow an example, test it:- find one-line answers to the following questions:-

1. What is the overall aim of the project?
2. What makes the project important?
3. What are the overall research methods?
4. State the 3 or 4 main problems the project needs to solve
 1. Why is each one important?
 2. How will the project solve the problem?
5. What will happen after the project is done?

...

- If finding and writing down those answers takes more than 10 minutes, the answer is "No".

AIMS & OBJECTIVES ***

. . . .

- Nobody is sure what Aims & Objectives mean, so you can write anything that helps your case as your aims and objectives.
 - What would you write?

. . . .

Why wouldn't you just use the key sentences?

- Overall Aim
 - **Promise + Importance** sentences
- Specific Aims
 - 3 **Problem** sentences . . .
- Overall objective or intro to objectives
 - **Project** Sentence
- Specific Objectives
 - **Implementation sub-project** sentences
 - Maybe add the **Next** sentence as a final objective

Alternatives

- No Overall Aim
- One Aim

. . . .

No Synonyms

- **Problems** = Aims = Research Questions = Hypothesis Tests
- Sub-projects = Work Packages = Objectives
- If the funder makes you use more than one term, **tell the reader they mean the same thing.**

Principles of short talks and interviews ***

General Principles

- Decide what message you want your audience to take away.
 - Learn it
- Use a good communication approach to deliver that message
 - Tell - explain - remind.
- Keep to time
- Be yourself.
 - The point of talks and interviews is to find out what you are like.

Talks ***

Create a pyramid of cues

- Message size is 1 short sentence
 - Expands into 3 or 4 short bullets
 - * Each bullet expands into a section that makes the point

...

- Learn the message
 - Make it the first sentence of your talk
 - And the closing message too
- The body of your talk expands the message into 3 or 4 points
 - Explains each one
- Then draw the conclusion (= the message)

...

- And thank the audience

Communication Basics ***

- Remember: It's human-to-human

...

- Tell-Explain-Remind
 - Tell them your message
 - Explain it to them
 - Then remind them what you told them

...

- Try to like your audience
 - It helps with the body language

...

- Look at your audience and expect them to look at you
 - Or to shift their gaze and look at what you are looking at

Slides, Handouts and Scripts ***

- Slides illustrate or emphasise, not expand

...

- Must have very clear explanation of
 - What point the slide makes (short statement)
 - What is on the slide - use a pointer
 - How it demonstrates the point
 - Which point it demonstrates.

...

- No slides is fine if you are not showing pictures (job talk).
 - And impresses people
 - You can use 'prompt' slides on your phone
 - Make sure your prompts work for you

...

- Handouts
 - Only if teaching.
 - Never to expand the message - write a book!

...

- Scripts
 - Bad to script the whole talk
 - Script the first sentence
 - * for each slide if necessary.

Interviews ***

- It's like several short talks with the topics chosen by the panel

...

- Prepare answers for the obvious questions
- Time is always a problem so give a short answer and offer to expand it.
 - Tell, explain, remind
- Practise speaking your answers.
- Learn your short answers.
- Look mostly at the questioner but also at the chair and the other members of the panel

Take Home Message ***

- Always know what your message is.
- And how much time you have to communicate it.
- Remember your audience is only human.

Thank you

Promise Sentence Exercise *** **

Why is the first sentence important?

...

- It has to be good enough to want to read your application
- They will have 99 other applications.
 - They know most of them are headed for the shredder.
- They also have a TV.
- What will make them want to read your application?

...

- A plausible and attractive promise
 - What are the elements?

...

1. A project that is likely to advance an important area of knowledge.
2. A project that is likely to be successful.
3. Evidence that you are competent to carry out the project.

The Perfect Promise Sentence *** **

Three Elements

...

1. What the project will achieve, in 'big picture' terms.
 - A project that is likely to advance an important area of knowledge.

...

2. How it will achieve it (a more specific and detailed statement of the goal).
 - A project that is likely to be successful.

...

3. A reference your achievements using similar methods.
 - Evidence that you are competent to carry out the project.

The Exercise *** **

1. Interview your neighbour (3 mins)
2. Swap roles and interview again (3 mins)
3. Write a promise sentence for your neighbour's project (2 mins)
4. Write a Sentence for your own Project (2 mins)
5. Optimise and discuss.

...

The information you need to gather in your interview is:-

1. What the project will achieve, in 'big picture' terms.
2. How it will achieve it (a more specific and detailed statement of the goal).
3. An example of your achievements using that approach.

eg **The aim of the project is to enable improvements in training social workers by analysing the role of writing in social work practice using an integrated ethnographic and linguistic methodology we have developed.**

Interview Question Exercise ***

- Imagine you are in an interview for your dream fellowship. The first question is "Would you tell us why you have applied for this fellowship?"
- Write a list of the points you would want to make in your answer.

...

- Compare notes with your neighbour.

...

- How would you begin your answer?
 - Write the first sentence

Pairing Exercise ***

Pair an Aim (Problem Sentence) with an Objective (Implementation Sentence)

- We need to know X because Y
- We will do Z and it will tell us X

Example

- We need to know the institutional writing demands of contemporary social work.
- We will analyse texts and explore how writing is managed alongside other commitments to characterise the institutional writing demands of contemporary social work.

Create an example using your own problem and [sub-project](#)

Can you rewrite it as an Aim and an Objective?

Marie Curie Criteria ***

- Excellence 50%
 - Quality and credibility of the research/innovation action (level of novelty, appropriate consideration of inter/multidisciplinary and gender aspects)
 - Quality and appropriateness of the training and of the two way transfer of knowledge between the researcher and the host
 - Quality of the supervision and of the integration in the team/institution
 - Capacity of the researcher to reach or re-enforce a position of professional maturity/independence

...

- Impact 30%
 - Enhancing the potential and future career prospects of the researcher
 - Quality of the proposed measures to exploit and disseminate the action results
 - Quality of the proposed measures to communicate the action activities to different target audiences

...

- Implementation: 20%
 - Coherence and effectiveness of the Work Plan
 - Appropriateness of the allocation of tasks and resources
 - Appropriateness of the management & risk management structures and procedures
 - Appropriateness of the institutional environment (infrastructure)

...

- Pick a sub-category & write a paragraph that states how you meet the criterion.

EPSRC Research Criteria (Panel) ***

- Your research should demonstrate a high degree of novelty in the proposed research in comparison to the broader research context of the area internationally.
- You should be able to articulate a strong vision for the research proposed in the proposal and possess the ability to deliver it.

[EPSRC Web Page](#)

EPSRC Applicant Criteria (Interview) ***

- You should be able to demonstrate a vision of the contribution that will be made to the research area and an independence of research ideas.
- You must show an awareness of research in other fields or across technology readiness levels, and an aspiration to work across boundaries and/or to conduct high risk research.
- You can show evidence of an aptitude and potential to lead, inspire and influence for example, through mentoring or self organisation of peers. You should show how you have developed of a network of relevant independent contacts.
- You must demonstrate excellent communications and interpersonal skills and show that you aspire to develop these across a broad audience.
- Pick a criterion & write a paragraph that states how you meet it.

