



The Research Gap in the Context of Paradigm Shifts

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Abstract

This paper aims to provide a theoretical examination of the concept of the research gap in light of the paradigm shifts that have shaped scientific inquiry. It is based on the premise that the research gap constitutes a fundamental dimension of scientific research and one of the core concepts upon which the epistemological structure of scientific inquiry is built.

The study adopts a theoretical and analytical approach to the concepts of the research gap and the paradigm. It seeks to explore the relationship between paradigm shifts and the formation of research gaps by shedding light on the ways in which changes in prevailing paradigms contribute to the emergence and redefinition of research gaps. In doing so, the paper addresses its central research question: How has paradigm shift contributed to the formation and development of research gaps within the field of scientific research?

The study concludes that the relationship between research gaps and paradigm shifts is not a direct one, but rather an interactive relationship. The accumulation of research gaps can lead to a reconsideration of existing knowledge and may contribute to paradigm shifts and the reshaping of scientific knowledge.

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1. Introduction

Scientific research constitutes a fundamental pillar of human knowledge across all disciplines and is regarded as a defining characteristic of the modern era. This is because nations have come to recognize that their greatness and progress depend largely on the scientific and intellectual capacities of their peoples. (Al-Shahri, 2021, p. 923) Scientific advancement relies on identifying and comprehending paradigm shifts, which Thomas Samuel Kuhn describes as transformative turning points that reshape the fundamental structures of a scientific field within the scientific community. (Alavian, 2025, p. 1)

From this perspective, the research gap emerges as one of the fundamental elements in this process. It arises when a paradigm, as a guiding framework, fails to adequately explain certain phenomena that warrant investigation. This inadequacy prompts a reconsideration of existing intellectual foundations and creates opportunities for paradigm shifts that ultimately contribute to the advancement of scientific knowledge.

In light of the above, the significance of this study lies in its attempt to examine the concept of the research gap beyond its conventional understanding by linking it to the context of paradigm shifts within scientific research.

Accordingly, this study seeks to answer the following research question:

How do paradigm shifts contribute to the formation of research gaps in scientific research?

To address this question, the article adopts a theoretical-analytical approach. Based on

this approach, the study is structured according to the following outline:

- ***Methodology***
 - ***Conceptual foundations of the study's key terms***
 - ***The emergence of the concept of paradigm in academic discourse***
 - ***The importance of identifying research gaps and methods for their detection***
 - ***Where should the research gap be presented in scientific research?***
 - ***Types of research gaps***
 - ***The benefits of using paradigms as a theoretical framework for scientific research***
 - ***Research Gaps and Paradigm Shifts: The Relationship between the Traditional and Emerging Paradigms***
- Conclusion***

2. Methodology

This study adopts a theoretical-analytical approach based on a narrative review and analysis of the relevant scholarly literature, with the aim of exploring the relationship between research gaps and paradigm shifts, particularly in light of ***Thomas Kuhn's*** conception presented in his book ***The Structure of Scientific Revolutions***. This approach is appropriate to the nature of the study, as it does not seek to measure a phenomenon empirically or test experimental hypotheses. Rather, it aims to develop an interpretive framework that connects the concepts relevant to the subject under investigation.

To achieve this objective, the study drew on reliable academic sources, including specialized books, articles published in peer-reviewed journals, and relevant

scholarly chapters. The study also made use of recognized academic databases and specialized research platforms, including *Google Scholar*, *ASJP*, and *ResearchGate*, in addition to selected reliable *websites* relevant to the subject of the study. The search process was guided by a set of keywords, including *research gap*, *paradigm shift*, *scientific revolutions*, *Thomas Kuhn*, and *research methodology*, in both *Arabic* and *English*.

The selection of the literature was based on several criteria, including its direct relevance to the research topic, the scholarly value of the source, and its contribution to the development of the concepts addressed in the study. No specific time frame was imposed, allowing the study to incorporate both foundational classical contributions, particularly those of Thomas Kuhn, and more recent scholarship addressing the concept of research gaps and its applications across various scientific disciplines. The analysis also involved comparing different conceptualizations of research gaps and examining their points of convergence with the concept of paradigm shifts, ultimately leading to an integrated theoretical interpretation of their dialectical relationship.

3. Conceptual Foundations of the Study's Key Terms

According to Francis Bacon, the ability to define and control concepts is an expression of scientific competence, or what may be referred to as cognitive power. This is due to the crucial role that concepts play in strengthening such intellectual capacity. The advancement of scientific knowledge and its ability to address numerous problems largely depend

on the development and refinement of scientific concepts and terminology, which, in turn, enable researchers to formulate new perspectives and innovative understandings. (Seffari & al, 1999, pp. 90-91)

Accordingly, the present study is based on the following key concepts:

3.1 The Concept of the Research Gap

The Oxford Advanced Learner's Dictionary of Academic English defines a gap as a space between two things or within something, particularly where a part is missing. This meaning is reflected in expressions such as the generation gap and the technological gap between developed and developing countries. (Haloui & Moulay Tahar, 2024, p. 746)

(Al-Shahri, 2021, p. 926) Argues that a research gap represents an imbalance in the body of existing research, characterized by an abundance of studies in certain areas and a scarcity of research in others. These underexplored areas, despite their significance and the need for further investigation, have received little or no attention from researchers.

