Beyond Data Triangulation: Visualization of the Invisible in Sociological Research Report Writing

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ABSTRACT

This paper aimed to explores the use of visualization techniques to represent and analyse sociological data by making them more understandable in report writing. Utilizing content analysis drawing from other studies and secondary sources of data. The paper argued that triangulation helps the researcher to arrive at the understanding of relationships of cause and effect of all social phenomena. Visual sociology increases validity of data through several viewpoints in the process. The paper further posits that visualization help in transmission of information to key audiences through pictures and other forms of visual art, television broadcasts, billboards, videos/films, animation and live performances. This further demonstrate the advantage of visual sociology in the technological world. The various forms of new media source for visual reporting such as slideshow presentations, uploaded videos, for effectiveness to convey intended messages. The paper concludes that all the existing tools of social research have advantages and disadvantages. Each method contains its strength and weakness. No single one proves all the required ideals. Therefore, it is useful to triangulate and employ visualization of the invisible in sociological research report writing in order to complement the weaknesses of other methods so as to have a holistic view of sociological realities. The paper recommends among others that, sociological researchers (in this era) should go beyond the conventional dependence on textual and statistical data by incorporating visual methods such as photography, mapping, film, and digital imagery as legitimate tools of inquiry and interpretation of sociological reporting and writing.

INTRODUCTION

Like in every discipline sociology has its own protocol and methods of conducting social research. Many of these methods are shared with other disciplines, while others are more domesticated in sociology (Alubo 2012). The goal of sociological research, is to explain any aspect of society or social action which has formulated the research problem (Igbo 2011). The goal is to achieve a causal understanding of the relationships between and among social phenomena. However, it is not an easy task for sociologists to isolate or distinguish cause from effect, nor to determine which social variable serves as the cause and which as the effect, given the complexity of social life (Igbo 2011). The problem of establishing cause and effect relationship is further made complex on many occasions sociologists find that a given effect may be associated with many causes rather than one. In trying to understand this fact, we see that every moment of human life whether indoors or outdoors our eyes are flooded with many kinds of information. This information must be sorted and simplified at the same time to make meaningful sense of it (Rishante 2007). For instance, walking down on any street

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in any place, any number of varying information could have revealed within the human eye view: tree moving, automobiles, group of people dressed in symbolic outfits, sign board planted at the centre of roundabout, large commercial billboard advertising particular product or some other products and some strange objects one cannot identify from distance. Over the past decades, sociology has mainly relied on written texts and statistical data to explain social life. However, as technology has advanced and social life has become more complex in the digital era, there is now a need to include visual methods to complement the traditional approaches used in the past.

It is in recognition of this fact that in recent times, visual sociology has gained prominence as vital methodological approach in social sciences. It involves the systematic use of visual materials as both data and mode of presentation to analyze and communicate socio-cultural phenomena (Harper, 2022). Visual sociology transcends mere illustration, it provides the epistemic lens through which researchers capture the complex interplay between people, symbols, spaces and imagines. Within the context of methodological triangulation, visual methods serve as integrative tool that complements quantitative and qualitative approaches, thereby enhancing the robustness and credibility of sociological inquiry (Pink, 2021). The significance of visual data becomes even more pronounced in sociological report writing, where visualization assists in simplifying complex narratives and conveying abstract concepts with greater immediacy (Knowles et al., 2020). As such the digital revolution reshapes sociological practices, incorporating visual dimensions in both data collection and reporting is no longer optional but very imperative.