UKRI Project ***

- Excellence of the research and innovation
- Importance, novelty and feasibility of the proposed programme of work (and whether long-term Fellowship support is needed to enable this)
- Robust methodology and appropriate consideration of research and innovation reproducibility, openness¹, governance and ethical / social responsibility issues
- Overall potential of the fellowship to establish or maintain a distinctive and outstanding research/innovation activity
- Pick a criterion & write a paragraph that states how you meet it.

UKRI Candidate ***

- Be recognised to be of the highest standard relative to their career stage and on a trajectory to become world-class
- Clear evidence of independence and thought leadership, which may go beyond the level normally expected of their current position
- Demonstrate an ability to be, or become, a clear communicator and disseminator of knowledge and innovation, able to inspire and lead others; and ability to develop new relationships and influence across multiple disciplines and sectors
- A broad understanding of the research / innovation landscape at both the national and international level and clarity on how their research / innovation will contribute to it
- A clear plan to support the training and development of the fellow (and, if applicable, their team) and for gaining advice or mentorship; supporting not only the programme but also their broader professional development
- Pick a criterion & write a paragraph that states how you meet it.

The Recipe ***

Process

- [Make sure you have a fundable project](#)

- Prepare your Ingredients
 - Implementation sentences
 - Problem Sentences
 - Project & 'Next' Sentences
 - Elevator Pitch
- Build the Case for Support
- Write a Grant in 10 Steps

Implementation sentences *** **

Describe a sub-project and say what problem it will solve.

We will measure neural responses as functions of stimulus strength during perceptual tasks in order to calculate the perceptual capabilities of single neurons in cortical area V1.

- There will be three.
- The sub-projects will solve the three **problems** in order.
 - Define the sub-projects before you define the **problems**
- Common mistakes
 - Failing to describe research
 - Failing to say what problem it solves
 - Forgetting to use the same description as the **problem** sentence.
 - Changing the syntactic structure unnecessarily
 - Too long
- Examples

Problem Sentences *** **

State a research problem (& why it's important)

We need to know the perceptual capabilities of single neurons in cortical area V1 in order to establish the potential contribution of V1 to perception.

- There will be three
- They will state the problems that are solved by the **implementation** sub-projects
- Common mistakes
 - Different statement of the research problem from that in the corresponding **implementation** sentence
 - Describing the sub-project instead of stating the problem
 - Changing the syntactic structure unnecessarily
 - Too long
- Examples

Project & 'Next' Sentences *** **

Project

- **Project** sentence summarises the project in whatever way is appropriate
- If they only read 1 sentence about your project, it will be this one.
- Summarise the project or state its scope.

- Go beyond the **promise** sentence

Next Sentence

- Introduces your discussion of what will happen after the research is complete
- It will depend to a certain extent on whether the importance is academic or practical or both.
 - e.g. State in about 40 words what you will do to maximise the benefit from the project.

Examples

Elevator Pitch *** **

Also known as “Global sales pitch”; makes the Importance Proposition

- **Promise** Sentence should have 3 parts:-
 1. What the project aims to achieve, in ‘big picture’ terms (too vague for insiders).
 2. What you actually expect to achieve (too detailed for outsiders).
 3. A reference to your achievements using similar methods, to show you are competent.

. . .

The aim of the project is to enable improvements in training social workers by analysing the role of writing in social work practice using an integrated ethnographic and linguistic methodology we have developed.

Example Elevator pitch . . .

- **Importance** sentence says what it is that makes the outcome important. For example...
 1. Quantify the real-world problem it will help to solve.
 2. Say what it will allow us to do that we can’t do now.
 3. Prepare to say which named priorities of your funder it contributes to, and how?

. . .

Social care costs 27 billion pounds annually in the UK and problems arising from errors in writing increase the risk of harm to service users.

Another EG

Build the Structure *** **

- Standard Structure: Key sentences as Introduction and Skeleton
- Variations
- ESRC Aims and Research Questions
- EPSRC Guidance
- Suggested Structure for EPSRC

Standard Structure *** **

1. Introduction - All the Key Sentences - **Write it Last.**
 - **Problem** key sentences can be research questions, aims or hypotheses.
 - **Implementation/sub-project** (and **Project** and **Concluding** key sentences) can be objectives.

2. Background - four sections - sells the project - **Write it after the Methods.**
 - **Importance** section explains what makes the project important.
 - **Problem** section x 3, each explains one of the problems/aims/research questions.
3. Methods - five sections - describes the Project - **Write it First**
 - **Project** Describe the project as a whole.
 - **Implementation / Sub-project section x 3** Each describes a sub-project and shows that it solves the corresponding **problem**.
 - **'Next'** Say what will happen after the project (impact?). Then add detail.
4. Track record (required by MRC, BBSRC, EPSRC, NERC); create your own key sentences - **Write it anytime after the Methods**

Alternative Structures *** **

Some funders specify requirements that appear to be incompatible with the standard structure, but these can usually be addressed by one or other of two approaches.

. . .

1. Moving sub-components around
 - e.g. BBSRC require you to introduce the 'Research Plan and Methodology' with the Overall Aim & Specific Objectives. Can do this by having separate introductions for the Background & Methods sections. Or by double-naming the introduction, see below

. . .

2. Using composite titles to avoid repetition
 - e.g. ESRC ask both for aims and for research questions: [call each aim a research question](#).
 - EPSRC ask for 4 sections covering same topic 'Background', 'National Importance', 'Academic Impact' and 'Research Hypotheses & Objectives' [solution here](#)
 - BBSRC problem (above) can be solved by writing the Aims and objectives as subsections of the introduction.

ESRC Aims and Research Questions ***

- ESRC guidance suggests separate subsections for aims and research questions:-
 - “The introduction should set the aims and objectives of the study in context. It should briefly sketch
 - “The detailed research questions to be addressed should be clearly stated.”
- It is dangerous to give the impression that research questions and aims refer to different goals.
- This is a problem

. . .

- Readers will be confused if you give the impression that research questions and aims refer to different research goals.

. . .

- Make it clear that the research questions and the aims are the same; e.g.
 - “We have three research aims which are expressed in our three research questions”.

. . .

- From that point on, follow the [No Synonyms guideline](#)

. . .

- – Use one term or the other.

EPSRC Guidance *** **

Previous Track Record (up to 2 sides)

Description of proposed research and its context (6 sides)

- Background
 - Introduce topic and explain academic and industrial context
 - Demonstrate understanding of related work
- **National importance**
 - Contribution to other disciplines, economy & society.
 - Long term effects; relation to national strategic needs.
 - Fit with UK research & EPSRC's [portfolio](#), [research areas & strategy](#).
- Academic Impact
 - Describe academic impact
 - Explain collaborations; justify Visiting Researchers
- Research Hypothesis and Objectives
 - Set out your research idea or hypothesis
 - Explain why the proposed project is novel and timely
 - Identify the overall aims of the project, and the measurable objectives
- Programme and Methodology
 - Detail and justify research methodology
 - Describe the work programme & milestones for each member of the team,
 - Explain how the project will be managed.