(Rayees, 2017, p. 66) defines a research gap as a research question that has not been addressed, or has not been sufficiently addressed, in previous studies. Identifying research gaps within the existing literature is often a challenging task for researchers and academics, particularly for novice researchers and those at the early stages of their research. This challenge arises from the lack of clear and systematic criteria for detecting research gaps, making their identification and analysis both complex and ambiguous. For example, when a researcher explores a broad field and subsequently narrows the focus to a more

specific area of inquiry, this process may facilitate the formulation of the research problem.

Similarly, (Wang & al, 2016, p. 251) define a research gap as a topic or area in which insufficient information limits the possibility of reaching a clear conclusion regarding a particular research question.

3.2 The Concept of Paradigm

Thomas Kuhn defined it in his renowned work *The Structure of Scientific Revolutions* as a framework of concepts, principles, rules, and standards shared by members of the scientific community, which guides their scientific practices and shapes how they understand and investigate scientific problems within a shared intellectual framework. (Delio, 2023, p. 16)

According to Dmitry Burover, a paradigm can be understood as a coherent intellectual framework comprising a set of theories that develop in succession and are connected by a shared research subject and a common effort to address similar problems and questions. This framework also encompasses the methods, models, and tools associated with these theories, which researchers use to address scientific problems within the prevailing intellectual framework. (Vorobev, 2026, p. 23)

From this perspective, the emergence of problems or questions that the prevailing intellectual framework cannot adequately address may reveal the existence of research gaps within that framework. The accumulation of such gaps may, in turn, lead to a reconsideration of some of its components, potentially paving the way for a paradigm shift.

The French dictionary Le Larousse defines “paradigm” as a masculine noun derived from the Latin *paradigma* and the Greek *paradeigma*. In linguistics, it refers to a set of inflectional forms of a word that serves as a model, such as noun declensions or verb conjugations. In logic, it denotes a theoretical model of thought that guides scientific inquiry and reflection. In philosophy, according to Plato, a paradigm refers to the examination of a concrete example from which broader conclusions can be drawn. In psychology, it refers to a methodological procedure that serves as a reference model. (LAROUSSE)

3.3 The Concept of Paradigm Shift

A paradigm shift refers to a significant change that occurs when the usual way of thinking or doing something is replaced by a new and different approach. Such a development leads to a fundamental transformation in our understanding of evolution and progress. (Merriam-Webster, 2025) The term is also used interchangeably with “model shift” or “conceptual shift.”

A paradigm shift can also be understood as a fundamental change in the various processes through which science is practiced, interpreted, and produced. Paradigm shifts in science have gradually become a central focus of academic inquiry. Some scholars argue that data-intensive research represents the fourth scientific paradigm, while others suggest that the application of artificial intelligence constitutes a new scientific paradigm in its own right. Both perspectives represent important future trajectories; however, no consensus has yet been reached regarding the direction or foundational principles

upon which the next paradigm shift in science will be based. (Dong & al, 2022, p. 22)

To further clarify, it is useful to present some examples of paradigm shifts that reflect fundamental changes in patterns of thought and in the understanding of phenomena across different fields of knowledge, as follows:

- **Cosmological paradigm:** This refers to the shift in cosmology from the Ptolemaic model to the Copernican model. This transformation constituted an intellectual revolution that changed humanity's understanding of its place in the universe, paving the way for the emergence of modern science based on experimentation and observation rather than reliance on inherited knowledge.

- **Sociological paradigm:** This refers to the shift in sociological thought from a focus on broad structural explanations, as in Marxism, which attributes social phenomena to economic structures and class struggle, to symbolic interactionism, which emphasizes the meanings individuals construct through their everyday interactions. This shift reflects a transition from a holistic and macro-level explanation to a more detailed approach concerned with social action and meaning.

- **Psychological paradigm:** This refers to the shift from behaviorism, which focused exclusively on observable and externally measurable behavior, to the cognitive approach, which re-emphasized the importance of internal mental processes such as perception, thinking, and memory. This shift enabled a deeper understanding of human beings as thinking agents rather than merely stimulus-response systems.

- **Philosophical paradigm:** Philosophical thought has undergone a transitional phase marked by a shift from structuralism, which organizes cultural and linguistic phenomena through underlying structures, to hermeneutics, which prioritizes interpretation and understanding, particularly with regard to meaning, texts, and historical context. This transition reflects an increasing emphasis on the role of the interpreting subject in the production of meaning.

- **Gender paradigm:** This refers to the shift in gender studies from biological determinism, which links gender identity to fixed biological factors, to approaches that recognize the diversity of gender identities and respect difference. This shift has contributed to the recognition of previously marginalized phenomena, such as gender transition.

