MAHIYAH: Journal of Islamic Thought and Philosphy
Vol. 3 No. 2 (November) 2026
E-ISSN: 3163-5946 P-ISSN: 3163-5962

CHARLES SANDERS PEIRCE'S ABDUCTIVE LOGIC AND ITS RELEVANCE TO THE DEVELOPMENT OF CONTEMPORARY ISLAMIC EPISTEMOLOGY

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Abstrak

Penelitian ini mengkaji konsep logika abduktif dalam pemikiran Charles Sanders Peirce serta relevansinya terhadap pengembangan epistemologi pemikiran Islam kontemporer. Peirce mengkritik logika tradisional Aristotelian yang terlalu berfokus pada proposisi kategoris dan penalaran deduktif sehingga membatasi kemungkinan lahirnya pengetahuan baru. Melalui pragmatisme, semiotika, dan model penalaran abduktif, Peirce mengembangkan paradigma epistemologis baru yang memandang pengetahuan sebagai proses penyelidikan, interpretasi, dan pembentukan hipotesis yang berlangsung secara terus-menerus. Penelitian ini menggunakan metode studi kepustakaan (library research) dengan pendekatan filosofis melalui analisis terhadap sumber primer dan sekunder yang berkaitan dengan pemikiran Peirce dan epistemologi Islam kontemporer. Hasil penelitian menunjukkan bahwa logika abduktif Peirce tidak hanya memberikan kontribusi penting terhadap perkembangan logika modern dan semiotika, tetapi juga menawarkan model penalaran yang dialogis, kontekstual, dan terbuka. Konsep fallibilism, komunitas pengetahuan (community of inquiry), dan interpretasi semiotik memiliki relevansi bagi rekonstruksi epistemologi Islam kontemporer, terutama dalam pengembangan metodologi ijtihad dan interpretasi yang lebih adaptif terhadap tantangan sosial dan perkembangan ilmu pengetahuan modern.
Kata Kunci: *Logika Abduktif, Charles Sanders Peirce, Pragmatisme, Semiotika, Epistemologi Islam*

Abstract

This study examines Charles Sanders Peirce's concept of abductive logic and its relevance to the development of contemporary Islamic epistemology. Peirce criticized traditional Aristotelian logic for its excessive emphasis on

categorical propositions and deductive reasoning, which, in his view, limited opportunities for generating new knowledge. Drawing on pragmatism, semiotics, and abductive reasoning, Peirce developed an epistemological paradigm that understands knowledge as an ongoing process of inquiry, interpretation, and hypothesis formation. This study adopts a library-based research design and a philosophical approach, examining primary and secondary sources on Peirce's thought and contemporary Islamic epistemology. The findings indicate that Peirce's abductive logic made a significant contribution to modern logic and semiotics and continues to offer an open, dialogical, and context-sensitive model of reasoning. The concepts of fallibilism, the community of inquiry, and semiotic interpretation are relevant to the reconstruction of contemporary Islamic epistemology, particularly to the development of more adaptive approaches to ijtihad and religious interpretation in response to contemporary social and scientific challenges.

Keywords: *Abductive Logic, Charles Sanders Peirce, Pragmatism, Semiotics, Islamic Epistemology*

Introduction

Until the mid-nineteenth century, traditional logic rooted in Aristotle's thought remained the dominant paradigm in philosophy and science. This logic was first systematically formulated through the theory of syllogisms and categorical propositions and was subsequently developed by medieval Scholastic thinkers.[1] In both Western and Islamic intellectual traditions, Aristotelian logic was understood not merely as an instrument of thought but also as a methodological foundation for the advancement of science, theology, and metaphysics. Indeed, in classical Islamic education, the science of manṭiq occupied an important place as a means of understanding argumentative structures and the validity of reasoning.[2]

Although René Descartes, a pioneer of modern philosophy, criticized Scholastic logic as excessively formal and unproductive in generating new knowledge, traditional logic continued to dominate modern intellectual discourse. Descartes proposed mathematics and

[1] Kadir Sobur, "Logika Dan Penalaran Dalam Perspektif Ilmu Pengetahuan," *TAJDID: Jurnal Ilmu Ushuluddin* 14, no. 2 (2015): 387–414, https://doi.org/https://doi.org/10.30631/tjd.v14i2.28.

[2] Parviz Morewedge, "Logic and Aristotle's Rhetoric and Poetics in Medieval Arabic Philosophy, and: The Poetics of Alfarabi and Avicenna (Review)," *Journal of the History of Philosophy* 30, no. 4 (October 2022): 605–8, https://doi.org/10.1353/hph.1992.0089.

analytic geometry as models of rational thought that offered greater certainty than Aristotelian syllogisms.[3] Nevertheless, the influence of traditional logic remained so strong that Immanuel Kant even claimed that Aristotelian formal logic had attained a complete and final form.[4] It was against this background that Charles Sanders Peirce advanced a fundamental critique of the limitations of classical logic while proposing a new paradigm of epistemology and reasoning.

