

Writing Research Grant Applications

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Programme

Things you Need to Know

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Introduction

This workshop is designed to start you working on a 'recipe' for an application for a research project grant, such as a research council standard grant. In the morning session we discuss the things you need to know and do before you start writing. In afternoon session you start writing and get feedback. Follow-on consultations may be available for you to seek further feedback or advice on any topic.

The workshop covers the following issues:-

- Writing a grant application is very difficult unless you design a fundable project before you start. We will discuss how you can assess whether you have a fundable project.
- We will discuss the elements of an individual research funding strategy.
- I will explain what information to include in the case for support so that it convinces the reader:-
 - that your project is important,
 - that your project is likely to be successful,
 - that you are competent to lead the project, and

- that the project is good value for money.
- We will discuss the way funding decisions are made and how to exploit them.
- We will discuss a 'recipe', a step-by-step guide to constructing a case for support.
- We will discuss how the requirements of a grant application dictate writing style.
- We will discuss how fellowship applications differ from grant applications.

If you have a fundable project in mind at the start of the day, you should have a rough draft of the skeleton of the case for support by the end of the day. If you don't have a suitable project in mind at the start of the day you can practise the skills of writing the 10 key sentences with a dummy project, or maybe you will be able to formulate something to work with in the morning.

For several project exercises you will need to work with a summary of a research project: I recommend that you use a summary from a successful grant application. The workshop handout, which can be downloaded from [the resources web page](#), contains summaries from successful ERC and UKRI grant applications. You can also find summaries in [the ERC](#) and [the UKRI](#) databases of funded projects and the [nihj journals library](#).

The handout is designed to be read on a screen, not printed. It is important that you bring a WiFi enabled laptop, a smartphone or a tablet to the workshop. There is no need to look at the handout before the workshop.

Andrew Derrington

Detailed List

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Are you Ready to Start ***

...

- Do you have a project?
 - Big picture goal
 - Detailed approach
 - * aims/problems/research questions
 - * how you will achieve/solve/answer them

...

- Break your project into implementation [sub-projects](#).
 - May be easier to assemble sub-projects from smaller parts
 - Define the important problem that is solved by each sub-project.

...

- What is the evidence that your project is of interest to your chosen funder?
 - Can you express it in one sentence?

...

- What have you done that would convince a sceptic that you can do the project?
 - Can you express it in a single statement?

...

- If impact is part of the funding criteria:-
 - Who will benefit most from your research?
 - * How will they benefit?
 - * What is their involvement in the development & delivery of the project?

...

Your application will need to answer all these questions.

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 Contexts? (Dr Pig method)
 - Different collaborators/consortia/industrial partners
 - * 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".

Writing Guidelines ***

- Vocabulary simple & clear
 - same-meaning = same word or phrase ALWAYS
 - No Initialisations

...

- Sentences easy to process
 - As short as possible
 - * no lists
 - * no multiple verbs, adverbs or adjectives
 - * no inessential adjectives or adverbs
 - Same job = same structure
 - Use Evidence

...

- Sections and paragraphs
 - Hierarchical detail
 - * heading
 - * Key Sentences
 - * Summary paragraph
 - * Topic Sentences

...

- 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.

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.

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

Example

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.**

Why you need a magic formula ***

The Case for Support must persuade the funder to fund your project.

1. **What do funders want?**
 - This tells you what information the Case for Support must include.
2. **How do funders make decisions**
 - This tells you the requirements for the Case for Support.
 - **You need a magic formula to meet them.**

Grant Funders have Four Questions about the Project ***

1. **Do we care?**

. . .

- Does it fit with published priorities?
- Does it fit the scheme (training, career development, mobility...)

. . .

2. Will it work?

. . .

- Will it achieve its declared goal?
 - Will the results be put to use?

. . .

3. Can you do it?

...

- Can you carry out the project?
 - Does your institution have the necessary facilities?

...

4. Is it worth it?

...

- Are resources Necessary & Sufficient
 - Are they in-line with what we usually fund?

Importance *** **

What content?

...

- A convincing promise about the overall aim that the project will deliver
- Explanation of what makes it fit the funders priorities.
 - [Support it with a review of the literature](#)

...

Where?

...

- First two key sentences
- First two sections

Example

Success *** **

What Content?

...

- Problems you have to solve to deliver the 'promise'.
- Research that will solve those problems.
 - Impact and dissemination plans?

...

- Where?

...

- Problems in the Background
 - can be expressed as RESEARCH QUESTIONS, AIMS, OBJECTIVES or HYPOTHESES
- Research in the Methods/Research Plan section (**Implementation**)
 - 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".
- Always match the background to the research plan, even when they are entries on a form.

Competence * ****

What Content?

...

- Publications should give evidence that the team has the necessary skills
 - quality and authorship matter
- Track record gives evidence that PI can deliver
- Environment gives evidence Institution can support

...

Where?

...

- Case for support
 - Background
 - Methods
 - Track record and Environment
- CV

Value for Money * ****

- What Content?

...

1. Mention the resources to be used in the project
 - Resources funded by the grant are necessary
 - Other resources show that the institution is contributing
 - Do this in the case for support
2. Explain that the resources requested are appropriate and good value
 - Do this in Justification of Resources.

NEVER try to compete on price

The Decision * ****

...

- Who decides?

...

- Committee of successful researchers

...

- Not knowledgeable about your particular research area.

...

- Too busy to read your grant carefully

...

- May have 'user' representation
- Supported by secretariat

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

- Applications
 - 50-100 per meeting.

...

- Expert referees' reports
 - Evaluation and score.
 - 2-5 per application
 - Often conflicting

...

- Designated members' reports
 - Oral report by 2 or 3 members .
 - < 5 minutes

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

- Presenting members oral report
 - Who, what, why, how, strengths, weaknesses, referees, conclusion, suggested score
 - One person may report on 10 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 *** **

- Reading Order: **PIPPIN** “An excellent person or thing” *Oxford English Dictionary*
 - **P**romise? (the case in one sentence)
 - What makes that promise **I**mportant,
 - 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 **N**ext
- [Examples of Project Key Sentences](#)
- [Use the key sentences as a framework for writing the Case for Support](#)
- Use the key sentences as the [Introduction](#)
- and as the [Summary](#)
- Every Reader gets the same picture, no matter what they read
- And referees know where to look for detail
- Writing Order:-
 - Implementation
 - Problem
 - Project & Importance
 - Next
 - Promise

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 neurons and the performance of the whole visual system** in order to establish the contribution of neurons to perception.

. . .

Implementation Key Sentence

We will record 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 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 neurons in cortical area V1

We need to know **the perceptual capabilities of neurons in cortical area V1** in order to establish the contribution of V1 to perception. The 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 neurons and the perceptual capabilities of the individual.

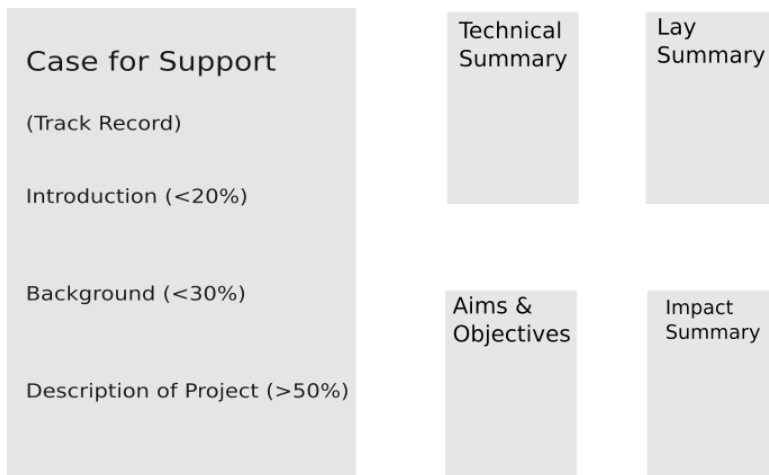
- Description of corresponding **Implementation** Sub-project

Measuring **the perceptual capabilities of 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 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](#)
- [NIHR](#)
- [Leverhulme Awards 2016](#)

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

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

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 outcome it will produce.

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

We will carry out an ethnographic study, in order to characterise the writing practices of professional social workers.

- Common mistakes
 - Failing to describe research
 - Failing to say what problem it solves
 - Too long or too complex
- Examples

Problem Sentences * ****

State a research problem in terms that match the (& why it's important)

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

We need to know the writing practices of professional social workers so that we can identify current strengths and areas of good practice.

