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Quantitative vs. Qualitative Research

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Quantitative vs. Qualitative Research

From the very first days of my undergraduate training I heard stories about the vast differences between qualitative and quantitative research and how the two main ‘camps’ are the academic equivalent of the Capulets and the Montagues. How different the approaches to research are in theory and practice, the degree to which they create divisions between students and colleagues, and their impacts on knowledge generation processes are subject to enduring debate. An understanding of the essential, or perhaps ideal-type, bases of each approach is fundamental in assessing the role of each style of research in the contemporary academy.

 **What Is This Concept?**



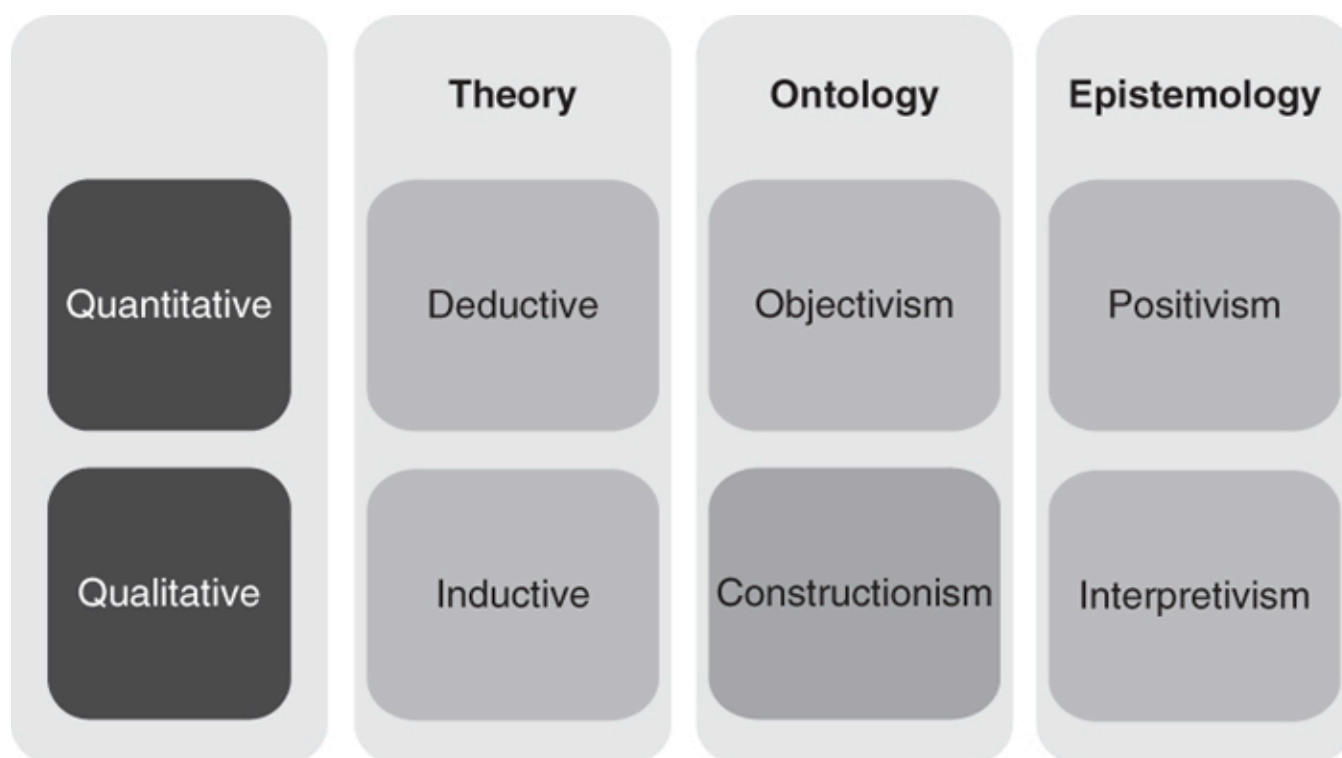
A *methodology* is an overall approach to the accumulation of knowledge based on theoretical and philosophical principles about what can be known by people and how it can be known through particular techniques of knowledge acquisition. A *method* refers to the techniques of knowledge acquisition. While the two terms are used synonymously consider a method as a sub-component of one's overall methodology.