Peirce is known as an American philosopher who made major contributions to logic, semiotics, pragmatism, and epistemology. He is regarded as a principal founder of modern pragmatism and a pioneer of contemporary semiotics. One of his major contributions was the development of a theory of signs according to which human thought operates through processes of signification.[5] For Peirce, logic cannot be separated from the theory of signs, because knowledge is always mediated by signs, interpretation, and relations of meaning.[6]

Peirce's principal criticism of traditional logic concerned its excessive focus on categorical propositions of the subject–predicate form, with insufficient attention to relationships among propositions and the dynamics of inference. In his view, not all knowledge can be reduced to the Aristotelian syllogistic model. Many propositions express relations and require more complex analysis than a simple subject–predicate structure permits. Peirce therefore developed a new approach emphasizing the importance of relations in logical thought. This development gave rise to the subdiscipline known as the logic of relations, an important foundation of modern logic (Pietarinen & Bellucci, 2021).

The development of relational logic built on the early contributions of Augustus De Morgan. However, significant advances occurred when Peirce began developing relational analysis systematically in the 1870s. Through this approach, Peirce not only reformulated formal logic but also constructed a new epistemological

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[3] Hassan Hanafi, *Studi Filsafat 2: Pembacaan Atas Tradisi Barat Modern* (Yogyakarta: LKiS, 2015). 89.

[4] Theguh Saumantri, "Metafisika Empirik Dalam Pemikiran David Hume," *Jaqfi: Jurnal Aqidah Dan Filsafat Islam* 7, no. 2 (December 13, 2022): 231–44, https://doi.org/10.15575/jaqfi.v7i2.20180.

[5] Howard A. Smith, "Peircean Theory, Psychosemiotics, and Education," *Educational Philosophy and Theory* 37, no. 2 (January 9, 2005): 191–206, https://doi.org/10.1111/j.1469-5812.2005.00109.x.

[6] D. R. Anderson, *Charles Sanders Peirce's Philosophy of Signs: Essays in Comparative Semiotics* (Bloomington: Indiana University Press, 2017). 217.

paradigm centered on inquiry, experience, and the potential for discovering new knowledge. Whereas Kant focused on the question of how knowledge is possible, Peirce shifted epistemological attention toward how knowledge is acquired and how its claims can be tested in other words, how knowledge can be attained.[7]

Within this framework, Peirce developed the concept of abductive reasoning as a form of inference that enables human beings to formulate hypotheses from limited facts. Unlike deduction, which draws conclusions about particular cases from general premises, and induction, which develops generalizations from empirical observations, abduction seeks the most plausible explanation of a phenomenon. Abduction provides the basis for scientific creativity because it makes it possible to generate new hypotheses before their implications are derived deductively and tested inductively.[8] Thus, in Peirce's system, logic is not merely an instrument of formal verification but also a means of discovering knowledge.

Peirce's ideas are particularly relevant to the development of contemporary Islamic epistemology. Some strands of Islamic epistemological discourse have tended to privilege normative-textual approaches and rigid models of deductive reasoning. These tendencies may limit the capacity to respond to complex contemporary social realities, especially questions involving pluralism, science, technology, and cultural change. In this context, Peirce's abductive logic offers a more open, dialogical, and investigative epistemological approach by accommodating interpretation, hypothesis formation, and the evolving character of knowledge. Such an approach is particularly relevant to contemporary ijtihad and the renewal of methodologies in Islamic studies.[9]

Furthermore, Peirce's semiotics makes an important contribution to the development of hermeneutics and the interpretation of religious texts. From a Peircean perspective, meaning is not fixed once and for all but develops through ongoing interpretation. This allows for a more

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[7] T. L. Short, *Peirce's Theory of Signs* (New York: Cambridge University Press., 2017). 198.

[8] Charles Sanders Peirce, "The Essential Peirce," in *Selected Philosophical Writings*, ed. Nathan Houser and Christian Kloesel, 1st ed. (Bloomington: Indiana University Press, 2019).

[9] Theguh Saumantri and Hajam Hajam, "Urgensi Metodologi Studi Islam Interdisipliner Untuk Moderasi Islam," *An-Nawa : Jurnal Studi Islam* 5, no. 1 (June 26, 2023): 1–18, https://doi.org/10.37758/annawa.v4i1.579.

context-sensitive understanding of religious texts without abandoning their normative dimension. Peirce's thought can therefore serve as a bridge between the modern Western philosophical tradition and contemporary Islamic epistemology, particularly in efforts to develop a model of knowledge integrating revelation, reason, experience, and social reality.