- Common mistakes
 - Describing the sub-project instead of stating the problem
 - Too long or too complex
- 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

- Say what will happen after the project is finished
- What will we be able to do then that we can't do now?
 - New kinds of research?
 - Solve a societal problem?

Examples

Elevator Pitch *** **

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

. . .

- **Importance** sentence: what 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.

. . .

- **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.

. . . 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
 - NIHR ask for 'Aims and Objectives' in the middle of the case for support . . .
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 appears to 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.

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** (2 sections + 3 subsections)
 - 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.** **Importance** Sentence followed by details that cover the topics specified by EPSRC.
 - a. -c. **Problem** sections as sub-sections of importance
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.

Pairing Exercise ***

Pair an **Implementation Sentence** with the **Problem Sentence** that justifies it

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

Example

- Implementation
 - We will carry out an ethnographic study, in order to characterise the writing practices of professional social workers.
- Problem
 - We need to know the writing practices of professional social workers so that we can identify current strengths and areas of good practice.

Create your own example

Can you rewrite it as a Aim and an Objective?

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.**

How the Structure Works *** **

(Key Sentence Names are **Bold Font**)

. . .

1. **Introduction** (summarises whole case for support using all key sentences)
 - **Promise, Importance, Problem₁₋₃, Project, Implementation₁₋₃ & 'Next'**

...

2. **Background** (Literature review=> **Promise** is Important; Solving **problems** is criterion for success)

- **Importance:** Sells **promise** => *IMPORTANCE PROPOSITION*
- **Problem₁:** Explains **Problem₁**
- **Problem₂:** Explains **Problem₂**
- **Problem₃:** Explains **Problem₃**

...

3. **Methods / Research Programme** (Project is value for money & will be successful)

- **Project:** Introduces the project.
- **Implementation₁:** How sub-project 1 will solve **Problem₁**
- **Implementation₂:** How sub-project 2 will solve **Problem₂**
- **Implementation₃:** How sub-project 3 will solve **Problem₃**
 - Mention resources used in research => *VALUE for MONEY PROPOSITION*
 - Explains how Project solves **Problems** => *SUCCESS PROPOSITION*
- **Next:** Says what happens after the project.
 - Expectations depend on funder & on importance proposition.

...

4. Some funders require section on track record & environment

- Track record demonstrates all necessary skills
- Environment describes all necessary infrastructure & support
 - => *COMPETENCE PROPOSITION*

Fellowships ***

- Fellowships 101
- Key Sentences
- Generic Criteria
- MSCA Criteria
- UKRI Criteria
 - Project
 - Candidate
- EPSRC Criteria
 - Project
 - Candidate
- Talks and Interviews

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

Fellowship Key Sentences *** **

Fellowship Key Sentences 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 sentence 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

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

Principles of short talks and interviews * ****

General Principles

- Decide on your take-home message.
 - Learn it
- Use it as a cue for the whole talk
 - Tell - explain - remind.

- Keep to time
- Be yourself.

Talks ***

Message as a cue for the talk

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

. . .

- And thank the audience

Communication Basics *** **

- Look at the audience
 - Look at the screen when you want them to . . .
- 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

Slides, Handouts and Scripts *** **

- Slides illustrate or emphasise, not expand

. . .

- Must explain
 - What point the slide makes
 - What is on the slide - use a pointer
 - How it demonstrates the point

. . .

- 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

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.

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, openness, 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.

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](#) . . . - Pick a criterion & write a paragraph that states how you meet it.

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.

. . . .

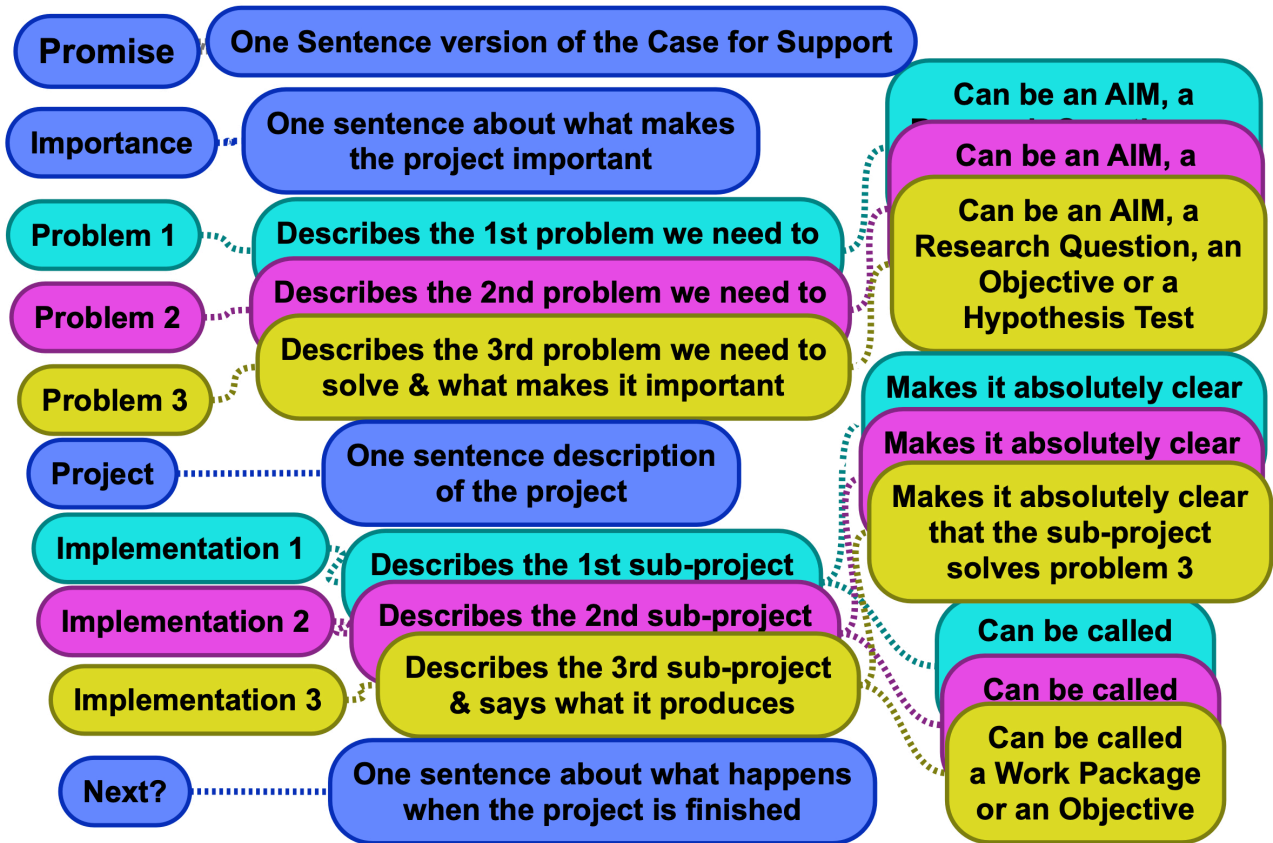
- Pick a criterion & write a paragraph that states how you meet it.