Composite Titles to Comply with EPSRC Guidance *** **

1. **Track Record**
 - If you don't need 2 pages for your track record, put pilot data in the track record section.
2. **Background** (5 sections)
 - i. **Aim, Research Hypothesis and Objectives.** This is a standard introduction that uses all the key sentences in order.
 - ii. **National Importance and Academic Impact section.** This and everything that follows is the same as the standard structure. It uses the **Importance** Sentence followed by details that cover the topics specified by EPSRC.
 - iii. -v. **Problem** sections as for standard structure
2. **Programme and Methodology.** (5 sections)
 - i. **Project** sentence & subsection;
 - ii. -iv. **Implementation sub-projects** 1-3
 - v. **'Next'** section
 - Must include milestones and explain how the project will be managed.

Write a Grant in 10 Steps *** **

1. You can start as soon as you have thought of a viable project.
2. Check that the project is suitable for your chosen funder and funding scheme.
3. Divide the project into sub-projects and assemble the information you need to describe each and to explain its importance.
4. Initiate the costing process & institutional approvals in parallel with the writing.
5. Draft your Key sentences in this order:-
 - i. **Implementation** sentences.
 - ii. **Problem** sentences.
 - iii. **Project** and **'Next'** Sentences
 - iv. **Importance** sentence.
 - v. **Promise** sentence

If you need a lay summary, begin working to prepare and test it.
6. Draft the case for support.
7. Add any funder-specific information or sections to the case for support.
8. Draft any required information on the project timetable and project management.
9. Assemble the budget and write the Justification of Resources
10. Finalise any attachments and summaries you need to submit.

What should the elevator pitch say? ***

- Why is this a good Person?
- Why is this a good project?
 - Direct Outcome?
 - Training Outcome
- Why is this a good place?

Gathering information for the elevator pitch ***

Ask your neighbour about their project. Try to understand and remember:-

- What will their project achieve?
- Would that achievement be important? Why - objectively?
- Why would they be a good person to receive a fellowship -
 - Get evidence rather than value claims.
- How will the project develop their career?
- Why would their chosen organisation/lab be the best place to hold the fellowship - objectively?

After 5 minutes, change roles and repeat.

Writing the Elevator Pitch ***

1. Imagine that you are trying to persuade a committee to give your neighbour a fellowship.
 - Write a short statement that will convince them to do so.
 - You have 5 minutes.
2. Imagine that you are trying to persuade a committee to give you a fellowship.
 - Write a short statement that will convince them to do so.
 - You have 5 minutes.

Writing Guidelines ***

- **Assert, then justify:** make a statement, then explain it
 - **Key sentence** at the start of every section
 - Start every paragraph with the '**Topic Sentence**'
- ...
- No Synonyms: **pick the best term and use it repeatedly.**
- Create **tag phrases**
- No Homonyms: ambiguity is your enemy.
- **Short paragraphs** (~6 paras per page)
- Short Sentences (easier if you avoid adverbs, adjectives and **nominalisations**)
 - And **know when to use the passive** (e.g. "Rules were made to be broken.")
- Use Headings and Sub-Headings
 - **Re-use phrases from the key sentences**
- Use similar structures for sentences with similar function.
- Avoid value claims (state evidence instead)
- Bullet lists good, lists inside paragraphs bad.
- NIUTEIISPOU is one of the **seven deadly sins**
- ...
- Useful Software (if you don't like the tools in MS Word)
 - **The Writers' Diet**
 - **HemingwayApp** also available as a text editor.

Nominalisations *** **

- A nominalisation is a noun phrase constructed from a verb,
 . . .
- which can be used with a general purpose verb to create a flabby, pompous, long-winded way of saying something simple.
 . . .
- We will investigate X
 - We will carry out an investigation into X
- We will analyse
 - We will undertake an analysis of
- . . .
- You can make it more pompous and long winded by using a few adjectives to describe the nominalisation:-
 - We will undertake a detailed, rigorous and searching analysis of ...
- But sometimes a nominalisation is what you need:-
 - “Our aim is to” is better than “We aim to....” if you want to discuss aims.

Are you Ready to Start ***

Do you have a fundable project?

- . . .
- Break your project into three implementation sub-projects.
 - May be easier to assemble them from smaller parts
- . . .
- Define the important problem that is solved by each sub-project.
 . . .
- What does your project promise to achieve?
 - State the overall promise in terms intelligible outside your research discipline.
 - Often this is something you will contribute to, rather than achieve completely.
- . . .
- What is the evidence that your project is of interest to your chosen funder?
 . . .
- What have you done that would convince a sceptic that you can do the project?
 . . .

If impact is part of the funding criteria:-

- . . .
- Who will benefit most from your research?
 . . .
- How will they benefit?
 - What will you do to ensure that they benefit?
 - What is their involvement in the development of the project?

. . .

Your application will need to answer all these questions.

Workshop Aims ***

- To help participants formulate realistic and ambitious career plans
 - Analyse your options
 - * Be aware of potentially misleading information
 - * Understand who makes relevant decisions and how
 - * Understand what questions you need to ask and answer
 - Create the best possible set of choices
 - Make plans to improve your choices if necessary.
- To teach you how to write grant or fellowship application.
- To tell you how to prepare for short talks and interviews.
- Chatham House Rule
 - “...participants are free to use the information received, but neither the identity nor the origin of the speaker(s), nor that of any other participant, may be revealed.”

Strategy 101 ***

- Decide on your goal
 - What do you want to achieve?
 - * When do you want to achieve it?
 - * What data tells you that the goal is achievable?
 - * What are the intermediate steps?
 - What data will tell you that you have achieved it?
- Review the data now.
- Plan a series of actions to reach your goal by your deadline.
 - Review progress against target periodically.
- Repeat
- Suggested timeframe - 5 year goal, 1 year reviews.
 - Use your employer’s annual review process.
- Discussion points:-
 - Do you have a 5-year goal?
 - How to set a 5-year goal?

Post-PhD Academic Jobs ***

- Research Fellowships
 - [Issues to consider](#)
- Post-doctoral Jobs
 - [Issues to consider](#)
- Lectureships
 - [Issues to consider](#)

Fellowships * ****

Not all fellowships provide the same scale of support or independence:-

- Fellowships targeted at future leaders ([UKRI](#), [EPSRC](#), [ERC Grant](#))
 - Full salary for 3+ years + full research costs for independent project.

- Aimed at high fliers
- May be restricted to priority areas (EPSRC)
- Institutional support (part salary, future job) may be required.
- Full salary, limited research expenses, 3+ years (URF, some unis)
 - Can apply for project grants
 - Some expect institution to commit to future job
- Salary for < 3 years (MSCA IF, some unis)
 - Attach yourself to a funded research group
 - Apply for fellowship funding
- Post-doctoral job in disguise (eg)
- Research expenses, no salary(eg)

So how do you decide which to target?

