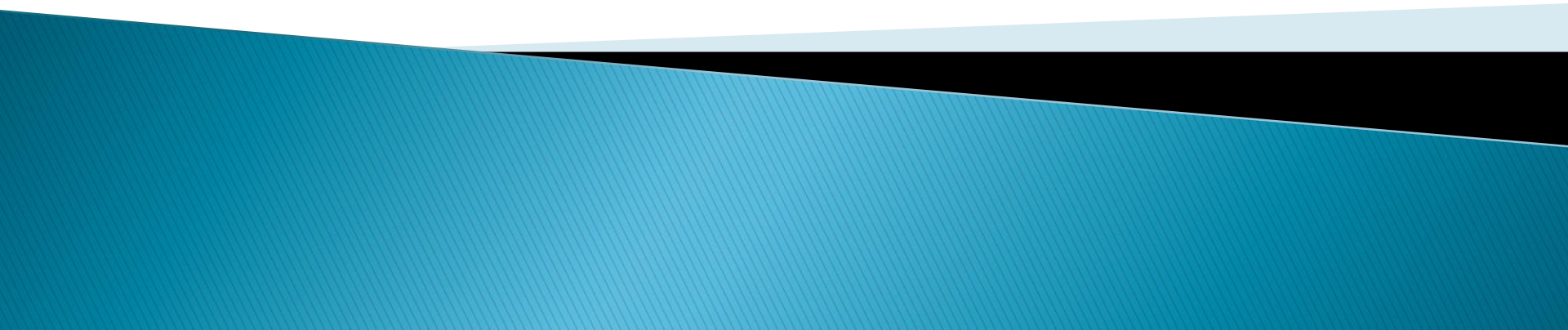


Experimental Psychology

M4X00905

Lecture 2: Philosophy of mind and
philosophy of science.

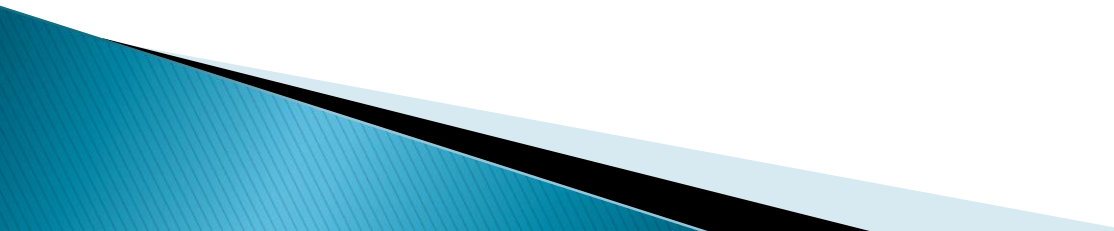
Dr Kate Williams



Context of Knowledge

- ▶ Must consider the time when research/ideas were carried out/formed
 - Aristotle – pre-science
 - Descartes / Galileo – religious upheaval
 - Milgram – McCarthyism in USA

Early Ideas

- ▶ Aristotle – everything has an essence
 - Rocks; Swallows; Humans
 - Behaviour of everything is governed by this essence
 - ▶ Hippocrates
 - Humors (yellow & black bile; phlegm; blood)
 - A basic personality theory?
- 

16th Century

- ▶ The Reformation – change in religious viewpoints
- ▶ The Renaissance – change in artistic thinking
 - Montaigne – late 16th Century
 - ‘What do I know?’ Doubt as the key to humanity
 - Francis Bacon – formulation of scientific enquiry

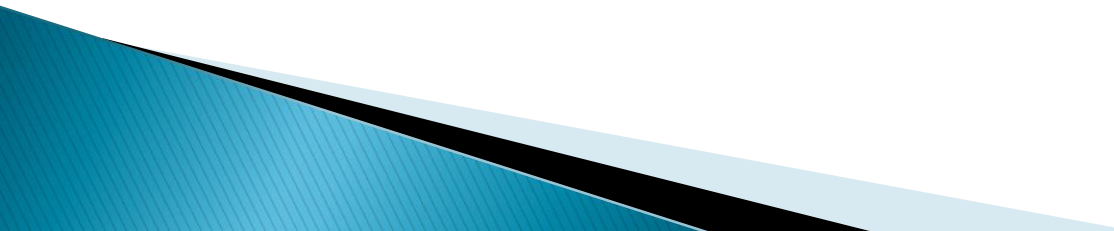
17th Century: Rene Descartes

- ▶ Cartesianism – mechanics (e.g., cartesian well)
- ▶ What do I know?
 - Subject all thought and experience to test
 - Method of doubt (evil demon)
 - All perception and knowledge could be false
 - All mechanics could be false
- ▶ But...
- ▶ ‘Cogito ergo sum’ – ‘I think therefore I exist’
- ▶ The fact that I am having that thought cannot be false