- **Artificial intelligence paradigm:** Since approximately 2010, the field of artificial intelligence has witnessed a significant shift from knowledge-based models relying on manually programmed rules to data-driven models, particularly with the development of deep learning techniques. This transformation has enabled substantial progress across multiple domains, driven by the use of large-scale datasets known as Big Data, replacing earlier rule-based systems. (Bachaga, 2023, p. 5)

3.4 The Concept of Scientific Research

In terminological usage, the word "research" refers to the pursuit of truth, the investigation of truth, its careful examination, and its dissemination among people. (Khan, 2011, p. 19)

Ibrahim Salama defines scientific research as a method of inquiry through which a

specific problem can be solved by means of systematic and precise investigation aimed at collecting verifiable evidence and data relevant to a given problem.

Van Dalen defines scientific research as a precise and critical attempt to find solutions to problems that disturb and puzzle human beings. (Saber & Khafaja, 2002, p. 25)

Other scholars define it as a systematic approach to understanding that aims to discover new facts and verify existing ones, or to examine and clarify established facts and analyze the relationships between them, while developing new concepts, tools, and theories that facilitate the study of human behavior. (Al-Sharif, 2018, p. 364) In the same context, (Abu Al-Nasr, 2025, p. 254) explains that scientific research goes through several stages, namely:

- Defining the theoretical framework,
- Defining the methodological framework,
- Fieldwork,
- Data coding and tabulation,
- Presentation of results and recommendations.

4. The Emergence of the Term “Paradigm” in Academic Discourse

The origin of the term paradigm can be traced back to Plato, who used it in his works to denote a model or ideal exemplar of something. Its reintroduction into modern academic discourse, however, is attributed to at least three main sources. In his lectures during the 1930s, the Austrian-British philosopher Ludwig Wittgenstein used the term paradigm to refer to exemplary cases or what he called “yardsticks,” which he considered necessary for the functioning of shared language games. In this sense,

Wittgenstein’s use of the term is closely aligned with its Platonic usage. The concept of paradigm was also employed independently in linguistics to describe certain linguistic structures and patterns.

The idea of paradigm as being linked to the underlying assumptions of a theory or position was first explicitly introduced by Robert K. Merton in the 1940s.

For Merton, paradigms are schematic frameworks used to present the fundamental assumptions, concepts, and unresolved questions associated with a particular theory or intellectual position. In particular, Merton emphasized the importance of clarifying the conceptual assumptions embedded in qualitative descriptions and developed models applicable to entire scientific disciplines, such as sociology.

Later, some scholars conceptualized paradigm as a worldview adopted by an individual or a culture. For instance, Peter Schwartz and James Ogilvy argue that a paradigm represents an intermediate level of abstraction between the individual and the real world, functioning as a lens through which one interprets reality. (Chafe, 2024, p. 2)

With the emergence of the paradigm concept, knowledge began to follow a new trajectory, characterized by a departure from determinism and certainty. As a result, the absolute principles that once explained phenomena and structured the understanding of the world gradually began to disintegrate and fade. The perspective based on the cumulative nature of knowledge was also close to disappearing. In its place, emphasis shifted toward the cognitive model, which in turn

established a new way of perceiving the same phenomena. (Saad H. , 2017, p. 47)

5. The Importance of Identifying Research Gaps and Methods for Their Detection

5.1 The Importance of Identifying Research Gaps

This section may be introduced through the following question: Why is it necessary to identify research gaps? The answer lies in the fact that identifying gaps in the scholarly literature and understanding the reasons behind their emergence can help transform these gaps into specific research needs. It also contributes to setting research priorities and conducting relevant studies aimed at addressing these gaps.

As a result of these factors, early-career researchers, in particular, are required to master this essential skill in order to produce meaningful and impactful research within their fields of specialization. (Baako & al, 2022, p. 552) Identifying research gaps holds significant importance in academic and scientific research, as it plays a crucial role in guiding researchers toward areas that require further investigation and in shaping the direction of future studies. This section highlights the importance of identifying research gaps, emphasizing its role in advancing knowledge and promoting scientific development.

- **Enhancing innovation and advancement:** Identifying research gaps enables researchers to expand the boundaries of existing knowledge and foster innovation. By recognizing areas characterized by insufficient or incomplete information, researchers can propose new

ideas, theories, and methodologies to address these gaps. This process contributes to the development of scientific thinking, stimulates intellectual curiosity, and leads to new discoveries that broaden the horizons of knowledge.

- **Enhancing research credibility:** Identifying research gaps helps ensure the validity and credibility of scientific work. By understanding what is already known and identifying areas of limited knowledge, researchers are able to design studies that systematically and rigorously address these gaps, thereby improving the quality of research and enhancing the reliability of its findings.

- **Guiding research questions and objectives:** Research gaps provide essential guidance in formulating research questions and objectives. By identifying gaps in the literature or knowledge base, researchers can focus their efforts on addressing them directly. This clarity of purpose helps organize the research process, streamline efforts, and maximize the scientific impact of the study.

- **Targeting relevant and meaningful research:** Identifying research gaps ensures that research efforts are directed toward relevant and significant areas. It helps researchers avoid duplicating existing studies and encourages the exploration of under-researched fields. By focusing on these gaps, researchers contribute to producing knowledge that is valuable, applicable, and aligned with societal needs.