Against this background, this article examines abductive logic in Peirce's thought and its relevance to the development of contemporary Islamic epistemology. It focuses on the relationships among logic, pragmatism, semiotics, and abductive reasoning within Peirce's philosophical system. Although Peirce's original writings are technically demanding and often employ complex symbolic notation, this study examines his principal ideas through a philosophical and interpretive approach informed by contemporary Peirce scholarship. The article thus seeks to contribute to scholarship on Islamic philosophy and contemporary epistemology, particularly by helping to develop a more open, critical, and contextual paradigm of thought.

Research Method

This study employs a library-based methodology and a philosophical approach to critically examine Charles Sanders Peirce's abductive logic and its relevance to the development of contemporary Islamic epistemology. The philosophical approach is used to analyze Peirce's major concepts including pragmatism, semiotics, the logic of relations, and abductive reasoning enabling an analysis that is not merely descriptive but also argumentative and interpretive in assessing Peirce's contributions to contemporary methodologies in Islamic studies.[10] The primary sources include Peirce's major works, particularly the Collected Papers of Charles Sanders Peirce and The Essential Peirce. Secondary sources comprise books, journal articles, and previous studies relevant to the topic.

Data were collected through document analysis. Sources were selected according to their relevance, credibility, and publication date. The data were analyzed using a descriptive-analytical method: Peirce's abductive logic and theory of signs were first presented systematically, followed by an analysis of their relevance to the development of contemporary Islamic epistemology. This approach provides a critical

[10] Kaelan, *Filsafat Bahasa, Semiotika, Dan Hermeneutika* (Yogyakarta: Paradigma, 2020). 221.

interpretation of the contribution of Peirce's abductive logic to the formation of a more dialogical, open, and contextual Islamic epistemological paradigm.[11]

RESULTS AND DISCUSSION

Pragmatism and the Theory of Inquiry

In modern philosophy, Charles Sanders Peirce is recognized for his fundamental reformulation of epistemology through a pragmatic, inquiry-oriented approach. Describing himself as a 'laboratory philosopher,' Peirce began his epistemological project by criticizing the Cartesian method associated with René Descartes. In Peirce's view, Cartesian methodical skepticism did not reflect actual scientific practice because it overemphasized individual doubt and the search for absolute certainty. Knowledge, he argued, does not emerge from isolated individual reflection but through sustained collective inquiry within a scientific community.[12]

Peirce rejected the Cartesian assumption that philosophical doubt is the starting point of knowledge. Human beings, he argued, always begin inquiry from an existing set of beliefs formed through everyday experience. Doubt is not artificially produced by methodological procedure; it arises genuinely when previously settled beliefs are disrupted by new experiences or contradictions.[13] Inquiry therefore begins with a state of uncertainty or doubt and leads to a new, more stable belief. Peirce's epistemology is consequently oriented not toward achieving absolute certainty but toward transforming doubt into belief through rational and open procedures of inquiry.

In his well-known essay 'The Fixation of Belief,' Peirce outlined four methods through which people fix their beliefs. The first is the method of tenacity, which involves stubbornly maintaining a belief without considering criticism or new evidence. The second is the method of authority, in which beliefs are accepted because they are endorsed by a political, social, or religious authority. The third is the a priori method, in which ideas are accepted because they appear rational or align with

[11] Emzir, *Metodologi Penelitian Kualitatif* (Jakarta: Rajawali Press, 2017). 56.

[12] Theguh Saumantri, "Hegel's Rationalism: The Dialectical Method of Approaching Metaphysical Problems," *Jurnal Filsafat Indonesia* 6, no. 3 (2023): 455–64, https://doi.org/https://doi.org/10.23887/jfi.v6i3.58381.

[13] Mustaqim, "Pragmatisme Dalam Filsafat Kontemporer: Analisa Atas Pemikiran Charles S. Peirce," *Al-Mabsut: Jurnal Studi Islam Dan Sosial* 3, no. 1 (2019): 189–210.

prevailing intellectual preferences. According to Peirce, these three methods suffer from fundamental weaknesses because they remain dependent on human subjectivity and fail to ensure openness to correction.[14]

As an alternative, Peirce proposed a fourth approach, the method of science, based on the assumption that objective reality exists independently of human opinion.[15] Under this method, truth is pursued through systematic observation, testing, and verification, all subject to critical scrutiny. Reality is understood as something that can be known through continuing investigation, even though human knowledge of it never attains final certainty. This view gave rise to fallibilism: the conviction that all human knowledge may be mistaken and always remains open to revision in light of new evidence.[16]

Fallibilism is one of the principal foundations of Peirce's pragmatism. Unlike rationalist epistemologies that seek absolute certainty, Peirce regarded the imperfection of knowledge as a natural condition of scientific development. Error is not an epistemological failure but an inherent part of scientific inquiry. The development of knowledge therefore depends on the continuing human capacity to test, refine, and revise beliefs on the basis of empirical experience and rational argument. In this respect, Peirce's pragmatism is dynamic, dialogical, and anti-dogmatic.

