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Do We Need Mixed Methods Designs in Social Science Research?

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ABSTRACT: The objective of this article is to reflect on the need for mixed methods designs in the social sciences. I propose to theorize seeking to answer the question of whether it is possible to use grounded theory with mixed designs, based on some publications about these methods in this multidisciplinary field. My working hypothesis is that grounded theory cannot be applied with these methods, for two reasons: first, because grounded theory is aimed at generating an understanding of the way in which the members of the studied community understand their interactions, and a theoretical or conceptual paradigm, or a set of them, would superimpose pre-established notions that would prevent observing the communicative exchanges of the participants from the communicative notion of themselves. And the second, related to this, arises from what Forni and De Grande **(2020)** say that inductive methods are not compatible with mixed methods, which I find logical, because inductive methods are aimed at constructing knowledge from of the empirical manifestation of the phenomenon studied, and it would not be possible to reach knowledge from that reality, if it is looked at through a theoretical or conceptual paradigm. If my suspicions are confirmed, my answer regarding the need for mixed designs in the social sciences would be: as long as it seeks to understand the universe with deductive reasoning. We'll see.

KEYWORDS: *M*ixed designs, inductive reasoning, triangulation method, mixed method, grounded theory.

WHAT ARE MIXED DESIGNS?

Mixed designs in social science research are strategies that combine qualitative and quantitative methodologies with suitable theoretical paradigms in the same study seeking that the confluence strengthens the fragile aspects that a single theoreticalmethodological perspective can show.

Such an undertaking involves the important effort of matching the nodal qualities of the respective methods and paradigms chosen, without affecting scientific rigor. This, as can be expected, is very complex and is also risky, because despite the efforts, the final result could lack validity. María Antonia Gallart states that we cannot "give recipes or indicate possible solutions" (1993, pág. 107) for the difficulties that will arise with these strategies —which is understandable considering that even single-method studies present multiple difficulties— but that the integration of methods can become the most appropriate approach for certain investigations. She proposes to clearly define three aspects before facing the research task: 1) what are the questions that will be answered for each strategy, that is, what answers will be given from the quantitative perspective and which from the qualitative perspective; 2) how the analysis will be carried out and 3) what assumptions support the study. "The quality of the study will depend on the congruence of these three steps: question, analysis and assumptions, as well as the adequacy and creativity of the quantitativequalitative integration" (p. 108).

According to Forni and De Grande (2020), currently, the most popular ways to combine methods in social sciences are methodological triangulation and mixed methods. Both are procedures that combine different methodological and/or theoretical strategies in the same study. This practice of combining methods has been present in the social sciences since the beginning of the 20th century, but the notion of methodological triangulation became popular only after the middle of the century, and that of mixed methods, towards its last decade. Although late, the combination of methods has been well received in Latin American academic publications.

Continuing with these authors, the paradigm war was appeased because the promoters of methodological triangulation 1) argued in favour of the complementarity of qualitative and quantitative strategies, 2) made it explicit in a theoretical and epistemological sense, and 3) carried out studies where they used it, so that when the more recent mixed methods appeared, they were more easily accepted.

The dissemination of mixed designs in textbooks and seminars has led to the knowledge of these strategies in increasingly wider and more varied audiences to the point that today, both methodological triangulation and mixed methods are widely used in the social sciences, confirming the legitimacy of the qualitative and quantitative strategies united in scientific production in Spanish language (Forni and De Grande, 2020).

Because in the literature search on mixed designs that I conducted for the purposes of this text, I found more articles on methodological triangulation and mixed methods than any other types of mixed research, I´m going to delve into these two particular mixed methods. I think that in approaching this topic, it´s a good idea to choose to refer to specific mixed designs as I propose to do here, so that there doesn´t remain the idea that mixed designs are free and chaotic and that, like dog broth, it can be throw ingredients at hand into the pot without how or when. However I note this, which I consider applies in general to many heuristic methods: the knowledge we have about them is provisional, in continuous reworking, and nourished by the reflections and suggestions of the researchers who use them. At the end of the day, what is relevant about any research in a methodological sense will be that it punctually explains the procedures carried out.