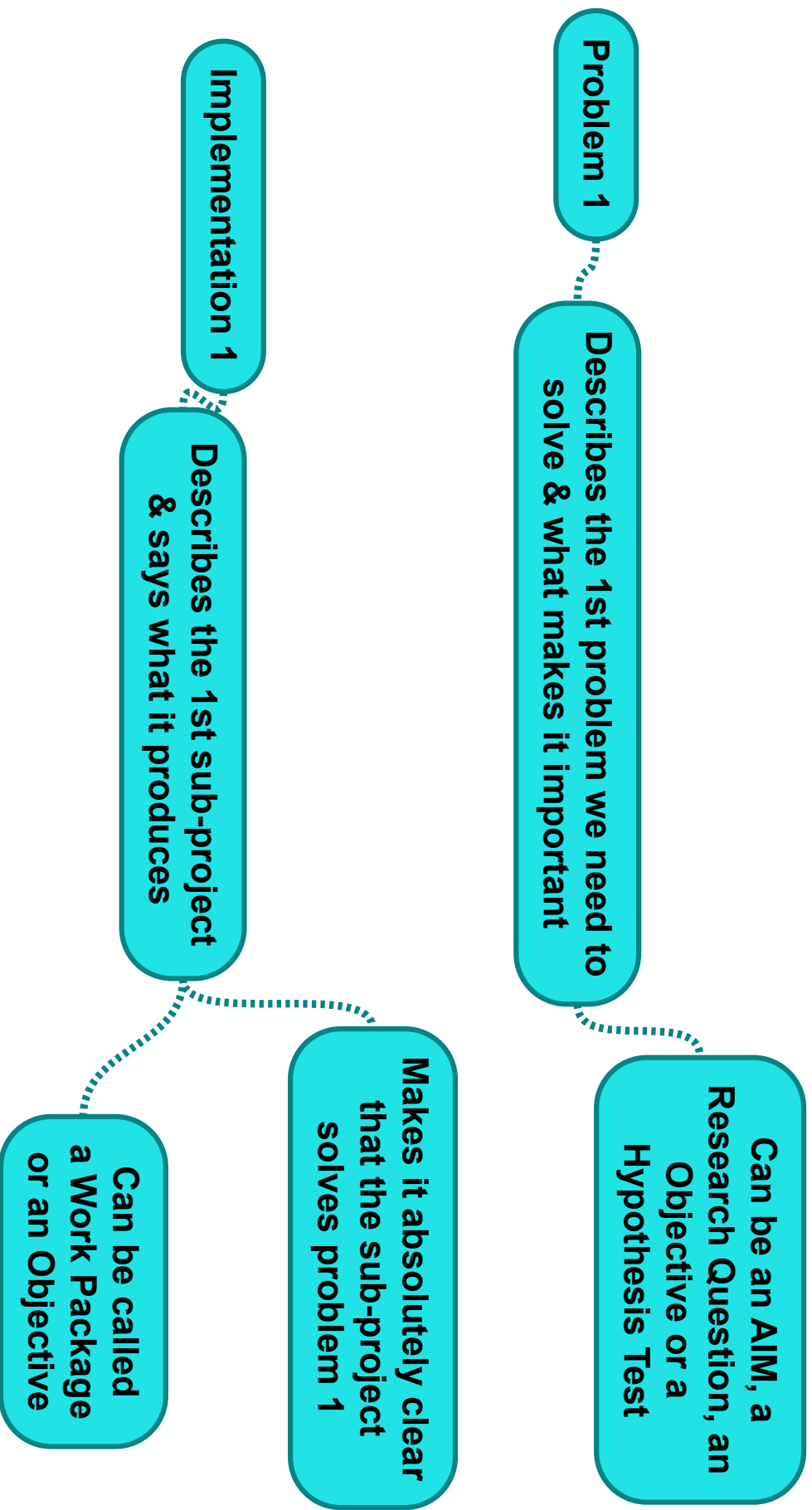
Write a Grant in 10 Steps *** **

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** sentenceIf 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.

Introduction Structure

The Key Sentences





Examples ***

- Key Sentences 1-5 (Background)
- Key Sentences 6-10 (Project)
- Aims and Objectives
- All The Key Sentences as Aims & Objectives
- Elevator Pitch
- Tag Phrases
- Workshop Key Sentences

You can also find summaries of successful projects in [the ERC](#) and [the UKRI](#) databases of funded projects.

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 so that we can identify current strengths and areas of good practice.
- **4 Problem₂** We need to know the institutional writing demands of contemporary social work so that we can identify the writing skills that social workers need.
- **5 Problem₃** We need to understand how writing practices shape professional social work so that we can identify how writing skills could lead to future improvement in practice.

[The Key Sentence Technique](#)

[Problem Sentences](#)

Example Key Sentences continued * ****

Key Sentences 6-10 describe the project

- **Project** The project will use a methodology that integrates ethnographic description, discourse analysis and tracking the production of texts to analyse the writing practices and the work of 50 professional social workers in three local authorities in the UK.
- **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 need to answer:-
 1. We need to know the writing practices of professional social workers so that we can identify current strengths and areas of good practice.
 2. We need to know the institutional writing demands of contemporary social work so that we can identify the writing skills that social workers need.
 3. We need to know how writing practices shape the nature of professional social work so that we can identify how writing skills could lead to future improvement in practice.
- 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

Key Sentences as Aims & Objectives *** **

Aims

The overall 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. The project is important because 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. The project has three aims, which are to answer the following research questions:-

1. We need to know the writing practices of professional social workers so that we can identify current strengths and areas of good practice.
2. We need to know the institutional writing demands of contemporary social work so that we can identify the writing skills that social workers need.
3. We need to know how writing practices shape the nature of professional social work so that we can identify how writing skills could lead to future improvement in practice.

Aims and Objectives

Key Sentences as Aims & Objectives (continued) *** **

Objectives

- The project will use a methodology that integrates ethnographic description, discourse analysis and tracking the production of texts to analyse the writing practices and the work of 50 professional social workers in three local authorities in the UK. It has 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.

We will develop effective writing practices that will improve training and practice of 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? Answering this question will allow us to identify current strengths and areas of good practice.
2. What are the institutional writing demands of contemporary social work? Answering this question will allow us to identify the writing skills that social workers need.
3. How do writing practices shape the nature of professional social work? Answering this question will allow us to identify how writing skills could lead to future improvement in practice.
 - 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 we have developed.

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**? Answering this question will allow us to identify current strengths and areas of good practice.
 2. What are **the institutional writing demands of contemporary social work**? Answering this question will allow us to identify the writing skills that social workers need.

3. How do **writing demands and practices shape professional social work**? Answering this question will allow us to identify how writing skills could lead to future improvement in practice.
- 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**.

Review Exercise ***

- Take a summary from the [handout](#) or from from [the ERC database](#) or [the UKRI database](#).
 - We have taken [this one](#)
- Write a one-sentence summary.

. . .

- Find the **importance** sentence or its elements.
 - Can you improve it?
- Identify or write a set of **implementation** and **problem** sentences for the project.
- Identify or write a **project** sentence
- Identify or write a **'next'** sentence

Summaries

Cities in Global Financial Networks: Financial and Business Services and Development in the 21st Century (ERC)

Financial and business services (FABS), including law, accounting, and business consulting, have been one of the most dynamic sectors of the world economy, with a fivefold rise in real value added since 1980. Although FABS are central to the processes of globalisation, financialisation, urbanisation and development, our understanding of the sector in the context of tumultuous changes of the early 21st century is partial. How have the FABS firms and centres been affected by the global financial crisis and the Eurozone crisis? How are they changing in response to new financial regulation, the expected shift of economic activity to the Asia-Pacific region, and the digital revolution? What are the impacts of FABS on urban, regional, and global development? We urgently need groundbreaking frontier research to better understand the nature and dynamics of FABS, and their implications. This project is designed to address this challenge by focusing on three objectives: mapping the FABS sector and its transactional networks worldwide; analysing strategies of FABS firms, as well as policies towards FABS and their institutional environments in cities; explaining the impacts of FABS, their strategies, and place-specific factors on growth, stability, and inequality at urban, regional, national and global level. In doing so, we will develop a new theoretical framework, called the Global Financial Networks, which positions FABS and their networks in the broader economy. Using a mixed-methods approach, we will document the development of FABS and their consequences, cutting through the hype of financial centre indices, and through the fog of ideologically charged debates on the virtues and vices of the financial sector. One of the outcomes of the project will be the world's first ever atlas of finance. The project will provide a robust evidence base crucial in shaping future rounds of investment by and in FABS, and policies towards FABS by governments and other organisations.

Note: This summary and the ERC summaries on the next few pages come from the [ERC database](#).

Workshop Key Sentences *** **

1. The workshop teaches an approach to grant-writing that won the presenter continuous funding during his research career and that has been refined by his analysis of committee decisions on thousands of grant applications.
2. A successful approach to grant writing makes research grant applications easier to write and more likely to be successful. It must have three elements:-
 - 3) An effective strategy to maximise success and reduce wasted effort, so that it is clear when to write grant applications and how to prepare.
 - 4) A specification for an effective grant application so that it is clear what to write.
 - 5) A recipe for producing effective grant applications so that it becomes easy to write them.
6. The workshop will teach participants all the elements of a successful approach to grant writing.
7. The presenter will explain how the uncertainty of funding decisions can ameliorated by an effective grant-writing strategy.
8. The presenter will explain how funding decisions are made and derive a specification for an effective grant application.
9. The workshop will include writing exercises and explanations to help participants follow the presenter's recipe for producing effective grant applications.
10. The workshop will equip participants to develop personal funding strategies.

Summaries: Multi-Subject ****

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

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 (ERC)

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.

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

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 (ERC) ****

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 (ERC)

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.