Peirce articulated his pragmatic principle systematically in the essay 'How to Make Our Ideas Clear. There, he explained that the meaning of a concept must be understood through the conceivable practical consequences associated with it. He wrote:

> "Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have."[17]

This principle indicates that an idea cannot be understood solely in abstract or metaphysical terms; it must also be examined through its practical implications in actual experience. In other words, the meaning

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[14] John Dewey, "The Pragmatism of Peirce," *The Journal of Philosophy, Psychology and Scientific Methods* 13, no. 26 (December 21, 2016): 709, https://doi.org/10.2307/2012320.

[15] Afga Sidiq Rifai, "Kebenaran Dan Keraguan Dalam Studi Keislaman (Telaah Pemikiran Charles Sander Peirce Dalam Buku Contemporary Analytic Philoshophy)," *Jurnal Penelitian Agama* 20, no. 1 (August 1, 2019): 95–109, https://doi.org/10.24090/jpa.v20i1.2019.pp95-109.

[16] Theguh Saumantri, *Filsafat Ilmu (Sebuah Dialektika Ilmu Pengetahuan)* (Bengkulu: CV. Brimedia Global, 2022). 89.

[17] Peirce, "The Essential Peirce." 232.

of a concept lies in its conceivable practical consequences. For example, if someone wishes to determine whether a substance is sodium, that hypothesis must be examined through specific empirical procedures, such as observing its reaction when placed in hot water. In this sense, Peirce's pragmatism is not merely a theory of meaning but an epistemological method for clarifying scientific hypotheses.

Beyond clarifying concepts, Peirce's pragmatism also offers a basis for criticizing speculative metaphysics that has no empirical or practical implications. Nevertheless, his pragmatism differs fundamentally from logical positivism. Whereas logical positivism tends to reduce meaning to empirical verification alone, Peirce retains a metaphysical dimension through his commitment to realism and the existence of natural laws. For Peirce, scientific knowledge concerns not only actual empirical facts but also the possibilities, or 'would-bes,' inherent in the structure of reality.[18]

From the perspective of contemporary Islamic epistemology, Peirce's pragmatism is highly relevant to efforts to develop a more open and context-sensitive model of knowledge. Certain traditions within Islamic epistemology have been dominated by deductive and textualist approaches that tend to regard truth as final and closed to reinterpretation.[19] Through fallibilism and the scientific method, Peirce offers an epistemological paradigm in which knowledge constitutes an ongoing process of inquiry. This approach can contribute to the development of contemporary ijtihad that is more dialogical, critical, and responsive to social change.

Peirce's pragmatism also opens a path for integrating revelation, reason, empirical experience, and social reality in the construction of Islamic epistemology. Religious knowledge is understood not merely as the reproduction of normative doctrines but as an evolving process of interpretation and critical examination within human experience. [20] Peirce's pragmatism can thus be regarded as a relevant philosophical

[18] Arjuna Hiqmah Lubis, "Pragmatisme Charles S. Peirce Dan Implikasinya Pada Penentuan Awal Waktu Salat Dan Pelaksanaannya," *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 5, no. 1 (June 20, 2019): 14–35, https://doi.org/10.30596/jam.v5i1.2743.

[19] Theguh Saumantri, "Konstruksi Pengetahuan Dalam Perspektif Metodologi Program Riset Ilmiah Imre Lakatos," *Tasamuh: Jurnal Studi Islam* 14, no. 2 (2022): 282–99, https://doi.org/https://doi.org/10.47945/tasamuh.v14i2.680.

[20] Mustaqim, "Pragmatisme Dalam Filsafat Kontemporer: Analisa Atas Pemikiran Charles S. Peirce."

approach to renewing the methodology of contemporary Islamic thought, especially in responding to modernity, diverse forms of knowledge, and the changing dynamics of global society.

Logic in Peirce's Philosophical System

In Charles Sanders Peirce's philosophy, logic is understood not simply as a formal instrument for testing the validity of arguments but as a normative theory of reasoning and scientific inquiry. For Peirce, logic concerns the cognitive norms governing how people ought to think, construct inferences, formulate hypotheses, and clarify meaning. [21] Accordingly, logic has a broader epistemological dimension than classical formal logic, which concentrates on the structure of propositions and syllogisms.