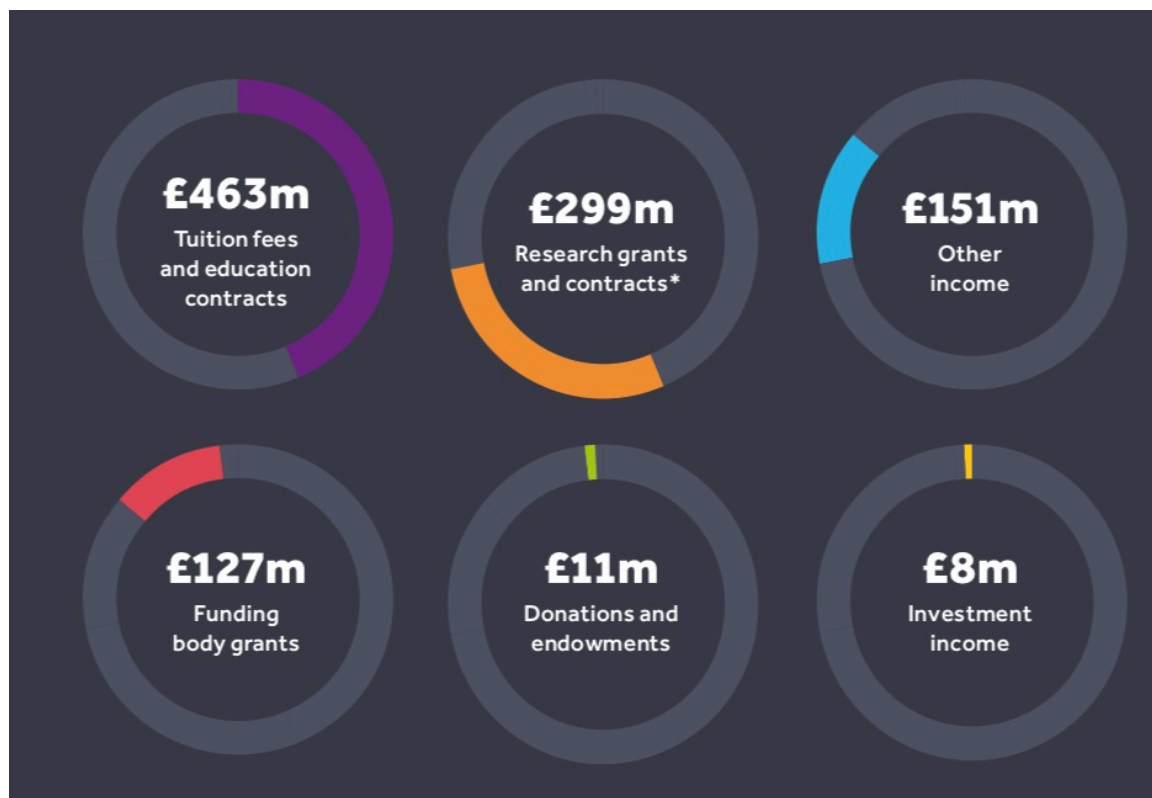
Postdocs *** **

- Advantages
 - No need to apply for resources
 - Potential opportunity to learn new skills?
 - New environment.
 - Somebody else has worked out a workable project?
 - * Should be an easy path to first-author publications.
- Potential problems
 - Career development opportunities?
 - Independence?
 - First author publications?
 - Project may be unworkable.
- How do you assess the risks of a post-doc job before you take it?
 - Research visits
 - Ask the right questions of the right people
 - Remember the selection process is 2-way

Lectureships *** **

- What makes one department better to work in than another?
 - The balance between research and teaching
 - The way it is run

The balance between research and teaching * ****



Compare this (numbers are £ x 10⁶)

With this (numbers are £ x 10³) * ****

Income		
Tuition fees and education contracts	1	158,221
Funding body grants	2	28,469
Research grants and contracts	3	6,921
Other income	4	32,575
Investment income	5	702
Total income		226,888

HESA have data on all universities

- <https://www.hesa.ac.uk>
- Task
 - Which are the most research intensive universities in the UK?
 - What is the typical balance between teaching and research
 - * in a research-intensive university?
 - * in a teaching-intensive university?

Departments *** **

- Some teaching-intensive universities have research-only departments
- Some academics maintain their research by collaborating with nearby universities that have better facilities.
- In any department different people have different tasks, assigned by their managers
- Some research-intensive universities create teaching-only contracts.
- Academic managers can be
 - Dictatorial and bullying
 - Collegial and supportive
- Promotion (e.g. to Professor) can often give you better options
- This raises 3 questions:-

...

1. How do you find out which departments might be good for you?

...

2. How do you get a job in such a department?

...

3. How do you get promoted?

Examples ***

- Key Sentences 1-5 (Background)
- Key Sentences 6-10 (Project)
- Aims and Objectives
- Elevator Pitch
- Tag Phrases

Example Key Sentences *** **

Key Sentences 1-5 Give the background and context

- 1 **Promise** The project aims to enable improvements in training social workers by analysing the role of writing in social work practice using an integrated ethnographic and linguistic methodology we have developed.
- 2 **Importance** Social care costs 27 billion pounds annually and problems arising from errors in writing increase the risk of harm to service users.
- 3 **Problem₁** We need to know the writing practices of professional social workers.
- 4 **Problem₂** We need to know the institutional writing demands of contemporary social work.
- 5 **Problem₃** We need to understand how writing practices shape professional social work.

The Key Sentence Technique

Problem Sentences

Example Key Sentences continued *** **

Key Sentences 6-10 describe the project

- **Project** Our methodology integrates ethnographic description, discourse analysis and tracking the production of texts.
- **Implementation₁** We will carry out an ethnographic study, in order to characterise the writing practices of professional social workers
- **Implementation₂** We will analyse texts and explore how writing is managed alongside other commitments to characterise the institutional writing demands of contemporary social work.
- **Implementation₃** We will use discourse analysis and track texts relating to specific cases to understand how writing practices shape professional social work.
- **'Next'** We will develop effective writing practices that will improve training and practice of social work.

The Key Sentence Technique

Implementation sentence Explanation

Project & 'Next' Sentence Explanation

Example Aims and Objectives *** **

- Our project has three aims, which are expressed as the research questions we seek to answer:-
 1. What are the writing practices of professional social workers?
 2. What are the institutional writing demands of contemporary social work?
 3. How do writing practices shape the nature of professional social work?
- Our project will answer the three research questions by pursuing the following three objectives:-
 1. We will carry out an ethnographic study, in order to characterise the writing practices of professional social workers
 2. We will analyse and quantify texts and explore how writing is being managed alongside other commitments in order to characterise the institutional writing demands of contemporary social work.
 3. We will use discourse analysis and track the trajectories of texts relating to specific cases in order to understand how writing practices shape professional social work.

