

Faculty of Health and Wellbeing

PhD Students' Workshop
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Introduction to research philosophies

Peter Allmark PhD
Centre for Health and Social Care Research

Aim of the session

- To develop an understanding of concepts and terminology related to the philosophy behind research projects

Overview

- Why inquire?
- Three types of inquiry?
- Method vs methodology
- Why don't we know already?
 - Errors of perception, errors of reasoning
- Philosophy of Science
- Ontology - realism, nominalism, idealism
- Epistemology - rationalism, constructivism, empiricism
- Philosophies of science - e.g. critical realism
- Why matter - natural and social science
- Why matter - complexity

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Why inquire?

- Knowledge - All men by nature desire to know - Aristotle

Craft

Practical wisdom

Scientific knowledge

Inquiry is stimulated by the desire to know or do something you can't or don't currently.

- Unlike other animals, human beings spend a lot of time thinking about what is not going on around them, and contemplating events that have happened in the past, might happen in the future, or will never happen at all. (Killingsworth M, Gilbert D 2010 *Science*, 330, 932)

Allows us to learn, reason and plan.

Why?

What ?

When?

Inquiry

How?

Who?

Three types of inquiry

- Empirical
- Formal
- Philosophical

Not all inquiry is scientific inquiry e.g. research in philosophy or maths.

Is all empirical inquiry scientific? Boundaries of science - something we think about today.

- Is aspirin effective in reducing stroke?
- What's the best method for training fast bowlers?
- What factors influence domestic violence?
- Should relatives be present at in-hospital cardiac arrest?
- What's the lived experience of young women with breast cancer?

Some questions you might ask in a thesis.

All are empirical but the answer is not in front of your nose - so you need to find the answer - the way you do this is your method?

Aspirin - epidemiology and/or RCT

Fast bowler - comparative study of current methods

Domestic violence - far less obvious - could look at statistics in countries and correlate to factors but the number of correlations would be immense and perhaps many spurious. Probably more in the realm of developing and then testing theories through mixed method

Cardiac arrest - involves philosophical work - "Should" in order for what?

Breast cancer - qualitative?

So these are the methods - but what is methodology?

Method v methodology

- Method = means by which you will attempt to answer question
- Methodology = justification for the choice of method

For example:

What is the lived experience of young women with breast cancer - RCT?

Is aspirin effective - an interview study.

Domestic violence - survey of correlation of national characteristics with national statistics.

BUT may be more than one way to answer question:

Aspirin - RCT or epidemiological study

Domestic violence - interviews with perpetrators, survivors, review of other evidence

Choice then depends on feasibility, cost, plus what is most likely to give you the answer

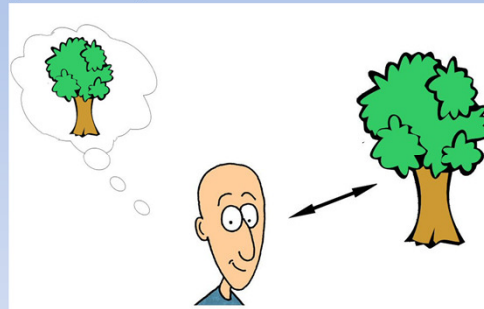
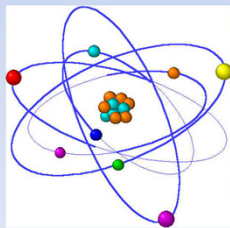
Why inquire? Why don't we already know?

- Because we have a (limited) perspective;
- Because we make errors
 - perception
 - reasoning



