The research process

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The research process that you will learn about in this module consists of the following stages:

1. Literature review
2. Theory
3. Formulation of hypothesis
4. Operationalisation; choice of research method, definition of concepts, measurement setting, sampling
5. Conducting the research
6. Processing of results and analysis of data
7. Presentation of results

Source: SQA Unit descriptor for FM66 34 Social Science: Research and Methodology (SCQF level 7)

The cyclical nature of research

Research is a process, not an event. One of the biggest problems with studying research is that it is very difficult to engage with the concepts and develop a useful understanding of the research process from a textbook. This is not an issue that is unique to the social sciences, or to the study of research methods and techniques. However, when you read in a textbook that one of the issues that can prevent research progressing is cost, you cannot possibly grasp the complexity of funding processes and the potential bias that various funding sources will introduce.

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Literature review and identifying a research topic

Choosing a topic

When you undertake a piece of research you commit to a laborious and often monotonous process that may stretch across several years. We mention this at this stage as we have found that over the years when students write about the research process they give the impression that it is simply by following a linear, step by step guide that research is carried out. The reality is much more complex, and frankly can be quite frustrating for the researcher. Reaching a conclusion is often the result of a lengthy and dynamic process that is more about persistence, rather than following a neatly laid out plan. What this means is that researchers must be flexible, reflective practitioners who are open to adjusting their perspective at any stage in the research process.

For this reason, among others, the process of research in the social sciences is said to be cyclical in nature. For example, say that you are interested in looking at how happy people are in different geographical regions of Europe. You begin by looking at the existing literature and summarise what is already established knowledge on the topic. You do this by accessing peer-reviewed, published materials that are available through a variety of databases (you may have already experienced the perils of a database search during your induction to the course). Now you are trying to identify a gap in the research. You are doing this because it does not always make sense to conduct research that does not add to the knowledge community. As it happens, you discover through your review of the existing literature, that many people have conducted research on happiness across different geographical regions. You have hit your first research issue.
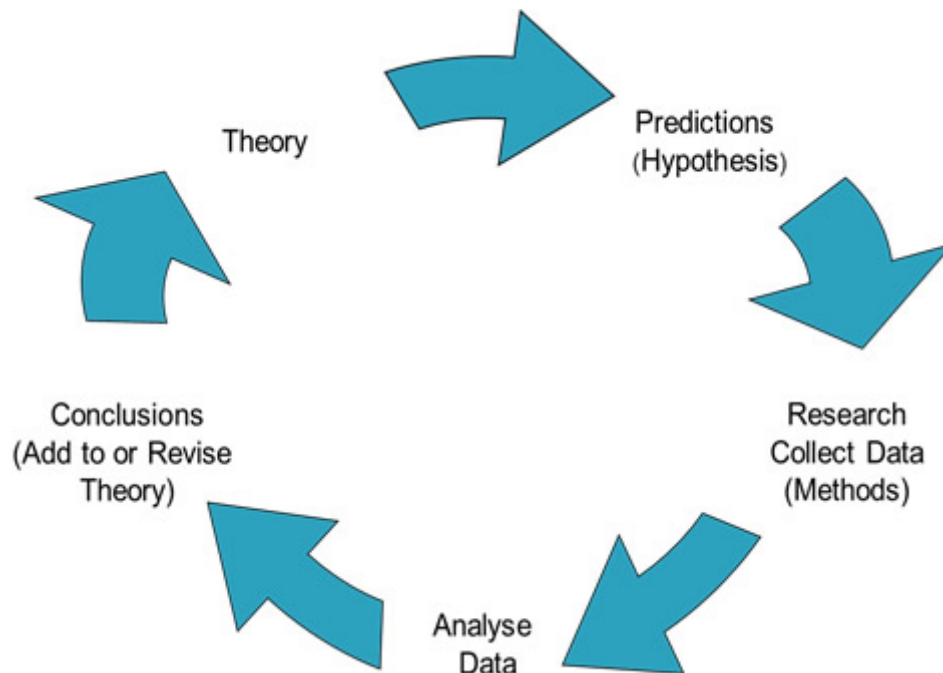
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Fig 1.2 The research cycle

Adjusting your focus

The topic that you wanted to pursue, that you thought was such an original idea, has been researched comprehensively. At this point, before you have even settled on a topic, but in conjunction with reviewing the literature, you need to make a change. You could narrow the focus and reduce the geographical element. You might even look for literature on research that has been conducted on happiness levels across different geographical regions in Scotland. Alas, you discover that this too has already been covered extensively and we know that Fife is the happiest place in all of Scotland, according to a survey conducted by Bank of Scotland in 2016. However, there is some hope. This is a survey that utilised a 'Happiness index'.