- **Promoting interdisciplinary collaboration:** Research gaps often extend beyond the boundaries of individual disciplines, making them fertile ground for interdisciplinary collaboration. Identifying

shared gaps across multiple fields encourages researchers from diverse backgrounds to work together. This interdisciplinary approach leads to a more comprehensive understanding of complex problems and enhances the exchange of ideas and expertise.

- **Contributing to policymaking and decision-making:** Identifying research gaps has important practical implications, particularly in policymaking and decision-making. By revealing gaps between research evidence and practical application, it enables policymakers to make informed decisions and develop evidence-based policies. This helps bridge the gap between academia and real-world practice, leading to tangible improvements across various domains. (Sai Srinivas, 2023, pp. 8-9)

5.2 Methods for Identifying Research Gaps

Identifying research gaps, known as the “3Us framework,” is essential for advancing knowledge and guiding future research efforts. This approach is used to assess the significance or value of the gap a researcher seeks to address. It refers to three key criteria: Unexplored, Underdeveloped, and Uncertain areas. (Lim, 2026, p. 13)

In addition, identifying research gaps requires a systematic approach to reviewing the scientific literature, analyzing trends, and understanding the needs of the knowledge domain. As with all research, it is important to formulate questions that require further investigation and to identify gaps in the literature that should be addressed. As a first step, researchers can begin by identifying and selecting relevant information sources,

including books, indexes, academic databases, and the Internet.

There are several methods for identifying research gaps, including citation analysis reports, meta-analysis reports, content analysis reports, and systematic reviews. However, meta-analysis is considered the least preferred method among researchers due to a lack of knowledge and expertise in this area. In contrast, systematic reviews are among the most commonly used and effective approaches for identifying research gaps, as the researcher reviews and analyzes the literature over a defined period of time.

For example, a researcher may select a time frame ranging from 5 to 10 years, depending on the availability of scientific literature. There is also a clear gap between theory and practice, as theorists often lack knowledge of the practical applications of research findings, while practitioners possess field-based experiential expertise. Therefore, it is beneficial to address the problem from both perspectives, theoretical and applied.

Another method for exploring research gaps is citation tracking, including both backward referencing and forward referencing. According to Florida Atlantic University, backward referencing also known as backward searching is defined as the process of identifying and examining the references or works cited within a particular study or research paper. This approach helps in understanding the development of knowledge on a specific topic, as it is used by researchers to trace the origins and evolution of a theory, concept, or model. It is also useful for identifying experts, institutions, or

organizations specialized in a given research field.

Forward referencing, on the other hand, involves identifying studies that have cited a specific research work after its publication. This type of search focuses on publications that appeared subsequent to the original study, thereby helping researchers expand their understanding of the topic by tracking later studies. Through this approach, researchers can identify new findings and recent developments in the field. (Rayees, 2017, pp. 69-70)

From another perspective, many specialists in the field argue that, in order to identify any type of research gap, a general approach consisting of four main steps can be followed:

- Expanding the scope of reading within the researcher's academic discipline and identifying key terms (keywords).
- Reviewing relevant literature, such as books, studies, and published research, based on these terms.
- Identifying the central issue or the primary research motivation.
- Determining the aspects or issues that have not yet been addressed, particularly those related to major problems and future challenges. (Bin Islam, 2024, p. 681)

6. Where is the Research Gap Presented in Scientific Research?

The research gap is considered a pivotal starting point in scientific research, as it highlights the need for the study and helps clarify its scientific value and define its problems. This is achieved through a careful and systematic review of the literature, which reveals gaps, inconsistencies, and helps avoid duplication. In turn, this provides optimal guidance for the research methodology, sets priorities, and shapes research

questions, ultimately contributing to the advancement of knowledge. (Qanai, 2026, p. 773)

This raises a common question among researchers regarding the most appropriate place to present the research gap in academic studies, as well as the possibility of including it in multiple sections. In scholarly practice, the research gap can indeed be integrated into several parts of a research paper, thesis, or dissertation, as follows:

- **At the end of the introduction:** This is one of the most important locations for presenting the research gap. After defining the key terms and concepts of the study, the researcher identifies what has not been addressed in the existing literature, thereby paving the way for the formulation of the research problem.

- **In the statement of the research problem:** The research gap can be embedded within the problem formulation to justify the need for the study. This is done by highlighting deficiencies or knowledge gaps in previous literature and emphasizing the importance of addressing them.

- **In the results and discussion section:** The research gap may also be revisited in the results and discussion section, where the researcher connects the findings to the previously identified gap. This involves addressing the key question: How have the study's results contributed to filling or narrowing this gap? (Saad Y., 2022)

7. Types of Research Gaps

Classifying research gaps helps facilitate their understanding and systematic analysis. They can be classified as follows:

7.1 Theoretical Gap

The theoretical gap, also known as a “theory application gap,” is defined as a deficiency or limitation in existing theories and models within a specific field of knowledge that has not been adequately or effectively addressed. This gap refers either to the absence of a satisfactory theoretical explanation for a given phenomenon or to the inability of current theoretical frameworks to fully account for certain related aspects or variables.

This type of gap is often identified through a review of the scientific literature, where the researcher conducts a critical analysis of previous studies in order to detect contradictions, shortcomings, or unresolved conceptual and methodological limitations. Through this careful examination, the researcher is able to identify areas that still require theoretical development or reinterpretation.