Quantitative methodology is based on the interconnection between the practice of deductive theory testing, a belief in objectivism, and the application of positivist methods of inquiry. Deductive theory testing means using principles derived from theories that explain events, happenings, processes, entities, phenomena in the world as the basis for our research. In the deductive approach to research, evidence is gathered in to test whether or not pre-existing theoretical ideas are accurate and predictive when applied to 'real-world' data. A general belief in objectivism refers to the philosophical idea that the world is organised by general, universal social and biological laws governing life. These laws pattern or structure the world, and exist independently of human subjective interpretation of them. Finally, quantitative researchers 'know' the world by collecting data through positivist techniques such as large-scale surveys, standardised scales and questionnaires, and, most importantly, through experimental protocols. These techniques measure concepts in the world numerically, and privilege the statistical analysis of data to test research hypotheses. The goal of quantitative methodology is to examine whether or not research hypotheses (as derived from theory) have any predictive and explanatory value in the world as evidenced by patterns in objective, numeric data. Quantitative methodology is most popular among sport and exercise physiologists, biomechanists, psychologists and nutritionists.

Qualitative methodology, by contrast, is based on the interconnection between the goals of inductively developing theoretical understandings of the world, a belief in constructionism/subjectivism, and the application of interpretivist methods of inquiry. Induction refers to the process of collecting data in order to tease out or build a theoretical understanding of the world. In the inductive approach to research, academics may commence a study with only a very loose or fragmented understanding of a subject and build a more conceptual, general theoretical description of the subject through careful observation of it over time. Constructionism or subjectivism refers to a philosophical position that the reality of social (and to a degree social psychological or psychological) experiences is a matter of subjective interpretation. There are no fixed laws

governing all life or social processes, but, rather, the realities of life are constructed by people on an ongoing and everyday basis. Thus, interpretivist methods are explored in research practice. Interpretivist methods are those designed to allow researchers to understand how people construct and understand the realities of their lived experiences. Qualitative methodologists argue that, to understand others, techniques of data collection such as observation, ethnography, interviewing and narrative analysis are required.

Figure 4 Quantitative and qualitative methodologies



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The nature of a research question itself indicates the researcher's methodological standpoint or preferences. Consider the following examples and identify which methodological camp gives rise to the question:

- Does the consumption of a maltodextrin-fructose drink (250ml) every 25 minutes of competition delay onset of perceived muscle fatigue for elite-level women tennis players during matches lasting two or more sets?
- What are elite-level women tennis players' definitions of femininity in the sporting world?

Why Is This Relevant to Me?



I could most likely spend the better part of the next year researching and reviewing all that has been written about the apparent differences between quantitative and qualitative methodologies. Quantitative methodologies tend to be privileged amongst students as 'science', while qualitative methodologists are generally understood as interesting and relevant but biased and unscientific. The key differences focused upon by students and academics alike are the following:

- Quantitative data, as numeric, are objective while qualitative data, as words, images and texts, are subjective.
- Quantitative researchers investigate in 'unnatural' or contrived settings, while qualitative researchers conduct studies in the real world.
- Quantitative research focuses on variables and causal factors while qualitative research studies the meaning of experiences within particular cultures.
- Quantitative research is always deductive while all qualitative research is inductive.
- Quantitative research is directed toward the discovery of scientific laws while qualitative research identifies patterns in how people assign meaning to life.