Peirce viewed the production of knowledge as always occurring within a dynamic framework of inquiry. Logic should therefore be understood as a method for directing inquiry toward increasingly well-grounded and objective knowledge. In this context, logic is not merely a tool for linguistic analysis or formal deduction but a theory of the procedures through which knowledge is discovered—a logic of inquiry.[22] This marks an important shift from the traditional paradigm of logic toward an investigative logic more receptive to experience, hypotheses, and developments in modern science.

As his thinking developed, Peirce became dissatisfied with the excessive reliance of modern epistemology on Cartesian rationalism and Immanuel Kant's transcendental critique. Although Peirce adopted elements of Kant's philosophy, particularly the importance of categories in human experience, he criticized Kant for failing to provide an adequate epistemological justification for cognitive norms. Peirce thus sought to reconstruct the Kantian framework through pragmatic and phenomenological approaches grounded more firmly in concrete experience and scientific practice.

An important aspect of Peirce's philosophical system is his architectonic approach to the classification of knowledge. He divided the normative sciences into three principal branches: aesthetics, ethics, and logic. In this hierarchy, logic depends on ethics and aesthetics. Aesthetics

[21] Anderson, *Charles Sanders Peirce's Philosophy of Signs: Essays in Comparative Semiotics*. 167.

[22] Manfred Kraus, "Manfred Kraus Charles S . Peirce ' S Theory Of Abduction And The Aristotelian Enthymeme," *The Journal of Speculative Philosophy* 46, no. 2 (2018): 237–38.

examines the ideal ends worthy of human pursuit; ethics governs human action in achieving these ends; and logic provides norms for sound reasoning in the pursuit of knowledge.[23] In Peirce's view, logic does not stand independently but forms part of an overall normative system involving values, action, and rationality.

This perspective reveals the strongly practical dimension of Peirce's logic. Thinking is not an abstract process detached from human life; rather, it is connected to human action and the pursuit of values. Logical reasoning must therefore guide human beings as they confront complex and changing realities. Peirce's logic is consequently dynamic and anti-dogmatic, and remains open to the revision of beliefs in response to new experience and inquiry.

Peirce's philosophical investigations rest on a system of categories developed in response to Kantian categories. Employing a phenomenological approach, Peirce formulated three fundamental categories of experience: Firstness, Secondness, and Thirdness. These categories provide the ontological and epistemological foundations of his logical system. Firstness concerns possibility and pure quality; Secondness concerns facts and the resistance of reality; and Thirdness concerns mediation, law, and relations of meaning.[24] Logic operates primarily at the level of Thirdness because it involves interpretation, generalization, and the formation of rational laws.

Peirce also regarded mathematics and phenomenology as important foundations for developing logic. Mathematics, in his view, is the most fundamental discipline because it requires no external justification beyond its internal consistency. Phenomenology, meanwhile, describes the basic structures of human experience before they are subjected to further logical and metaphysical analysis.[25] Through this approach, Peirce sought to construct a more comprehensive philosophical basis for modern logic—one that is not only formal and symbolic but also connected to experience, reality, and human processes of knowing.

Within his logical system, Peirce developed three principal forms of inference: deduction, induction, and abduction. Deduction derives

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[23] Rizal Mustansyir, *Bahasa Ilmiah Dalam Perspektif Charles Sanders Peirce* (Yogyakarta: Fakultas Filsafat UGM, 2019). 117.

[24] Smith, "Peircean Theory, Psychosemiotics, and Education."217.

[25] Fildza Nardina Fitria and Theguh Saumantri, "Mengungkap Kekuatan Transformasi Melalui Rasionalitas Serta Kritisisme," *Media: Jurnal Filsafat Dan Teologi* 5, no. 1 (February 29, 2024): 81–96, https://doi.org/10.53396/media.v5i1.226.

logical consequences from general premises; induction formulates generalizations on the basis of empirical facts; and abduction generates new hypotheses as possible explanations of phenomena. Of these, abduction occupies a central place because it is the source of scientific creativity and the starting point of inquiry.[26] Through this conception, Peircean logic becomes not merely a tool of demonstration but also a method for discovering knowledge.

The relevance of Peirce's logic to the epistemology of contemporary Islamic thought lies in its capacity to offer an open, dialogical, and investigative paradigm of knowledge. Certain Islamic epistemological traditions have tended to rely on normative and textualist deductive models. As a result, knowledge production may be reduced to the reproduction of established doctrines rather than a continuing search for meaning.[27] In this context, Peirce's logic offers a methodological alternative that permits the integration of revelation, reason, empirical experience, and social reality.