Descartes continued

- ▶ If 'I' exist but I don't know my body does...
 - The I must be separate from the body
 - This must be the mind
 - The mind cannot be mechanical in the same way that the body is
 - ▶ Cartesian Dualism
 - The body is a physical mechanism, the mind/soul is a non-physical substance
 - According to Descartes, this is supported by a variety of novel thought, particularly linguistics
- 

The Mind–Body Problem

- ▶ One of the biggest arguments in philosophy and psychology...
 - ▶ How does a non–physical mind influence a physical body (and vice–versa)?
- 

Possible Explanations

- ▶ We don't understand the substance yet
 - The mind does exist but we have not yet discovered the substance or way of it interacting
 - Science does not know everything yet...

- ▶ Property Dualism
 - Mind and body are the same substances but the mind has emergent properties
 - Properties that go above and beyond mere properties of the substance
 - E.g., a molecule of water H_2O is not wet, but when you put enough of them together you get the property of wetness

- ▶ Functionalism – the function of what things do
 - Cognitive psychology and the computer metaphor
 - If we can make a computer behave as a human ‘mind’ would then functionalism works
 - Humans have nerve signals, computers have wires etc., but the function would be the same

 - ▶ Concept of ideas
 - Are ideas based upon mechanical knowledge from an external world? Or can we have innate conceptual ideas?
- 

Beyond the Mind

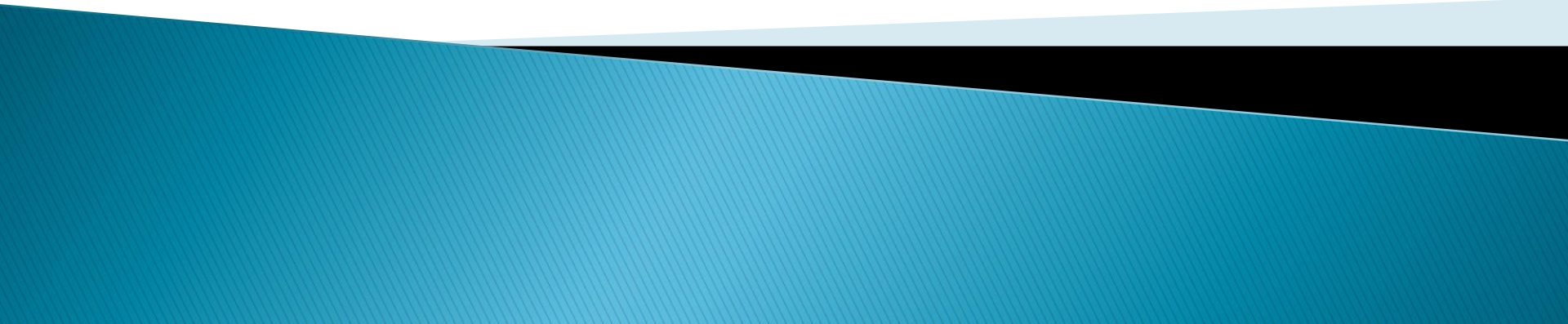
- ▶ Knowledge from an external source awakens/activates an innate predisposition set up to carry out that task
 - E.g., Chomsky's linguistic theory
 - ▶ Alternative viewpoint – Empiricism
 - Sensory experience as the ultimate source of knowledge
 - Built upon Bacon's argument for empirical observation as the basis for empirical science
- 

- ▶ Hobbes – association of ideas
 - One thought leads to another
 - But ultimately from the environment impinging upon the senses
 - ▶ Locke – mind–body problem cannot be understood by humans
 - But it does not matter
 - ▶ Berkely – if we can explain all we know of reality by our senses why create additional things to try to explain them?
 - Occam's Razor
- 

