

Learning about Scientific Method in Cognitive Educational Psychology

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Research Orientated and Research Based: Learning about scientific method through conducting and reporting on a simple experiment to help students develop essential cognitive skills and research knowledge required for future employment.

Each lecture in this module presents pivotal theories which help to explain cognitive processing, and these are presented with research studies which either support the theory or offer evidence against it. Typically, pivotal historic studies are presented at the beginning of the lecture, and these are then compared to research published in the past 10 years to offer a narrative of how our knowledge of the cognitive process has changed or adapted over time based on this evidence.

This structure of showing how theories have been updated by research over time is intended to mimic the 'scientific method' which is the most common method used in cognitive psychology. In this sense, the students are shown each week how research is a cyclical process and how theories and research findings are constantly being adapted and updated to inform our knowledge of the topic. As the scientific process is so central to the module, in the first seminar of term, students are asked to carry out a simple experiment based on the 'Stroop task'. Working in small groups, they complete the Stroop task, allocating roles as experimenter and participant and following instructions on how to carry out the task and collect results. Once this is completed, they are then asked to try and identify;

a) what they think the purpose of the task is; b) what question the study helps to answer; c) what was measured and how; d) what does the study show; and, e) what topic of cognitive processing they think it helps to explain. They then map their answers onto the scientific method (using figure 1) to give a visual representation of how each of these areas feed into each other.

Throughout the module these key features of a study (i.e., 'aims', 'research questions', 'method', 'results', 'conclusion' and 'what does this mean') are then always used to break down a research study. For example, these are used as subheadings on all power-point slides when describing any empirical research. At the beginning of the semester, these subheadings are filled in by me but as we progress through the semester, some of these are left blank or presented with less information. Typically, empirical studies with 'blanks' are the ones which will form the basis of the seminar activity, which aims to explore what these cognitive results mean for education. This is done to encourage students to read the original research papers and means they can use it as a means of formative assessment (i.e., we discuss these subheadings at the start of the seminar and students can reflect on what they understood from the study or what they struggled with). Similarly, these 'blanks' form the basis of some of the 'pause for thought' breaks³¹ where students might be asked to think about whether the study supports, contradicts or changes the interpretation of previous research/theories discussed.

The purpose of using this research process breakdown within and across the lectures/seminars, means students should (hopefully!) have an understanding of the research process that occurs when creating and carrying out an empirical study as well as beginning to understand how this research process can also be used to integrate and synthesis research evidence to form a larger understanding of a topic.

31 These are 2 minutes of 'quiet time' and occur after the first 25 minutes of the lecture and 25 minutes after the mid lecture break. The intention is to break up the lecture and give students a mini break to refocus their attention!

Scientific Method

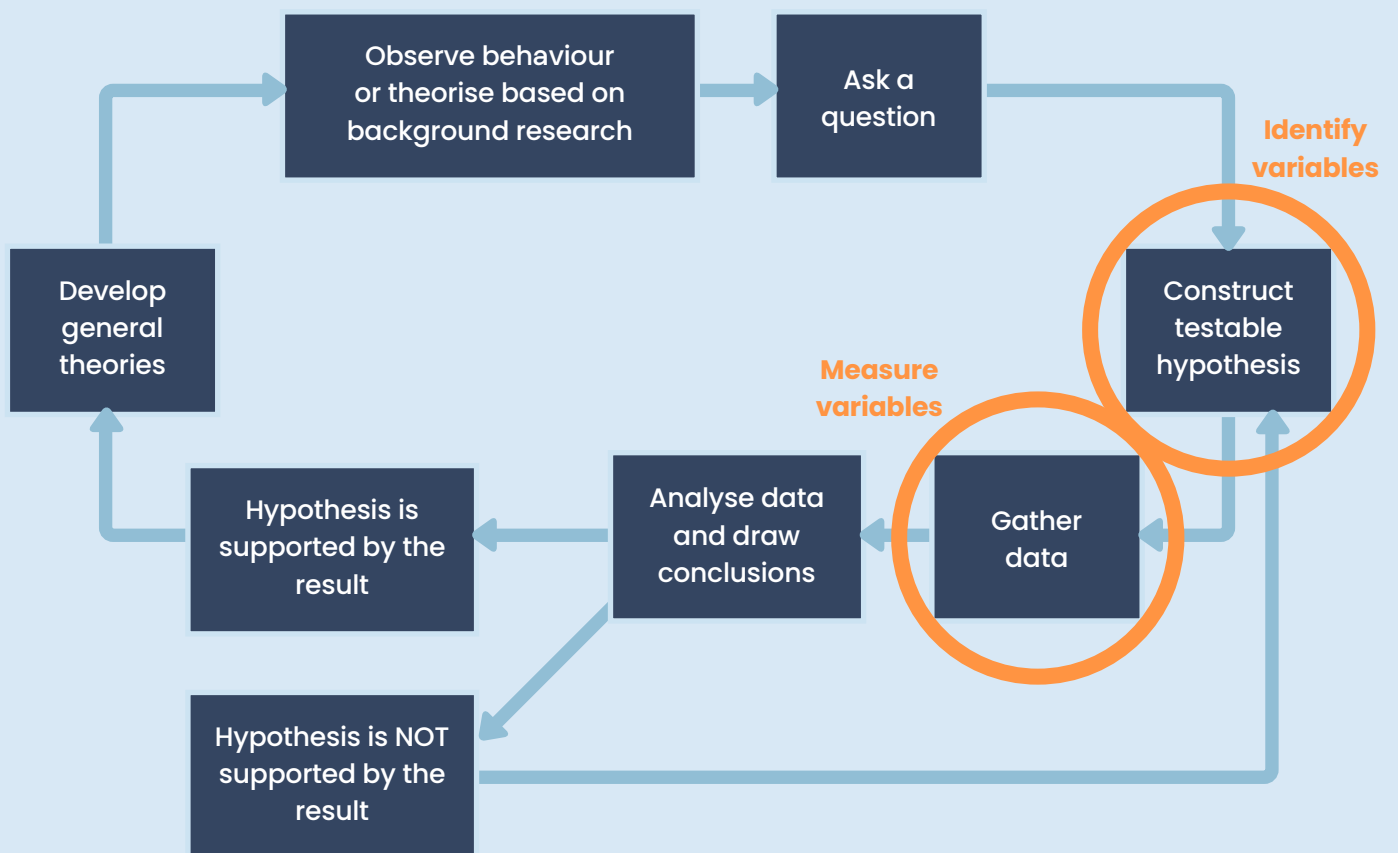


Figure 1: visual representation of the 'Scientific Method' used in Seminar 1