Aims and Objectives

Aim, Objectives, WPs *** **

The aim of the project is to enable improvements in training social workers by analysing the role of writing in social work practice using an integrated ethnographic and linguistic methodology we have developed. It has three objectives, which are to answer the following research questions:-

1. What are the writing practices of professional social workers?
 2. What are the institutional writing demands of contemporary social work?
 3. How do writing practices shape the nature of professional social work?
- The project has three work packages that will answer the three research questions:-
 1. We will carry out an ethnographic study, in order to characterise the writing practices of professional social workers
 2. We will analyse and quantify texts and explore how writing is being managed alongside other commitments in order to characterise the institutional writing demands of contemporary social work.
 3. We will use discourse analysis and track the trajectories of texts relating to specific cases in order to understand how writing practices shape professional social work.

Better not to refer to a work-package by its number - everybody has a WP-1. [Writing Guidelines](#)

Aims and Objectives

Example Elevator pitch *** **

Promise

- The central aim of the project is to enable improvements in training and practice of social work by analysing the role of writing in social work practice using an integrated ethnographic and linguistic methodology.

Importance

- Social care costs 27 billion pounds annually in the UK and problems arising from errors in writing increase the risk of harm to service users.
- [Check for Tag Phrases.](#)

Elevator Pitch

The Importance Proposition

Example Tag Phrases *** **

(Definition)

- Our three aims are to answer the following three research questions:-
 1. What are **the writing practices of professional social workers?**
 2. What are **the institutional writing demands of contemporary social work?**
 3. How do **writing demands and practices shape professional social work?**
- Our project will answer the three research questions by pursuing the following three objectives:-
 1. We will carry out an ethnographic study, in order to characterise **the writing practices of professional social workers.**
 2. We will analyse and quantify texts and explore how writing is being managed alongside other commitments in order to characterise **the institutional writing demands of contemporary social work.**
 3. We will use discourse analysis and track the trajectories of texts relating to specific cases in order to understand **how writing demands and practices shape professional social work.**

Summaries, con'td

Understanding geomorphic response to hydrological events: filling the data gaps

We will improve the management of river sediment and modelling of flood risk by developing and applying a 'sediments toolkit' for the characterisation of river bed grain size at local to catchment scales.

Flood intensity is increasing in the UK and many rivers are becoming more mobile, particularly Scotland's flashy and sediment-laden systems. Our understanding of how geomorphic systems respond and adjust to hydrological events comes principally from traditional morphological measurements, obtained from aerial photographs, LiDAR and maps. We know that the nature of the constituent sediments-especially size-is a critical element of geomorphic systems, controlling, for example, entrainment and mobility of sediment, channel conveyance during floods, and the ability to support ecologically and economically important fauna & flora. However, data on sediment properties is relatively sparse, principally because it is expensive and time-consuming to collect. SEPA have identified the lack of grain-size data at bar to catchment scales as

a critical data gap, limiting their ability to predict future patterns of channel erosion/deposition and to model flood risk. Obtaining such data is therefore a key priority.

Despite the development of several image-based grain-sizing methods in recent years (including by Graham/Rice), uptake of these methods by practitioners has been partial owing to limited guidance on their selection and use, and a reluctance to adopt new/unproven technologies. If these obstacles are overcome, image-based sediment characterisation could significantly improve understanding and management of geomorphic systems.

In this project, we will develop an integrated 'sediments toolkit' consisting of software, documentation and guidance for image-based sediment characterisation at multiple scales. It will be targeted at practitioners without specialist knowledge of image processing methods and released under an Open Source licence. Utilising the ability of small unmanned aircraft to obtain data over a wide range of spatial scales/resolutions, we will collect a heterogeneous dataset for a variety of river environments. Published and original (e.g. using structure-from-motion derived point clouds) algorithms will be tested to define a matrix of recommended methods for different scenarios, including: the nature of the environment being studied; the spatial and temporal resolution of the study (e.g. bar scale vs catchment scale); the nature of the data required (e.g. proportion of sand/gravel vs complete grain-size distribution); the accessibility of the site; and the resources (financial/human/technological) available.

The toolkit will have wide applicability to rivers in Scotland, the UK and beyond. We will use the River Dee, Aberdeenshire-where the 2015/16 floods caused significant erosion, destroying productive land and threatening infrastructure (e.g. Abergeldie Castle)-as a case study of how the incorporation of distributed grain-size data can improve river management. We will estimate sediment entrainment thresholds and identify potential zones of sediment supply, erosion and deposition. Management strategies will be designed to reduce flood risk, mitigate threats to infrastructure and maintain hydromorphological integrity (as required by Water Framework Directive, WFD). We will then explore applications in other environments where grain size is of fundamental importance for understanding geomorphic adjustment, such as beaches.

Understanding the ecological relevance of eDNA in freshwater lotic ecosystems

Understanding the impacts of environmental change and changing land use on biodiversity and how ecosystems work require comprehensive knowledge of communities and their ecology. Molecular biodiversity identification is emerging as a high throughput and cost effective alternative to traditional approaches and in particular, the analysis of environmental DNA (eDNA) provides an opportunity to measure biodiversity in space and time at unprecedented scales. Unlike DNA obtained through direct analysis of communities, eDNA refers to shed cells or free-DNA from organisms as they pass through an environment, or die and decay. eDNA is being applied for various uses such as identification and monitoring of endangered/invasive species and analysis of biodiversity. It is very clear that researchers can detect eDNA from a variety of natural environments and in particular, freshwater environments. However, understanding how those sources of eDNA relate to living biodiversity and associated ecological function in ecologically and socio-economically important river ecosystems is at the heart of the eDNA:LOFRESH proposal. Focusing on a range of exemplar experimental semi-natural and natural freshwater catchment systems from local to national scales, we will (a.) improve understanding of the movement, and persistence of lotic eDNA, (b.) quantify the relationship between lotic eDNA and the in situ community using different combinations of genetic and genomic approaches, (c.) improve methodological approaches for eDNA data acquisition and interpreting eDNA data using novel ecological and phylogenetic algorithms, (e.) develop and test new models relating lotic eDNA to stream biodiversity and ecosystem function and their variation in response to land use pressures. Over a 4 year period, five work packages (WPs) will be delivered by the Universities of Bangor, Birmingham, Cardiff and the Centre for Ecology and Hydrology. In WP1, we will use artificial stream channels in a series of experiments to assess the effects of a range of physical and chemical drivers on the loss of lotic eDNA and to compare and contrast genetic and genomic approaches for assessing known sources of lotic eDNA. In WP2, we will test our experimental findings from WP1 by tracking natural lentic (i.e. lake) and experimentally introduced control lotic eDNA through the natural stream network of

the intensely studied Conwy River research catchment in north Wales. WP2 will also assess relationships between observed lotic eDNA and the in situ community in selected tributaries of the Conwy displaying a range of physicochemical characteristics and experiencing different land use pressures. WP3 will sample lotic eDNA in coordination with an on-going national survey in Wales to up-scale the experimental and catchment-scale findings of WP1 and WP2 to the Welsh landscape and national scales. WP4 will provide informatics support, but specifically, develop workflows to identify species level diversity in eDNA datasets. Finally, in WP5 we will further test our model findings, by manipulating the experimental stream systems with emulated land use pressures, quantify the ecosystem functions of decomposition and food web structure and test linkages with eDNA signals. Effective engagement with a broad range of stakeholder groups (government, end-users, environmental agencies) and project partners (research institutions and academic partners specialising in eDNA, sequencing and informatics) will optimise impact and research synergies of potentially transformative science throughout the consortium network.