Our limited perspective

- For now we see through a glass darkly
- Corinthians 13:12

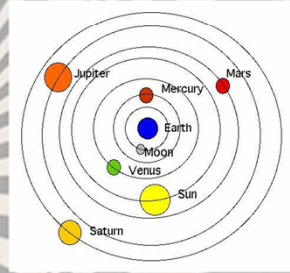


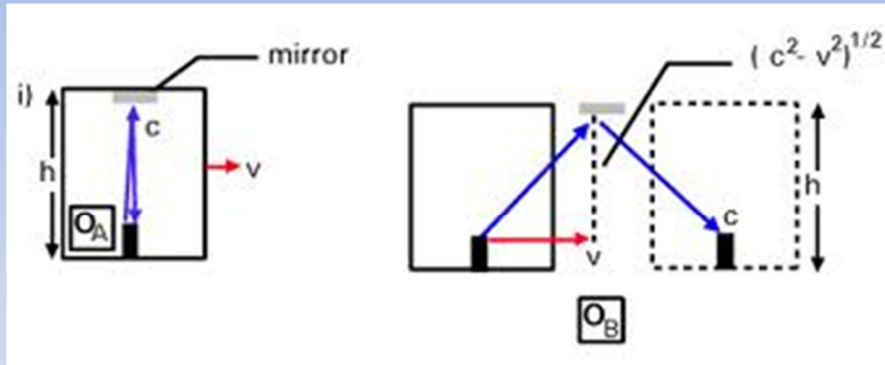
Cannot be right for at least two reasons

- 1) What we perceive is a product of what we are (e.g. colour vision)
- 2) Universals - We perceive a tree as an example of the collective "trees" but how do we develop these ideas of species etc.? Related - we don't just observe the world passively we create it through ideas such as "trees"
- 3) It's hard to imagine why we would need science if we perceived the world as it is unproblematically
- 4) Lots of things we think of as real we don't perceive (at least directly) e.g. gravity, atoms, forces and, above all, causes

We make errors of perception

- Illusions, hallucinations
- Geocentric
- Time and space

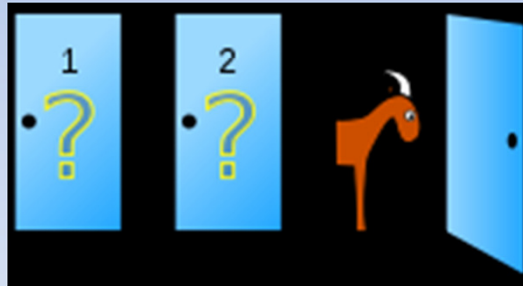




We make errors of reasoning

Monty Hall problem

- Switch
- Stay
- No difference



Suppose you're on a game show, and you're given the choice of three doors: Behind one door is a car; behind the others, goats. You pick a door, say No. 1, and the host, who knows what's behind the doors, opens another door, say No. 3, which has a goat. He then says to you, "Do you want to pick door No. 2?" Is it to your advantage to switch your choice?

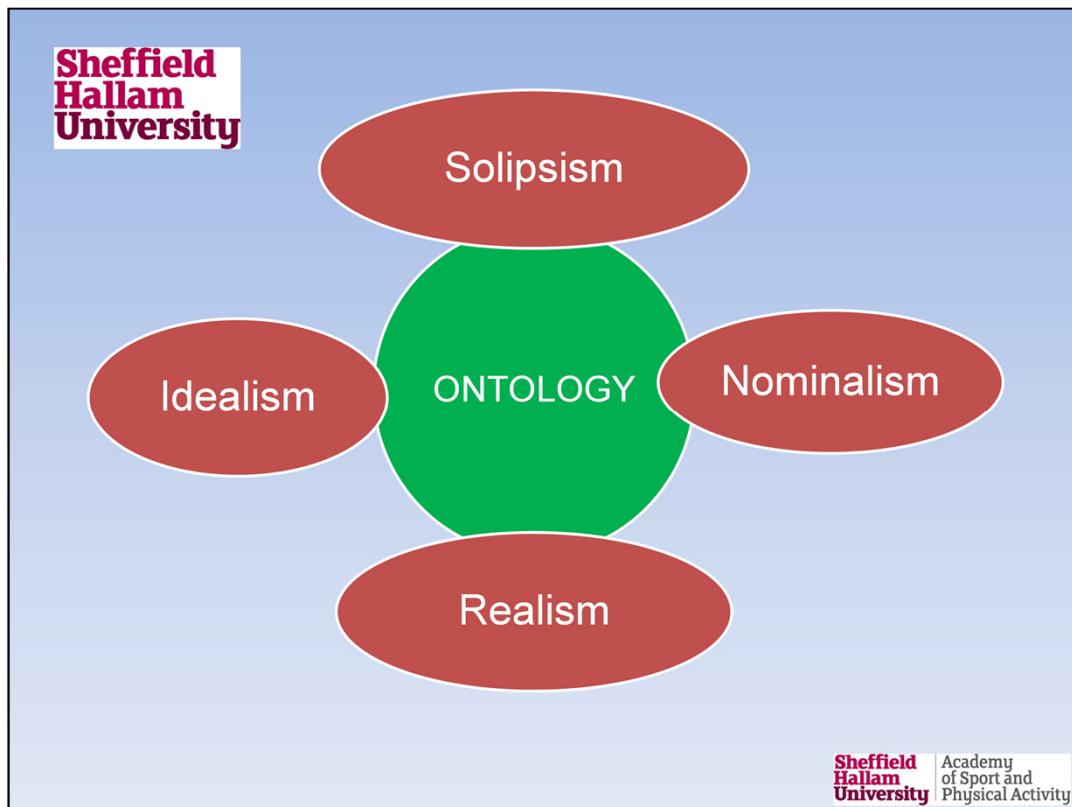
This is simple! Imagine the ways you can go wrong in reasoning from a set of epidemiological data to a conclusion about causes of disease.

