

# Triangulation

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Triangulation refers to the application and combination of several research methodologies in the study of the same phenomenon. The concept of triangulation, understood as in the action of drawing a triangle, may be traced back to the Greeks and the origins of modern geometry. Introduced in the social sciences in the 1950s (Campbell and Fiske, 1959), then heavily criticized in the 1980s (see Silverman, 1985; Lincoln and Guba, 1985; Guba and Lincoln, 1989) and in the 1990s (Flick, 2004, 2007), triangulation is a postpositivist methodological strategy. It has recently returned to favor, as a new generation of scholars is drawn to a mixed, or multimethod, approach to social inquiry (Teddle and Tashakkori, 2003; Creswell, 2011). When the term was introduced in the social sciences, the method designated by it functioned as a bridge between quantitative and qualitative epistemologies. It was seen as a way of helping qualitative researchers become more rigorous, perhaps by allowing them to address a methodological inferiority associated with “a kind of stepchild complex” (Kamberelis and Dimitriadis, 2004: 2). Advocates of mixed-methods research argue that it allows them to answer questions that other methodologies, taken singly, cannot. Further, it provides “better inferences based on a greater diversity of divergent views” (Teddle and Tashakkori, 2003: 14–15).

The use of multiple methods in an investigation with a view to overcoming the weaknesses or biases of a single method is sometimes called multiple operationalism. Indeed, in the social sciences, triangulation has become a metaphor for methodological integration of the postpositivist variety. The metaphor evokes multiple meanings, according to which triangulation can be (1) a synonym for mixed-method, multimethod, or mixed-model designs (Teddle and Tashakkori, 2003: 11, 14); (2) a method of validation; (3) an integration of different mixed-methods

approaches; (4) a way to combine quantitative and qualitative methodologies in the same study (Erzberger and Kelle, 2003).

However, the history of the term, its uses, and its meanings is not without contradictions (Denzin, 2012). For example, some distinguish triangulation from those kinds of multiple-method research that are informed by poststructuralism and cultural studies (Richardson, 2000). In such projects “there are multiple standards for understanding the social world (epistemological relativism) ... therefore diversity and contradictions should be incorporated within research accounts” (Spicer, 2004: 298; see also Denzin, 1989: 246). In contrast, Saukko (2003: 23) observes that the “classical aim of triangulation is to combine different kinds of material or methods to see whether they corroborate one another.”

## Need for Triangulation

Qualitative research is inherently multimethod in focus. However, triangulation – the use of multiple methods – reflects an attempt to secure an in-depth understanding of the phenomenon in question. Objective reality can never be captured. We only know a thing through its representations. Viewed thusly, critical or interpretive triangulation is not a tool or a strategy of validation, but an alternative to validation. The combination of multiple methodological practices, empirical materials, perspectives, and observers in a single study is best understood as a strategy that adds authenticity, trustworthiness, credibility, rigor, breadth, complexity, richness, and depth to any inquiry.

The social sciences, to varying degrees, use the following research methods and strategies: social surveys, experiments and quasi-experiments, participant observation, critical performance ethnography, interviewing, case-study and life-history construction, grounded theory, action inquiry, testimony, and unobtrusive methods such as use of archival materials, visual methods,

autoethnography, focus groups, and discourse analysis. Each of these methods and strategies has inherent weaknesses, which range from an inability to enter realistically into the subject's lifeworld in experiments and surveys to the problem of reflecting change and process in unobtrusive methods, to attention to rival interpretive factors in participant observation, and to an excessive reliance on paper-and-pencil techniques in surveys and interviewing.

The realities to which sociological methods are fitted are not fixed. The social world is socially constructed and its meanings to both observers and those observed are constantly changing. As a consequence, no single research method will ever capture all of the changing features of the social world under study. Each research method involves a different interpretation of the world and suggests different lines of action that the observer may take toward the research process. The meanings of methods are constantly changing, and each investigator brings different interpretations to bear upon the very research methods that are utilized. For those reasons, a productive search for sound interpretations of the social world employs triangulation strategies.

### Hermeneutics of Interpretation

What is sought in triangulation is an interpretation that illuminates and reveals the subject matter in a thickly contextualized manner. A triangulated interpretation reflects the phenomenon as a process that is relational and interactive. The interpretation engulfs the subject matter, incorporating all the understandings that the researcher's diverse methods reveal about the phenomenon.

A hermeneutic interpretation does not remove the investigators from the study, but rather places them directly in the circle of interpretation. While it is commonplace in the social sciences to place the investigator outside the interpretive process, and hence to ask the research methods to produce the interpretation that is being sought, hermeneutic interpretation states that the circle of interpretation can never be avoided but must be entered the right way. Triangulation is the appropriate way of entering the circle of interpretation. The researcher is part of the interpretation.