Different Viewpoints

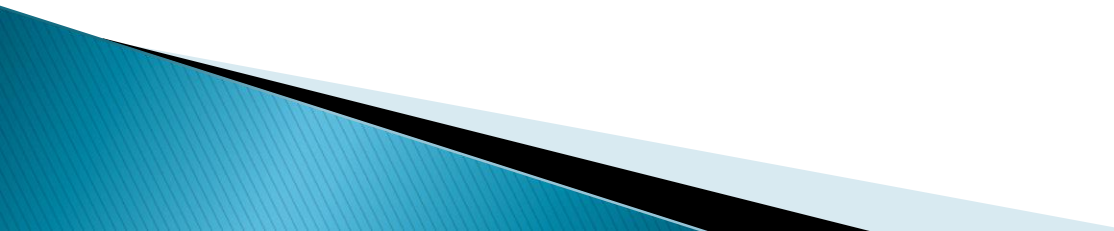
- ▶ Nativism
 - Descartes, Plato = Nature
 - ▶ Empiricism
 - Locke, Aristotle = Nurture
 - Locke at the extreme = blank slate (tabula rasa)
 - ▶ Introspectionists – the mind is transparent
 - We should be able to explore it
 - ▶ Simple ideas generate complex ideas
 - A Centaur is complex and does not exist in the real world – But its composite parts do and are simple
- 

The Philosophy of Science



Knowledge

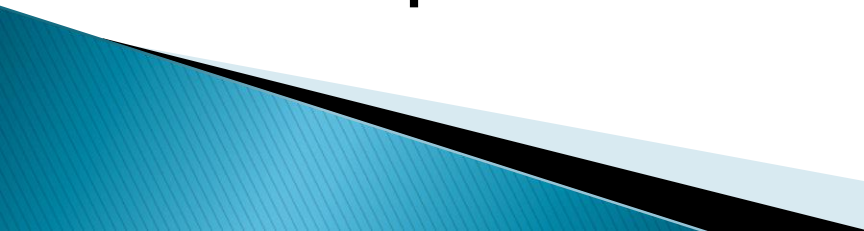
- How can we have knowledge as opposed to
 - Opinion?
 - Belief?
 - Epistemology – the study of knowledge
 - How do we know what we know?
 - Is what we ‘know’ correct?
 - If it is incorrect, is it knowledge?
 - If I ‘know’ the capital of Britain is Birmingham, is that knowledge?
 - If I ‘know’ that stress causes heart disease, is that knowledge?
- 

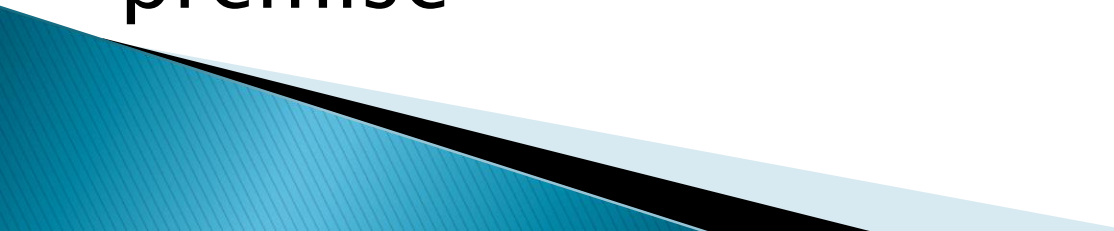
- ▶ Point One: 'Knowledge' can be a difficult thing for us to deal with in psychology.
 - Types of knowledge
 - Accurate/Inaccurate
- 

- Our knowledge is often informed by others
 - Experts
 - Scholasticism: pass knowledge on to others
 - Aristotle
 - Scientific Revolution: passing on knowledge in a precise and specific way.
 - Copernicus
 - Newton
 - Galileo
 - Experts whose theories were backed up by some form of evidence
 - Still does not make them necessarily correct, but gives a weight of evidence – changes the way people think.
- 

Empiricism: Bacon

► Induction

- Logic
 - Premises and Conclusions
 - All Xs are Y
 - A is X
 - Therefore A is Y
 - Two premises lead to a Valid conclusion
- 