The following summaries come from the [UKRI gateway to research](#) which contains information about successful UKRI grant applications.

Governance of Global Financial Markets: Institutional and Ethical Aspects (AHRC) ****

In the past decade an amorphous, quasi-formal, and polycentric system of governance for international financial markets has emerged. This consists of a web of public, quasi-public, and private international bodies, and thousands of quasi-binding standards and rules. These rules are addressed in a semi-mandatory form to the international financial community and, in practice, their application is not subject to any jurisdictional constraints. The most central parts of this governance system comprise international regulatory regimes based on 'soft law', which are imposed by regulatory networks such as the Basel Committee on Banking Supervision and the International Organisation of Securities Commissions (IOSCO). In addition, private institutions with quasi-regulatory responsibilities, such as the International Credit Rating Agencies, play an important role in the emerging global system of governance for international financial markets.

The current model of regulation for global financial markets is especially ineffective when it comes to:

1. coordinating appropriate responses to global regulatory challenges, such as, for instance, the regulation of the emerging mega- exchanges,
2. the containment of international financial crises
3. the identification of the appropriate framework for the operation of the global investment fund industry.

These weaknesses are, in part, due to the fact that the institutional arrangements underlying the governance and regulation of global financial markets are subject to a maze of conflicting political and economic interests and, in part, to the messy state of current institutional arrangements. Equally important is the fact that the current governance system has emerged almost by default and is the product of circumstance. As a result, it is mostly responsive rather than proactive intending to address the pressing issues of international monetary crises and of banking collapses that pose risks to systemic stability in a transnational context. Thus, it has failed to address important questions about the desired role of global finance.

This study strives to address some of these inadequacies and suggest workable solutions. It argues for the establishment of a formal institutional framework dealing with global financial markets. This would be largely derived from an amalgamation of the current semi-formal structures into a global functionary with rule-making powers. The operation of this framework would largely be based on the (familiar from EU law) principles of minimum harmonization and mutual recognition giving the benefit of a global common passport to firms, institutions, and markets complying with the agreed global regulatory standards.

Furthermore, the study examines the international consensus that underpins the operation of global financial markets through the lens of social contract theory. Thus, support is lent to the argument which views this consensus as an implicit global regulatory contract. The policy objectives that should be included in this contract constitute the normative foundations of an international governance framework for global financial markets. In this context, it is argued that the relevant governance framework should encompass two sets of policy objectives:

- (a) the primary goals of depositor/investor protection and protection of systemic stability and of market integrity and
- (b) the secondary goals of economic development and poverty eradication in very poor countries.

The pursuit of the second set of objectives would always be subordinate to fulfilling the principal objectives and would be facilitated by a properly devised system of regulatory incentives embedded in international capital adequacy regulation and global investment fund licensing schemes.

Strategic Network: Data and Cities as Complex Adaptive Systems (DACAS) (ESRC) ****

Urbanisation has been declared a planetary condition. Cities and urban processes have moved to the core of research agendas across several academic disciplines and interdisciplinary fields. New analytical frameworks and practical tools are needed to model, understand and manage urban transformations. Yet despite the increasing availability of urban (big) data and methods of analysis with the potential to allow an evidence-based understanding of socio-spatial change in different geographical contexts, current approaches fail to understand cities as complex adaptive systems. Although smart cities are seen as offering solutions to pressing global challenges, mainstream strategies do not yet offer an in-depth understanding of correlations and causalities between different urban systems and fail to address the links between 'soft' (economic, ecological and social) and 'hard' (engineered) systems. However, the ability to link and model different kinds of urban data and systems is indispensable for a holistic understanding of cities as complex adaptive systems and will be agenda-setting for future urban research and practice.

The proposed international Strategic Network Data and Cities as Complex Adaptive Systems (DACAS) aims to promote a decisively interdisciplinary approach to understanding urban processes and transformations through (big) urban data using a complexity science framework.

The Strategic Network has three objectives which are closely aligned with the Government's Department for Business, Innovation & Skills

- a. smart cities and
- b. development assistance strategies in the following ways:
 - a. DACAS will bring together noted academics with backgrounds in the social and natural sciences, including architects, engineers, physicists, geographers, mathematicians and ecological economists. Network activities will clarify and calibrate common interdisciplinary terminology using a complexity science framework. Relevant urban systems data will be identified; data sources, structures and methods of acquisition will be compared and methods of data analysis will be tested through cross-case analysis of soft and hard urban data sets (Obj1). Network activities will establish if and how data can be used to link hard and soft urban systems. Modelling techniques will be compared and linked across disciplines and innovative protocols will be established to identify cause-effect relationships in large complex (urban) data sets (Obj2). Network activities will facilitate the development of practical tools and innovative technological applications to exploit (big) urban data, reflect urban complexity and aid urban policy-making and practice (Obj3).
 - b. DACAS researchers will be based in Japan and the UK as well as Newton countries Brazil and China. Three events and one summer school (targeting specifically PhD and Early Career Researchers) will link academics with user communities from the public, private and third sectors. Two of these events will be hosted by our partners in Brazil and China.

In view of global environmental and economic crises where the pressures of urbanisation are expanding, DACAS has the potential to make a real impact in academic, policy and practice circles through multiple deliverables. Alongside academic papers produced by individual Network members, DACAS will publish a synthesis article in an internationally renowned journal. In addition to a dedicated website and a series of contributions to popular magazines and web blogs, DACAS will produce synthesis reports for researchers and practitioners and a UNU Policy Report/Policy Brief for policy makers. At the Manchester School of Architecture, students of Architecture will benefit directly from DACAS activities through the digital research-based MARCH atelier Complexity, Planning and Urbanism (CPU). Funding proposals for interdisciplinary research will be developed to ensure continued DACAS activities post-award (e.g. RCUK, ERC H2020, Belmont Forum).

Finance and Inclusive Growth in Low Income Countries: The Impact of Global Banking Regulation (ESRC) ****

In the wake of the global financial crisis, industrialized countries have agreed a series of regulatory reforms to repair and regulate their own financial systems. All countries, including LICs are encouraged to adopt these new global standards. Members of the G20 have asked the Financial Stability Board, IMF and World Bank to study how global banking initiatives will impact developing and emerging economies, identifying this area as a key policy concern for promoting inclusive growth. To date the scant research on this question addresses almost exclusively emerging market economies. LIC governments and advisers have voiced an urgent need for LIC-specific analysis.

This project will be amongst the very first to look at how political institutions and processes - at both the domestic and global levels - shape the impact of global banking initiatives on LICs and their ability to harness financial flows for inclusive growth. The core research questions are:

1. How much de facto flexibility do LICs have in respect of the new regulatory standards, how much do they need, and under what conditions (economic and political; global, regional and national) should they adopt new regulatory standards?
2. What strategies for influencing global standard-setting processes and institutions are likely to yield the best outcomes for LICs?

The project combines two disciplinary approaches: political science and economics. It combines quantitative and qualitative analysis, and will generate new datasets. Outputs will include top-quality peer-reviewed academic publications and a series of tailored policy briefs.

The project has been designed to maximize impact through continuous direct engagement with policy-makers confronting the problems the research addresses. The design of the research questions has been undertaken in dialogue with LIC and developing country policy-makers. We will continue to engage policy-makers through semi-structured interviews; annual workshops; and through the project's Expert Advisory Board. The Board includes Vivienne Apopo (Director General, East African Development Bank), Mthuli Ncube (Chief Economist, African Development Bank), Amar Bhattacharya (Director, G24 Secretariat).

Key beneficiaries are regulators, senior government officials, and other stakeholders in LICs engaged with promoting inclusive, sustainable growth. This includes the Community of African Banking Supervisors (CABS); the Banking Commission of the West African Economic and Monetary Union (WAEMU); the Regulatory Committee of the Central Bank of Angola; the National Financial Supervision Council (NFSC) of Vietnam; the Commercial Bank Supervision Department of the Bank of Laos; and the Central Banks of Tanzania and Uganda. Our impact strategy leverages existing close links between several of our researchers and key stakeholders in LICs.

The project will enhance the capacity of LIC governments to make choices about financial regulation, and to ensure global standard-setting processes support these choices. It will also enhance the capacity of scholars and stakeholders in LICs to continue the research in-country: to this end we are working with in-country researchers on the case studies and engaging Southern stakeholders with targeted dissemination. We will engage directly with academic institutions in LICs, such as the Department of Economics, University of Dar es Salaam (Tanzania); the Departments of Economics and Law, University Ouaga II (Burkina Faso); the Economics and Management Faculty of Lomé and Kara Universities (Togo); the Economics Department, Agostinho Neto University (Angola); the Fulbright School (Vietnam, a partnership between Harvard Kennedy School and University of Economics, Ho Chi Minh City).