WHAT IS METHODOLOGICAL TRIANGULATION?

Various authors refer to methodological triangulation but don´t define it *stricto sensu* perhaps because, as stated by Feria and others (2019), some consider it a procedure, others a technique, and even fewer, a method. For these authors, it´s correct to consider methodological triangulation as a method but the name should be changed:

we operationally define triangulation (or the better "contrast") as the method of scientific research that allows through an inductive inferential process, to objectify the information collected with other methods, both at the theoretical and empirical level, from comparison and cross-referencing of the data obtained from various sources, which leads to the acquisition of new knowledge for science (p. 143).

The problem with calling this method triangulation is that it causes confusion with the same term that comes from topography and navigation, where an unknown point C can be located from the location of the known points A and B. Forni and De Grande (2020), subscribing to the idea of various authors, affirm that Webb, Campbell, Schwartz and Sechcrest were the first to explain the application of the term triangulation to designate this scientific method in 1966 in their book *Unobtrusive Measures: Nonreactive Research in the Social Sciences*. These authors, Forni and De Grande, had to employ various strategies to integrate a corpus with studies on methodological triangulation, because the word "is a metaphor that precedes its use in research methodology, and this could affect the quality of the data that this article was in the process of producing" (2020, p. 178), so to select the relevant studies for their article, they inserted a qualitative reading stage that eliminated references to commercial, labour, geodesic or oedipal triangulation. To write the text that happens here, I also faced problems that couldn´t be avoided with Boolean operators in the bibliographic searches that I did, so even after achieving a manageable number of titles, I found various studies in fields of knowledge very distant from our interests.

The defense that Feria, Matilla and Mantecon make regarding changing the name of this method is rather enthusiastic:

With so much linguistic wealth existing in our Spanish language, was it necessary to reuse the term triangulation in the context of research methodology, when, since the 4th century BC, there was a method coined with said term? [And furthermore...] the Latin prefix for quantity *tri*, etymologically means three, however in the practical application of triangulation, sometimes it operates without considering the semantics of the concept, with two, four or more elements (2019, pp. 143-144).

For Forni and De Grande (2020), methodological triangulation in social sciences can be applied in various ways. It´s possible to combine data obtained from different sources, to combine researchers, to combine theories, or to combine methods. Starting from the fact that every method is imperfect and has biases, the promoters of triangulation advocate complementarity: they affirm that by investigating the same variables or categories with both paradigms, the weaknesses and strengths of each methodological strategy complement each other. They say that triangulation seeks convergence and that the most influential text on triangulation in the Spanish language appears in the book by Forni, Gallart and Vasilachis, in the chapter written by María Antonia Gallart, titled "The integration of methods and qualitative methodology. A reflection from the practice of research". According to Forni and De Grande (2020), Gallart states that the decision about which methodologies should be applied in triangulation is made based on the research question. I hoped that this discussion of the relevance of the question would support my hypothesis that grounded theory cannot be used in mixed designs, because as an inductive method it doesn´t work with a pre-established theoretical paradigm; but in her chapter, Gallart doesn´t elaborate on the theoretical paradigms, but rather focuses on illustrating with practical examples of research carried out with mixed designs, how the various problems that arise when using these methodologies can be solved. And although she addresses the relevance of the research questions, she doesn´t use the word "triangulation." And on the other hand, she doesn´t refer to the research question with those words either, but from a more generic approach where she alludes to the triggering concerns of a study, calling them "concerns" (Gallart, 1993).

I find it relevant to highlight these issues, because it´s appreciated that mixed designs are multiple and diverse, and that their successful application depends more on the ingenuity and creativity of the researchers, and less on the fact that they can be kept in

the bag that respectively labels them with specific names such as "triangulation" or "mixed methods". Before becoming a researcher, my understanding of methodology experts led me to believe that the rigor of a study lies in the meticulousness with which the researcher applies the method with which he or she works. But when we face the investigative task, it turns out that each case is always different, and that the success of the study depends more on the insight and talent of the researcher than on the punctuality with which the fathers of the chosen method conscientiously described their procedures. For this reason, I insist that the crux of thinking about the compatibility of methods lies in the clarity with which is distinguished the inductive or deductive reasoning applied in research. If they are to be combined, it will be up to the researcher to determine the relevance and need for such combinations. I believe that this can help more to decide whether the methods and theories that are planned to be used in the same study are supported in terms of epistemological congruence, than trying to follow exactly what the promoters of the method say. At the end of the day, it´s always up to the experts to determine the quality and rigor of each scientific work.