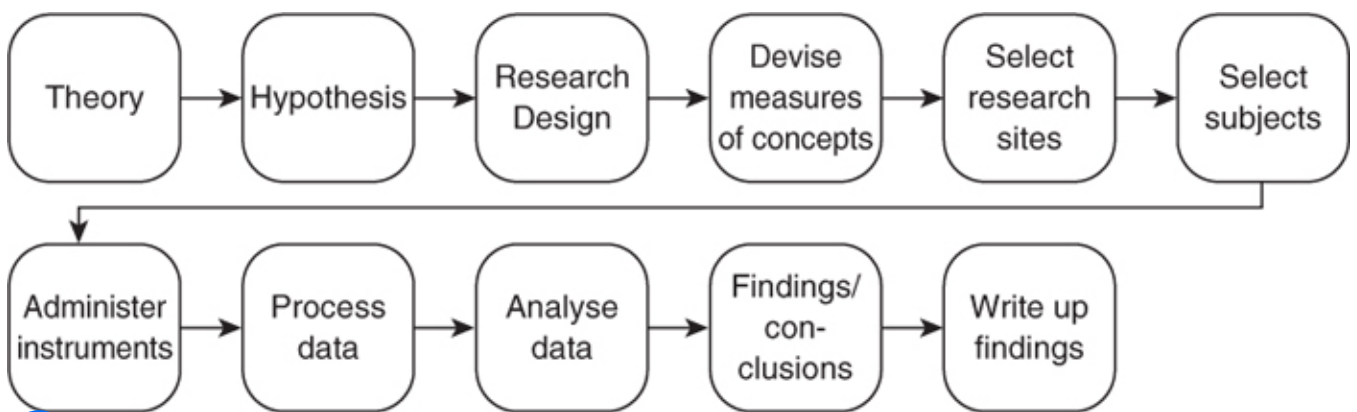
Like most myths, commonly held beliefs, or general assumptions, there is some empirical truth behind the dichotomies presented above. But the problem with the acceptance and reproduction of binaries lies in the ways in which students are asked, if not forced, to develop a 'this or that' mentality regarding what counts as legitimate knowledge. Rather than internalising and fully understanding the age-old methodological credo that the method(ology) should follow the question at hand, students often develop a mindset geared towards methodological tunnel vision.

Show Me How It's Used!

I love conducting quantitative research because of the linearity of the methodology. A well-planned quantitative study is elegant in both design and execution. If you are a person who believes in the scientific method, and who sees the world as organised (or some might say, 'determined') by factors, variables and forces, then quantitative methodology is for you. Quantitative research is conducted through a very common series of steps. First, a researcher develops a curiosity about the causal relationship between two 'things' in the world: say, between the consumption of a sports drink and fatigue during long bouts of exercise. Based on theory (bio-physical, in this case) the researcher is led to predict that a particular maltodextrin concentrated drink will delay fatigue in the body more effectively than water alone (this becomes the researcher's

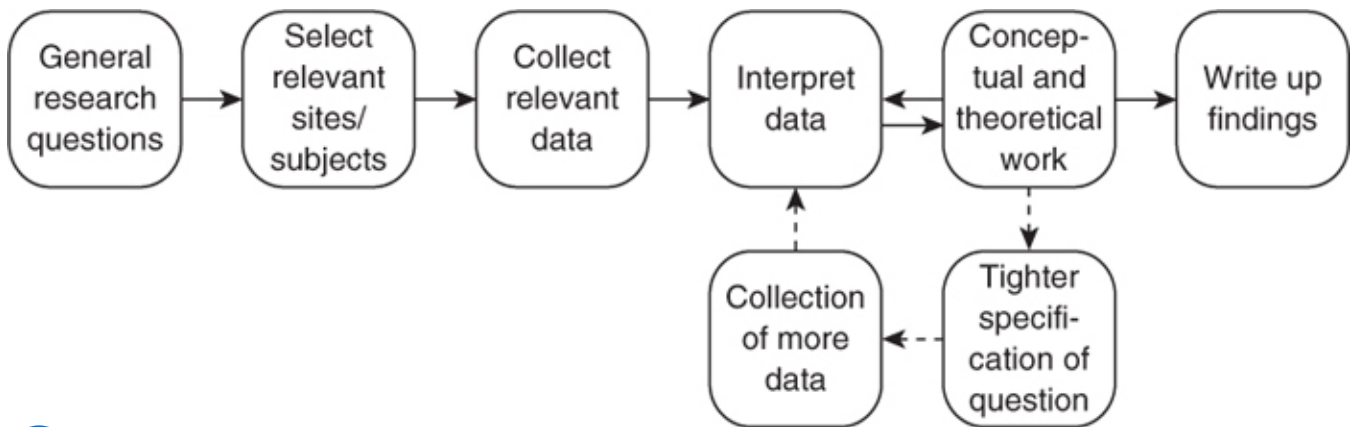
hypothesis). From there, the researcher determines the best way to measure the effects of drinking the concoction on fatigue, and how best to observe the process unfold in the body. Subjects are selected for the study and the researcher's hypothesis is tested in a standardised, controlled manner using the group. The relevant data are collected and transformed into numeric observations, and then analysed through a statistics computer program. From there, the researcher examines whether or not the numeric data reveal any definitive patterns regarding the original hypothesis, and concludes whether or not the theory of how maltodextrin drinks affect the body is supported by the evidence. The methodology is simple, clean, focused and efficient.