You investigate further and discover that what the media have reported as 'happiness' is not actually an objective, value free measure of happiness, but a score that is generated from the respondent's own ratings of their happiness about living in their community. Now you see that the existing literature focuses on the happiness that people say they feel, but this is not the same as how happy they actually are. At this point you realise that there is probably no way to objectively measure how happy someone is, and now you are not even sure that you are happy about conducting research in the area!

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What is being illustrated in this lengthy example is that even the first step, choosing your topic, is complex and subject to several other concerns than simply preference. Choosing a research topic is like picking a lock (not that we would condone such a thing, but the Skyrim/Fallout gamers among you will understand), each part of the mechanism needs to line up before the door opens. If we elaborate on this analogy, you might have a liking for a particular topic, which does not mean that you will be able to acquire funding from an institution or funding body for it. You also may not be ethically permitted to go around asking people about their happiness by seeing if they cry when you provoke them and so on. In short, what you are able to find out should be useful. Either you add something to the knowledge base that improves experience for people in general, or informs policy or other intervention. Few researchers get to conduct the research they actually want to. Researchers are governed by what is philosophically possible, ethically possible, financially possible, and often, mentally possible.

Design

Formulation of experimental or alternative hypotheses

Causality:

One of the things we are interested in when studying social science is what makes things happen. When we are talking about this in a scientific sense, we refer to this as causality, or cause and effect. When we talk about causality in social science, as in any other discipline that claims to use a scientific approach, we are referring to the relationships that exist between specific social events or occurrences. One of the purposes of social science is to work out what, if any, relationships do exist between social events. If we say there is a causal relationship between social event 'a' and social event 'b', we are saying that 'a' causes 'b'. We refer to these social events as variables; social event 'a' is the independent variable (the one that promotes the cause) and social event 'b' is the dependent variable (the one that is affected). You will learn more about an alternative relationship; correlation, when we reach the later stages of the module.

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Social science research often has a theoretical base, in that it is often engaged with testing or developing theories about how society and social structures operate and interact. Kerlinger (1979:64, in Creswell 2014:53-54) broadly defined a theory as:

> "A set of interrelated constructs (variables), definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena."

Theories assist our understanding of phenomena by clarifying the relationship between different variables. Theories can also help with explaining how and why different variables are related. Empirical research, on the other hand, is all about observations and measurements of the real world. As Bryman (2016:20) explains, the term empiricism is used in two main ways: to denote an approach to the study of reality that suggests that ideas must be subjected to the rigours of testing before they can be considered knowledge; and to refer to the idea that the accumulation of facts is a legitimate goal (for research) in its own right (as opposed to the development of existing or new theory).

It is crucial to realise, however, that while the two terms - theoretical and empirical - often tend to be used in a contrasting manner, research is often actually a combination of both approaches.

Theory

The underlying rationale or the basic approach to reasoning you take as a scientist has a direct impact on how you structure and develop a research project. Specifically, the relative importance of theory within any research agenda (e.g. is a research objective to test existing theories or make new ones?) can affect the fundamental approach to how the research is carried out.

Deductive reasoning

This approach to reasoning is where the researcher, based on existing knowledge and existing theory (and their own areas of interest), develops a theory which is then narrowed down to a hypothesis (or more than one) and then subjects it to empirical testing (more

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about hypotheses in later lectures). A generalised view of the process of induction would look something like this:

The "theory" used in deductive approaches may be more related to knowledge gathered from literature review, and hypotheses may not always be very clear cut - they can be quite generalised. It should also be noted that, even though the view of deductive reasoning shown above is quite orderly, often researchers will jump from one stage to another, not in the order shown here. For example, the original theory may be tweaked and changed after the data are collected and new information comes to light.