- Science is careful observation and careful reasoning to avoid error in discovering why the empirical world appears as it does to us from our limited perspective and how we can predict and control it.

- Philosophy of science is theory about
 - the nature of the world science is investigating (ontology)
 - the nature of knowledge and how we get knowledge of the world through investigation; what counts as scientific investigation (epistemology)

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Ontology is about the nature of things in the world:

Objects - such as cats and trees

Characteristics - such as colour, shape, smell

Universals - such as categories 'cats' 'mammals' 'animals'

Relationships - particularly 'cause' and 'laws'

Most philosophers don't have a problem saying that individual things exist - there's a cat on the mat, for example.

Solipsism is the exception - can set to one side

The disagreement between the other three is about i) do things exist outside of our perception of them and ii) do things exist that we can't perceive?

Saying yes to both (and at the opposite end to solipsism) is realism: This says that i) there is a mind-independent realm of things (e.g. both the trees we see and the ones we don't) and ii) included in this realm are things that we can never perceive directly (e.g. atoms) and some at all (e.g. causes, universals).

****BEWARE TERM IDEALISM****

Saying no to both is idealism: there might be a mind-independent realm but by

definition we can't know anything about it: objects and forces that we experience only exist in the way that they do because we perceive them - the world we experience is the world of our ideas and theories.