Impacts of hydrological variability on material transfers through the River-Estuary Transition Zone

Estuaries are biologically productive, susceptible to climatic variability, and vulnerable to nutrient enrichment. These characteristics are reinforced by their ability to trap, filter, and recycle particulate matter. The processing of particulate matter supplied to estuaries is therefore important and dependent on the major sources of material to estuaries. In this respect, suspended particulate matter (SPM) and its inherent chemical characteristics are instrumental in controlling the reactivity, transport, and biological impact of substances from river catchments to the coastal zone. During transport to the coast, the physical properties of SPM (particle size, density, settling velocity) change on short time and length scales, especially when terrestrial particles encounter the steep hydrodynamic, chemical, and biological gradients that characterise the River-Estuarine Transition Zone (RETZ), and enter the estuary. This is because SPM is largely in the form of flocs: aggregates of inorganic matter, organic matter, and water. Flocs grow to a much larger size than their individual inorganic components. Aggregation occurs when fresh water meets salt water in the RETZ and is further mediated by biological effects. Flocs are created when individual particles collide due to weak turbulence, and are ruptured by strong turbulence. Large flocs sink rapidly, thus transferring material to the sediment bed. So, the fate of terrestrial SPM (i.e., whether it is retained by rivers, transferred to estuaries, or exported to the coastal ocean) is strongly influenced by floc properties, which, in turn, are dependent on their provenance and genesis. Since flocs are fragile and ruptured by sampling, they are difficult to study. High resolution measurements are needed since flocs change their properties on short time and length scales. This has been difficult to achieve, but optical techniques are now available which allow high resolution in situ measurement of floc properties (size, volume concentration), which, coupled with measurements of mass concentration and settling velocity, provide assessment of floc strength. This project investigates the transfer from river catchments to estuaries of SPM and its particulate components (carbon, nitrogen, heavy metals). These terrestrial components are important for water quality and ecosystem functioning and health in the coastal zone, and are likely to be severely altered by changes to the fluvial regime - increased frequency of major flood events - driven by climate change. The aims are to determine (i) The varying provenance of riverine SPM, which changes seasonally and during episodic flood events, when material is mobilised, previously deposited on aerially exposed floodplains and high banks. We will use multiple geochemical proxies in the form of the C:N ratio, stable carbon isotopes, and the lignin-derived monomer yields of organic matter, as well as inorganic geochemical tracers in the form of heavy metals. (ii) How floc properties and geochemical composition evolve as they pass through the RETZ and the estuary. (iii) How flocs and material transfers respond to marine forcings (tidal, storm) and fluvial forcings, especially short duration (episodic) events. High resolution observational datasets from instrumented sampling sites in the catchment, RETZ, and estuary will be used to validate a 1-D vertical exchange model, which will be embedded in a 3-D hydrodynamic model for scenario testing of impacts of episodic river floods and storms on material transfers through the river-estuary system. The field study area is the macrotidal Dyfi system (West Wales), where there is a demonstration project set up by the Centre for Catchment and Coastal Research, which will provide a logistical infrastructure in support of this project. The project will be carried out with the participation of the Environment Agency and CEFAS, who will be important end users of the outputs.

Hydrological extremes and feedbacks in the changing water cycle

The prospect of significant climate change over the next decades means that society must urgently face up to the implications for the changing water cycle, in particular increasing risks from extreme floods and droughts. Guidance for policy-makers to support adaptation to these risks and to support mitigation strategies to combat climate change is urgently required. However, the ability of climate scientists and hydrologists to predict the possible magnitudes of floods and droughts, and the frequency with which they are expected to occur, is still limited. This is due largely to gaps in knowledge of how best to use available data and models; of particular concern is the limited ability of climate and hydrological models to produce realistic extremes and changing hydrological behaviour. For example, regional climate models produce data which often requires to be downscaled to finer resolutions, but questions arise about what properties of the downscaled data are critical and how the downscaling should be done. As another example, drought planning requires inter-annual and inter-regional rainfall and evaporation to be represented accurately, however there is little guidance about how this can best be achieved under future climate using available models. In addition, there are weaknesses in the simulation of hydrology (for example, groundwater storage, river flows and evaporation) which act as hurdles to development of next generation climate models; in particular models currently used to simulate feedbacks from the earth surface to the atmosphere neglect important hydrological processes. This proposal will produce the science and models needed to address these questions, integrating climate and hydrological science to take impact modelling beyond the current state of the art. Specifically, the proposal: 1. exploits current generation climate science and statistical methods to improve and enhance projections of potential change in hydrologically-relevant metrics over a time-scale of 10 to 60 years, in particular extremes of heavy precipitation and drought; 2. builds on the analysis of historical data to improve scientific understanding and develop innovative methods for the modelling of extremes and non-stationarity in the hydrological response to climate variability; 3. seeks to improve the representation of hydrological processes in land surface models, in particular, the enhanced modelling of surface and subsurface processes for simulation of land-atmosphere feedbacks. In addressing these gaps in knowledge, the proposed project will cross all four themes of NERC's Changing Water Cycle programme: land-atmosphere interactions; precipitation modelling; understanding of change; and innovative ways to assess consequences. Case studies will include the Thames catchment and the Eden catchment. These catchments are broadly representative of lowland and upland UK with substantial climate and hydrological datasets from NERC and DEFRA-EA experimental programmes. This project will consider local to catchment scales, with the view that the resulting science and models will ultimately be integrated into global scale models. The main project outputs will be: 1) improved quantification of future variability and extremes of precipitation and evaporation over hydrologically relevant scales in the UK; 2) improved models of the hydrological water cycle response to these extremes, with the explicit inclusion of non-stationary conditions; 3) the inclusion of earth-atmosphere feedback processes and their effects in climate models, in particular the recognition and inclusion of unsaturated zone and groundwater storage and discharge. In all cases, new modelling tools will be developed to test the ideas of meteo-hydrological functioning.