1. Researcher tests or verifies a theory
2. Researcher tests hypotheses or research questions from the theory.
3. Researcher defines and operationalises variables derived from the theory.
4. Researcher measures or observes variables using an instrument to obtain scores.
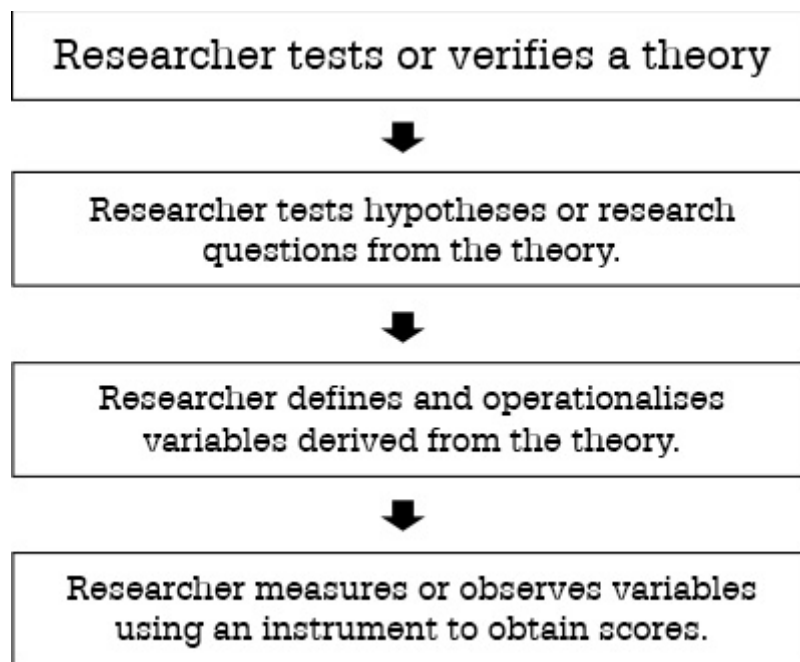
Fig 1.3: The deductive approach typically used in quantitative research (adapted from Creswell 2014:59

Inductive reasoning

This approach works (almost) in the opposite way to the deductive approach. With an inductive stance, theory is the outcome (as opposed to the starting point) of research. Following this approach, a researcher moves from specific observations towards broader generalisations and theories. Patterns or consistent themes are looked for in specific

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observations/datasets, with hypotheses then being formulated which can be further explored and then developed into theories. The inductive approach tends to be more open ended and exploratory than the more focused deductive approach, and can be quite daunting at the beginning, when it appears you are gathering data without knowing what you are looking for. A generalised structure for inductive approaches would look something like this:

Researcher tests or verifies a theory

Researcher tests hypotheses or research questions from the theory.

Researcher defines and operationalises variables derived from the theory.

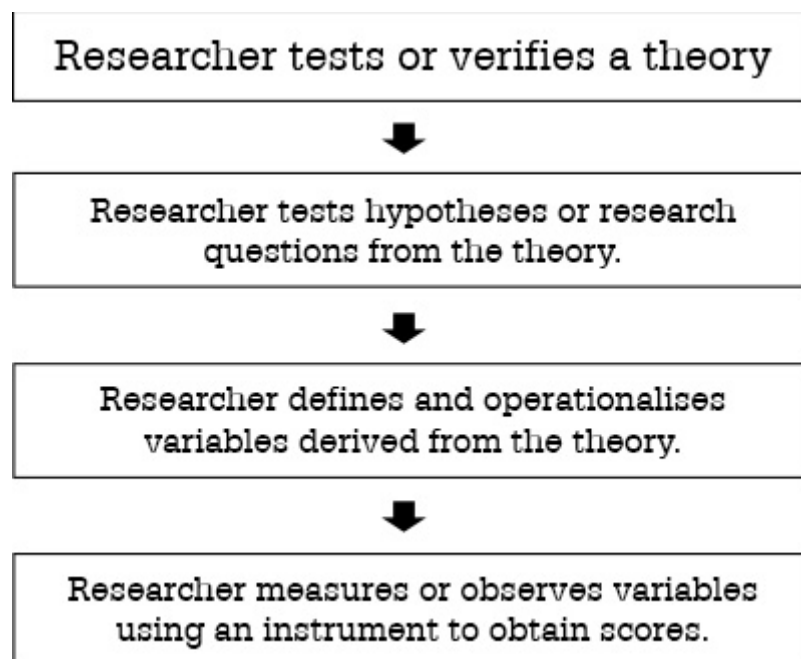Researcher measures or observes variables using an instrument to obtain scores.

Fig 1.4: The inductive approach typically used in qualitative research (adapted from Creswell 2014:66)

It is important to realise that, even though inductive and deductive approaches seem at odds with each other, the most common situation is that research takes on an element of both approaches, within a framework which is dominated by one or the other.

One of the purposes of social research methods is to enable us to demonstrate whether or not causal relationships exist. Experimentation is the main type of research method that is used for this purpose, as it seeks to demonstrate the relationship between different variables. One of the difficulties that we have with many aspects of social life and human behaviour is that we cannot demonstrate causal relationships between social events. This is not a failing of social science or social research methods, but, rather, it is a reflection of the complexity of social life and human behaviour and our inability to reduce complex human behaviour and social events to a small number of variables, which we can subject to some

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form of experiment. This is why we have other forms of research methods, particularly qualitative methods, which can be used to provide explanations, if not to demonstrate causality.