### Types and Strategies of Triangulation

While it is commonly assumed that triangulation is the use of multiple methods in the study of the same phenomenon, this is only one form of the strategy. There are four basic types of triangulation: (1) data triangulation, which involves time, space, and persons; (2) investigator triangulation, which consists of the use of multiple rather than single observers; (3) theory triangulation, which consists of using more than one theoretical scheme in the interpretation of a phenomenon; (4) methodological triangulation, which involves using more than one method and may adopt within-method or between-method strategies. There is also multiple triangulation, whereby the researcher combines in one investigation several observers, theoretical perspectives, data sources, and methodologies. Additional types of triangulation have been identified, for example, those labeled reflexive, structural, and multipurpose.

Critical or interpretive triangulation can be viewed as an alternative or incitement to traditional postpositivist forms of validation. Interpretive triangulation opens the space for conversations about how a text authorizes or legitimizes itself through the use of multiple voices and representational forms. These forms may act as catalysts to transgressive validities and to a politics of resistance (Lather, 1993).

### Problems in Designing Multiple Triangulated Investigations

There are at least four basic problems to be confronted in carrying out multiple triangulated research. These are (1) locating a common subject of analysis to which multiple methods, observers, and theories can be applied; (2) reconciling discrepant findings and interpretations; (3) novelty, or the location of a problem that has not been investigated before; and (4) restrictions of time and money.

The location of a common subject of analysis can only be resolved through a clear understanding of the question the investigator wishes to answer. Divergent and discrepant findings are to be expected. Each inspection of the phenomenon is likely to yield different pictures, images, and

findings. Novel or new problems are often, upon inspection, not new, but merely manifestations of familiar topics, previously examined from different perspectives and with questions in mind. Restrictions of time and money are the least problematic ones; for, if investigators are thoroughly committed to understanding a problem area, they will persist in examining it even under difficult circumstances.

### Criticisms of Triangulation

It must be noted that the method of triangulation is not without its critics. Several criticisms have been brought to bear upon the traditional treatments of the triangulation strategy.

#### *Data Triangulation*

Silverman (1985) has argued that a positivistic bias underlies the triangulation position and that this is most evident in the concept of data triangulation. He argued that a hypothesis-testing orientation is present when authors argue that hypotheses that survive multiple tests have greater validity than those subjected to just one test. He also suggested that to assume that the same empirical unit can be measured more than once is inconsistent with the interactionist view of emergence and novelty in the field situation. If, as Silverman argued, all social action is situated and unique, then the same unit, behavior, or experience can never be observed twice. Each occurrence is unique. Patton (1980: 331) has correctly noted that the comparison of multiple data sources will “seldom lead to a single, totally consistent picture. It is best not to expect everything to turn out the same.”

#### *Investigator Triangulation*

No two investigators ever observe the same phenomenon in exactly the same way. Guba and Lincoln (1989: 307) suggest that it is a mistake to “expect corroboration of one investigator by another.” The argument that greater reliability of observations can be obtained by using more than one observer is thus indefensible. This does not mean, however, that multiple observers or investigators should not be used. Douglas (1976) has

suggested that team research (a term similar to that of multiple observers) allows an investigator to gain multiple perspectives on a social situation. Members of a research team have a multiplying effect on the research: each one adds more than just his or her presence to the knowledge that is gained about the situation under study.

#### *Theory Triangulation*

If facts are theory-determined, then theoretical triangulation consists of using more than one theoretical scheme to interpret the phenomenon at hand. Seen thusly, this form of triangulation helps reveal complexity. However, Lincoln and Guba (1985: 307) argue: “The use of multiple theories as a triangulation technique seems to us to be both epistemologically unsound and empirically empty.” They base this conclusion on the argument that facts are theory-determined. Theoretical triangulation simply asks the researcher to be aware of the multiple ways in which the phenomenon may be interpreted. It does not demand that facts be consistent with two or more theories.

#### *Methodological Triangulation*

This strategy takes the position that single-method studies are no longer defensible in the social sciences. The researcher who uses different methods should not expect findings generated by these different methods to fall into a coherent picture. They will not; for each method yields a different picture and a different slice of reality. What is critical is that different pictures be allowed to emerge. Methodological triangulation allows this to happen.

#### *Multiple Triangulation*

Fielding and Fielding (1986) offered a critical interpretation of this strategy, arguing that, for research methods, multiple triangulation is the equivalent of correlation in data analysis. They both represent extreme forms of eclecticism. Further, they suggest that theoretic triangulation does not reduce bias, nor does methodological triangulation necessarily increase validity. If there is a case for triangulation, this is because we should combine theories and methods carefully

and purposefully, with the intention of adding breadth or depth to our analysis, but not for the purpose of pursuing “objective truth.”