Over the past decades, sociology has mainly relied on written texts and statistical data to explain social life. However, as technology has advanced and social life has become more complex in the digital era, there is now a need to include visual methods to complement the traditional approaches used in the past. A few early texts such as Frederic Thrasher's The Gang (1927) used photographs to illustrate research, but in the main sociologists tended to ignore visual images. This was not true of all other social scientists; for instance, many anthropologists worked with visual images and film to great effect, as in Margaret Mead and Gregory Bateson's Balinese culture (1942). The documentary film has proved invaluable to social historians (Scott & Marshall, 2005). Recently, a new branch of sociology called visual sociology has grown and become more popular. Much of it uses photography (increasingly video and film) as research tool to facilitate the gathering of data. Alternatively, visual images may be used as data in their own right, usually as part of sociological study of culture, in which firm and other artefacts may be examined, often with the aid of semiotics. Thus, visual sociology has evolved as a formidable methodological orientation within the broader sociological enterprise, emphasizing the interpretive potential of visual imagery in decoding social realities

It is in line with the foregoing background, this paper aims to evaluates beyond data triangulation: visualization of the invisible in social research report writing.

CONCEPTUAL CLARIFICATIONS
Triangulation
The concept of triangulation originates from the analogy of a triangle (Decrop, 1999). It refers to the process of examining a single point or phenomenon from multiple independent perspectives (Donkoh et al., 2023). The term itself was first derived from navigation, where it is used to determine an exact location by measuring the angles between two known reference points (Heale & Forbes, 2013). In essence, triangulation is borrowed from the mathematical field of trigonometry, in which it represents a method for identifying the position of points using the laws of trigonometry (Donkoh et al., 2023). In both mathematics and navigation, triangulation is widely applied in land surveying to pinpoint a specific location through measurements taken from two or more fixed sites. Within research, however, triangulation has taken on a broader meaning it refers to developing a comprehensive understanding of a phenomenon by integrating quantitative, qualitative, and other multiple research methods or data sources (Vivek et al., 2023).

According to Thurmond (2001), the term triangulation etymologically derives from the process of using trigonometric principles to determine an unknown point or event based on two fixed points separated by a known distance. Kimchi et al. (1991) define triangulation as the combination of two or more data sources, investigators, methodological approaches, or theoretical perspectives within a single study. Similarly, Thurmond (2001) describes triangulation as the use of multiple types of data within the same research process. Briller et al. (2008) emphasize that triangulation has its roots in the discipline of surveying, which relies on comparative measurements to accurately establish boundaries and spatial dimensions. Historically, it was first employed by positivist researchers as a means of confirming study findings and ensuring accuracy.

Over time, the concept has been successfully adapted into the social sciences. Oppermann (2000) notes that social scientists adopted triangulation to describe how employing multiple research approaches can help investigators converge more precisely on the desired information. Turner et al. (2009) define triangulation in social science research as the process of exploring a social phenomenon by drawing on data from varied and independent sources. Likewise, Greene et al. (1985) conceptualize triangulation as the integration of multiple theories, data sets, methodologies, and observers to

examine a single phenomenon. Denzin, (2021) maintain that triangulation in social research refers to the combination of multiple data sources, methods, or theoretical perspectives to validate findings.

Heale *et al.* (2013) link triangulation to research methodology and design, defining it as the use of different approaches to answer research questions or test hypotheses. In this regard, triangulation entails employing multiple theories, data sources, methods, or investigators in the exploration of a single issue. Denzin (1978) identifies four principal forms of triangulation: data triangulation, investigator triangulation, theoretical triangulation, and methodological triangulation. Triangulation is frequently associated with studies that combine both quantitative and qualitative methods of data collection and analysis. At its core, it involves examining a single phenomenon from multiple perspectives drawing upon diverse data sources, theoretical frameworks, methodological strategies, and researchers. The information obtained through triangulation serves to corroborate, deepen, and clarify the research problem, thereby reducing methodological and personal biases while strengthening the validity, reliability, and generalizability of research findings.