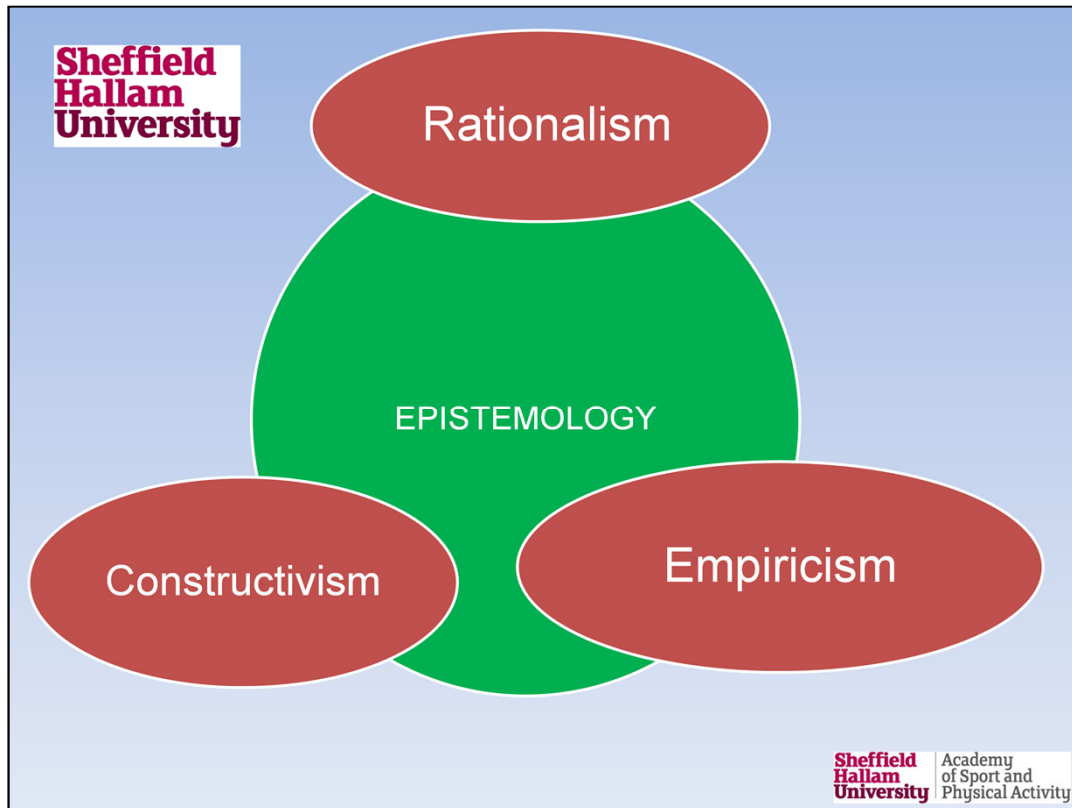
Nominalism takes a different route; it emphasises the human role in naming and categorising things: so the world of things exists outside of us but the way we experience it is down to our practices - we can divide the world up in lots of different ways. This means that experienced objects are real but could be described and categorised differently but that the non-perceived realm is not real, simply our way of understanding it.

The slide is titled 'Sheffield Hallam University' in the top left corner. It features a central image of Margaret Thatcher with a quote: 'There is no such thing as society: there are individual men and women, and there are families.' attributed to '(Margaret Thatcher)'. The source 'izquotes.com' is noted in the bottom right of the image area. To the left of the image is a diagram with three overlapping shapes: a top red oval labeled '(Social scientific) Nominalism/Idealism', a central green circle labeled 'SOCIAL ONTOLOGY', and a bottom red oval labeled '(Social scientific) Realism'. The bottom right of the slide contains the 'Sheffield Hallam University Academy of Sport and Physical Activity' logo.

Social ontology is about the status of social objects: individuals, agents, societies, class, anomie.

Thatcher's is nominalist/idealist statement: we see individuals and (perhaps) families - but the rest is names or ideas that are ways of thinking about the social world.

Also take the example of MONEY - it can't be mind-independent - as soon as we stop believing it's money it stops being money.



Empiricism key tenet is that everything we know about the world is ultimately founded in our experience of the world. Scientific theories do not give us (fallible) knowledge of a mind-independent world; instead they give us ways of understanding, manipulating and predicting the mind-dependent world of experiences. Ultimately, theories live or die on the basis of testing against empirical experiences e.g. in experiments.

Rationalism can be based in any ontology. It downplays the role of sensory experience in gaining knowledge of the world and emphasises instead the role of reason in thinking about those experiences.

~~Realists can accept this idea about testing but not the idea that scientific inquiry can't tell us something about the world beyond our experiences. Realists can accept that empirical experience is the SOURCE of all knowledge of the outside world but not that empirical experience is WHAT all knowledge of the outside world is about.~~

Constructivism is based in either idealist or nominalist ontology and is particularly influential in social science. Key idea is that we don't really know anything about the world but that we construct theories about it - perhaps believed on the basis that they are useful or not to us.

	\exists Mind-independent world (observables)	\exists Mind-independent world (non-observables)
Realism	✓	✓
Nominalism	✓	X
Idealism	X	X

\exists = there exists a ...