Taking into account the very useful clarification provided by Feria and others (2019) that in triangulation there are not necessarily three elements that must be involved in a mixed study with this methodology, the known forms of triangulation, according to Forni and De Grande (2020), are:

a) Intra-method, where variations of the same qualitative or quantitative method are combined. I confess that I´m not sure what the authors mean by "variants of the *same method*" (italics are mine) because it´s normal for the same method to accept different strategies in data collection or analysis. However, if the study carried out by Cantor (2002) can be used as an example of this type of triangulation, then it means that the object of study that belongs to one field of knowledge is enriched with perspectives from other fields of knowledge. In the case of Cantor, his object of study involves the term insecurity in the dimension of the social sciences and was enriched with other approaches to the same term, from the perspectives of work, education, health, family, and other social networks. b) Inter-methods, where qualitative and quantitative procedures are combined.

c) Data, where data is collected with different strategies. This type of triangulation also confuses me because, as far as I know, it´s common for the same study to collect data with different techniques, so it´s nothing new for the data to be integrated with different strategies. In fact, I only know of one study conducted with data obtained from a single technique[1].

d) That of researchers, which refers to the integration of a team of researchers from different movements, who overcome "the biases that a solitary researcher would give to a certain project" (Forni and De Grande, 2020, page 167).

e) The theoretical, where perspectives are combined with the idea of complementing the data analysis, or of deciding which is the most appropriate approach.

Triangulation, and mixed designs in general, seek to fill the gaps presented by single-method research. Combining methods is supposed to strengthen the results of a study.

The concept of triangulation is foundational in the development of research projects that combine quantitative and qualitative methodologies [and its benignity is that it became an] "olive branch" in the hard days of the war of paradigms when researchers faced arduous disputes over the legitimacy or scientificity of the then emerging interpretive or hermeneutic paradigm in the social sciences (p. 167).

WHAT ARE MIXED METHODS?

Forni and De Grande (2020) recognize the difficulty of determining when and who started the tradition of the term mixed methods but consider that the publication in 1998 of the book *Mixed Methodology. Combining Qualitative and Quantitative Approaches*, by Tashakkori and Teddlie, citizenized the name. As the concept of triangulation eroded the hegemony of "single method purists" (p. 168), mixed methods encountered less resistance to incorporation into the scientific community.

For Creswell, in Forni and De Grande (2020), mixed methods have the advantage that allow the researched reality to be observed through combinations or mixtures of methodological paradigms and research techniques. Forni and De Grande affirm that Creswell is the main promoter and the most active disseminator of the movement who, in plain terms, describes mixed methods as the study where "the researcher gathers quantitative and qualitative data, integrates them and then makes interpretations based on combine the strengths of both" (p. 168). The central premise is that combined quantitative and qualitative approaches provide a better understanding of the research problems.

"Eclectic and plural" would be adjectives for mixed methods. Mendizabal (2018) published an article where he called them "bold," and in the English title they called them "daring". These ways of proceeding are not liked by many researchers, but their defenders assure that they can "answer complex research questions" (p. 7).

The main characteristics of the mixed method, according to Cresswell and Plano Clark, in Forni and De Grande (2020), are: 1) they persuasively and rigorously collect and analyze both qualitative and quantitative data that were collected prioritizing the research questions; 2) they mix, integrate or link the two types of data concurrently, combining or merging them sequentially, or

[1] I am referring to the doctoral thesis of María Fernanda Feria Lince, who did a hermeneutical study to analyze working conditions, with a corpus integrated with a single photograph and without any other data. (Feria Lince, M. (2018). Condiciones laborales vistas a través de la fotografía. Estudio de caso: Sebastião Salgado. (F. d. Sociales, Ed.) Ciudad de México, Ciudad Universitaria: Universidad Nacional Autónoma de México).

building one on top of the other, or by embedding; 3) they give priority to one or both types of data, depending on what each investigation seeks to emphasize; 4) use the above procedures in a single study or in multiple phases of a study (I understand this to mean that the procedures can be applied once or several times in the same investigation); 5) frame these procedures within philosophical worldviews and theoretical lenses; and 6) combine the procedures into specific research designs that direct the plan for conducting the study.