Impacts of different vegetation in riparian buffer strips on hydrology and water quality

Technical Summary Buffer strips continue to be included as a 'catch-all' on-farm mitigation option to combat pollutant emissions contributing to failure of water quality targets and diffuse runoff problems contributing to flooding, but, evidence on the cost-effectiveness and cost-benefit of different vegetation types is limited. This project will use replicated plot experiments (n=3 per treatment) to test novel grass (*Festulolium loliaceum* cv Prior), deciduous woodland and willow bioenergy crops in buffers for reducing runoff and losses of nutrients, sediment and pesticides, using comparison with replicated controls (n=3). Samples of nutrients and sediment will be collected using flow-proportional sampling with autosamplers. Sampling for pesticides will be time-integrated using passive devices routinely deployed by water companies. New empirical data on the efficacy and costs of the buffer treatments for runoff and pollutant reduction at plot scale will be scaled up using a national modelling framework to explore strategic economic benefits for England and Wales. Industrial engagement will be enhanced through demonstration of the plots to

stakeholder groups. Scenario modelling will place spatially targeted application of the buffer treatments in the context of the evolution of agri-environment policy under CAP reform 2014-2020. The project team brings a strong track record of buffer research and well-developed links to stakeholder networks including the grass, woodland and willow industries and those associated with the Defra Demonstration Test Catchment and Sustainable Intensification platforms. . The outcome of the work will contribute new scientific knowledge with respect to the nutrient, sediment and pesticide trapping efficacy of these vegetation types, economic assessment of different potential crops in buffers strips, as well as help develop protocols and guidelines that simplify key messages for buffer strip vegetation management options.

Abstract This project will investigate the impacts of different vegetation in buffer strips on runoff and pollution loss from agricultural land. Runoff from agricultural land and the pollution it carries continue to cause problems for flooding and water quality. The impacts of flooding arising from runoff from farmed land have been well documented in recent times, including during the wet winter of 2013 - e.g. on the Somerset Levels. Many of our rivers experience water quality problems which have implications for freshwater biology and water treatment costs. Better controls are therefore required in the context of the need for sustainable intensification of our farming. Buffer strips continue to feature in current revisions to agri-environment policy for helping deliver sustainable farming. These revisions affect subsidies for farmers in the form of 'greening' options and funding as part of the new Countryside Stewardship scheme (which commences in January 2016). Despite the continued inclusion of buffers as a 'catch-all' on-farm control option to combat diffuse runoff problems contributing to flooding and, pollution contributing to failure of water quality targets, evidence on the costs and effectiveness of different vegetation types is limited. This project will therefore use an established experimental facility to test deep-rooting grass, deciduous woodland and willow bioenergy crop covers in buffers for reducing runoff and losses of nutrients, sediment and pesticides. The buffers will be tested for reducing runoff and water pollution from grass and maize during a five year study. To expand beyond the experimental site, the new data on the costs and effectiveness of the different vegetation covers will be scaled up to examine potential economic benefits across England and Wales. A clear understanding of costs and benefits is important for industry to engage with research outputs and to encourage on-the-ground delivery of tested measures for farmers. Engagement with industry will be enhanced through demonstration of the plots to stakeholder groups. The project team brings a strong track record of buffer research and well-developed links to stakeholder networks including the grass, woodland and willow industries and those associated with on-going research platforms such as the Defra Demonstration Test Catchment (DTC) and Sustainable Intensification Platform (SIP) programmes, as well as the BBSRC funded North Wyke Farm Platform national capability.

Context, Identity and Choice: Understanding the constraints on women's career decisions

There has been vast improvement in workplace gender equality, but there remain marked differences in the roles in which women and men work. Explanations for this inequality have focused on the barriers women face. However, as women begin to enter male-dominated roles, a new explanation has arisen: that remaining gender inequality must reflect fundamental differences between women and men, including differences in (a) ambition and desire for power, (b) needs for work-life balance, and (c) willingness to take career risks. Central to this analysis is the assumption that the glass ceiling is broken and thus inequality must be due to women's active choices. This explanation downplays the fact that social context continues to be a barrier to women's success and places responsibility for gender inequality on women themselves. Indeed, there has arisen the suggestion that gender equality necessitates women overcoming 'internal obstacles', 'leaning-in' and altering their choices (Sandberg, 2013), rather than challenging the status quo. I argue that diametrically contrasting structural barriers with women's choices is unhelpful. Instead, I suggest that women's choices are shaped and constrained by the gendered nature of organisational and social contexts and how women see themselves within these contexts. I propose a programme of research, across 3 integrated streams, that investigates how social and organisational structures define identities and constrain women's choices in relation to ambition, work-life balance, and career risk-taking. I have four key objectives: (1) to clarify how organisational and social contexts define identity and constrain women's

choices, (2) to use an interdisciplinary, multi-methodological approach, to produce innovative theory and data, (3) to work collaboratively with stakeholders, and (4) to inform practical interventions designed to facilitate the increase of women's participation in hitherto male-dominated roles.

Crosslocations in the Mediterranean: rethinking the socio-cultural dynamics of relative positioning

The Mediterranean, a key socio-cultural, economic and political crossroads, has shifted its relative position recently, with profound effects for relations between the peoples associated with its diverse parts. Crosslocations is a groundbreaking theoretical approach that goes beyond current borders research to analyse the significance of the changes in relations between places and peoples that this involves. It does this through explaining shifts in the relative positioning of the Mediterranean's many locations – i.e. the changing values of where people are rather than who they are. Approaches focusing on people's identities, statecraft or networks do not provide a way to research how the relative value of 'being somewhere in particular' is changing and diversifying. The approach builds on the idea that in socio-cultural terms, location is a form of political, social, economic, and technical relative positioning, involving diverse scales that calibrate relative values (here called 'locating regimes'). This means locations are both multiple and historically variable, so different types of location may overlap in the same geographical space, particularly in crossroads regions such as the Mediterranean. The dynamics between them alter relations between places, significantly affecting people's daily lives, including their life chances, wellbeing, environmental, social and political conditions and status. The project will first research the locating regimes crossing the Mediterranean region (border regimes, infrastructures; digital technologies; fiscal, financial and trading systems; environmental policies; and social and religious structures); then intensively ethnographically study the socio-cultural dynamics of relative positioning that these regimes generate in selected parts of the Mediterranean region. Through explaining the dynamics of relative location, Crosslocations will transform our understanding of trans-local, socio-cultural relations and separations.

Democratic Secrecy: A Philosophical Study of the Role of Secrecy in Democratic Politics

Transparency in politics is the mantra of democratic governance. Should state secrecy, such as classified intelligence programs or closed-door political bargaining be abolished? Despite its revered status, many feel that complete transparency would undermine effective functioning of governments. Take the public responses to the Wikileaks disclosures: many of the disclosures were assessed favorably, but few people defended the idea of total transparency that inspired them. If both complete secrecy and complete transparency are to be rejected, what ratio of secrecy and transparency in politics should we seek? Democratic theory leaves this question unanswered: no systematic assessment of the role of secrecy in a democracy is available. This project solves this problem. By employing the tools of analytic political philosophy, social choice and game theory, we develop a theory of democratic secrecy centred around three theses: 1. Secrecy in exercising executive and legislative power can be democratically authorized; 2. Secrecy protects the integrity of democratic decision-making processes; 3. Balancing secrecy and transparency is an exercise in balancing the values underlying democratic authority and democratic decision-making mechanisms. The results of this philosophical study set a new course in democratic theory by demonstrating that democratic governance requires less openness than traditionally assumed. To complement the theory, criteria for political accountability for wielding political secrets and criteria for assessing responsibility for their unauthorized disclosure are designed. Our results have practical relevance: understanding when and why secrecy is morally acceptable may change the policy approach to transparency provisions, and provide a better fit between the “public right to know” and the needs of governments. Scholars from Poland and the Netherlands assess the use of governmental secrecy in these two, respectively old and new, EU member states.