Question

What do you understand by the concept of causality in the social sciences?

Answer: this is about identifying if one thing actually causes another thing to change. When we classify two variables as having a causal relationship it means that one directly impacts the other. This is an important distinction and it is vital that you grasp this concept. This is because a lot of information in the social sciences, and other disciplines, appears to be related somehow, but not necessarily to the extent that we can identify a causal relationship. Sometimes the issue is not clear enough and we can only say that the variables appear to be related somehow, but we are not sure which variable is impacting the other. This is known as a correlation and you will learn more about this when you come to look at numbers.

Formulation of hypothesis

Following a deductive approach, a hypothesis is a testable statement that you create based on the theory that you have identified in your literature review. An experimental hypothesis is one which is created to test for a causal relationship. An alternative hypothesis is one which is created to identify a correlation. The scientific method largely focuses on experimentation and therefore an experimental hypothesis is most suitable. A null hypothesis is what you support if you do not generate results that you expected and therefore your prediction (experimental hypothesis) is not supported.

Please see session 4: Experimental design for a detailed overview of hypotheses.

Operationalisation:

Choice of research method, definition of concepts, measurement setting, sampling

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I should remind you here that this module is primarily concerned with the scientific method and is therefore largely focusing on a deductive approach to research. Therefore, much of the following content will relate to the deductive approach and also sees causality as central to the scientific method.

Once you have established your research question, you will finally be ready to consider the research method/s that you will employ to actually generate the data you need. The most important point here is that you use the method that allows you to generate appropriate forms of data. For example, there is little need to conduct lengthy unstructured interviews that produce hours of conversation needing to be transcribed when you simply want to know what time people prefer to have their dinner.

Which method is most suitable?

Often, students and researchers will opt for the method that they are most familiar with. In terms of the scientific method of research this tends to be an experiment. However, while identifying a causal relationship between variables is aspirational in much social research, it is not always ethically or philosophically possible. In addition to these constraints, we do not always pose research questions that can be neatly answered by demonstrating causality. This is where survey and observational research come into the limelight. These types of research generally allow us to identify the prevalence of behaviours, or gather opinion. Case studies go even further and can enable a very detailed understanding of a particular person or organisation. You will learn more about each design and the methods that are associated further on in the module.

Before you can choose your research method, you need to establish what it is you are trying to find out. You then almost need to work backwards from the question that you pose to consider what you are actually going to measure to demonstrate causality, correlation, prevalence etc. Often in social research we want to gain a measure of things that are known as abstract concepts. Other examples of these could be love, exploitation or national identity. We mentioned the concept of happiness earlier and highlighted the difficulty in objectively measuring the happiness of a person or group of people. There are certain
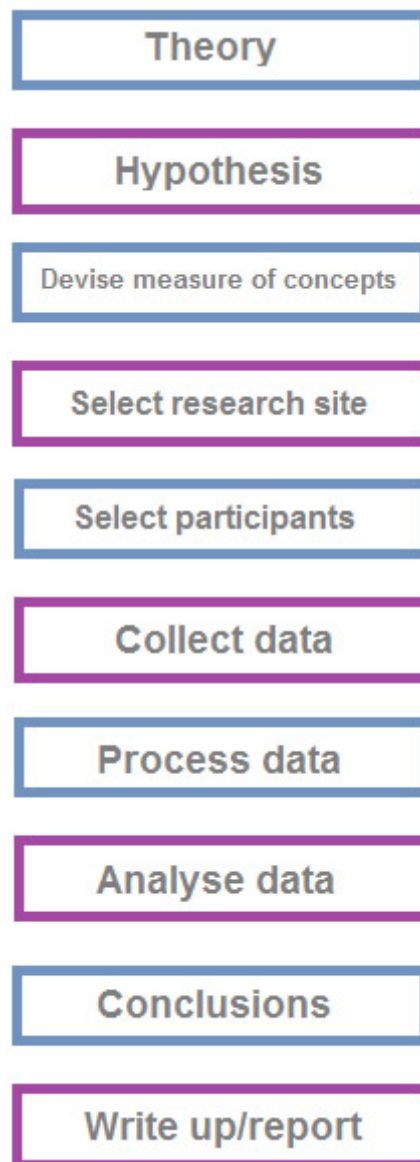
variables which we could argue indicate happiness. We might wish to include laughter, smiling, good sleeping patterns etc. We may wish to consult literature to see if someone has developed a set of indicators of happiness to see if they suit our research purpose. There are of course issues of validity here. Discuss this with your lecturer in the tutorial or online learning environment.