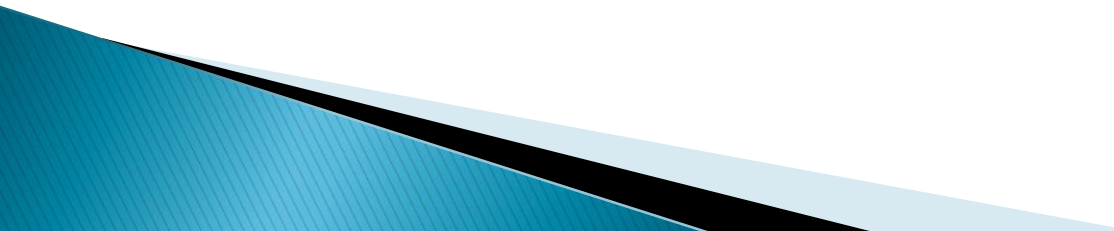
- All humans are mortal (Premise)
 - I am human (premise)
 - Therefore I am mortal (Conclusion)
-
- All humans are green (Premise)
 - I am human (Premise)
 - Therefore I am green (Conclusion)
-
- Both valid as arguments – although the second argument may contain a false premise
- 

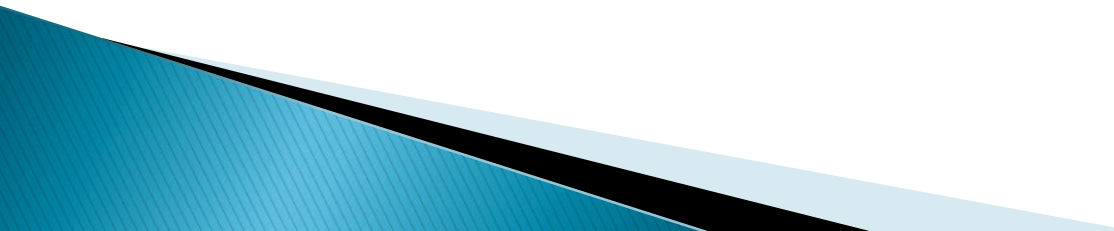
- All Xs are Ys (Premise)
 - A is Y (Premise)
 - Therefore A is X (Conclusion)

 - Invalid argument – ‘All Xs are Ys’ is not the same as ‘All Ys are Xs’ – there may be some Ys that are not Xs

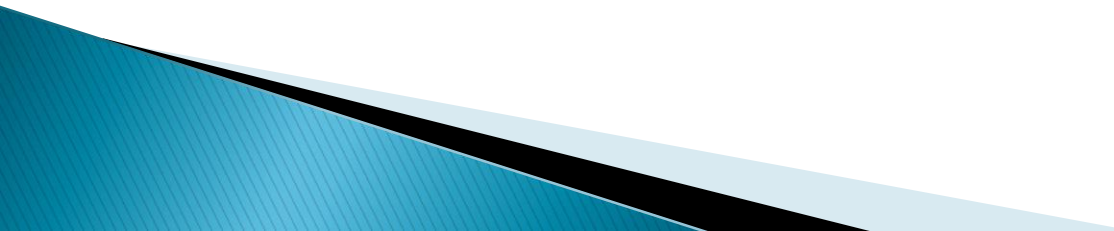
 - All humans are mortal (Premise)
 - My pet rabbit is mortal (Premise)
 - Therefore my pet rabbit is human (Conclusion)

 - ‘Logical Fallacy’
- 

- ▶ The Bible says that God exists
 - ▶ The Bible is the word of God and therefore true
 - ▶ Therefore God exists
-
- ▶ Valid conclusion from the premises – but circular – the premises can only be true if the conclusion is true
- 

- Point One: 'Knowledge' can be a difficult thing for us to deal with in psychology.
 - Point Two: Arguments can be valid, invalid, circular, etc.
 - Valid does not necessarily equal 'right'
 - Important for us to consider when examining things scientifically.
- 

▶ Naive Inductivism (Bacon)

- Observation and Induction
 - Once we have enough observations we can infer general laws
 - All birds lay eggs
 - All metals expand when heated
 - Objects fall and accelerate at a uniform rate
 - Will the sun rise tomorrow morning?
- 

- Weakness of scientific method
- “When is it legitimate to infer a universal generalisation from a collection of observation statements?”
- “When a large number of observations of Xs under a wide variety of conditions have been made, and when all Xs have been found to possess property Y, and when no instance has been found to contradict the universal generalisation ‘all Xs possess property Y’”
- (Ladyman, 2002, pp28 – 29).

