

# A Philosophical Analysis of the General Methodology of Qualitative Research: A Critical Rationalist Perspective

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**Abstract** Philosophical discussion of the general methodology of qualitative research, such as that used in some health research, has been inductivist or relativist to date, ignoring critical rationalism as a philosophical approach with which to discuss the general methodology of qualitative research. This paper presents a discussion of the general methodology of qualitative research from a critical rationalist perspective (inspired by Popper), using as an example mental health research. The widespread endorsement of induction in qualitative research is positivist and is suspect, if not false, particularly in relation to the context of justification (or rather theory testing) as compared to the context of discovery (or rather theory generation). Relativism is riddled with philosophical weaknesses and hence it is suspect if not false too. Theory testing is compatible with qualitative research, contrary to much writing about and in qualitative research, as theory testing involves learning from trial and error, which is part of qualitative research, and which may be the form of learning most conducive to generalization. Generalization involves comparison, which is a fundamental methodological requirement of any type of research (qualitative or other); hence the traditional grounding of quantitative and experimental research in generalization. Comparison—rather than generalization—is necessary for, and hence compatible with, qualitative research; hence, the common opposition to generalization in qualitative research is misdirected, disregarding whether this opposition’s claims are true or false. In conclusion, qualitative research, similar to quantitative and experimental research, assumes comparison as a general methodological requirement, which is necessary for health research.

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## Introduction

Qualitative research typically involves empirical study of human beings' experiences and behaviors, as well as related matters that do not involve or reduce to quantified—numerical—measures (note that qualitative research may also involve non-human beings, such as primates; traditionally, ethology, as the science of animal behavior, has used qualitative research, although it has also developed methods of quantifying its observations [21]). Qualitative research is becoming more common as part of health research, such as in mental health research [9]. This is illustrated in the use of qualitative research in pilot studies, as well as in mixed design, i.e., combined qualitative and quantitative, studies. Until now, philosophical aspects of qualitative research in general, as well as in relation to health research, are not sufficiently discussed and worked out beyond broadly claimed opposition to positivism and application of some philosophical approaches, such as phenomenology [9].

Such philosophical discussion of qualitative research is important as it may refine conceptual underpinnings of qualitative research in general, as well as in relation to social sciences and health research, and thus possibly lead to a refining of relevant qualitative research methods, findings and conclusions. This article will attempt such a philosophical—particularly epistemological—discussion of qualitative research in general, as well as in relation to mental health research as an example (based in part on the author's research experience). I will use standard strategies of conceptual analysis [22], such as counterexamples, refuting common assumptions, and seminal approaches and insights from the philosophy of science, particularly from Popper-inspired critical rationalism, which views science as consisting of (preferably bold) conjectures and (preferably severe) attempts at their refutation [16, 17] and argues against the logic of induction [12, 13]. The article will address five partly related key issues of general methodology: (a) the role of induction in qualitative research; (b) the role of theory testing in qualitative research; (c) the role of generalization and of comparison in experimental and quantitative research; (d) the role of comparison in qualitative research; and (e) the role of qualitative research in mental health research, as an indicative if not conclusive example for health research.

## The Role of Induction in Qualitative Research

Induction, which is traditionally related in philosophy to positivism (defined as the belief in the certainty, or at least in the determinable probability, of empirical knowledge), has been widely endorsed as fundamental to qualitative research (which is traditionally opposed to positivism). Induction is considered to be necessary for finding (or creating), and more notably, for examining, conjectures in

qualitative research, e.g., in thematic analysis, where finding (or creating) and confirming—such as by reaching saturation of—themes, respectively, is commonly argued to occur through inductive inferences that lead from special instances, i.e., data, to more general conclusions, i.e., themes [7]. This is notwithstanding the common—although I would argue false—claim of qualitative researchers that they do not conjecture in advance nor confirm conjectures as such. Induction is particularly forcefully argued for in a distinct qualitative research methodology termed grounded theory, which aims to find (or create), and even more importantly, to confirm, models or theories, again through inductive inferences that lead from special instances, i.e., data, to more general conclusions, i.e., models or theories [6]. Some other commonly used qualitative research methodologies are ethnography, which studies humans in relation to their social and physical environments, phenomenology, which studies the lived—so-called subjective—experience of humans, and narrative research, which studies the life stories of humans [7]. Note that thematic analysis, as a method of data analysis, is common to many of these qualitative research methodologies [5].