Measurement setting or operationalisation

The diagram below illustrates the processes involved in quantitative research. Bryman (2016:152) refers to this overall approach as the basis for operationalisation. In a nutshell operationalisation can be seen as the process by which abstract concepts can be translated into indicators or measurable variables.

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Theory

Hypothesis

Devise measure of concepts

Select research site

Select participants

Collect data

Process data

Analyse data

Conclusions

Write up/report

The process of quantitative research (Adapted from Bryman 2016:150)

Ethics in research

While you may be aware of financial and philosophical reasons that research is constrained by, sometimes we cannot find something out because it simply would be unethical to do so. For those of you who have studied Higher psychology, you will be familiar with Milgram (1963) study on obedience. This study, among others, was a fundamental turning point for concern for the participant in research. The ethical guidelines that are in place today were borne out of the aftermath of these controversial studies. At the centre of the research process we find human beings, and ensuring that people are treated as such ethical

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guidelines much be adhered to. The following passages have links to an example of ethical guidelines.

There are several areas that come under the broad heading of ethics. Consideration of participant safety, as discussed previously, is probably the first thing that comes to your mind. However, we also consider issues of academic misconduct here in terms of intellectual property rights and plagiarism.

Ethical guidelines

Link

Many social science disciplines have an overarching organisation that produces a set of ethical guidelines for researchers. Examples are the British Sociological Association (BSA) and the British Psychological Society (BPS). Have a look at some of the ethics case studies on the Economic and Social Research Council (ESRC) available via this link:http://www.esrc.ac.uk/funding/guidance-for-applicants/research-ethics/ethics-case-studies/

The following is an extract from their website that outlines some general principles for social sciences researchers:

Our six key principles for ethical research are:

- research should aim to maximise benefit for individuals and society and minimise risk and harm
- the rights and dignity of individuals and groups should be respected
- wherever possible, participation should be voluntary and appropriately informed
- research should be conducted with integrity and transparency
- lines of responsibility and accountability should be clearly defined

> independence of research should be maintained and where conflicts of interest cannot be avoided they should be made explicit.

Researchers should consider ethics issues throughout the lifecycle of a research project and promote a culture of ethical reflection, debate and mutual learning. The lifecycle of research includes the planning and research design stage, the period of funding for the project, and all activities that relate to the project up to - and including - the time when funding has ended. This includes knowledge exchange and impact activities, the dissemination process - including reporting and publication - and the archiving, future use, sharing and linking of data" (ESRC 2017).

Discuss

Read the guidelines and see if you can highlight some of the key issues researchers must consider. Prepare to discuss this in the tutorial or online learning environment.

Intellectual property rights and plagiarism

With so much research available through open source portals on the internet, it would be easy for researchers to use someone else's ideas and pass them off as their own. This is not only morally wrong, it is illegal and taking someone's work can be viewed in the same way as any other theft. However, as with much of social science research, the issue is not always clear cut.

The sharing of ideas is an aspect of research that can often help researchers to formulate ideas and receive feedback and guidance from their peers. One unfortunate aspect that severely limits the conversations which academics can have with each other is that their ideas might be used by someone else, you do not get a receipt when you share key points from your unpublished research. Therefore, there is always a degree of hesitation when considering the sharing of new ideas or research directions. Publication is the way in which researchers can protect their intellectual property. Although that does not always mean that they will receive credit for their work.

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Nina Paley [CC BY-SA 3.0], via Wikimedia Commons

An example that might help with this is in music. Say a musician writes a wonderful melody and lyrics and they post a YouTube video of them performing the song. If a famous band were to hear this melody, they might decide to write their own lyrics and release a song that becomes a number 1 hit because of their large number of fans. The original musician might never see the success that the famous band had with their song, and they probably would not be able to afford take the band to court to claim ownership of the material. If we take the issue back to social science research, we can see that researchers need to guard their ideas in order to be able to fully realise the potential themselves because the realisation of ideas can cost time and money.

 Link

Intellectual property can be people's ideas, a data set that they generated through primary research, inventions, original works of authorship, words, slogans, designs, proprietary information etc. Plagiarism is the act of taking another researcher's intellectual property, without permission or credit to them as the original author or creator. For more information on how to credit someone in relation to research, and other academic work (like essays or reports), go to the UHI website. You can access the information by clicking this link: https://www.uhi.ac.uk/en/libraries/how-to/

In simple terms, plagiarism is the act of copying a work, wholly or partially, and then pretending to be its original author. Generally speaking, reference to the original source material must be made as much as possible, and writers should not give an impression of others' work to be his/her own.