Visualization

Visual sociology refers to the systematic use of visual materials such as photographs, films, drawings, and digital imagery in both the generation and presentation of sociological knowledge. In its broadest sense, visual sociology encompasses any branch of sociology that appeals to the sense of sight as a means of understanding social phenomena. It relies primarily on vision as the sensory medium through which observations are interpreted or decoded (Rishante, 2007). Essentially, visual sociology involves the study and interpretation of conventional and unconventional signs and symbols. A *sign* is anything that indicates or suggests the presence of something else. The something implied by a sign may represent an idea, a situation, a condition, or a tangible object. For instance, a footprint may signify that a person has passed through a particular area, while an elevated body temperature serves as a sign of possible metabolic dysfunction. However, it is important to note that signs are merely indicators or symptoms; they should not be regarded as definitive scientific evidence. For example, a footprint may appear to suggest human presence, yet it could just as easily have been a drawing or an artificial impression. Thus, in visual sociology, signs and symbols are interpreted contextually and critically to avoid erroneous assumptions about the phenomena they represent.

Report Writing

Report writing refers to the systematic process of documenting findings, facts, and recommendations in a structured, coherent, and objective manner for a specific audience. A report is a nonfictional document designed to organize and present factual information on a particular topic, issue, or event, often aimed at informing readers who may be unfamiliar with the subject matter. There are various forms of reports academic, business, scientific, and technical each serving distinct purposes and audiences, and characterized by specific formats and writing styles. Effective report writing requires careful attention to organization, logical flow, and clarity. This is often achieved through the use of well-defined headings and subheadings, adherence to established formatting guidelines, and alignment with the expectations of the target audience. Reports serve as an efficient medium for communicating facts, analyses, and insights on a given subject. However, developing strong report-writing skills can be challenging without proper understanding of structure and conventions. Effective use of images, charts, maps, and infographics increases the comprehensibility of research outcomes, particularly for interdisciplinary or non-specialist audiences (Banks *et al.*, 2021). Visual integration also fosters narrative coherence and improves the aesthetic quality of academic reporting. Therefore, mastering the essentials of report writing including appropriate formatting, structural coherence, and best practices enables the writer to produce clear, credible, and persuasive reports that effectively convey information and support informed decision-making. In sociological report writing, visuals function as communicative devices that translate abstract ideas into accessible representations.

METHODOLOGY

This paper is strictly is a theoretical based in nature utilizing content analysis. Drawing from other existing studies from other organizations and secondary sources of information such as journal articles, books, conference papers and reports from the media as a basis for analysis against the existing literature and experiences. Therefore, the paper is basically descriptive based on observation and data taken from the above-mentioned sources.

DISCUSSION OF FINDINGS
Significance of Visual Sociology in Triangulation and Report Writing

Research plays a crucial role in the process of design. A designer must acquire as much knowledge as possible about the target audience or users to ensure that the design outcome is purposeful and effective. Successful design cannot be based on personal assumptions; rather, it must be grounded in evidence and understanding derived from systematic inquiry. The appropriateness of a visual communication product lies in its suitability for its intended purpose. An inappropriate use of visual language may evoke unintended or adverse reactions from the

audience. The adage a picture is worth a thousand words aptly captures the value of visual sociology as both an academic pursuit and a professional field. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), Framework for Cultural Statistics FCS 2010), visuals hold significance because they add meaningful context to messages, are often easier to recall than words, stimulate imagination, and foster shared experiences among viewers. Visual sociology involves the transmission of information to audiences through visual media such as photographs, films, drawings, animation, billboards, television broadcasts, and live performances. With the continuous advancement of technology, new forms of media such as digital slideshows, uploaded videos, and interactive content have expanded the scope and relevance of visual sociology in effectively communicating intended messages.

Gandu (2011) asserts that sociology employs the visual as a supplementary method alongside other conventional techniques of data collection. However, the use of visual materials in research introduces complex issues, such as the visual credibility gap. Goldstein (2007) observes, that photographs may not inherently lie, but manipulated by those who take or edit them. Similarly, Akpan (2005) cautions that the decision to employ visual sociology in research should not rest on the outdated assumption that photographs never lie, since digital technologies have made it possible to alter images easily. The intent behind using visual methods in sociological research, therefore, is not to distort reality but to complement other qualitative approaches, enhancing the richness and depth of data collection. According to Akpan (2005), photographs serve as valuable tools for readers or audiences unfamiliar with the study area, helping them visualize and understand contextual realities. Nevertheless, detecting inaccuracies in images is challenging, as visual representations often resist quantifiable evaluation (Goldstein, 2007). The essential principle, therefore, is that image production and interpretation should adhere closely to scientific and ethical standards. The cultural context within which image is produced, presented, and interpreted play's crucial role in shaping its meaning and significance. Campion (2007) notes that photography, though relatively young as a medium, has undergone a complex evolution since its invention in 1840. He further traces the origins of visual sociology to its roots in social documentary photography. Ball *et al.,* (1992) acknowledge Georg Simmel (1921) as one of the earliest social scientists to examine the sociological implications of visual imagery and human visual perception. They argue that among the five human senses, sight possesses a particularly sociological function.