Moreover, the conception of logic as a theory of inquiry is relevant to developing methodologies of contemporary ijtihad. Peirce's approach allows religious knowledge to be understood as the product of interpretation, remaining open to criticism and critical examination. This is important in confronting modernity, cultural pluralism, and the continuing development of science. Peirce's logic can thus serve as one philosophical foundation for an Islamic epistemology that is more contextual, critical, and responsive to changing historical circumstances.

Peirce's Concept of Categories

A fundamental component of Charles Sanders Peirce's philosophy is his triadic theory of categories, known as Firstness, Secondness, and Thirdness. These categories form an ontological and epistemological foundation for his philosophical system, including logic, semiotics, and the theory of knowledge. According to Murray G. Murphey, Peirce's categories represent a creative synthesis of Immanuel Kant's transcendental philosophy and the Platonic tradition of idealism.

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[26] Gusmail, "Properti Tari Waktu Dalam Lipatan: Analisis Semiotika Melalui Pendekatan Charles Sanders Peirce," *Puitika: Jurnal Humaniora* 14, no. 1 (2018): 14--24, https://doi.org/http://dx.doi.org/10.25077/puitika.14.1.14--24.2018.

[27] Theguh Saumantri, "Peran Teks Dan Konteks Dalam Penafsiran Filsafat: Menelusuri Keragaman Mazhab Pemikiran," *Indonesian Journal of Islamic Theology and Philosophy* 7, no. 1 (2025): 65–92, https://doi.org/https://doi.org/10.24042/ijitp.v7i1.27231.

From Kant, Peirce adopted the idea that human experience is shaped by certain categorical structures, but he developed these categories in a more phenomenological and realist direction.[28]

In the early development of his thought, Peirce connected these categories to three principal domains of reality: matter as the object of cosmology, the soul as the object of psychology, and God as the object of theology. From this triadic structure, Peirce derived three fundamental forms of experience, termed 'the It,' 'the Thou,' and 'the I,' which subsequently developed into the concepts of Firstness, Secondness, and Thirdness. These categories function not only as metaphysical classifications but also as universal principles explaining how human beings understand reality and construct knowledge.

Firstness refers to pure quality, possibility, or immediate experience not yet connected with anything else. It is the domain of potentiality and spontaneous awareness prior to relationships or interpretation. In human experience, Firstness can be understood as a pure sensation, feeling, or a particular quality experienced before rational analysis. For example, the experience of redness, pain, or a particular form of beauty arises as an immediately felt quality before it is conceptually understood.[29]

Secondness, by contrast, concerns actual facts, resistance, and existential relations between things. At this level, human experience encounters concrete reality, which responds to, exerts pressure on, or resists consciousness. Secondness represents the dimension of action and reaction within empirical experience. An example is the causal relation observed when sodium is dropped into hot water, producing an explosion or flame. In this case, reality is no longer merely a potential quality but appears as an actual fact directly experienced.

Thirdness is the most important category in Peirce's philosophical system because it involves mediation, law, interpretation, and rational regularity. It enables human beings to understand relationships among empirical facts through patterns, concepts, or laws. If Firstness concerns quality and Secondness concerns fact, Thirdness is the principle explaining the relations between them. In the example of sodium reacting with hot water, human beings do not merely observe an empirical event; they also understand the chemical laws explaining why

[28] Murray G. Murphey, *The Development of Peirce's Philosophy* (London: Hackett Publishing Company, 2020). 219.

[29] Carl R. Hausman, "Charles Peirce's Evolutionary Realism as a Process Philosophy," *JSTOR* 38, no. 12 (2023): 13–27.

the reaction occurs. Thirdness thus provides a foundation for scientific knowledge and rationality.[30]

From a logical perspective, these categories are closely related to Peirce's theory of relations. He classified propositions and relations according to the number of elements, or relata, involved. A predicate such as '...is a bird' is a monadic relation or one-place predicate; '...respects...' is a dyadic or two-place relation; and '...gives...to...' is a triadic or three-place relation. According to Peirce, an adequate scientific and descriptive language must accommodate all three kinds of relations, especially triadic relations, which underpin mediation and interpretation.

Peirce's emphasis on Thirdness also reveals his criticism of nominalism, which tends to reduce reality to individual facts alone. For Peirce, laws, regularities, and universal relations possess an objective reality that cannot be reduced to mere names or linguistic constructions. He therefore situated himself within philosophical realism. In his view, the world comprises not only isolated facts but also patterns and laws through which human beings can understand the order of reality.[31]

In the early phase of his thought, Peirce's defense of these categories was strongly influenced by the logic of relations. Later, however, he increasingly adopted phenomenology to explain the foundations of human experience. Through phenomenological reflection, he concluded that triadic structure cannot be eliminated from human experience. Every experience simultaneously involves quality, fact, and the mediation of meaning. Triadicity is therefore a universal principle in all processes of knowledge and interpretation.