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Link

Please see the following link for more information on intellectual property and how it is legally protected:

https://www.gov.uk/intellectual-property-an-overview/overview

Conducting the research: Research issues common to all methods

Values and opinions in the social sciences

Social science aims to use scientific methods even though the field of study is dynamic. Social situations are continually changing, different interpretations may need to be applied. Bryman (2016:13) discusses the "messiness of social research" and highlights that things do not always go according to plan.

Within social science there is a debate over the extent to which values or opinions should inform these interpretations. Clearly scientific arguments and facts are used to support differing viewpoints, but to what extent is it acceptable for matters of opinion to influence the outcomes of research? There is a role for interpretation in much of social science, but there is none for what we should see as bias.

Positive and normative statements

Positive statements are 'is' statements; normative statements are 'ought' or 'should' statements. Positive social science deals with facts. This means that we are dealing with statements or arguments that are factual in content. Positive statements are factual statements that can be supported by evidence. The following are examples of positive statements:

- The United Kingdom voted to leave the European Union.
- Living standards have risen in Britain since the end of the Second World War.
- Immigration into the United Kingdom has increased since the Eastern European countries joined the European Union in 2004.

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Normative social science deals with values. This part of social science does not necessarily deal with facts, but with contentious arguments or matters of opinion. Normative statements are not factual statements and cannot be supported by evidence. The following are examples of normative statements:

- The United Kingdom should leave the European Union.
- Britain has become better off since the end of the Second World War.
- There has been too much immigration in to the United Kingdom since the Eastern European countries joined the European Union in 2004.

The above examples were designed to demonstrate the point about the difference between 'is' and 'ought' statements. In real social research, the difference between 'is' and 'ought' statements may not be so clear.

The problem of bias

Although it would seem that social science should attempt to be as neutral as possible in its claims, this is not always the case. Much of social science displays opinions and values, especially qualitative research. This is sometimes identified as betraying a bias. Bias has several meanings in social science research. It might suggest one of the following:

- that research has been conducted in such a way that a particular outcome was inevitable
- that it is the intervention of a social researcher in a particular social situation that has brought about the recorded outcome
- that the interpretation of events is not supported by the evidence and is more informed by the views of the researcher(s)

Pearson Scott Foresman derivative work: Ken g6 - Peacock_(PSF).png(Public domain)

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Bias in the above forms is not acceptable in social science research. This does not mean, however, that social science researchers are not allowed to hold views. They are human beings and hold views like all other human beings. We refer to such views as values. What is important for social science research is that the views, or values, of individual researchers are not allowed to dominate the research process and thereby contaminate it. Social science researchers must follow recognised processes and conventions if they wish their research findings to be accepted. As long as research is conducted within the parameters of what is acceptable within individual social science disciplines, then it should be accepted. As social scientists we need to be able to identify bias whenever it appears.

Can we claim that social research is value free?

Much social science research is value-laden. This does not mean that it should be dismissed. Much in-depth social research has been carried out with an awareness that a bias has probably been introduced, or that it is informed by values. Much of it has been carried out from a particular position, such as a Marxist or Feminist standpoint. Some of it will have been carried out using methods that have been much-criticised, such as participant observation. This does not mean that it is unacceptable. In fact, we should recognise that there is little in social science that is truly value-free.

What we expect when we approach social science research is that there is some indication of awareness of any potential bias that may be present in the work and, preferably, that this should be acknowledged at the outset. If we are aware that a piece of research has been carried out from such a standpoint, then we are more able to form an assessment of it on its merits rather than through our own judgement. Likewise, when we come to assess social science research, we should attempt not to import our own views.

A note on reflective writing in social sciences

One of the developments that has taken place recently in social science writing is that of reflective writing. This allows social science researchers, or students, to comment, or reflect, upon what they are doing and to express a view. This may take the form of an evaluation at the end of a research project, or some form of log or journal which is maintained

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throughout the project. It is frequently used as a form of assessment. It will not be used for assessment purposes as part of this module.

Can the social sciences ever be value-free? Write down your thoughts on this and prepare to discuss this in the tutorial or online learning environment.

Processing of results and analysis of data:

Data analysis is often placed too low down on the researcher priority list and can be a real sticking point in much research. You may find that you have generated a data set that you simply do not know how to extract information that will allow you to answer a research question or support/refute your hypotheses.

One very important point to make here, and this should always be at the forefront of any researchers' mind, you do not really make a choice about which type of data to generate and therefore analyse. What I mean by this is that you need to employ the method that will generate data that is appropriate to answer the research question you are asking. This will become clearer as you develop your understanding of data in the social sciences, however, put very simply you cannot answer a question about how people feel about bullying (see link to ERSC) with numbers alone. Similarly, there is little use in interviewing respondents about their experience of life in a conflict zone if you want to find out how many people have been injured in said conflict.

