

Scientific Logic – The CyclePhysical & Life Sciences versus the Social Sciences

Research Activity	Physical & Life Sciences	<u>Challenge</u>	Social Science	<u>Challenge</u>
Observe	With careful definition this can be relatively objective An issue is how to determine what is the dependent variable and what are the independent variables	Mostly routine – sometimes it is not clear what is actually being observed as opposed to what is being thought	No two social science entities are the same and thus objectivity is in question both in terms of what is being seen and by whom it is being seen – the variables present are also a challenge	Careful work in understanding the issues – physical observation and literature
Reflect	It is usually said that it is possible to know how many variables there are in the environment – the issue of dependent and independent variables is relatively straight forward	Always a challenge and there will often be differences in opinion Is what is thought to have been observed the same as what has happened	It is not possible to know how many variables there are - Ceteris Paribus is fundamentally important	There is normally a range of different ways of thinking about the people or organisations observed
Speculate	Theory /Law/Principle creation is the next step Other words are sometimes used such as paradigm or framework	Science is littered with failed theories Occam's razor is particularly important here - No theory ever explains all the phenomena in the domain as a theory is by its nature an approximation	Theorising is sometimes regarded with suspicion Theoretical conjectures are more acceptable	More caution is required and formal theories are not that common Some social science research will stop at this point Induction

Test	<p>Formal experiments with all the usual controls in place Clear and agreed guidelines as to the rules for rejection of hypotheses</p> <p>However the rules regarding levels of confidence are open to some discussion</p>	<p>Often routine but validity, reliability and generalisability are issues</p> <p>The conditions under which statistical techniques may be used are not commonly known by many researchers and the results reported are often not useful</p>	<p>In most cases formal experiments are not appropriate Argument is the primary driver Substantive level theory – minor abstraction Midlevel theories – more abstraction Formal theories – highest level of abstraction</p>	<p>As many ways of testing as there are theoretical conjectures Here creativity is a central issue http://www.youtube.com/watch?v=k6D6gO6CGdU&feature=fvwrel</p>
Reformulate	<p>The rejection or non rejection of hypotheses may produce a refined theory</p>	<p>Mechanics are routine but the interpretation of the findings are not</p>	<p>The theoretical conjecture is capable of substantial modification</p>	<p>Careful reflection on the meaning of the results of the test is required Deduction</p>
Validity, reliability, objectivity and generalisability	<p>These concepts are relatively well defined and procedures relating to them are well established</p>	<p>There are always judgements to be made and different people make different judgements</p>	<p>A different vocabulary is required http://www.socialresearchmethods.net/kb/qualval.php</p>	<p>Transferability, authenticity, believable, resonance, dependability, conformability</p>
Usability	<p>Normally theories developed by Physical & Life Sciences will have direct and immediate application but there is also room for basic or fundamental research</p>	<p>Mostly routine but there can be surprises as to how technology is eventually used</p>	<p>Social science is driven by problem solving --- mostly</p>	<p>This needs to be addressed as a separate matter in any published work</p>
Observe	<p>And so the cycle continues.....like the circles that you find in the wind mills of your mind</p>	<p>http://www.youtube.com/watch?v=D1zuAQAhMI&feature=relmfu</p>	<p>And so the cycle continues.....like the circles that you find in the wind mills of your mind</p>	<p>http://www.youtube.com/watch?v=r0cN_bpLrxk</p>