To summarise ONTOLOGY

Realism posits a mind-independent world of both observables (individual objects), observable with aids (e.g. bacteria) and non-observable (e.g. gravity, causes)

Nominalism posits a mind-independent world of observables and observable with aids but denies the existence of non-observables

Idealism emphasises the minds role in the creation of the world - the world we experience is the one of our ideas - lots of versions of this of which solipsism is the most extreme example - constructivist epistemology seems to create an idealist ontology

	Knowledge is:
Rationalism	Based in the working of human reason
Empiricism	Based in human sensory experience
Constructivism	A human construction or model used by us for different purposes - there is no model that is better than another - just useful or not

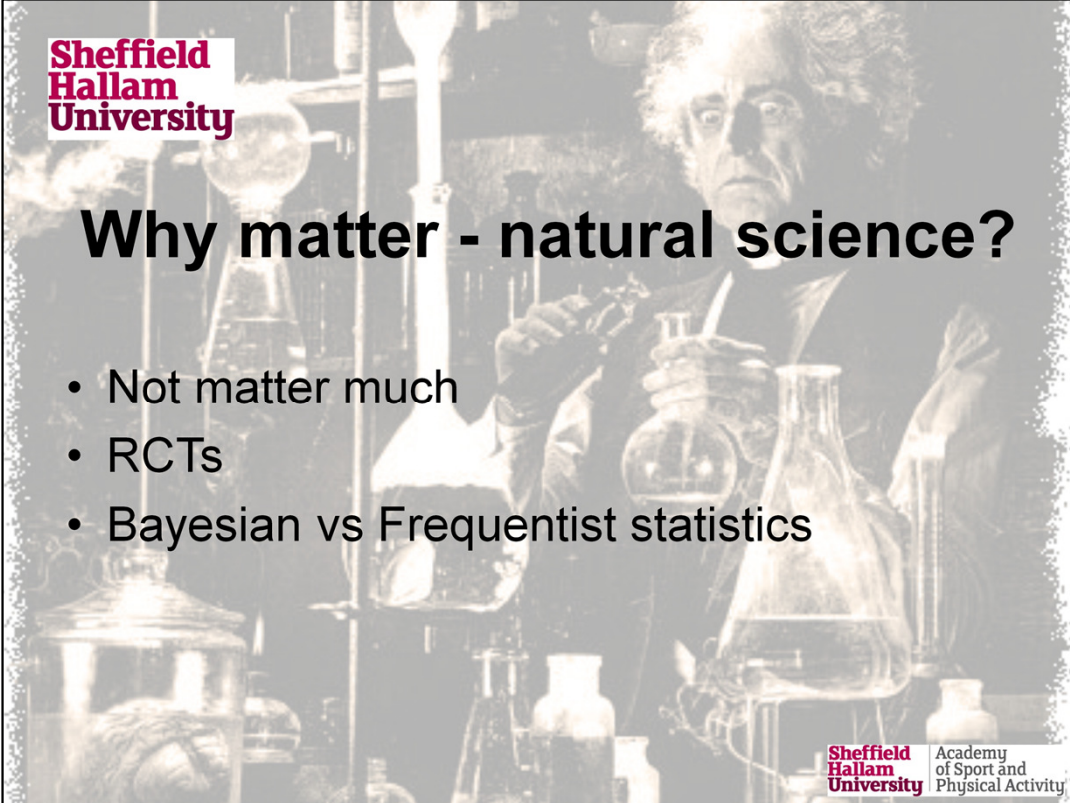
What are the philosophies of science?

- Accounts of the ontology and epistemology of scientific inquiry:
- Examples: critical realism, positivism, pragmatism, empiricism, relativism, constructivism.
 - But in any single project, usually only one or two of these underpin the study. Often unstated

Philosophy of science	ONTOLOGY	EPISTEMOLOGY	METHOD
Logical positivism/ logical empiricism	Nominalist	Empiricist/ constructivist	Quantitative - perhaps qualitative
Constructivism	Idealist?	Constructivist	Mainly qualitative, often social science
Phenomenology	Idealist	Empiricist	Mainly qualitative
Naïve realism [aka 'positivism']	Realist	Empiricist	No-one - but many are falsely accused!
Sophisticated e.g. critical realism	Realism	Empiricist/ constructivist	Quantitative, qualitative, mixed, often social science

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Why matter - natural science?