Visual anthropology is a research method that studies the visual aspects of societies. It is based on the idea that cultures have strong visual elements, which can be recorded through drawings, photographs, films, and videos (Jary *et al.,* 2005). Visual images thus, serve as a medium through which individuals interpret and make sense of both their social and physical environments. Rishante (2007) explains, visual communication provides mechanisms for people to cope with the overwhelming influx of information in modern society. Although visual problems or data may initially seem abstract, visual images help clarify their meanings and sociological relevance. They reveal the extent to which social problems affect people and communities and provide insight into practical interventions aimed at addressing those problems. Through observation, documentation, photography, videography, and critical analysis, visual sociology offers a methodological approach to studying social behaviour and social reality. The objective of science is to discover, describe, explain, and where possible control phenomena. In contrast, the goal of social science is to observe, verify, and interpret social behaviour and relationships. Social scientists operate through observation, experience, and theoretical reflection, employing systematic methodologies to generate understanding. However, unlike the natural sciences, social phenomena are influenced by numerous variables that cannot be measured or replicated with absolute precision.

In natural science, a researcher's findings are validated when another scientist can reproduce the same results under identical experimental conditions. Such replication is rarely possible in the social sciences, as social research occurs in dynamic, real-world settings that cannot be perfectly reproduced over time and space. Young (1968) observes social research as a scientific endeavor that, through logical methods, seeks to discover new facts or reinterpret existing ones by analyzing their sequences, interrelationships, causal connections, and governing principles. Since social research often relies on a single method, which may be limited in scope or application, the use of multiple methods enhances credibility and confidence in research outcomes. This methodological pluralism forms the foundation of triangulation a principle widely advocated in social science research.

On this basis, the integration of visual sociology within triangulation and research report writing represents a valuable innovation in contemporary social inquiry. It enriches the research process by combining visual, textual, and theoretical dimensions to produce deeper, more holistic insights into social reality. Unlike traditional sociology, which relies heavily on textual representation, visual sociology emphasizes *seeing as knowing*, the vision is central to understanding the social world (Knowles, 2020). Visual data not only supplement textual narratives but also uncover layers of meaning often inaccessible through interviews or surveys alone. Visual sociology enhances triangulation by integrating visual evidence

alongside qualitative interviews, focus groups, and quantitative surveys. This integration strengthens data credibility by providing multi-sensory corroboration (Flick, 2023). In ethnographic fieldwork, photographs and video recordings serve as visual field notes that enrich textual observations. Such visual records capture emotional expressions, spatial arrangements, and environmental contexts that written narratives may overlook. Rose (2022) notes that visual data not only add depth to the interpretative process but also reveal contradictions that lead to more reflexive and authentic conclusions. Thus, visual sociology operates as both methodological and epistemological enhancement of triangulation, ensuring that findings are not limited by linguistic abstraction and researcher bias.