According to Mendizabal (2018), when mixed methods are used, theoretical, epistemological perspectives and points of view of qualitative and quantitative methods are combined, and he advises using them when it´s necessary to solve complex research problems, answer dense questions and achieve practical purposes. "The goal is to achieve greater understanding, confidence in the data, enrichment, validity, breadth and depth" (p. 5). This author assures that the basic condition of mixed methods is that the integration of data is carried out both in the analysis and in the interpretation; and she recognizes that, in part, the use of this methodology is based on triangulation, although with contributions to the design.

As can be expected, like triangulation, mixed methods have been criticized by single-method purists, but they have also been criticized by triangulation pragmatists themselves, who affirm that their method, triangulation, must be conformed to the framing of mixed methods. They remind me of the purists of positivist methods, who affirmed that qualitative methods should be focused on providing novelties in the collection of data that would later be analyzed and interpreted from a quantitative perspective.

As a conclusion to both methodologies, and before moving on to final reflections, in the next section I present a succinct outline of the differences that seem most visible to me between triangulation and mixed methods.

WHAT ARE THE DIFFERENCES BETWEEN TRIANGULATION AND MIXED METHODS?

Triangulation is a method that can be applied to a stage or element of an investigation. For example, in a study, there can be a combination of methods, a combination of data collected with different paradigms, a combination of researchers of different styles teaming up for the same study, or a combination of theories. On the other hand, mixed methods are applied to the entire study.

Triangulation, when a combination of methods is, can be done in two ways: the first is within the same method, for example, a triangulation of fields of knowledge that forms a more robust object of study because it draws on different disciplines. And the second is between methods, for example applying one method for a longitudinal analysis and another for a transversal analysis. When is data triangulation, statistical data and qualitative data, naturally collected with their respective strategies and techniques, can be incorporated into the study. On the other hand, mixed methods, since they cover the entire study, only present variations with respect to the final objective of the study. Among them, mixed methods for convergent, exploratory or explanatory studies are considered basic designs; however, when they are carried out for interventions, for social justice studies or for multi-stage evaluations, they are considered advanced designs.

These are in general terms the obvious differences that I find between both methods based on the authors mentioned. In the next section I´m going to refer to what I find common and, in my opinion, the most valuable of both methods.

RESEARCH QUESTIONS IN MIXED DESIGNS

Regardless of the differences between triangulation and mixed methods, what I find common between both methods, in addition to the obvious and preponderant fact that they belong to mixed research, is that they both privilege, above all the decisions that must be made when carrying out research and as a starting point for the study, to the research questions. This seems very valuable to me because, in my understanding of the genesis of an investigation, I consider that in the element or fact that triggers it, lies the type of logical reasoning that is going to be applied throughout the study -—inductive or deductive— and, consequently, the determination of the methodology to be applied. I share Tello´s (2011) consideration that the research question belongs to inductive logic, unlike the hypothesis investigations that belongs to the deductive reasoning. It means that when inductive paradigm methodologies are applied, the studies are carried out based on a research question, and for this reason, they don´t seek to verify knowledge, but rather to discover it. Except for Carvajal and others (2023), the authors I reviewed to write this text allude with little depth to the type of logical reasoning used in mixed designs, and all, following the exception, referred to the question as the triggering factor for the research, but no one said that a study with these methods cannot be done based on a hypothesis. Where am I going with these emphases? To the next:

If the research question, and not the hypothesis, indicates the path to be followed in the study, does this mean that the mixed designs known as triangulation and mixed methods are both inductive, even when combined with quantitative methods? My answer is that it would be understood that way, but the elements I use to affirm it aren´t solid enough and I cannot conclude from aspects that the authors mention without sufficient specificity in their articles. Pages ago I pointed out that Gallart (1993) in his chapter referred to the triggering questions as "questions", while Forni and De Grande (2020) paraphrased it with the term "research questions", so it may well be the case that the authors don´t worry about calling with one term or another the phrasing or set of phrasings that is/are proposed as a trigger element/s at the beginning of an investigation, whether these are concerns, research questions, or hypotheses.