The project will enjoy a ready exploitation route, building on the excellent track record and extensive network of the Global Economic Governance Programme (GEG) and the Blavatnik School of Government, University of Oxford.

Voices in the City: Understanding the Role of the City of London as a Multi-Level Policy Actor and the Impact of the Financial Crisis (ESRC) *****

'Voices in the City' sets out to unpack the black box of the City of London. The global financial crisis has exposed the financial services industry to an unprecedented level of political scrutiny and driven demands for stronger regulation. Understanding the dynamics of the City as a policy actor and how it has adapted in response to the financial crisis has therefore never been more important. Few studies have explored the role of the 'City' in the policy process in great detail. Consequently many important questions remain unanswered. How can we conceptualise the City of London as a policy actor? How does the City try to shape the regulatory agenda at multiple levels? What has been the impact of the global financial crisis on its policy role? To what extent have its regulatory policy preferences been redefined? How can we explain the City's influence within the policy process?

To address these, the study offers a new way of conceptualising the City of London as a policy actor: analysing its internal dynamics, policy preferences and lobbying strategies in national, European and international policy processes. This is operationalised by undertaking a comparative analysis of two rounds of negotiations on the regulation of the banking industry: the Basel 2 agreement (2004) and EU Capital Requirements Directive (2005); and the Basel 3 agreement (2010) and EU Capital Requirements Directive IV (2011). In each case an international non-legally binding accord was agreed by the Basel Committee of Banking Supervisors, and then amended and transposed into binding legislation within the European Union.

The research pioneers, tests and refines a new approach to understanding the role and power of international financial centres in three main ways. First, the project employs an innovative analytical framework to systematically map the City's membership on the basis of shared beliefs and values, and the extent to which lobbying activity is coordinated between different actors. This is intended to reveal important new insights about its capacity to speak with one voice, the origins of its policy preferences and internal divisions, and the complex and opaque relationship between the City and Westminster. Second, by examining the dynamics of regulatory negotiations in the European and international arenas, the research aims to unpack the tactics, strategies and narratives that City actors employ to lobby policy makers at multiple levels. Finally, the use of case studies of regulatory reform before and after the onset of economic turmoil that began in 2007 ensures that it is well placed to explain the impact of the global financial crisis on the City. This enables us to analyse the extent to which its policy preferences have shifted over time and how lobbying strategies have been reconfigured in response to the radically altered political and economic context.

The study will draw upon extensive survey data and in-depth interviews with policy makers, industry regulators, trade representatives and members of leading City firms to provide a rich empirical account of how the City wields influence within the policy process. It also seeks to engage a wide international audience, encourage the sharing of different perspectives, and facilitate lively discussion and debate about the future of the City of London. This is to be achieved through an ambitious programme of interdisciplinary networking and collaboration, international conference presentations and high impact publications, practitioner workshops and policy briefings, and a public roundtable debate. In short, the project promises to shed new light on a critically important but hitherto neglected actor within the national, European and international policy process.

Digital City Exchange (EPSRC) ****

City infrastructure has evolved through many vintages of technology; its various components are not efficiently connected and configured. Utilities and services using this infrastructure often operate sub-optimally, constraining development of new value-added services. Digital technologies enhance our ability to collect appropriate data and conduct analysis at a systemic level, thereby enhancing efficiency and allowing valuable new service businesses to emerge for the first time. This enhances quality of life, making our cities more globally competitive and providing opportunities for new jobs, both within existing companies and because entirely new companies have been empowered to spring up.

One simple application is the problem of managing peak demand for infrastructure, whether for energy, waste, water, or transport. Peak demand requires the provision of expensive infrastructure, the need for which can be avoided if demand can be spread more evenly. Failure to resolve this issue leads to costly symptoms such as traffic congestion or power outages. As urban populations expand, these problems are becoming more apparent and pressing. At present, those responsible for urban services attempt to resolve each of these problems in isolation - for example, congestion charging for transport takes no account of effects thereby induced on demand peaks for energy, implied effects on the bunching of hospital services, or whether congestion in supermarkets is thereby reduced or exacerbated. When systems interact as much as this, optimization at a higher level will yield important efficiency gains - cheaper costs, additional leisure time, better quality of life - making such cities more attractive places for businesses and consumers.

Developments in pervasive sensing, large-scale modelling, new analytical and optimisation techniques and web services technologies offer a new wave of opportunities to re-think an integrated urban infrastructure. New markets for digital services will grow from the ability to integrate, analyse, model, and act upon data from multiple sources.

Making this happen in reality also requires progress in the understanding of business models, consumer behaviour at a systemic level, and the prototyping of service innovation to accelerate the development of financially viable new services. This proposal seeks to create understanding at each stage in this chain, and to validate the benefits thereby obtained.

Financial risk and the impact of climate change (NERC) ****

In 2015, the Governor of the Bank of England issued a stark warning that both the impacts of climate change and those of climate policies could have pronounced effects on the UK's financial and insurance industries. At the core of climate-related impacts, there is a dilemma: while climate policy seeks to avoid long-term physical damages from climate change, it may also negatively affect financial markets as the valuation of fossil fuel-related financial assets falls. Such assets could become effectively 'stranded' by the transition to environmental sustainability. The financial risks arising from the transition and the stranding of fossil-fuel assets have been termed 'transition risks'.

The adoption of climate laws and policies, including the 2008 Climate Change Act in the UK, has supported the development and uptake of low-carbon technology, significantly reducing the demand for fossil fuels worldwide. This change in demand, together with the expectation of more stringent climate policies in the future, is rapidly changing the market outlook for fossil fuel-related industries and associated physical and financial assets. Companies could invest in oil wells, refineries or tankers that, in a scenario of low demand, may fail to generate the expected return and thus become stranded. If the risk of asset devaluation is underestimated by investors, a climate bubble - which may already exist - could grow significantly, the bursting of which could lead to panic selling and a propagation of losses across the financial network, potentially triggering financial instability as severe or worse than that experienced worldwide in 2007.

This project aims to develop a robust characterisation, quantification and communication of climate-related transition risks, thus addressing a key objective of the UK Climate Resilience programme. To achieve this, we will improve and apply a set of software tools and a consultative analytical procedure to assess the risks to the UK's financial and economic stability of a rapid transition to a low-carbon economy, and its impact on the real economy, jobs and income. We have recently developed a new computer model of the energy-economy-environment system uniquely well suited to this problem. The potential global loss in value of fossil-fuel assets we estimated to be \$1-4tn, and its impact on the macroeconomy potentially twice as large. Our model represents the first of a new generation designed to assess the impacts of detailed climate policy packages on global and national economies. The model simulates the uptake of key low-carbon technologies in the most emissions-intensive sectors (power generation, road transport, household heating, industry and land-use).

To address the issue of financial contagion, triggered by fossil-fuel asset devaluation, we will map out the network of ownership of fossil-fuel assets to create a form of "fossil-fuel financial geography". Focusing on the largest privately and state-owned companies and covering most of the global value at risk, we will gather data on the distributions of both their physical fossil-fuel assets and the main investors in their financial assets, thus mapping the principal linkages between fossil-fuel assets and financial actors. Using this map, together with our modelling toolkit, we will explore the vulnerability and resilience of the UK's economy and financial sector, and investigate the magnitude and distribution of potential impacts.

Our ultimate goal is to identify and explore risks and assess strategies and responses that could reduce climate-related transition risks and improve the UK's economic resilience.

Community Innovation in Sustainable Energy (EPSRC) ****

Community-led sustainable energy projects are flourishing in the UK. Community projects involve local groups developing low carbon energy solutions appropriate to local situations, and with community groups having ownership over outcomes. Examples include solar water heating clubs, or insulation clubs, which provide mutual support for system installation; energy awareness and behaviour networks, which provide guidance and reassurance to neighbours on energy matters relevant to them; and co-operatively-owned small-scale renewable energy systems, such as micro-hydro and wind.

The Government's Low Carbon Community Challenge joins a portfolio of policies helping innovative community projects. It is argued these will nurture local support for wider processes of low carbon energy transition. Intermediary organizations, such as local and national energy agencies, span local groups through their technical advice, and helping new community projects access resources and networks. If renewed policy interest is to lead to effective institutional support, then evidence is needed about community diffusion processes, performance, and interaction with mainstream energy systems.