Beyond aesthetics, visuals are analytical instruments, image-based analysis can reveal power dynamics, cultural hierarchies, and spatial inequalities that might remain implicit in textual narratives (Pink, 2021). Harper (2022) notes, that visual reporting aligns with the participatory ethos of contemporary sociology, empowering participants by incorporating their perspectives through co-created visual materials. Moreover, in the era of digital scholarship, visual reports enhance dissemination and engagement through interactive online platforms and visual archives, enabling broader access to sociological knowledge (Flick, 2023). The inclusion of visual data fosters methodological reflexivity, compelling researchers to interrogate the positionalities and interpretive assumptions (Pink, 2021). Through the lens, triangulation becomes not merely validation strategy but creative synthesis of modalities that extends the epistemological reach of sociological inquiry. The integration of visual materials in report writing transforms the sociological text into multisensory narrative that communicates complexity with greater immediacy and clarity. Visuals when employed judiciously do not function as decorative adjuncts but as analytical and interpretive devices (Banks et al., 2021). They aid in articulating patterns, relationships, and meanings that resist linguistic encapsulation. The capacity to read, interpret, and produce visual data with theoretical and methodological sensitivity (Knowles *et al.*, 2020). Visual images illustrate the spatial dynamics of community life and policy-oriented research, infographics and spatial maps to synthesize complex datasets into accessible visual summaries. Harper (2022) posits, that visual report writing also democratizes knowledge dissemination by making academic findings accessible to non-specialist audiences. The fusion of visuals and text fosters communicative transparency, enhances engagement, and preserves the emotional texture of lived experience attributes increasingly valued in participatory and public sociology. Visual sociology greatly enhances the methodological diversity of sociological inquiry. It fosters interdisciplinarity and participatory engagement, bridging the gap between academic research and public understanding. Visual reporting serves as an effective tool for teaching, knowledge dissemination, and policy engagement by transforming complex sociological insights into accessible and visually communicative forms.

Ethical Considerations in Visual Research Triangulation and Report Writing
Despite its numerous strengths, visual sociology faces several challenges, including subjectivity in interpretation, ethical complexities surrounding image use, and the absence of universally accepted analytical frameworks. Some scholars remain skeptical about the epistemological validity of visual data when compared to traditional text-based analyses. Visual sociology offers rich methodological contributions. It also presents significant ethical concerns related to consent, representation, and data ownership. Researchers must carefully address issues of anonymity and confidentiality, particularly when the work involves identifiable subjects (Rose, 2022). Ethical visual research therefore requires transparency, informed consent, and reflexivity throughout the processes of data collection, interpretation, and presentation (Banks et al., 2021).
Furthermore, the ethics of visual representation demands critical examination of power dynamics between the observer and the observed. Researchers must ensure that visual materials do not perpetuate stereotypes, reinforce inequality, and exploit vulnerable populations (Knowles, 2020). Visual data often present greater interpretive ambiguity than textual or numerical data, as the meaning (through multiple layers of perception, cognition, and contextual) is translated into sociological insight. The foundation of visual sociology which emphasizes the process of visual perception is highly sensitive and involves numerous methodological artifacts.

Pitfalls of Visual Research Triangulation and Report Writing
Visual sociology in the context data triangulation of report writing implies that images may be interpreted differently depending on the researcher's theoretical orientation, cultural background, and methodological stance, thereby reducing the consistency, reliability, and replicability of research findings. There is little agreement on systematic methods for analyzing visual data, similar to those used for textual or numerical evidence. Visual Sociology lacks of standard which often lead to inconsistent image analysis manifested in unclear coding procedures, variable interpretive structures, and difficulties in cross-study comparison ultimately weakening the methodological rigour of sociological reports. Visual sociology introduces distinct ethical challenges related to anonymity, informed

consent, and the depiction of vulnerable populations. Frontiers in Sociology (2024) established persistent ethical dilemmas in qualitative and visual research contexts. In report writing, neglecting to adequately disclose or address these ethical issues compromises the credibility and integrity of the research, raising legitimate concerns about participants' rights, dignity, and privacy. Visual representations are inherently non-neutral and often reflect the researcher's positionality, design choices, and interpretive framing. Visual designers unintentionally perpetuate stereotypes and biases through representational decisions. When incorporated uncritically into sociological reports, images inadvertently distort narratives and reinforce dominant ideologies, thereby misrepresenting rather than illuminating social realities. The inclusion of visual data within traditional report formats dominated by textual analysis, tables, and quantitative summaries also poses structural and stylistic challenges. Reports often struggle to justify how visual materials are selected, analyzed, or theoretically linked. Inflibnet (2023), visual sociology has historically been marginalized due to the positivist preference for objectivity and textual dominance. Consequently, visuals are sometimes treated as decorative supplements rather than integral analytical components, weakening the coherence and analytical depth of the report. Visual data tend to capture context-specific social realities and are interpreted through variable theoretical lenses, replicating or generalizing findings across different studies due to problematic. This limitation, common in qualitative inquiry, is even more pronounced in visual methods where meaning is inseparable from medium and context.