The goal of multiple triangulation is a fully grounded interpretive research approach. Objective reality will never be captured. In-depth understanding, not validity, is sought in any interpretive study. Multiple triangulation should never be eclectic. It cannot, however, be meaningfully compared to correlation analysis as used in statistical studies.

### Alternative Validities

It is now understood that there are multiple forms of validity – that is, many different ways of authorizing a text and its arguments (Lather, 1993; Saukko, 2003: 18). These ways supplement, if not replace, triangulation as a preferred strategy of validation. Saukko (2003: 19–22) reviews three alternative validities. Dialogic validity asks how well a text captures the point of view of the person under study. Deconstructive validity addresses a text’s historicity, its hidden politics, and its underlying binary oppositions. Contextual validity asks how a text anchors itself in material reality, in concrete historical contexts, in the political economy of daily life. Each of these validities problematizes the positivist concept of a single truth. This opens the door for considering different ways of extending the logic of classic postpositivist triangulation.

### Alternative Paradigms for Combining Methodologies

Richardson (2000) disputes the concept of triangulation, asserting that the central image for qualitative inquiry is the crystal or the prism, and not the triangle. Mixed-genre texts, including performance texts, have more than three sides. Like crystals, montage in film, the jazz solo, or the pieces in a quilt, the mixed-genre text can assume an infinite variety of shapes, substances, and transmutations. Crystals or prisms reflect externalities. They refract within themselves. This creates different colors and patterns, casting off in different directions.

Saukko, building on Richardson (2000), also challenges the classic postpositivist model of triangulation, because the model presupposes a fixed or semi-fixed view of reality and a representation of methods as magnifying glasses that reflect or reveal this reality. The notion of prism works well with dialogic and deconstructive validity. Like the prism, these validities draw attention to the multiple ways reality is constructed. Classic triangulation disappears under the prism model. Still, with its emphasis on fluid reality, the prism model gives too little attention to history and social context. Thus Saukko advances a material-semiotic perspective. This model looks at how material reality defracts rather than refracts vision. A defraction model shows how research is a material practice that “alters or creates reality” (Saukko, 2003: 27). This visual defraction model is then compared to a participatory, dialogic model where multiple dialogues between multiple realities are created and encouraged. A dialogic framework attunes the researcher to the many different voices at work in a concrete situation. The scholar seeks out and incorporates multiple points of view in the research. This expands the egalitarian base of the project and enhances its claims to strong objectivity – that is, to the commitment to take multiple perspectives into account (2003: 29).

### The Incompatibility Thesis

The incompatibility thesis disputes the key claim of triangulation, namely that methods and perspectives can be combined. The incompatibility thesis argues that “compatibility between quantitative and qualitative methods is impossible due to incompatibility of the paradigms that underlie the methods” (Teddle and Tashakkori, 2003: 14–15). The incompatibility argument potentially discredits triangulation as a research strategy. On this scenario, researchers who try to combine methods that are incompatible “are doomed to failure due to the inherent differences in the philosophies underlying them” (2003: 19). Others disagree with this conclusion, and some contend that the incompatibility thesis has been largely discredited because researchers have demonstrated that it is possible to successfully use a mixed-methods approach.

There are several schools of thought on this thesis, including the four identified by Teddlie and Tashakkori: (1) the complementary strengths, mixed-methods model; (2) the single-paradigm mixed-methods model; (3) the dialectical mixed-methods model; and (4) the multiple-paradigm mixed-methods model.

Researchers using the complementary strengths, mixed-methods model believe that the use of mixed methods is possible, but that the methods and their findings must be kept separate, so that the strengths of each paradigm are maintained. Others argue that methods can be mixed, because the paradigms are not pure anyway. In contrast, Morse (2003) warns that ad hoc mixing of methods can be a serious threat to validity. Single-paradigm scholars (model 2) seek one paradigm to support their methodological preferences and critiques, for example connecting constructivism and qualitative methods. Pragmatists and transformative emancipatory action researchers posit a link between their model and mixed methods (Teddlie and Tashakkori, 2003: 20). Adherents of model (3), the dialectical model, assume that all paradigms (and methodologies) have something to offer and “that the use of multiple paradigms contributes to greater understanding” (Teddlie and Tashakkori, 2003: 22). Scholars in this group work back and forth between a variety of tension points such as etic–emic, or value neutrality–value commitment.

In model (4), the multiple-paradigm mixed-methods model, several paradigms and mixed methods models are combined. It is argued that no single paradigm can apply to all designs or methods; that is, particular paradigms may work best with particular epistemologies and methodologies. “Several paradigms may serve as the framework for a triangulation design” (Teddlie and Tashakkori, 2003: 23). The multiple paradigm position acknowledges the fact that a complex, interconnected family of terms, concepts, and assumptions surrounds the concept of “qualitative research.” These include the traditions associated with postpositivism, postfoundationalism, post-structuralism, and the many qualitative research perspectives and methods connected to cultural and interpretive studies.