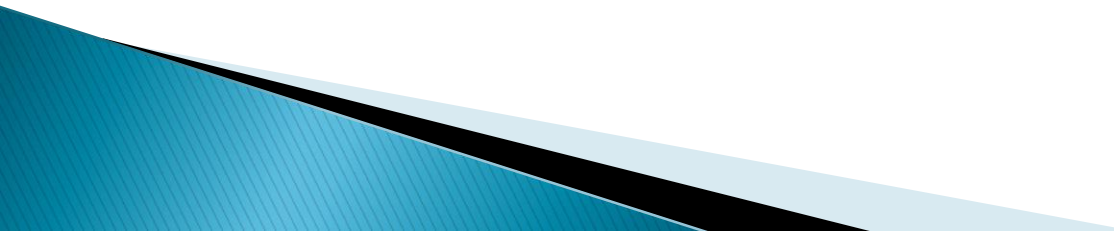
- **Principle of induction**

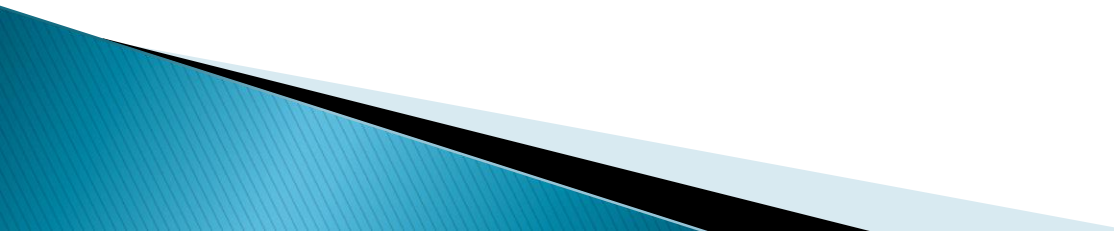
- **Principle of Causation (Hume)**
 - Contiguity: the relation of space and time
 - A causes B when:
 - Events of type A precede events of type B in time
 - Events of type A are constantly conjoined in our experience with events of type B
 - Events of type A are spatio-temporally contiguous with events of type B
 - Events of type A lead to the expectation that events of type B will follow
- A pool ball hitting another ball – red ball moves before white ball has a chance to hit it – how?
- Pedestrian crossings – you press button but light doesn't change, someone else presses and it changes – who got the lights to change?

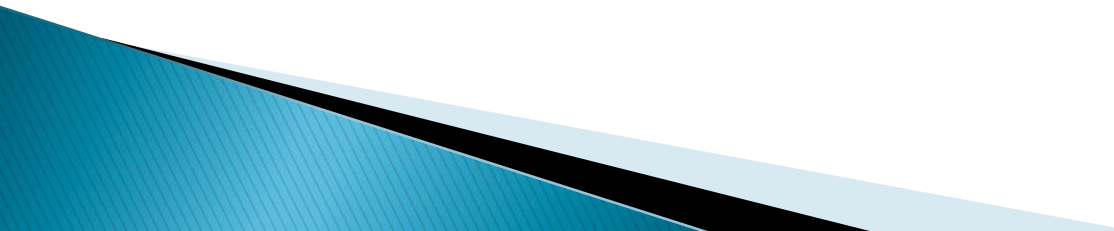
- ▶ Problems of induction: the ‘all swans are white’ fallacy.
 - If you travel the world and see all white swans – are all swans white?
 - What if you see a black swan?
 - Can we ever have true knowledge?
 - What do we do when our premises are proved false?
- 

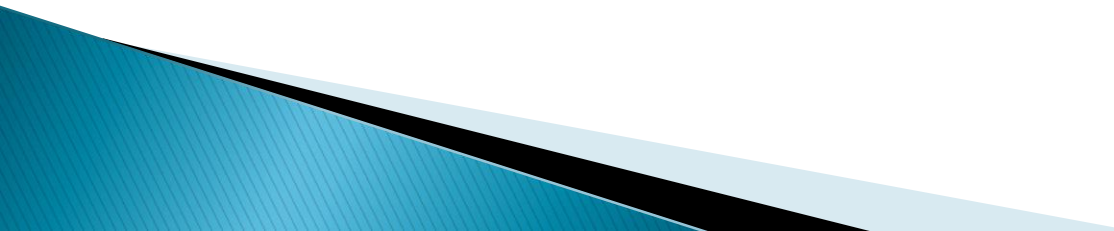
► Falsification (Popper)

- We should not attempt to support our theories – this is the wrong way around
- We should create a theory and then try to prove it wrong
 - If I continue to find white swans I still **have not ‘proved’** that all swans are white
 - But if I find just one black swan I **have** proved it wrong
- **Empirical refutation – need to be able to disprove a theory.**
 - Why psychology doesn’t care about Freud any more