The faint touches that I can show to emphasize inductive logic are in the quote from Feria et al. (2019), which appears pages ago: "Triangulation […] as the method […] that allows, through an inductive inferential process, to objectify information collected with other methods". But here these authors don´t claim that triangulation is inductive, but rather that the integration of the methods involved in triangulation is carried out inductively.

Carvajal and others (2023) don´t accentuate the emphasis of the other authors reviewed here, regarding the relevance of the research question as the factor that determines the strategies and procedures to be incorporated. For these authors, it´s the theory that indicates the paradigm under which the research will be carried out:

If the research is carried out under an inductive approach and the theory developed is under a qualitative inquiry and complemented by the quantitative method, the resulting methodological triangulation will be simultaneous while, on the other hand, if the research developed is deductive *a priori* and the quantitative method can be complemented by the qualitative method, sequential triangulation would be addressed (p. 48).

But if we take this as the criterion to define the direction at the beginning of a research, wouldn't we be imposing a paradigm on a research question and on a research object that haven´t been determined yet?

In my working hypothesis I stated that grounded theory, because it´s an inductive method, cannot be applied with mixed designs, because these methods combine quantitative paradigms that are always deductive and that, when incorporated into a study, bring their philosophical paradigm that superimposes an understanding of the universe to a universe that we want to understand without paradigms. However, no author stated that it´s mandatory, in the case of mixed designs, that quantitative understanding of the world necessarily must be incorporated into mixed research. I´m saying that I believe that it would be possible to use grounded theory in mixed research if the incorporated quantitative method only carries its data. Perhaps it´s possible that all combination options involving an inductive method with an inductive paradigm, and inductive data collection, and inductive analysis, and inductive interpretation, can be invited to grounded theory. And how karmic that now with mixed designs interested in preserving inductive reasoning, quantitative methods can only be called upon to provide their techniques for collecting data and comparing them, without intervening in the interpretation carried out from the qualitative perspective.

ARE MIXED DESIGNS NECESSARY IN THE SOCIAL SCIENCES?

To conclude, I answer the question of whether mixed qualitative and quantitative designs are necessary in the social sciences. My answer, as a fan of grounded theory, is that we need mixed inductive designs, because only with them are discoveries made, while deductive ones only verify theories.

I didn't think triangulation was a very innovative methodology. I don´t find anything new about inter-method and data triangulation. I say this accepting that I probably haven´t understood them well, because I wrote this text with a very small bibliography. As I understood it, what happens is that there are forms of triangulation that are applied in practically all qualitative studies, but that before Webb hadn´t been called in any way.

On the other hand, the mixed methods did seem quite innovative to me. If there´s a strategy that will provide strengths to our study and we can have it, we are obliged to use it.

I once asked a computer-savvy friend why I had to upgrade my computer if, as it was, I was using it satisfactorily and had gotten used to all its features. His response was: "The criterion is always to choose the latest technology." At first, I thought what he told me was commercial, and when I upgraded my equipment, I immediately regretted doing so. But with use I discovered its new functions, I appreciated them, and I got used to taking advantage of them. Today I know that if I hadn´t made the effort to learn to use the new tools, I would have been amazed and each advance in technology would have meant delay and suffering. Therefore, the correct question would not be whether mixed designs in the social sciences are necessary or not but, rather, if in some way, due to the fact that we are professors, social researchers are going to assume a responsibility both with students and with science, regarding putting into practice novel ways of doing research, whose experiences can also be useful to other researchers, and which can contribute to the democratization of science, in the sense that these methods incorporate and accept diverse paradigms. So, the answer is: "definitely yes: there are cases in which we must apply mixed designs." Of course, the latter, as long as the research question indicates that direction as the most pertinent.

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