Clearly, multiple frameworks and understandings circulate in the discourses that define how

multimethod approaches are to be taken up at this time in history.

## Conclusion

Over the past four decades the discourse on triangulation, multiple operationalism, and mixed-method models has become quite complex and nuanced. This entry has attempted to present some of this complexity, some of its history. This is not a neat, linear history. Each decade has taken up triangulation and redefined it to meet perceived needs. The very term “triangulation” is unsettling and unruly. It disrupts and threatens the belief that reality can ever be fully captured or faithfully represented in all its complexity.

Drawing again from Saukko (2003: 32), bringing these different views of triangulation and multiperspectival research into play with one another, “holding them in creative tension with one another ... cultivates multidimensional research and politics.” There is no intention of arriving at a final, correct, enlightened view. The goal of multiple or critical triangulation is a fully grounded interpretive research project with an egalitarian base. Objective reality will never be captured. In-depth understanding, the use of multiple validities, not a single validity, and a commitment to dialogue and strong objectivity are sought in any interpretive study.

SEE ALSO: Methods, Mixed; Validity, Qualitative.

## References

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- Campbell, D.T. and Fiske, D.W. (1959) Convergent and discriminant validation by the multitrait–multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Creswell, J.W. (2011) Controversies in mixed methods research, in *Handbook of Qualitative Research* (ed. N.K. Denzin and Y.S. Lincoln), 4th edn, SAGE, Thousand Oaks, CA, pp. 269–284.
- Denzin, N.K. (1989) *The Research Act: A Theoretical Introduction to Sociological Methods*, 3rd edn, Prentice Hall, Englewood Cliffs, NJ.
- Denzin, N.K. (2012) Triangulation 20. *Journal of Mixed Methods*, 6, 80–88.

- Douglas, J.D. (1976) *Investigative Social Research: Individual and Team Field Research*, SAGE, Beverly Hills, CA.
- Erzberger, C. and Kelle, U. (2003) Making inferences in mixed methods: the rules of integration, in *Handbook of Mixed Methods in Social and Behavioral Research* (ed. A. Tashakkori and C. Teddlie), SAGE, Thousand Oaks, CA, pp. 457–488.
- Fielding, N.G. and Fielding, J.L. (1986) *Linking Data*, SAGE, Beverly Hills, CA.
- Flick, U. (2004) Triangulation in qualitative research, in *A Companion to Qualitative Research* (ed. U. Flick, E. von Kardoff, and I. Steinke), SAGE, London, pp. 178–183.
- Flick, U. (2007) *Designing Qualitative Research*, SAGE, London.
- Guba, E.G. and Lincoln, Y.S. (1989) *Fourth Generation Evaluation*, SAGE, Newbury Park, CA.
- Kamberelis, G. and Dimitriadis, G. (2004) *Qualitative Inquiry: Approaches to Language and Literacy Research*, Teachers College Press, New York.
- Lather, P. (1993) Fertile obsessions: validity after post-structuralism. *Sociological Quarterly* 34 (4), 673–693.
- Lincoln, Y.S. and Guba, E.G. (1985) *Naturalistic Inquiry*, SAGE, Beverly Hills, CA.
- Morse, J.M. (2003) Principles of mixed methods and multimethod research design, in *Handbook of Mixed Methods in Social and Behavioral Research* (A. Tashakkori and C. Teddlie), SAGE, Thousand Oaks, CA, pp. 189–208.
- Patton, M.Q. (1980) *Qualitative Evaluation Methods*, SAGE, Beverly Hills, CA.
- Richardson, L. (2000) Writing: a method of inquiry, in *Handbook of Qualitative Research* (ed. N.K. Denzin and Y.S. Lincoln), 2nd edn, SAGE, Thousand Oaks, CA, pp. 923–948.
- Saukko, P. (2003) *Doing Research in Cultural Studies: An Introduction to Classical and New Methodological Approaches*, SAGE, London.
- Silverman, D. (1985) *Qualitative Methodology and Sociology: Describing the Social World*, Gower, Brookfield, VT.
- Spicer, N. (2004) Combining qualitative and quantitative methods, in *Researching Society and Culture* (ed. C. Seale), 2nd edn, SAGE, London, pp. 293–304.
- Teddlie, C. and Tashakkori, A. (2003) Major issues and controversies in the use of mixed methods in the social and behavioral sciences, in *Handbook of Mixed Methods in Social and Behavioral Research* (ed. A. Tashakkori and C. Teddlie), SAGE, Thousand Oaks, CA, pp. 3–50.