- Freud's Oedipus Complex
 - Males want to have sex with their mother
 - If a male denies this they are repressing their true feelings
 - What is the problem with this?
 - If a male agrees with the first statement, this is true
 - If a male disagrees with the first statement the second comes into play, making the first statement true.
 - Unfalsifiable – untestifiable
 - Tautological
 - But can still form a basis for empirical research
 - So Freud gets back in to Psychology to a certain extent
- 

- ▶ “[We] must not look upon science as a ‘body of knowledge’, but rather as a system of hypotheses which in principle cannot be justified, but with which we work as long as they stand up to tests, and of which we are never justified in saying that we know they are ‘true’ or ‘more or less certain’ or even ‘probable’
 - Popper (1959, p317)
 - It’s a system – it’s a method of doing things.
- 

- ▶ This does not mean that we have to ‘throw away’ a theory just because it has been proved wrong on an occasion
 - Adapt and refine
 - But if we continually adapt and refine and it is still proved wrong, we will eventually discard
 - Replace with a different theory
- 

- Point One: ‘Knowledge’ can be a difficult thing for us to deal with in psychology.
 - Point Two: Arguments can be valid, invalid, circular, etc.
 - Valid does not necessarily equal ‘right’
 - Point Three: Science moves forward through the refinement, discarding, and creation of new theories (sometimes we return to reformulated versions of the old theories)
 - Science is never static.
- 

- **Revolution:** Kuhn's paradigm shift
 - Paradigm – the practices carried out in a discipline in order to study concepts
 - E.g., use of experimental methods in psychology – has to be a set-way.
 - Every so often a new way of thinking will change the way in which a discipline examines concepts
 - **'Paradigm shift'**
- 

▶ Cause of paradigm shifts

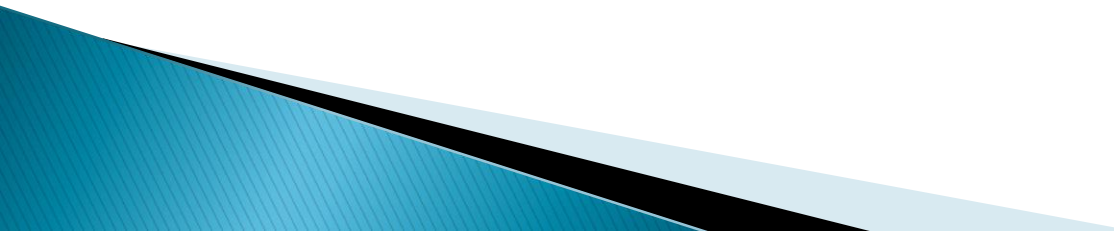
- Use of technology

- E.g., the invention of fMRI, PET, etc.
- Better than making up operational definitions.

- Refutation of leading theories

- Geocentrism to Heliocentrism – earth revolves around the sun not the other way around.

- ▶ Kuhn: Core values of a paradigm
 - A theory should be empirically *accurate* within its domain
 - A theory should be *consistent* with other accepted theories
 - A theory should be wide in *scope* and not just accommodate the facts it was designed to explain
 - A theory should be *fruitful* in the sense of providing a framework for ongoing research
 - A theory should be as *simple* as possible
- 

- A theory should be as *simple* as possible
 - Occam's Razor
 - Whenever we have two competing hypotheses, then if all other considerations are equal, the simpler of the two is to be preferred.
 - Keep it as simple as possible
- 

Psychology is not alone in these problems



Platypus – a mammal that lays eggs.

Is Psychology A Science?

Why or Why Not?

- ▶ Non-science
 - ▶ Pseudo-science
 - ▶ Bad science
- These are not the same things

▶ Hypothesis testing

- The principle behind experimental psychology
- Isolate variables of interest

Philosophy of Science Readings

- Hume
 - Locke
 - Mill
 - Kant
 - Popper
 - Kuhne
 - Ladyman, J (2002). *Understanding philosophy of science*. London: Routledge.
 - Okasha, S. (2002). *Philosophy of science: A very short introduction*. Oxford: Oxford Paperbacks.
- 

Next week....

- ▶ Lecture: Beginnings of Experimental Psychology.
 - ▶ Seminar: Thought Experiments.
 - ▶ ESSENTIAL READING:
 - Chapters 8 & 9 + 11 to 15. Farrell, M. (2014). *Historical and philosophical foundations of psychology*. Cambridge: Cambridge University Press.
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