- Not matter much
- RCTs
- Bayesian vs Frequentist statistics

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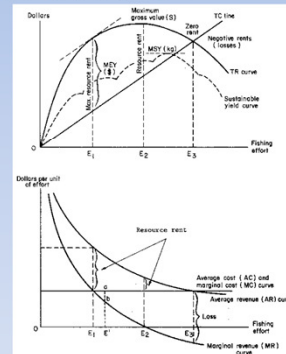
If you're doing a project that is lab-based or, say, a clinical trial then whilst you need to say plenty about your method you may not need to say much or anything about your methodology. This isn't because there is no methodology but rather that there isn't much dispute. Given the question, everyone agrees this is the right method to use. In general the background methodology is either sophisticated realism or logical empiricism.

There are disputes about methodology in this area - and some of these matter for method. For example, the idea that RCTs are the pinnacle for evaluating treatments is disputed by realists.

There's also an immense literature on the philosophy of statistics comparing, in particular, frequentism with Bayesianism.

But in the main, not too worrying.

Why matter - social science?



If you're doing a social science project you are likely to say something about methodology

Because there is dispute with many possible approaches vying for dominance.

In Economics - logical empiricism/positivism is dominant in its world of mathematical models - but there is a strong undercurrent of realist criticism

In Anthropology - constructivism rules

In Psychology - there is a split between lab-based science (empiricist or realist) and qualitative or mixed method approaches tied to realism, phenomenology, grounded theory and so forth

Why matter - health and social care?



Health and social care research can be either natural or social science so the comments before apply - if it's lab-based, methodology don't matter much.

The discussion about methodology has got mixed up with professional politics - researchers from outside medicine often curse the so-called medical model, by which they often seem to mean the kind of parody positivism I mentioned earlier -

Current upsurge in students undertaking research under a realist banner - and I think this gives us one other way to think about methodology - and that's in terms of complexity.

Table 1 Simple, Complicated and Complex Problems		
Following a Recipe	Sending a Rocket to the Moon	Raising a Child
The recipe is essential	Formulae are critical and necessary	Formulae have a limited application
Recipes are tested to assure easy replication	Sending one rocket increases assurance that the next will be OK	Raising one child provides experience but no assurance of success with the next
No particular expertise is required. But cooking expertise increases success rate	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success
Recipes produce standardized products	Rockets are similar in critical ways	Every child is unique and must be understood as an individual
The best recipes give good results every time	There is a high degree of certainty of outcome	Uncertainty of outcome remains
Optimistic approach to problem possible	Optimistic approach to problem possible	Optimistic approach to problem possible

From Glouberman and Zimmerman 2002

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This is from Systems theory but can be extended to think about research methodology

Think about research as attempting to solve a problem: Add the words "How do I find out what, who, how etc" to the beginning of your question.

How do I find out whether aspirin is effective in reducing complications following a stroke? This problem is complicated, like sending a rocket to the moon, but the goal is straightforward and the means to meet the goal is widely agreed. Here,

little discussion of methodology is required.

How do I find out what are the factors that potentiate domestic violence? Here the problem is complex. In the first place, what counts as domestic violence won't necessarily be agreed. Even where it is agreed, each act of violence will be different and it will be possible to pick out huge numbers of factors in each act (colour of the wallpaper, time of day, age of agents, social class and so on and on) - how are we to pick out the right ones to suggest as factors? So we're not sure what it is, nor how to find out the factors potentiating it - methodology must come into the fray here. Without some discussion of it you expose yourself to the possibility of taking a course you cannot justify.

- Method is how you will try to answer your question
- Methodology is your justification for your choice of method
- Methodology is based in our ideas about what there is (ontology) and how to find out about it (epistemology)
- These are different theories of these in philosophy that are instantiated in research

- Ontology: realism, nominalism, idealism
- Epistemology: rationalism, empiricism, constructivism
- Combinations of these make up the philosophies such as critical realism, social constructivism, logical empiricism
- Engagement with methodology in a thesis matters most where there is complexity, especially in social science

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