There are problems in the induction-endorsing argumentation that is favored by many qualitative researchers. First, induction can (and has) lead to false conclusions, as it is logically invalid, as argued by David Hume long ago, and as repeatedly and forcefully argued later on by Popper [16], among others. This is so because the particular or the special does not entail the universal nor even the (more) general, which is a simple matter of (classical and other) logic; perhaps what Popper added to Hume in this regard, is that induction does not confer likelihood or probability—in addition to not conferring certainty—on conclusions. Second, and related to the first point, it is commonly argued and agreed that (all) theories are underdetermined by (all) facts [4], which is an inherent feature of open systems (which are relevant because humans are open systems, hence qualitative research is about special—human—open systems). Thus, induction cannot lead to determination of theories by facts, similar to any other type of inference, and as such cannot confirm theories or their methodological equivalents. Third, and related to the first two points, even if induction may be helpful in generating, i.e., finding or creating, conjectures (be they themes, models, theories or hypotheses), it cannot provide them confirmation (or refutation, and more generally testing).

The distinction between generating and testing conjectures harks back to the positivist distinction between the context of discovery and the context of justification [18]. Although this positivist distinction has some problematic assumptions, e.g., that facts are discovered (rather than created), which is contested by social constructionists [20], and that theories can and should be justified rather than critically tested, which is contested by critical rationalists [16], the fundamental claim of this distinction, i.e., that the generation of a conjecture is distinct from its testing, still holds. Note that although the generation and the testing of conjectures may be mutually exclusive, they may not be mutually exhaustive, as there may be another methodological “context,” that of choice or selection of conjectures for testing after they are generated [19]. Thus, testing conjectures is distinct from generating conjectures in qualitative research or for other purposes, and should be considered separately. To sum, induction is not sound or relevant for theory testing

in research in general, and therefore it is not relevant for theory testing in qualitative research, in spite of a common (mistaken) view still being that it is valid.

Relativism, which is a well known possible alternative to positivism, and hence arguably to inductivism, and according to which there is no (one) empirical truth nor empirical falsity or at least such truth and falsity cannot be determined, is riddled with well known philosophical weaknesses such as self-refutation, and hence it is suspect if not false too. I will therefore not address it further here (recognizing that, perhaps even more than inductivism, relativism is commonly—and I would argue mistakenly—viewed in social and health sciences as valid and useful). Note that importance of varied context does not entail relativism.

### **The Role of Theory Testing in Qualitative Research**

Following the discussion of the role—or rather lack of it—of induction in qualitative research, a question that can and should be raised is whether theory testing has a role in qualitative research (because if it does not, then induction may not be more problematic than any other type of inference in relation to qualitative research). First, theory testing assumes that empirical research requires theory, partly because facts are theory laden [16]. The statement that facts are theory laden means that facts, as empirical observations (in the sense of both the process and the product of observing), are guided by and assume unobserved claims about the world, such as assumptions about the accuracy of the means of observation (senses, technology and other). This is probably best known in philosophy of science in relation to the Duhem-Quine theorem, and has been associated—not always rigorously—with the argumentation for the impossibility of conclusive empirical refutation [10]. The argumentation that facts are theory laden is related to but distinct from the argumentation that (all) theories are underdetermined by (all) facts; the relation between these two sets of argumentation may be one of the most fruitful and still insufficiently explored matters in epistemology in general and in philosophy of science in particular, to my mind. Empirical research is, simply put, a systematic attempt to learn new things about the world (defined as reality, without committing to realism or to alternative metaphysical approaches). Because qualitative research, as part of empirical (natural and social) research, is typically a systematic attempt to learn new things about the human world, it is reasonable to argue that qualitative research requires theory. Therefore, contrary to some writing about and in qualitative research [7], it is reasonable to argue that theory testing has a role in qualitative research, and an important one at that.