We are all Ayotzinapa: The role of Digital Media in the Shaping of Transnational Memories on Disappearance

The project seeks to study the role of digital media in the shaping of transnational memories on disappearance. It investigates a novel case that is in process of shaping: the disappearance of 43 students in Mexico in September 2014. The role of the new media in getting citizens’ attention and in marking a “turning point” was crucial to the upsurge of a counter-movement against the Mexican government and qualifies the event as significant for the transnational arena. The groundbreaking aspect of the project consists in proposing a double approach: a) a theoretical approach in which “disappearance” is considered as a particular crime that becomes a model for analyzing digital memory. Disappearance is a technology that produces a subject with a new ontological status: the disappeared are non-beings, because they are neither alive nor dead. This ontological status transgresses the clear boundaries separating life and death, past, present and future, materiality and immateriality, personal and collective spheres. “Digital memory”, i.e. a memory mediated by digital technology, is also determined by the transgression of the boundaries of given categories b) a multidisciplinary approach situating Mexico’s case in a long transnational history of disappearance in the Hispanic World, including Argentina and Spain. This longer history seeks to compare disappearance as a mnemonic object developed in the global sphere –in social network sites as blogs, Facebook, Twitter and YouTube– in Mexico and the social performances and artistic representations –literature, photo exhibitions, and films– developed in Spain and Argentina. The Mexican case represents a paradigm for the redefinition of the relationship between media and memory. The main output of the project will consist in constructing a theoretical model for analyzing digital mnemonic objects in the rise of networked social movements with a transnational scope.

How elephants grow old

The ageing population structure of most European countries has major health, economic and social consequences that lead to a need to better understand both the evolutionary limitations of deferring ageing, as well as the mechanisms involved in growing old. Ageing involves reduced fertility, mobility and ability to combat disease, but some individuals cope with growing old better than others. Improving the quality of life at old age and predicting future changes in longevity patterns of societies might depend on our ability to develop indicators of how old we really are and how many healthy years we have ahead, and how those indicators depend on our health history across several decades. Yet, most model species used in biology are short-lived and provide a poor comparison to long-lived mammals such as humans. Further, they do not often inform on the mechanisms of ageing alongside its fitness consequences in natural populations of long-lived mammals. This project integrates different ageing mechanisms with unique data on lifelong disease and reproductive history in the most long-lived non-human mammal studied so far, the Asian elephant. I will examine how different mechanisms of ageing (telomere dynamics, oxidative stress and telomerase activity) interact with lifelong disease and reproductive history, and current endocrinological measures of stress and reproductive status. This will help us to better understand both the mechanisms of ageing and their consequences on senescence rates. To do so, I will combine the most comprehensive demographic data (N~10.000) on Asian elephants in the world with bi-monthly health assessments and disease records across life (N~2500) and with longitudinal markers of ageing and hormonal correlates of stress and reproductive potential (N~240). Understanding changes in health across life and its links to ageing rates, stress levels and life-history in a species as long-lived as humans will be relevant to a large range of end-users.

Leveraging Binary Analysis to Secure the Internet of Things

We are in the midst of the shift towards the Internet of Things (IoT), where more and more (legacy) devices are connected to the Internet and communicate with each other. This paradigm shift brings new security challenges and unfortunately many current security solutions are not applicable anymore, e.g., because of a lack of clear network boundaries or resource-constrained devices. However, security plays a central role: In addition to its classical function in protecting against manipulation and fraud, it also enables novel applications and innovative business models. We propose a research program that leverages binary analysis techniques to improve the security within the IoT. We concentrate on the software level since this enables us to both analyze a given device for potential security vulnerabilities and add security features to harden the device against future attacks. More specifically, we concentrate on the firmware (i.e., the combination of persistent memory together with program code and data that powers such devices) and develop novel mechanism for binary analysis of such software. We design an intermediate language to abstract away from the concrete assembly level and this enables an analysis of many different platforms within a unified analysis framework. We transfer and extend program analysis techniques such as control-/data-flow analysis or symbolic execution and apply them to our IL. Given this novel toolset, we can analyze security properties of a given firmware image (e.g., uncovering undocumented functionality and detecting memory corruption or logical vulnerabilities,). We also explore how to harden a firmware by retrofitting security mechanisms (e.g., adding control-flow integrity or automatically eliminating unnecessary functionality). This research will deepen our fundamental understanding of binary analysis methods and apply it to a novel area as it lays the foundations of performing this analysis on the level of intermediate languages.

Presenter



Andrew Derrington has in-depth experience of the research funding process. He obtained his first research grant, a Beit Memorial Fellowship for Medical Research, while he was writing his PhD. His research was continuously funded by fellowships, project and programme grants for the next 30 years. He served on research grant committees for The Science and Engineering Research Council, the Medical Research Council and the Wellcome Trust. His book, *The Research Funding Toolkit*, which he co-wrote with Jacqueline Aldridge, research and enterprise associate in the School of Psychology at the University of Kent, is the definitive guide to grant writing for early career academics and research professionals. It is based on Andrew's analysis of how grants committees make funding decisions.

Andrew has worked in eight Universities including two in the world top ten.

He has also worked as a journalist. Over several years he wrote two successful columns in the Financial Times. *The Nature of Things* covered science - from astrophysics to zoology. *Psych Yourself Up* was a guide to the different psychotherapies available in the UK.

Andrew set up [Parker Derrington Ltd](#) in 2013. He now works as a consultant, writing research grant applications and providing strategic advice and training to individuals and organizations.

Testimonials

I had a fantastically useful time attending your recent workshop at Leicester University. Writing the 10 key sentences was a very useful exercise and I have, since, worked on them to discover they are a fab tool for any kind of writing really.

Dr Ranjana Das, University of Leicester

Andrew blends easy authority and extensive experience with humour and approachability. The result is a workshop full of practical, memorable advice on how to compete more successfully for research funding.

Professor Peter Clegg, Institute of Ageing and Chronic Disease, University of Liverpool}

I attended one of Andrew's workshops when I was a senior lecturer. The hands on advice about how to structure my applications in a really appealing fashion enabled me to win a grant of nearly →£600K the next year. I still implement the advice that I received in that workshop, and pass it down to junior colleagues. I find that Andrew's advice has a high success rate!

Prof Theresa Gannon, University of Kent

I still use the tips you gave me for my successful Wellcome SRF application. Your advice on "12 key sentences" is spot-on and helps people focus on the aspects of the proposal that are critical to success instead of getting bogged down in reams of text.

Prof Mark Baxter, Mount Sinai School of Medicine

Andrew's grant-writing workshops teach you how to convince the world that it needs your research. They are the most useful training events I have ever attended. His advice about how to sell the big idea without compromising on the science was critical to the success of our →£9.3 million ESRC application.

Prof Julian Pine, University of Liverpool