Data analysis: quantitative and qualitative data

Quantitative data analysis will be the primary focus of this module as you are largely considering the scientific method. This means that hypothesis testing is the main goal and therefore quantitative data is predominantly generated and analysed. This means that you will be working with data that can be quantified, or counted, therefore produced in numerical form. Certain types of numerical data can be counted but only in categories, and in this case the number is simply a label, rather than a true numerical value. More about this in the descriptive statistics section.

Have a look at some examples of quantitative research from the ERSC.

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Qualitative data is very different from quantitative data in that it does not rely on numbers and quantity to give the data meaning. Qualitative data is usually in the form of text, images, voice, other sounds. These things can be quantified in terms of how many times they occur, they can even be given numerical labels, but the focus here is not on the numerical value of variables, instead the meaning is key here. A typical example of qualitative data would be a recorded conversation between respondent and interviewer that is later transcribed (typed out). The researcher then analyses the data to look for themes and tries to establish their findings based on codes that they use to sort through the data. This is a very time consuming process. Have a look at some examples of qualitative research from the ERSC.

Descriptive statistics; measures of central tendency and dispersion Correlational analysis

The maths part! You have already learned that social scientists use evidence to make positive statements about the world. Often this evidence comes in numerical form and can be quite a lot of information in its raw form. In order to be able to draw meaning from a data set, we have to summarise the data to a manageable form. This is where statistics come in.

Please bear in mind that this is an introduction to the research methods in the social sciences and you will not be expected to understand statistics beyond calculating the mean, mode, median, range, standard deviation and rank correlation coefficient for a data set. You will learn more about this when you come to descriptive statistics and distributions and graphs.

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By Cmglee (Own work) [CC BY-SA 3.0 or GFDL], via Wikimedia Commons
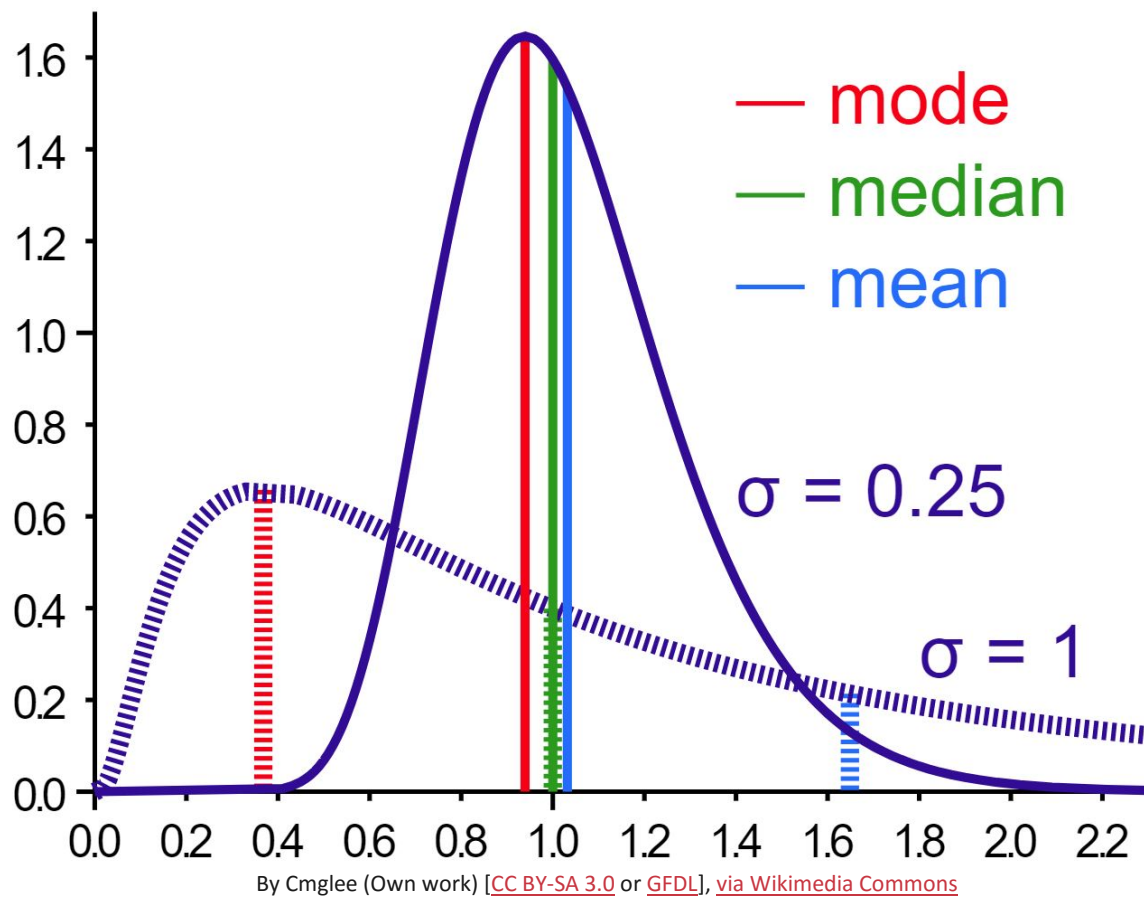
Presentation of results