CONCLUSION

In recognizing the importance of visual sociology in triangulation of sociological research, it becomes essential to understand the significance and role of visual imagery in interpreting complex social phenomena and identifying areas that require intervention. Effective research must therefore integrate multiple methodological approaches to produce accurate and comprehensive results. Without such methodological integration, the objectives of a study may not be fully realized or aligned with its intended purpose. Every research method in the social sciences possesses both strengths and limitations; no single approach can adequately capture the full complexity of social reality. Consequently, triangulation becomes invaluable, as it allows researchers to combine different methods to offset individual weaknesses and achieve a more holistic and common understanding of social phenomena.

In consideration of the place of visual sociology it is relatively helpful to identify the significance of visual images in understanding the intersection of the phenomenon of the issue and provide intervention needs.

Good research therefore must combine both methods to produce accurate result. Without the combination, the objectives of the research cannot be clearly achieved for it intended purposes. All the existing tools of social research method have advantages and disadvantages. Each data method contains strength and weakness. No single one proves all the required ideals. Therefore, it is useful to triangulate in order to complement the weaknesses of other methods so as to have a holistic view of social realities.

RECOMMENDATIONS

Sociological researchers should go beyond the conventional dependence on textual and statistical data by incorporating visual methods such as photography, mapping, film, and digital imagery as legitimate tools of inquiry and interpretation of sociological research reporting writing. This will enhance the visibility of otherwise abstract social realities and strengthen the empirical depth of sociological reports writing.

Academic institutions and research organizations should formulate clear methodological and ethical frameworks for the collection, analysis, and presentation of visual data for triangulation reports writing. Establishing such standards will ensure consistency, reliability, and scientific validity in sociological studies employing visual materials. Researchers must be trained for effective ethical dimensions of visual data production and dissemination, including issues of informed consent, representation, and data ownership. Ethical awareness is essential to prevent the exploitation and misrepresentation of individuals and communities captured through visual means of report writing.

Furthermore, sociological researchers should adopt triangulation strategies that deliberately integrate visual approaches alongside quantitative and qualitative methods. Such methodological complementarity will help offset the limitations of any single approach and facilitate a more holistic understanding of social phenomena. Sociology curricula at both undergraduate and postgraduate levels should incorporate visual literacy, photo-elicitation, visual content analysis, and digital ethnography. Building these competencies will enable emerging researchers to interpret, construct, and communicate sociological knowledge through visual dimensions effectively.

Researchers should utilize digital platforms and software tools for visual analysis and report presentation, such as infographics, interactive dashboards, and visual storytelling techniques. This will enable collaboration between sociologists, visual artists, photographers, and information technologists to broaden methodological creativity and innovation in sociological report writing. Such interdisciplinary synergy will enrich research output and make sociological findings more relatable and

impactful. Researchers should adopt a reflexive stance when interpreting visual data, acknowledging the positionality, biases, and the sociocultural contexts that shape visual meaning in sociological research report writing. Reflexivity ensures that visual sociology maintains both intellectual rigour and ethical sensitivity.

Sociologists should use visual reporting techniques to translate complex social research findings into accessible forms for non-academic audiences. Finally, sociologists should continue to explore ways of visualizing the invisible such as emotions, power dynamics, inequalities, and social exclusion through innovative visual methodologies. This will expand the epistemological boundaries of sociology and contribute to more comprehensive understanding of human experience.

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