Second, theory testing involves learning by trial and error, i.e., learning from mistakes, which is arguably necessary for learning new things about the world [17]. I will not argue here for the necessity of learning by trial and error for learning new things about the world, partly because it is widely accepted and partly because it is in line with common sense and experience. Some philosophers, such as Popper [16, 17], seem to argue that learning by trial and error is both necessary and sufficient for learning new things about the world. The joint necessity and sufficiency of learning by trial and error for learning more about the world is controversial, as some other

forms of learning, such as learning by doing as others do, which occurs in social learning [3], may contribute to learning new things about the world; it may be argued that learning by merely doing as others do can result in learning new skills rather than new knowledge, and that research is about learning new knowledge, hence learning by doing as others do may not be directly relevant to research. Thus, like other types of empirical research, qualitative research uses (or at least should use) learning by trial and error. If induction is not sound or relevant for theory testing, as argued above, learning by trial and error may be the form of learning most (or singularly) conducive to generalization. This is so because, at least according to a non-inductivist approach such as critical rationalism [12, 13], generalizations are theories, even if sometimes low level ones, i.e., not rich in theoretical detail (relative to other theories); learning by trial and error can eliminate proposed generalizations that are not compatible with outcomes of theory testing, so that other proposed generalizations can be upheld until further testing (hence corroboration rather than confirmation) is possible.

Generalization has been widely considered an important goal of research as, traditionally, modern science has explicitly aspired to universal—or at least as much as possible, general—statements, as argued for in philosophy of science [16]. Qualitative research has commonly rejected generalization [7], based on the argument that qualitative research aims at context-specific statements. It does (or at least should) use learning by trial and error, which is conducive to generalization, as argued above. Note that some leading qualitative health researchers have argued for generalization in qualitative research, e.g., Morse et al [14], who unfortunately endorse induction, hence their argumentation for generalization is suspect if not false, due to induction being not sound or at least not relevant to theory testing in research, as argued above. An important question that is relevant to ask is to what extent is generalization required for qualitative research, and whether generalization can be further analyzed to examine its relation to empirical research—experimental and quantitative, as well as qualitative.

### **The Role of Generalization and of Comparison in Experimental and Quantitative Research**

Why is generalization, or the aspiration for universal—or at least as much as possible, general—statements, widely considered an important goal of modern science? It has been argued that modern science is narrowly modeled on physics, which assumes laws of nature, which have traditionally been considered universal (although lately there is discussion whether laws of nature may be different in different parts of space and time where sufficiently different conditions hold, such as at the very beginning of the universe, or in other—conjectured—universes). As non-physical sciences, such as some health-related and other social sciences, do not usually postulate their own laws of nature, perhaps not even laws of human nature, generalization may not be required for non-physical sciences. The aspiration to find laws of human nature in the social sciences and in related inquiry such as in history has been labeled historicism and has been argued to misconstrue the role of such

sciences and inquiry and the phenomena they address [15]. Perhaps most importantly, this argumentation (re)directs the focus of philosophical discussion in relation to science, and to knowledge more generally, from essence or substance (such as theory) to method (of inquiry). When generalization is viewed this way it is metaphysically oriented, in that it addresses the structure of the world (in the form of laws of nature), whereas generalization can also be viewed as epistemologically or perhaps even more accurately as methodologically oriented, in that it addresses method (of inquiry). What can such a methodological characterization of generalization consist of?