Publication and the peer review process

Once you reach this stage it is finally time to present the information that you have found and in the academic community this is usually done via publication in a relevant journal, institutional publication, and conference presentation as a speaker or poster presenter. However, in order to ensure that your ideas and work are credible, you must first pass through a series of peer-review stages. What this means is that experts in the field of research and methods will scrutinise your work, comment on it and make recommendations as to whether the work merits publication. We end this session with a humorous (all too accurate) cartoon that illustrates this process well.

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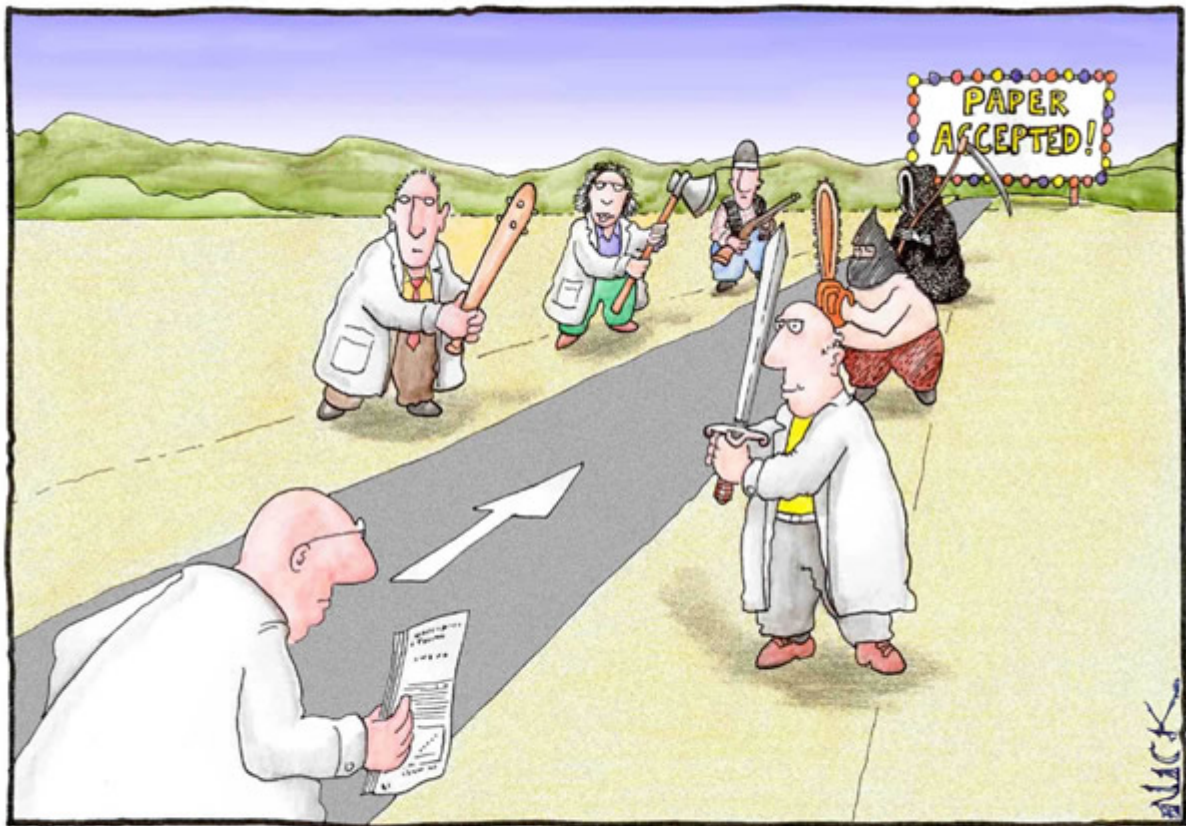
Most scientists regarded the new streamlined peer-review process
as "quite an improvement."

Cartoon by Nick D Kim, scienceandink.com / Used by permission.

Reading

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