Independent academic analysis struggles to keep pace with the extent of innovation or to document the diversity of community activity involved. Little is known about the conditions under which community-led innovations do or do not diffuse. The processes by which similar projects replicate in different communities remain unclear. Opportunities for scaling-up projects so that follow-on projects benefit wider sets of local community are similarly obscure. And the possibilities that community-led innovations may provide adaptable and appropriate sustainability solutions that can be translated into mainstream energy market settings has yet to be seriously considered.

Our aim is to analyse community energy in order to understand its diffusion and explain its potential in wider energy transitions. We divide community energy into three broad fields - community renewable, community demand reduction, and community awareness-raising/behaviour-support. We wish to see whether diffusion over the last ten years in each field is leading to the development of standard community models that replicate more readily, can be scaled-up, or can be translated into mainstream business settings. We will meet this aim through an engaged research approach that will deliver on four specific objectives:

1. Analyse how diverse community-led projects diffuse through processes of replication, scaling-up, and translation;
2. Evaluate the performance of local community energy projects and assess their potential in wider low carbon transition processes (using UK Foresight scenarios);
3. Provide critical reflection and empirically-backed recommendations for national policy-makers and key energy companies on how to support community approaches to everyone's mutual benefit;
4. Develop and advance innovation theory appropriate to community-led sustainable energy.

A web-based survey will be complemented with in-depth case studies. Interviews with community energy intermediaries, policy-makers and businesses will complement a content analysis of 'best practice' reports. Stakeholder workshops will develop four UK Foresight scenarios for community involvement in energy and the built environment in the future, and their contribution to different low carbon transition pathways. Final analysis and synthesis will lead to clear recommendations for policy.

Our proposal contributes to the EPSRC-EdF call on the social and economic sciences of People, Energy and Buildings by:

- a. explaining how local communities intervene in energy systems;
- b. quantifying their role in the diffusion of energy efficient technologies and local renewable energy; and
- c. assessing how community energy projects could contribute to UK energy systems under a range of future scenarios.

Sustainable Management of Orchard Pollination Services (BBSRC) ****

Abstract

Insect pollinators provide a vital ecosystem service supporting crop pollination and reproduction in wild plants. Reported declines in pollinators threaten this service and could have serious implications for food security. A key crop dependent on insect pollination is apples, and the contribution of wild pollinators to UK apple production is worth an estimated £95M p.a. However, “pollination gaps” of more £6000/ha have been identified in some varieties, where desired yields and quality are not being achieved due to inadequate pollination. This presents a major opportunity for growers for increased production and profit through better pollination. The documented decline of pollinating insects also poses a significant risk to fruit production by negatively impacting on crop production. In response, top fruit growers have articulated the need to effectively manage pollination services by wild insects in a way that is cost effective in order to maintain production and quality in the face of continued environmental change.

Our project will develop high quality science to address this need by designing and testing three pollinator management strategies in field scale trials in commercial apple orchards. These include establishing flower rich strips to provide food and shelter for pollinators, providing nesting habitat for ground nesting bees, and adapting the number and placement of ‘polleniser’ trees in orchards to increase levels of pollination.

Apple trees are predominantly self-incompatible and require pollen from ‘polleniser’ trees to set fruit, so although they don’t produce saleable fruit, pollenisers are planted in orchards. Currently the number of pollenisers planted is based on a rule of thumb of 1 polleniser for every 12 apples trees. As a first step in this project we will trial different numbers and arrangements of polleniser tree in study orchards and measure how this effects pollination and apple production in order to establish an optimum arrangement and ratio.

Flower strips are known to benefit pollinators. In this project, for the first time, we will design bespoke flower strips specifically aimed at supporting known apple pollinators. We will design our flower strips to contain plants that are particularly good for ground nesting bees and bumblebees which have been identified as top pollinators in apple orchards. Furthermore, we will top our margins (i.e. use a high level cut to remove just the flowers) during apple flowering to push pollinators off the flower strips and onto the apple blossom thus maximising the benefit strips provide. The impact of these targeted flower strips on pollinators and apple production will be measured in field scale trials in commercial orchards.

While the provision of floral resources for pollinators is a well-established approach for increasing pollinator numbers, provision of nesting sites has been widely overlooked and little is known about the effect this can have on pollination service. In this project we will create novel ground nesting bee nest sites in our study orchards and measure the impact these have on bee populations and their contribution to the pollination of apples.

Findings from our field trials will be brought together, and the cost of interventions and the economic return in terms of long-term improvements in quality and production will be established. Our overarching aim is to understand the mechanistic basis of how these three interventions, individually and in combination, effect the value of pollination service contributions to production and profit, so that we can “engineer” the most effective in-orchard interventions. The costs and benefits of these approaches will be assessed to allow specific management recommendations to be made to growers that are practical to implement and provide proven economic returns to growers by supporting long-term stable pollination of apple orchards.

Technical Summary

Insect pollination is essential for apple production, improving yield, fruit quality and market value. Pollination deficits in excess of £6,000/ha in UK dessert apple orchards have been identified, so significant economic returns by improving pollination services could be made. Research shows that the majority of apple pollination services are provided by a few species of wild bees. The aim of this project is to design and test three interventions to enhance the effectiveness of wild pollinators of orchards.

Pollinisers are trees grown in orchards providing a viable pollen source for the commercial trees, but do not contribute to production. Currently the numbers and locations of pollinisers in orchards uses a 'rule of thumb'. The optimum number and spatial distribution of polliniser trees in orchards will be tested in field trial manipulations.

Floral strips benefit pollinators and enhancing wild bee nesting habitat can locally enhance bee numbers. We will "engineer" the optimal floral composition of flower strips, based on morphology and flowering time, to develop and test flower margins specifically targeted at apple pollinators. In tandem, ground nesting bee habitat will be created to test effects on pollinators and pollination service. Impact of these interventions, individually and in combination, on pollinators and pollination services will be tested in a large scale field trial.

Bio-economic analysis of these interventions will be undertaken utilising a production function method linking management and habitat quality parameters to pollination services as well a portfolio analyses developing spatially explicit management portfolios for growers. Findings will be disseminated through our industrial partners and then to the wider grower community and more broadly through policy benefitting top-fruit production across the UK by promoting cost effective wild pollinator management strategies increasing production quality and stable yields.

Rethinking Fashion Design Entrepreneurship: Fostering Sustainable Practices (AHRC) ****

The UK is known for its successful creative industries and its fashion designers are widely acknowledged as creative influencers on the world stage. The UK's designer fashion sector, largely made up of micro and small enterprises (MSEs), constitutes a globally recognised creative engine, effectively acting as R&D for the wider fashion industry. Design-led fashion enterprises, whilst often struggling financially themselves, provide pioneering alternative visions of prosperity in business. This project investigates the role of creative entrepreneurship and design in fashion MSEs as a potential driver for change, providing a valuable lens through which to examine the future for a sustainable fashion industry.

A multi-disciplinary research team will work directly with a range of design-led fashion MSEs as co-producers of the research. The fashion designer-entrepreneur, and leaders in MSE teams, will be the focus of analysis. The research will explore sustainability as a creative endeavour, examining four key areas: design and operations; business networks and ecosystems; working practices; entrepreneurship and business models. This will lead to new knowledge and understanding of the internal operations and external context within which these fashion MSEs operate. This knowledge will be applied to establish and support new sustainable models of business development, repositioning designer fashion MSEs as major contributors to the UK's creative and sustainable economy, and ultimately informing future UK policy for the creative industries.

The research will analyse existing and novel business models and practices that foster sustainable prosperity, a concept aiming to balance environmental, social, cultural and economic considerations. We will identify barriers and points of intervention in order to develop alternative business support mechanisms for sustainability to inform fashion businesses at both small and larger scales. To meet this complex challenge, the academic team is drawn from three leading research centres and universities, whose complementary academic expertise will provide a novel cross-disciplinary approach to research in fashion innovation and sustainable prosperity. Led by London College of Fashion (LCF) at University of the Arts London (UAL), the project is a collaboration between UAL's Centre for Sustainable Fashion (CSF), Middlesex University's (MU) Centre for Enterprise and Economic Development Research (CEEDR) and the Open University's (OU) Department of Design. CEEDR is a key partner in Surrey University's Centre for Understanding of Sustainable Prosperity (CUSP). To maximize the impact of the project directly on the fashion sector, the research team will work closely with the Centre for Fashion Enterprise (CFE), a fashion business incubator based at LCF (est. 2003); the British Fashion Council (BFC), the UK industry body responsible for promoting international sales of designer fashion; and the Ethical Fashion Forum (est. 2005), an alternative sourcing platform for international fashion MSEs working with sustainability.