Generalization, methodologically viewed, attempts to find similarities of a phenomenon across different circumstances, so that learning about the phenomenon in one set of circumstances can apply—as is or with modifications—to another set of circumstances, thus reducing the need to learn anew about the phenomenon in each different set of circumstances. Hence, in order to generalize, comparison—of circumstances—is necessary. Such comparison is fundamental to experimental research such as in physics, where values of most controllable variables are held constant as much as possible in order to manipulate one or only a few variables of interest, which serve as change of circumstances, thus learning about the phenomenon studied. Quantitative research, such as that involved in clinical trials, uses comparison similarly, but because it can control less variables than experimental research due to the complexity of the phenomena it studies and due to ethical constraints related to its research with biological and social systems, it commonly compares similar but distinct systems across different—interventional and control—circumstances, rather than comparing the same system across different circumstances (as experimental research commonly does). That being said, quantitative research sometimes compares the same system across different circumstances, such as in an N of 1 ABA design, which is often found in psychology research; N of 1 means one (usually human) research participant, ABA design means that circumstance set or condition A is first implemented with the research participant, then circumstance set or condition B is implemented with that research participant, then circumstance set or condition A is again implemented with that research participant—this design could be extended or complicated with more repetitions of A and/or of B, and/or with other circumstance sets or conditions added. And experimental research sometimes compares similar but distinct systems across different—interventional and control—circumstances, such as in subatomic physics.

Thus, comparison may be (methodologically) necessary for experimental and quantitative research. Note that comparison can lead to learning about differences in relation to a phenomenon across different circumstances, which can be as, if not more, informative than learning about similarities in relation to a phenomenon across different circumstances, because such differences facilitate refutation of theories—and hence growth of knowledge [16]—whereas such similarities facilitate corroboration of theories—and hence no change in knowledge; admittedly, both differences and similarities facilitate theory testing, which involves both refutation and corroboration. This argumentation suggests that comparison may be (methodologically) necessary but not sufficient for generalization (as qualitative research commonly declines generalization, as noted above, than in order to not digress from the purpose of this article, I will not discuss the question of what else is required for

generalization in addition to comparison, other than to suggest that an—or perhaps the—additional requirement may be the positing of a theory or hypothesis that refers to similarities of the studied phenomenon across different circumstances). If so, what role, if any, can and does comparison have in qualitative research, which, as noted above, commonly rejects generalization, but perhaps should not reject comparison if comparison is fundamental to research yet not sufficient for generalization?

### **The Role of Comparison in Qualitative Research**

Qualitative research is typically conducted by collecting data from and about one or more groups of people, and addresses similarities and differences within, between and across groups (similarities and differences between groups refer to groups of participants as units of analysis, so that similarities and differences within groups are ignored for that purpose, whereas similarities and differences across groups refer to participants as units of analysis, so that similarities and differences between groups as such are ignored for that purpose; hence, within-group, between-group and across-group analyses are distinct and complementary, although perhaps not mutually exclusive nor mutually exhaustive). These data can be collected from and/or about participants and/or from documentation. The data are most commonly collected by means of individual or group interviews (such as semi-structured individual interviews or focus group interviews, respectively), participant or other observations, and/or review of documentation. Collected data can then be analyzed in various ways that are grounded in part in the overall methodology of the study, such as phenomenology (which studies the lived experience of human beings in relation to one or more phenomena) and ethnography (which studies human beings in relation to one or more of their environments), and that range from simple thematic analysis that clusters and labels parts of the data that seem similar to complex coding schemes that involve explanatory models and more [5, 7].

In order to address similarities and differences within, between and across groups, comparison of data from and/or about participants and/or from documentation is required. Sharing characteristics and other contingencies with a group, as well as having characteristics and other contingencies that are not shared with that group, consists of distinct circumstances (of participants), which can be compared. For example, participants in qualitative research can be compared on similarities and differences in their experience of a shared event such as a natural disaster that happened to all of them, which may lead to enhanced knowledge of common as well as unique aspects of such experiences, with possible implications for policy and service planning. Hence, comparison is possible in, and (methodologically) necessary for, qualitative research, which addresses similarities and differences within, between and across groups. If so, qualitative research shares the general methodological requirement of comparison with quantitative and experimental research. Thus, comparison is arguably fundamental to any—qualitative, quantitative and experimental—empirical research, whereas generalization may be important for quantitative and experimental research but not for qualitative research.

Indeed, as implied from the argumentation above, qualitative research seems to use comparison routinely and prominently, perhaps at least as much as quantitative and experimental research; as such, comparison is, and arguably has to be, a mainstay of qualitative research—past, present and future. If so, what may be the role of qualitative research in mental health research (based partly on the research experience of the author) as an example of health research?