In epistemology, Thirdness occupies a central position because it is a primary concern of scientific inquiry. According to Peirce, the purpose of inquiry is not simply to gather empirical facts but to discover the patterns, laws, and regularities underlying diverse sensory experiences. [32] Knowledge develops when human beings connect different facts through interpretation and rational generalization. Logic and scientific method therefore serve as means of discovering Thirdness in reality.

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[30] Short, *Peirce's Theory of Signs*. 234.

[31] M. H Fisch, *Peirce, Semeiotic, and Pragmatism* (Bloomington: Indiana University Press, 2016).

[32] Akhmad Muzakki, "Titik Temu Epistemologi Barat Dan Islam," *ULUL ALBAB Jurnal Studi Islam* 10, no. 1 (December 26, 2018): 85–106, https://doi.org/10.18860/ua.v10i1.6070.

Peirce's theory of categories is relevant to the development of contemporary Islamic epistemology because it offers an integrative account of the relationships among empirical experience, rationality, and transcendent meaning. Some approaches to Islamic epistemology have tended to separate revelation, reason, and empirical experience sharply.[33] Through Peirce's triadic structure, however, these three dimensions can be understood as interrelated aspects of knowing. Firstness may be associated with the intuitive and spiritual dimension of human existence, Secondness with empirical experience and social reality, and Thirdness with rational interpretation of revelation and reality.

Thirdness also has important implications for contemporary Islamic hermeneutics. Interpretation of religious texts cannot end with their literal meaning; it requires interpretive mediation attentive to their social and historical contexts as well as their ethical purposes. Peirce's theory of categories may therefore offer a philosophical foundation for a more contextual, dialogical, and open model of Islamic epistemology, one responsive to the development of modern knowledge without losing its normative orientation.

The Concept of the Sign

The concept of the sign occupies a central place in Charles Sanders Peirce's philosophy because it is integral to knowledge, reasoning, and the formation of meaning. Peirce regarded meaning and representation as the most important forms of Thirdness. His entire system of logic and epistemology was therefore built upon the theory of signs, subsequently known as semiotics. For Peirce, thinking is fundamentally a process of signification, through which human beings interpret reality by means of signs. He even argued that almost every aspect of reality can be understood as a sign insofar as it points beyond itself through the mediation of meaning.[34]

Unlike the concept of the sign in structural linguistics, which focuses primarily on linguistic relations, Peirce's semiotics has a much broader philosophical scope. In his account, signs do not function in isolation but involve a triadic relation among the representamen (the form of the sign), the object (what the sign refers to), and the interpretant (the understanding produced through interpretation). This triadic

[33] Syamsuddin Arif et al., "Epistemologi Dan Teologi Dalam Pemikiran Al-Ghazali Tentang Ilmu Kasyf," *TSAQAFAH* 16, no. 2 (November 16, 2020), https://doi.org/10.21111/tsaqafah.v16i2.4765.

[34] Short, *Peirce's Theory of Signs*. 250.

structure demonstrates that meaning is not simply given; it is mediated through interpretation.[35]

Peirce maintained that a sign can refer to its object only insofar as the sign is understood and interpreted as representing that object.[36] Interpretation is therefore central to semiosis. Each interpretation of a sign gives rise to another sign, which in turn calls for further interpretation. This process is ongoing and never definitively complete. Peirce's semiotics can therefore be understood as a theory of understanding, explaining how human beings form meanings through inference and interpretation.

For Peirce, interpretation is always related to reasoning. When someone understands a sign, that person is in fact making an inference concerning the object to which the sign refers. For example, when someone says, 'You look tired,' the statement may generate further interpretations, such as the belief that the person needs rest, the hope that they will go to sleep soon, or the action of offering them a cup of coffee. In this process, thought mediates between the sign and its object. Peirce's theory of signs is thus closely related to logic and to his model of abductive reasoning.

To explain how signs operate, Peirce developed an elaborate system of semiotic classification. One of his best-known distinctions divides signs into icons, indices, and symbols. An icon functions by resembling the object it represents. Examples include maps, photographs, and diagrams, which represent their objects by similarity of form. In this context, mathematical and logical symbols may also be understood as iconic representations when their structures resemble the relationships they describe.