The research team will also work with a group of 20 designer fashion MSEs who want to engage with sustainability practices. Four key project partners will provide current examples of different business models incorporating sustainability: Unmade, Christopher Raeburn, Martine Jarlgaard and RizBoardshorts. These four MSE partners will engage with the research team in knowledge exchange and evaluation throughout the entire project.

Outputs will include: case studies, academic journal articles, key findings report, and policy briefing note. In addition, a business support for sustainability 'toolkit' will provide new guidance for both emerging and established business support and incubator organisations (eg. CFE, BFC, Fashion in Leeds initiative) to foster more sustainable fashion practices.

Limits to sustainable avian flight performance (BBSRC) ****

Abstract

We propose to undertake the first detailed scientific studies into the flight biology, migratory physiology and energetics of bar-headed geese in the wild using the latest electronic datalogging technology. Ultimately, we will address the question of where are the limits to sustainable avian flight performance at high altitudes and what is the effect of body mass? In particular, how do larger species cope during flight with the combined effects of reduced air density, low oxygen availability and decreased temperature?

Only a few species of larger birds are thought to be able to sustain long periods of flapping flight at high altitudes and these have received little study. The best known species is the bar-headed goose (*Anser indicus*) which performs one of the most physically challenging and impressive avian migrations by flying twice a year through the high plateau areas of the Himalayas, with some populations travelling between high altitude breeding grounds in China and lowland wintering areas in northern India. Despite their extraordinary flight performance and immensely interesting physiology and behaviour, neither the aerodynamic or physiological adaptations required to perform such feats are well understood.

We will use miniature GPS tracking devices to provide detailed position and altitude during the flights so that we can identify their route in relation to the geographical topography and environmental conditions. This will also allow us to measure their rates of climb when migrating through the mountains. The bar-headed goose migration is exceptional for such a large bird as aerodynamic and biomechanical considerations suggest that as birds increase in body mass flight performance should deteriorate. Thus, bar-headed geese with a body mass of around 2.5 to 3.5 kg should only have a marginal physical capacity to sustain climbing flight even at sea level, and this ability should get worse as altitude increases due to the decrease in air density. By using 3-axis accelerometry we will be able to calculate the net aerodynamic forces acting on the body of the birds and monitor any changes in wingbeat frequency and relative wingbeat amplitude in response to changes in altitude and during the climbing flight.

Their flights are also remarkable due to the physiological difficulties of sustaining any kind of exercise while coping with the harsh environmental conditions of the Tibetan plateau, especially the low ambient temperatures and the reduced availability of oxygen. Nevertheless, bar-headed geese have been recorded to fly between 4,000 m and 8,000 m, where partial pressures of oxygen are around 50% that of sea-level and temperatures can be as low as -20 C. We will measure the heart beat frequency of the birds during flights at different altitudes and estimate the maximum efforts expended during climbing flights in relation to their maximum expected capabilities.

To place the remarkable migratory flights of the bar-headed goose in context, some 90% of avian migrations over land occur below 2000 m and the majority below 1000 m, which is well below the level of some of the main breeding lakes of the bar-headed goose (4,200 m to 4,718 m).

We anticipate that the geographical barrier of the Himalayas should force these relatively large birds to fly close to the limits of their cardiac, muscular, respiratory and aerodynamic abilities. Indeed, this proposal will address the hypothesis that these migratory climbing flights may only be possible with the assistance of favourable up currents of air due to weather fronts or topographical reflections.

Recent developments in electronic dataloggers now make it possible to measure both physical and physiological aspects of flight behaviour in free-flying birds rather than in animals constrained by captive conditions. Access to free-flying bar-headed geese would provide a unique opportunity to study the flight biology of a relatively large bird pushed to the extremes of its performance.

Technical Summary

We propose to undertake the first detailed scientific studies into the flight biology, migratory physiology and energetics of bar-headed geese (*Anser indicus*) in the wild using the latest electronic datalogging technology. Ultimately, we will address the question of where are the limits to sustainable avian flight performance at high altitudes? In particular, how do larger species cope during flight with the combined effects of reduced air density, low oxygen availability and decreased temperature? The bar-headed goose

performs one of the most physically challenging and impressive avian migrations by flying twice a year through the high plateau areas of the Himalayas.

We will use miniature GPS tracking devices to provide detailed position and altitude during the flights so that we can identify their route in relation to the geographical topography and environmental conditions. This will also allow us to measure their maximum rates of climb when migrating through the mountains. The bar-headed goose should only have a marginal physical capacity to sustain climbing flight even at sea level, and this ability should get worse as altitude increases due to the decrease in air density. By using 3-axis accelerometry we will be able to calculate the net aerodynamic forces acting on the body of the birds and monitor any changes in wingbeat frequency and relative wingbeat amplitude in response to changes in altitude.

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Sustainable Intensification of UK plum production (BBSRC) ****

Abstract

The food retail industry is experiencing increasing demand from consumers for UK grown fresh produce and would like to substitute imports with home produce. The demand for home grown plums cannot currently be met due to unreliable and inefficient cropping systems. This collaborative project will develop integrated new technologies that will address the major existing production problems and limitations for fresh plums. The sustainable intensification of this horticultural crop will be achieved through integration of a high-density growing system with new rootstocks, varieties and manipulation of tree architecture for increased yield, coupled with protected cropping regimes and component technologies that will regulate crop load, fruit ripening and give significant season extension. This intensive and profitable growing system will enable UK growers to confidently invest in plum production, delivering substantial economic impact (>£10 m/yr) to the UK horticulture industry.

Technical Summary

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Project ACE: Active, Connected and Engaged Neighbourhoods (MRC) ****

Abstract

BACKGROUND AND AIMS: Low levels of physical activity in older people are associated with a number of physical and mental health problems. However, older people remain the least active of all age groups. Providing programmes to support increased physical activity can be expensive. However, one lower-cost option is to use volunteers to deliver such programmes. There is some evidence of positive effects in volunteer-based physical activity promotion schemes, but there is a lack of well-developed and evaluated programmes. The Active Connected Engaged Project (Project ACE) aims to develop and evaluate a practical, sustainable and low cost model of using volunteers to promote active ageing. However, before we go to the expense of a large trial (around #2million), it is important to make sure that the methods and procedures for assessing its impact are going to work as intended.

THE ACE PROGRAMME: The ACE programme is based on the latest evidence about what works best in promoting and sustaining physical activity in older people. The programme involves two meetings to engage participants and help them to understand the benefits of increased physical activity. Participants will then choose from a variety of physical activities that are available in their local community. An ACE activator will meet the participant up to 3 further times to review progress and to help to identify and overcome any obstacles they may encounter. Two paid neighbourhood co-ordinators will help to identify and train the twenty ACE volunteers and to identify local opportunities for physical activity.

METHODS: In the first stage of the project, we will develop the ACE programme, the volunteer training course and the role of the neighbourhood co-ordinator. In the second stage, 100 older adults aged 65-85 years with low levels of physical activity will be recruited through advertising campaigns and through promotion at local events. We will use interviews with groups of patients and intervention delivery staff to find out what people thought about the programme, what worked well or badly and how it might be improved. Other information will help us to plan the future trial (e.g. recruitment and attendance rates).

SERVICE USER INVOLVEMENT: Two members of the public will advise on recruitment, measurement and intervention methods, interpreting the findings and explaining the findings to the public.

Technical Summary

BACKGROUND/AIMS: Programmes that effectively increase physical activity in older people will yield large improvements in quality of life, independence, social activity and health and care costs related to cardiovascular disease, diabetes, dementia. Unfortunately, little evidence exists for effective interventions and at a national level, resources for prevention are scarce. The Active, Connected and Engaged (ACE) neighbourhoods project will develop and pilot a low cost, pragmatic, and sustainable intervention programme in which retired volunteers promote physical activity. The specific objectives are to: a) refine and manualise the intervention; b) monitor recruitment, retention, attendance and adherence rates; c) determine participant reactions to the intervention; d) estimate the variance in outcome measures to enable calculation of sample size for a future multi-centre RCT and e) estimate resource use/costs and develop methods for economic evaluation.