Theoretical gaps are highly significant because they stimulate the development of new theories, approaches, and ideas, thereby contributing to the renewal of knowledge and the expansion of scientific inquiry. Progress in any academic field is only achieved through the continuous review and reassessment of existing concepts in light of new evidence.

Conversely, ignoring such gaps may lead to stagnation in theoretical development and may also negatively affect practical applications. For instance, in the economic domain, overlooking theoretical issues related to inflation and market behavior may result in the inability to develop effective legal and regulatory frameworks. This, in turn, may contribute to the recurrence of financial crises, due to

policymakers’ and regulators’ lack of theoretical foundations that enable them to predict or mitigate such events.

Ultimately, a conscious engagement with theoretical gaps is not merely an academic exercise; it is a fundamental requirement for ensuring the continued development and relevance of knowledge in addressing real-world challenges.

For example: many researchers use the Technology Acceptance Model to study the reasons for accepting digital learning. However, very few researchers have examined the reasons for using generative AI tools in the learning of postgraduate students using the same model. (India, 2024)

7.2 Methodological Gap

The methodological gap refers to the need to introduce new research methods, tools, or techniques that have not previously been applied within the same field of study, or to integrate multiple approaches in order to analyze phenomena in a more comprehensive manner, leading to more robust and accurate results. This gap is identified by examining shortcomings in the research design and methodological tools used in previous studies. This type of systematic inquiry not only helps to address methodological deficiencies but also contributes to the development of theories and scientific classifications that have been rigorously tested.

In the context of political and international studies, there is an increasing trend toward methodological integration. This approach combines descriptive and analytical studies, mixes quantitative and qualitative methods, and balances inductive and deductive reasoning. It also involves a diversity of research techniques, ranging

from descriptive survey methods on the one hand to statistical analysis on the other.

Methodological gaps have been identified in previous international studies, such as the scarcity of experimental research, weak control over inductive analytical tools within IBM SPSS Statistics, the neglect of future-oriented research techniques, and the preference for individual research efforts over collaborative, team-based studies. (Haloui & Moulay Tahar, 2024, p. 752)

For example, a public health study may rely on self-reported measures, whereas biometric data could provide greater accuracy. Addressing methodological gaps often involves introducing innovative techniques, adopting interdisciplinary approaches, or improving the reliability and validity of existing tools. (Taherdoost, 2025)

Types of methodological research gaps include:

- **Data Gaps:** Data gaps refer to the lack or insufficiency of available data on a particular topic. These gaps may take the form of inadequate data, the absence of accurate or up-to-date information, or a lack of appropriate measurement instruments.

Example: Additional research may be needed to collect data on a specific population group or to develop new measurement tools that enable the collection of data related to a particular dimension or variable. (Academy, 2023)

- **Analytical Research Gap:** Also known as a data analysis gap, the analytical research gap refers to the use of analytical tools or data analysis techniques that have not previously been employed in the subject under investigation. In other words,

this gap arises when alternative analytical methods could provide new insights but have not yet been applied.

Example: An analytical gap may be identified when qualitative data analysis software such as NVivo or inductive analytical techniques are introduced into a study that previously relied solely on IBM SPSS Statistics for statistical analysis. (Al-Qahtani & Al-Shahri, 2019, p. 386)

- **Empirical Gap:** The empirical gap is a type of research gap associated with deficiencies in previous studies regarding practical or field-based evidence. This gap reflects the need to empirically evaluate research findings, hypotheses, or propositions in order to verify their validity. It commonly emerges when theoretical arguments or findings have not yet been tested in real-world settings, or when conflicting results require direct empirical verification.

Example: An empirical gap may exist when no previous study has evaluated a particular issue using an experimental design or field data, despite the existence of extensive theoretical discussion on the subject. (Miles, 2017, p. 4)

7.3 Knowledge Gap

A knowledge gap is defined as the difference between what is currently known and what ought to be known about a particular topic. Such a gap may arise from several factors, including insufficient or incomplete information, the existence of conflicting evidence, a limited number of available studies, or reliance on outdated data that no longer accurately reflects current realities.

Knowledge gaps constitute a significant obstacle to the advancement of a scientific field, as their persistence implies that

important aspects of the phenomenon under investigation remain insufficiently understood. Conversely, efforts to address these gaps stimulate further research and contribute to the generation of new ideas and applications that enrich scientific knowledge.

To identify a knowledge gap, researchers must conduct a comprehensive and rigorous review of the available literature in order to determine areas that still require in-depth investigation. Researchers may also employ field-based methods, such as questionnaires or interviews, to assess the level of knowledge and awareness among the general public or specialists regarding a particular issue. Such approaches can help reveal areas of insufficient understanding more clearly.

Addressing a knowledge gap contributes to the advancement of knowledge within a given field and creates opportunities for the emergence of new concepts, theories, or practices. It not only fills an existing deficiency but also reshapes and expands scientific understanding.