Despite the generationally reproduced reputation of qualitative research as 'soft' or as somewhat 'easier' than quantitative research, the reverse is most likely the case. Conducting qualitative research is far messier than quantitative research for at least a dozen reasons. First, qualitative research begins with a curiosity about something in the world, but does not commence with the guiding framework of theoretical axioms. Qualitative questions do not start with a predictive statement such as 'I bet this is related to this in this manner' (like quantitative research questions), but are general and open-ended. 'How do women tennis players construct femininity?', 'What is it like to live with cancer as a competitive athlete?', or 'How do young people experience medical discourses about obesity?', are all open-ended qualitative questions. Supposedly unguided by extant socio-cultural theories, a researcher who poses a question like 'How do women tennis players construct femininity?', must then select a group of women tennis players to study. From there, decisions regarding how one actually 'measures' their constructions of femininity follow; that is, how can we observe or learn their subjective constructions of femininity (the dominant method of choice is interviewing). Data are collected through a qualitative method, and then 'openly' analysed. Using words, phrases, actions or observations made regarding how women construct femininity, a researcher is presented with the task of abstracting concepts and potentially theories about gender from the data. It is precisely the opposite technique to that employed in quantitative research, and requires creativity, analysis and re-analysis of data, reframing the main questions underpinning the study over time. Although this seems insane to students at first, the true (substantive and theoretical) focus of the study may not emerge until midway through or even near the end of a project.



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Figure 6 Steps in qualitative research



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Qualitative research is, then, inherently frustrating for many students at first because it is not nearly as ‘structured’ or tightly packaged as quantitative methodology. Measurement procedures can be vague and not guided by templates or rules.

Problems, Pitfalls and Controversies

There is a fine line to be walked in the discussion, instruction and practice of qualitative and quantitative methodologies. While the methodologies are inevitably presented and practised sequentially in a research skills course as opposites, their respective contributions to the knowledge generation process should not be treated as antithetical to one another. Two stereotypes about the methodologies are also worth noting briefly. First, the commonly held notion that quantitative research cannot attest to meaning because it does not examine the contexts of life can be a warranted criticism but is not universally accurate. Survey methods in particular can measure context and examine the nature of how life unfolds. Additionally, survey and experimental methods can be

used to examine meaning, motivation, situational reaction and subjective construction by people/groups, and how they define things in the world as real.

Second, the widespread notion that qualitative research is undertaken inductively is perhaps one of the grossest misrepresentations of actual research practice. While induction is, in fairness, the ideal-type approach to theory and conceptual development when engaging in qualitative research, qualitative research practitioners often commence studies with pre-figured theoretical and conceptual guides in mind for 'reading' their data. As qualitative researchers develop theoretical preferences for understanding the world, studies evolve as ways of applying (but not testing!) concepts and theories in new ways or in new social contexts. While this might seem to be a small criticism or technicality, the use of theory or concepts as 'sensitising' challenges the very philosophical heart of qualitative methodology. Using well-defined theories and concepts to entirely direct a qualitative study is conceptually the reverse methodological 'offence' to the practice of 'data mining' for correlations (or the practice of 'exploratory factor analysis') in quantitative research. Methodologists including Alan Bryman (2004) have noted that, given the above trends and others, perhaps the immutable differences existing between the two camps are more of a textbook reality than an empirical one.

See also: [Applied vs. Pure Research](#); [Research Questions](#).

Key Readings

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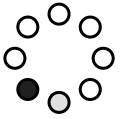
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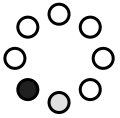
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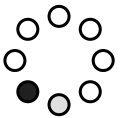


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