METHODS: We will conduct a two phase, 24-month pilot study involving two paid neighbourhood coordinators, 20 activity promotion volunteers [ACE activators] and 100 participants. In Phase 1, we will refine the ACE programme, develop the activator training manual and refine the role of the ACE co-ordinators. In Phase 2, 100 sedentary older adults aged 65-85 years will be recruited in two neighbourhoods in Bristol and will be randomised to the intervention and control groups. In the intervention group, the ACE activators will deliver up to five individual sessions over six months to engage and motivate participants and support maintenance, following a theoretically-driven behaviour change model. Controls will receive a booklet with information about local physical activity opportunities and will be offered the ACE programme at the end of the study.

The main outcomes (on which the study is powered) are: Recruitment rate and study completion rate. Intervention concordance (the proportion attending =3 of the 5 individual sessions) and intervention

fidelity will also be assessed. To pilot the trial measures, we will assess physical activity (by accelerometry), well-being, neighbourhood quality of life, perceptions of competence, autonomy, relatedness, and resilience, for both intervention participants and volunteers. Focus groups will explore topics related to recruitment, training and delivery of the ACE programme and discuss strategies that facilitate the lifestyle change process and that might improve the programme or the delivery of the research.

OUTPUTS: The main output will be a well-informed and grounded intervention that has potential for generalisation throughout the UK and is ready for evaluation in a definitive effectiveness and cost effectiveness trial.

School Health Action Research Partnership and Network (SHARPEN) (MRC) ****

Abstract

Secondary schools are important settings for health improvement, providing access to young people during a critical period when health risk behaviours markedly increase. Yet despite sustained effort to promote health through schools, the evidence for school-based interventions that effectively address issues such as obesity, smoking, alcohol use and mental health is limited. Health improvement research in school settings is challenging, with trials currently implemented in an ad hoc and inefficient manner. This is in stark contrast to research in primary care, which was greatly enhanced by the advent of primary care research networks (PCRN) which facilitated an increase in the quantity and quality of randomised trials, improved research capacity and provided support for practitioner-led research. Such a step change is urgently needed to advance school-based research in the UK.

The project aims to improve the quantity, quality and efficiency of public health research in schools by developing and evaluating a School Health Action Research Partnership and Network (SHARPEN). The research to evaluate and refine SHARPEN has 3 strands. In the first, researchers from Cardiff, Bristol, Oxford and Swansea universities will work in partnership with the Welsh Government, Cancer Research UK, Public Health Wales and Cardiff and Vale University Health Board to establish a network of up to 90 secondary schools that are 'trial ready', by developing more efficient recruitment, consent and data linkage procedures. We will identify the infrastructure and processes necessary to make the network efficient, effective, acceptable and rewarding for both schools and researchers. We will explore the barriers and facilitators to making the network sustainable. Students in network schools will complete the Health Behaviour in School-Aged Children (HBSC) survey, a school environment schedule will be completed for each school, and we will pilot a system that uses these data as a basis for providing regular, tailored feedback to schools on pupil health behaviours and the school environment.

In the second strand we will test the feasibility of establishing school-based action research partnerships to see whether they add significant value to the network model. Five schools will each form an action group of pupils, teachers, parents, health professionals and academics and over the course of a year each group will review their HBSC survey and school environment data, identify health priority areas, discuss the links between health and educational outcomes and develop and implement a school health action plan. Action plans will draw on the project partners and local resources and adopt a whole-school approach to health improvement. We will evaluate the action research partnerships to capture how they worked, the factors that hindered and helped them, and whether schools and other stakeholders found them feasible and useful. During this strand, student and parent views on data linkage will also be sought. Issues around informed consent and anonymity will be discussed with students and parents and if possible, data linkage will be piloted.

The aim of the third strand is to scope the potential for sustaining the network and expanding it in Wales and for transferring the network model to secondary schools in England. Lessons from the first two strands will be fed back to key stakeholders in England and Wales and their views will be sought on network sustainability and its potential for expansion. The development of new school health research networks in England and Wales has significant potential to coordinate, increase and strengthen school-based research and inform evidence-based school health activity, thereby contributing to young people's health in the UK.

Technical Summary

Schools are important settings for young people's health improvement, but research in UK secondary schools has become increasingly challenging with health improvement intervention trials undertaken on an ad hoc basis. A network of 'trial ready' schools with research literate staff would support more efficient health improvement research that could better inform public health policy and practice in schools. With the aim of facilitating a step change in the quantity and quality of school-based health improvement research and informed by the success of UK primary care research networks, this project will develop and evaluate a School Health Action Research Partnership and Network (SHARPEN) in Wales. Working with

Welsh Government, NHS and third sector partners we will identify the infrastructure and processes needed to support SHARPEN through a staged scoping and feasibility study with 3 strands.

- Strand 1 will establish and scope a basic school health research network (SHRN), using qualitative methods to explore staff, pupil and other stakeholder views on such issues as incentives to participate in SHRN and expectations of membership. New and efficient approaches to key elements of the research process, e.g. informed consent and whole school recruitment, will also be developed.
- Strand 2 will explore the feasibility of an enhanced, action research partnerships (ARP) model to support knowledge transfer and development of research-practitioners in schools. Transdisciplinary school action groups will review student health behaviour data, then develop and implement action plans. The ARP model will be evaluated using a mixed methods process evaluation. The potential for linking student health behaviour data with other routinely collected datasets will also be explored.
- Strand 3 will use surveys, interviews and consultation with policy and practice stakeholders to scope the barriers and facilitators to sustaining SHARPEN in Wales and the potential for transfer to England.

Centre for Diet and Activity Research (CEDAR) (MRC) ******Abstract**

Non-communicable diseases such as diabetes, heart disease, cancer and mental health problems account for 60% of deaths globally. Poor diet and lack of physical activity play an important role in increasing the chance of developing these diseases. Physical inactivity alone is estimated to account for around 1 in 10 deaths worldwide, comparable to the impact of smoking. Seventy thousand premature deaths in the UK alone could be avoided each year if diets matched nutritional guidelines.

In the face of these statistics it would seem intuitive that everyone should strive to make individual choices to eat a healthy diet and adopt an active lifestyle. However, we don't make such choices in isolation and our diets and activity levels are driven as much by the broader social, cultural, economic and physical environment in which we live by as our personal attitudes and beliefs. CEDAR aims to improve our knowledge of the population-level factors that influence these diet and activity behaviours.

Generating a greater understanding about these determinants is an important step in developing interventions to help populations adopt sustainable healthy behaviours. CEDAR also aims to evaluate the impact of such interventions both on short term behaviour change and, in the longer term, on health outcomes. However, not all interventions that impact on diet and physical activity are designed with changing these behaviours as their primary purpose. Indeed our physical activity behaviour is strongly influenced by the structure of the built environment around us. Therefore CEDAR also undertakes evaluations of interventions such as changes to the transport infrastructure that may impact on commuter and leisure physical activity levels as a by-product rather than their primary objective.

The evidence we gather will help politicians, health professionals and society at large make better decisions about how to improve health for the whole population, whether it is through direct public health interventions, or wider ways that influence how we live, travel and work.

Technical Summary

Our overall goal is to provide the evidence-base to inform interventions aimed at shifting population-level distributions of dietary and physical activity behaviour. We will achieve our aims through interconnected research themes which each employ a range of methods and experimental designs including analysis of quantitative and qualitative data from observational, interventional and natural experiment studies, modelling and evidence synthesis. We will study environmental and policy approaches to population physical activity change, specifically aiming to quantify the overall and distributional effects of interventions and understand related patterns and mechanisms of behaviour change.

In our health geography programme, we will develop and apply methods to understand the dynamic use of the environment and its role as a determinant of physical activity and dietary behaviours. We will study the pattern, correlates and determinants of change in physical activity levels through childhood and use the results to develop and evaluate population-level interventions.

Our dietary public health research will identify and measure socioeconomic determinants of dietary behaviour and the mechanisms giving rise to social and spatial patterning of diet quality. This programme is closely linked to our work on public health economics, focused on investigating the correlates, determinants and consequences of diet, physical activity and obesity and the cost-effectiveness of interventions that may promote healthy behaviours.

In the second quinquennium of CEDAR we will develop two themes.

- Dietary public health research will be expanded to include policy, environmental and intervention development approaches to obesity prevention, particularly in infants and young children.
- Public health modelling will be further developed to better estimate the population impact of interventions and explore agent based modelling of behaviour change to inform intervention development and data collection.

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