A contemporary example of a knowledge gap concerns the impact of emerging financial technologies on traditional banking systems. Despite rapid developments in this area, there remains a limited understanding of their associated risks, particularly those related to Cybersecurity, such as identity theft, data breaches, and other digital threats. Consequently, researchers can contribute by investigating these risks more thoroughly and proposing effective strategies for their management, thereby benefiting both customers and financial institutions alike. (India, 2024)

7.4 Conceptual Gap

Conceptual gaps arise when key concepts or terms within a research field are ambiguous, inadequately defined, or inconsistently understood among researchers. Such gaps may lead to conceptual confusion, making it difficult to build upon previous studies and to advance scientific knowledge in a cumulative and coherent manner. (Kakkar, 2025) This type of research gap concerns the researcher's ability to identify emerging or evolving concepts that have not been adequately addressed in previous studies. (Haloui & Moulay Tahar, 2024, p. 751)

7.5 Evidence Gap

Evidence gaps emerge when divergent or inconsistent findings create uncertainty, thereby highlighting the need for further research and investigation. (Hassan, 2025) This type of gap is associated with contradictions in the findings of previous studies. While the results of individual studies may be valid within their specific contexts, they may appear conflicting when examined within a broader theoretical or conceptual framework.

The identification of an evidence gap typically begins with the analysis of each research stream independently, followed by the synthesis and comparison of findings across studies in order to uncover areas of inconsistency or contradiction.

Example: Some studies suggest that social media use enhances psychological well-being, whereas others indicate that it exacerbates anxiety and depression. (Miles, 2017, p. 3)

7.6 Time-Wise Research Gap

A time-wise research gap occurs when a researcher revisits a topic that has previously been studied by another researcher but examines it within a

different time period. In this case, the purpose of the new study is to investigate changes in the phenomenon under consideration over time. The researcher is therefore required to provide a sound scientific justification for re-examining the phenomenon within its new temporal context. (Al-Qahtani & Al-Shahri, 2019, pp. 386-387)

7.7 Geographic Gap

Scientific research often concentrates on specific regions or population groups, while other geographical areas remain underrepresented or entirely overlooked. This situation gives rise to what is known as a geographic gap. Such gaps become particularly evident when studying phenomena that may manifest differently across various parts of the world, thereby necessitating the expansion of research to include a broader range of geographical contexts and settings. (Kakkar, 2025)

For example, climate change adaptation strategies may be well documented in Europe and North America but lack sufficient evidence from low-income countries, which are among the most vulnerable to its impacts. (Taherdoost, 2025)

7.8 Population Gap

A population gap occurs when certain population groups are underrepresented or excluded from research studies, resulting in findings that may be biased, incomplete, or lacking generalizability. This type of gap highlights the need to include diverse demographic groups in order to obtain a more comprehensive understanding of the phenomenon under investigation.

Example: A study on access to healthcare services that excludes rural communities or low-income populations may fail to capture the unique challenges faced by these

groups, leading to incomplete conclusions and policy recommendations. (Hassan, 2025)

8. Benefits of Using Paradigms as a Theoretical Framework in Scientific Research

In his philosophy of scientific development, Thomas Kuhn conceptualizes the evolution of science as a sequence of stages consisting of:

- Periods of normal science, characterized by the dominance of a particular paradigm;
- Periods of crisis, during which the prevailing paradigm loses its scientific authority due to the accumulation of anomalies;
- Scientific revolutions, which ultimately lead to a paradigm shift. (Ernst & Gleißner, 2022, p. 2)

According to Kuhn, scientific inquiry revolves around three standard focal points of facts, which are not always distinct from one another nor continuously separated. First, there is a set of facts that the paradigm has shown to reveal the nature of things in a particularly significant way. The paradigm confers importance upon these facts by employing them in the resolution of numerous problems, thereby making them a central concern for researchers who seek to identify them with greater precision and across a wider variety of cases. (Kuhn, The structure of scientific revolutions, 1978, p. 56)

Within this perspective, Kuhn explains that paradigms define the boundaries and standards of scientific research, functioning as a roadmap for problem-solving and for guiding scientific observation and experimentation. Although the concept was initially confined to the sciences, it later became evident that

paradigms also shape broader societal worldviews. This broader application was described by Riley Dunlap and Kent Van Liere through the concept of dominant social paradigms.

These paradigms are often formed unconsciously, with their underlying rules establishing the boundaries and standards that govern thought. As societies become increasingly complex, these rules become more deeply embedded, shaping individuals' perceptions of reality and creating what may be described as a metaphorical "box" from which it is difficult to escape. Ultimately, individuals unconsciously adopt the paradigm as the natural way in which things operate. When such acceptance persists without critical reflection or questioning, a condition known as paradigmatic blindness emerges. (Taveras-Dalmau & al, 2025, p. 1986)

In this regard, (Delio, 2023, p. 18), based on a review of literature addressing the use of paradigms, summarizes their significance as a theoretical framework in scientific research through the following benefits:

- Defining the theoretical framework of the study by situating the research topic within a broader body of specialized theoretical knowledge, particularly for researchers who reject the notion that methodological choices exist within a philosophical vacuum.
- Preventing theoretical, conceptual, and other deviations that may affect the original formulation of the research topic.
- Providing researchers with a coherent set of concepts and propositions that facilitate the understanding and direction of the research process (i.e., how the research should be conducted).