### **The Role of Qualitative Research in Mental Health Research**

Mental health research may be particularly compatible with qualitative research, due to its focus on normal and abnormal human experience and behavior (recognizing that biological psychiatry research, which focuses more narrowly on anatomical, physiological, biochemical, genetic and other aspects of the biology—narrowly defined—of abnormal human experience and behavior, may be less compatible with qualitative research). For instance, mental health research addresses major depression as possibly distinct from ordinary sadness [2]. This distinction may require qualitative study of experiences and behaviors of people with major depression, in order to clarify what, if any, experiential and behavioral differences exist between major depression and ordinary sadness. Such a distinction obviously requires comparison of major depression with ordinary sadness, which illustrates the important and arguably necessary role of comparison in qualitative research. More generally, qualitative research is most helpful, if not necessary, for systematic description of mental abnormality. It can also generate theories—in this case, mental health theories—for quantitative or experimental testing, which is a common role of qualitative research in social and health research, among other roles [8].

It may be assumed that experimental and quantitative research are so-called objective, e.g., that their findings are not dependent on features of the researcher(s), and that qualitative research is so-called subjective, e.g., that its findings are fully dependent on features of the researcher(s). This may be argued particularly in relation to mental health research, which is amenable both to biological research, which is supposedly objective, and to psychosocial research, which is supposedly subjective. Yet objectivity in research is suspect, as research findings are necessarily dependent on theory choice [19], which is partly dependent on features of the researcher(s), such as the researcher(s)' preferred metaphysics [1]. This can be illustrated in relation to mental health research, where theory choice may be particularly influenced by the views of the researcher(s) on human nature. Note that theory choice (for testing), also termed the context of introduction [11], is preceded by theory generation, also termed the context of discovery, and precedes theory testing, also termed the context of justification; simply put, empirical research proceeds from theory generation to theory choice (for testing) to theory testing, which in its turn may lead to further theory generation (or theory choice) and so on. Subjectivity in research is also suspect, as in order to be considered robust, research findings require replication by other researchers who may differ considerably from the original researcher(s), including in their preferred metaphysics and any other



apparently relevant feature; this applies to mental health research as to any other empirical research. Arguably, instead of objectivity or subjectivity, inter-subjectivity, which recognizes that research findings are dependent in part on features of the researcher(s) but requires findings to be replicated or at least replicable by other researchers in order to be robust [16], is or at least should be assumed by experimental, quantitative and qualitative research alike. If so, mental health research as well as more generally health and other empirical research (be it experimental, quantitative or qualitative), is or at least should be inter-subjective.

## Conclusion

Qualitative research, in relation to mental health research as well as more generally, such as in relation to other health research, involves some of the same fundamental epistemological or general methodological tenets as those of experimental research and quantitative research. These shared tenets consist of the irrelevance—if not falsity—of induction; of the importance of theory testing for research; of the necessity of comparison for research; and of the requirement of inter-subjectivity in research. Interestingly, these four epistemological or general methodological tenets are not specific to empirical research (which includes qualitative, quantitative and experimental research), as they seem to be shared with non-empirical research such as philosophical research. Among these four tenets, comparison may be the one that may seem least relevant to such non-empirical research. Space limitations do not permit discussion here of the relevance of comparison to non-empirical research, other than to note that philosophical research commonly if not always compares doctrines and arguments in order to reach conclusions. It is perhaps not a very surprising yet still an important conclusion of this philosophical examination of qualitative research that fundamental epistemological or general methodological tenets are shared across most if not all—empirical and non-empirical—research, as all research is systematic inquiry about the (external or internal) world, and as such inquiry may require or may at least benefit from the same guidelines, no matter what the type or content of research (the status of mathematical research and of humanities research such as literature studies in relation to this conclusion is beyond the scope of this article, although I suspect that such research also shares these four tenets). This conclusion points to a novel understanding of the conceptual relation between qualitative, quantitative and experimental research, which may be a closer relation than usually thought, and which should be explored further for its soundness and implications, including for mental health research as well as for other health research.

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