- Supporting research design and offering a structured and effective plan for collecting data from multiple sources.
- Clarifying the procedures for testing the proposed theory, particularly in quantitative research.
- Assisting in the formulation of research questions and hypotheses, as well as in the interpretation of findings.
- Organizing and synthesizing research results within a clear and coherent framework while highlighting the significance of disseminating them.
- Suggesting new directions and emerging areas for future research.
- Helping researchers avoid errors identified in previous studies and investigations.

From another perspective, a paradigm provides both the questions and the solutions simultaneously. This means that researchers operate within a framework that presupposes a specific correspondence between theory and experience. Such correspondence becomes possible through the conceptual structure embodied primarily in the assumptions and procedures that researchers internalize and reveal through their scientific practices. Consequently, researchers can only expand their understanding of the world through the paradigm itself.

As a result, paradigms tend to exclude facts that are inconsistent with their underlying assumptions. Researchers, consciously or unconsciously, may therefore disregard such facts and focus only on phenomena that the paradigm permits them to recognize and investigate.

Kuhn emphasized this point by noting that a paradigm developed specifically for a particular set of phenomena often exhibits

a degree of ambiguity when applied to closely related phenomena. In such situations, experimentation becomes essential for selecting among alternative ways of applying the paradigm to the phenomenon under investigation. (Sarai, 2017, p. 378)

9. Research Gaps and Paradigm Shifts: The Relationship between the Traditional and Emerging Paradigms

Contemporary research paradigms are generally not viewed as rigid and independent frameworks; rather, they can be integrated to form a more flexible and effective approach to scientific inquiry. Unlike the traditional positivist paradigm, which emphasizes the existence of a single objective reality and relies primarily on quantitative methods, more recent paradigms such as the interpretivist, critical, and arts-based research paradigms can serve as multiple complementary frames of reference.

This implies that researchers can strategically draw upon the methodologies, assumptions, and quality criteria associated with more than one paradigm in order to design a coherent and integrated study. Such integration is often a methodological necessity, given that real-world problems are inherently complex and can rarely be adequately addressed through a single methodological framework or a one-dimensional approach. (Joshi & al, 2026, p. 67)

Within the same context, (Besancenot & Dogguy, 2011, p. 2) argue that during a paradigm shift, two simultaneous processes are expected to occur. The first is the decline of the existing paradigm as it increasingly fails to solve emerging problems and explain anomalous cases.

The second is the rise of a new paradigm when a novel theoretical framework enables the generation and dissemination of promising findings. During such transitions, the prospect of achieving new discoveries reshapes researchers' scientific choices, leading them to gradually abandon traditional research domains in favor of a new set of assumptions and perspectives. Consequently, the research gap between a traditional and an emerging paradigm often arises when established frameworks become insufficient for explaining contemporary phenomena, while newer paradigms offer alternative interpretations, methodologies, and conceptual tools. This gap creates opportunities for researchers to reassess existing assumptions, challenge dominant perspectives, and contribute to the development of innovative approaches capable of addressing complex and evolving research questions.

In recent years, the information field has undergone significant transformations and changes in its theoretical foundations and diverse professional practices, as well as at the points where these aspects intersect. Researchers argue that the information field has gone through several important paradigm shifts, beginning with a move from a system-centered focus to a user-centered focus, and subsequently toward information environments that integrate people, information, technology, and their practices within particular contexts. Given the changing nature of information phenomena today, paradigm shifts can help guide a proper examination and understanding of the foundations of this field and their significance. (Tang & al, 2021, p. 1217)

Paradigm shifts typically follow a metaphorical cycle consisting of five stages. The process begins with the establishment of a paradigm. As this paradigm becomes entrenched and evolves into a set of unquestioned beliefs, a condition of paradigmatic blindness emerges. As knowledge advances, however, anomalies begin to appear phenomena that cannot be adequately explained or resolved within the rules of the prevailing paradigm. Initial responses often involve denying these anomalies or minimizing their significance.

When such attempts fail, researchers begin to reassess their underlying assumptions by questioning the paradigm's rules, beliefs, and foundational premises and evaluating their validity, purpose, and relevance. This constitutes the second stage. During this process, alternative solutions may be proposed, although they often remain largely compatible with the dominant paradigm.

As these efforts continue to prove inadequate, researchers increasingly engage with an alternative paradigm, marking the fourth stage of the process. Ultimately, the shortcomings of the prevailing paradigm become impossible to ignore, prompting a transition toward a new paradigm that is better aligned with the evolving state of knowledge. This constitutes the fifth and final stage.

Paradigms themselves, however, are not permanent. When adopted uncritically, they become institutionalized and initiate a new cycle that reproduces paradigmatic blindness. This cycle reveals a fundamental paradox of paradigm shifts: although new paradigms emerge to challenge established systems, they may

eventually become ideological frameworks themselves, reproducing the same form of paradigmatic blindness that characterized the paradigms they replaced. (Taveras-Dalmau & al, 2025, p. 1987)

According to Thomas Kuhn, the path toward normal science begins with the recognition of anomalies encountered during research conducted within the fundamental commitments of the dominant paradigm. As these anomalies accumulate, they gradually undermine the existing research tradition, leading it into a state of crisis. When scientists particularly younger researchers become aware of this crisis, they begin to explore more sophisticated and suitable scientific theories. These theories spread through textbooks, monographs, seminal scientific works, and other scholarly channels. Such dynamic processes eventually give rise to mature science, or what Kuhn termed normal science. (Mengistie, 2013, p. 43)

In a similar vein, (Khanum, 2023, p. 308) argues that research gaps may emerge as a result of changes in social or technological trends that necessitate new approaches, perspectives, or solutions. For example, emerging technologies or social movements may generate novel research questions and challenges that have not been addressed by previous studies.

In light of these perspectives, the relationship between a paradigm shift and a research gap can be described as indirect yet closely connected within the broader process of scientific and intellectual development. A research gap represents a deficiency or limitation in explaining a particular phenomenon within the prevailing theoretical framework, whereas

a paradigm shift signifies a fundamental transformation of that framework itself.

Kuhn emphasized that scientific progress does not occur solely through gradual accumulation. Rather, it proceeds through stages beginning with normal science, which primarily focuses on solving problems within an established theoretical framework and contributes incrementally to the expansion of knowledge without necessarily seeking revolutionary discoveries. Nevertheless, the history of science demonstrates that unexpected discoveries and new theories sometimes emerge unintentionally within this framework when researchers encounter phenomena that cannot be explained by the prevailing paradigm. At this point, a research gap becomes evident. Such anomalies prompt the re-evaluation of accepted assumptions, ultimately leading to a paradigm shift that transforms the understanding of scientific phenomena and reshapes the direction of research within the discipline. (Kuhn, *The Structure Of Scientific Revolutions*, 1990, p. 52)

Kuhn further noted that not every anomaly or irregularity in scientific research leads directly to a crisis or paradigm shift. Many anomalies are often ignored or temporarily accommodated within the framework of normal science. However, when an anomaly becomes particularly significant challenging the core assumptions of the dominant paradigm or hindering its important applications it evolves into a genuine research gap that attracts

increasing scholarly attention. As researchers focus more intensively on the issue and the prevailing paradigm proves incapable of explaining it, a state of crisis emerges. This crisis paves the way for what Kuhn referred to as extraordinary science, creating the conditions necessary for a paradigm shift that fundamentally restructures scientific and intellectual understanding. (Kuhn, *The Structure Of Scientific Revolutions*, 1990, p. 82)

In summary, Kuhn viewed paradigms as influential models that support and shape the framework of normal scientific practice. However, as tensions, inconsistencies, and unresolved anomalies accumulate within these frameworks, crises emerge, ultimately paving the way for paradigm shifts that replace existing systems with new ones better equipped to accommodate emerging data, ideas, and discoveries. (Alavian, 2025, p. 2)

Based on these perspectives, it can be argued that a research gap represents only an initial stage in the trajectory of scientific inquiry, whereas a paradigm shift constitutes a more advanced stage that arises from the accumulation of such gaps until they develop into a genuine crisis. Accordingly, the relationship between the two is not direct but rather one characterized by accumulation and evolution. In practical terms, not every research gap leads to a paradigm shift, however, the accumulation of unresolved gaps may serve as a catalyst for profound transformations in the structures of science and knowledge.

10. CONCLUSION

research gap in scientific inquiry does not merely represent a deficiency or the absence of previously unexplored knowledge within a particular field. Rather, it reflects limitations in existing knowledge and may reveal limitations within the prevailing paradigm. In this sense, a research gap can represent an initial stage in the development of scientific knowledge, particularly when gaps accumulate and encourage researchers to reconsider existing concepts and assumptions.

The study also concludes that a paradigm shift does not necessarily eliminate research gaps, rather, it reshapes them within a new conceptual framework. Accordingly, the relationship between research gaps and paradigm shifts is reciprocal and dynamic, involving continuous interaction between the emergence and accumulation of research gaps, the reconsideration of existing knowledge, and the emergence of new research questions and problems within the new paradigm.

This study was limited to a theoretical analysis of the relationship between research gaps and paradigm shifts, without testing the proposed framework through an empirical study or a systematic analysis of the relevant scholarly literature. It also focused on literature related to the philosophy of science and research methodology, which may limit the extent to which some of its findings can be generalized across different scientific disciplines, particularly those that adopt different

This study concludes that a

methodological or epistemological approaches.

The findings of the study contribute to a broader understanding of the research gap, as a gap does not merely indicate a lack of knowledge but may also reveal aspects of existing knowledge that require reconsideration and further development. From this perspective, the study provides a framework that may help researchers identify research gaps and understand their significance. It may also assist reviewers and journal editorial boards in assessing the originality of research topics and their potential contribution to the advancement of scientific knowledge.

The findings also open avenues for future research that could examine the relationship between research gaps and paradigm shifts across different scientific disciplines and trace how certain gaps develop into new research topics or fields. Future studies could also examine the role of artificial intelligence and modern digital tools in helping researchers identify research gaps and detect emerging directions in scientific research.

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