An index is a sign that has a direct or existential connection with its object. Smoke is an index of fire, footprints are indices of someone's presence, and demonstrative expressions such as 'this' and 'that' function as indices in everyday language. Indexical relations are factual and point

[35] Theguh Saumantri, "Konsumerisme Masyarakat Kontemporer Dalam Pemikiran Jean Baudrillard," *Paradigma: Jurnal Filsafat, Sains, Teknologi, Dan Sosial Budaya* 28, no. 2 (2022): 56–68, https://doi.org/https://doi.org/10.33503/paradigma.v28i2.1962.

[36] Peirce, "The Essential Peirce." 219.

directly to particular objects.[37] Epistemologically, indices are important because they establish a connection between signs and empirical reality.

A symbol, by contrast, derives its meaning from social, cultural, or linguistic convention. Verbal language is among the most prevalent forms of symbolism in human life. The Indonesian word 'air' ('water'), for example, has no natural connection to the substance it denotes but is understood through linguistic agreement within a language community. In Peirce's semiotic system, symbols are essential because they enable human beings to construct abstract knowledge, laws, and complex conceptual systems.

Peirce also introduced the concept of the rheme, a type of sign resembling an open sentence whose meaning admits further interpretation. The meaning of a rheme remains open because further elements are required to determine it. This theory demonstrates that language and signs are inherently dynamic and open to new interpretation. Peirce's semiotics thus rejects the view that meaning is static and final.

For Peirce, the theory of signs is important not only for linguistics and communication but also as a central foundation for logic and scientific method. Scientific reasoning proceeds by interpreting empirical signs and connecting them with particular hypotheses. Logic within Peirce's system is consequently part of semiotics. Deductive, inductive, and abductive reasoning operate by transforming and interpreting signs in ways that generate new meanings.[38]

In pragmatism, Peirce's theory of signs also provides the foundation for explaining the meaning of a concept through its practical consequences. A concept is considered meaningful insofar as it produces identifiable implications for human experience and action. Peirce's semiotics is therefore pragmatic in orientation, linking meaning to the processes of actual life rather than merely to abstract linguistic structures.

Peirce's theory of signs is highly relevant to the development of contemporary Islamic epistemology, particularly for hermeneutics and the interpretation of religious texts. Some approaches in Islamic studies have tended to interpret texts in strictly literal and textualist terms, leaving limited scope for context-sensitive interpretation. Through Peircean semiotics, religious texts may be understood as systems of signs

[37] Dian Nurrachman, "Teks Sastra Dalam Perspektif Semiotika Pragmatis Charles Sanders Peirce," *Al-Tsaqafa: Jurnal Ilmiah Peradaban Islam* 14, no. 1 (June 20, 2017): 83–88, https://doi.org/10.15575/al-tsaqafa.v14i1.1793.

[38] Short, *Peirce's Theory of Signs*. 263.

open to renewed interpretation as social and historical circumstances change.

Peirce's concept of semiosis further suggests that human understanding of revelation is not necessarily exhausted by one definitive interpretation but develops through dialogue among text, interpreter, and social reality. This is important for contemporary Islamic epistemology, which seeks a more dialogical, critical, and contextual approach while retaining the normative dimension of revelation. [39] Peirce's theory of signs may thus provide one philosophical foundation for more responsive methodologies of Qur'anic exegesis, Islamic hermeneutics, and religious studies amid the dynamics of modern society.

Hypotheses and the Model of Abductive Reasoning

Within Charles Sanders Peirce's philosophical system, science fundamentally involves the interpretation of signs. Scientific knowledge arises not from empirical facts alone but through inference and the interpretation of observed phenomena. Peirce's model of scientific reasoning is therefore inseparable from semiotics, logic, and the method of inquiry. Reasoning, in this context, is not only a means of demonstration but also an instrument for discovering new knowledge.[40]

Peirce developed a theory of scientific inference encompassing three principal modes of reasoning: deduction, induction, and abduction. These modes do not operate in isolation; rather, they form a dynamic cycle within scientific research. In Peirce's view, knowledge develops through continuous interaction among hypothesis formation, the derivation of logical consequences, and empirical testing. Scientific logic is thus not linear but cyclical and open to continuous revision.

In discussing induction, Peirce rejected the classical assumption that induction can produce absolute certainty. For him, induction yields probabilistic conclusions based on empirical observation and, where appropriate, statistical sampling. Quantitative induction seeks to estimate the probability that a population possesses particular characteristics, while qualitative induction tests a hypothesis by examining its empirical

[39] Taufik Hidayatulloh and Theguh Saumantri, "Theology of Peace Based on Religious Harmony in Asghar Ali Engineer's Perspective," *Journal of Ushuluddin Studies* 10, no. 1 (2023): 105–24, https://doi.org/https://doi.org/10.15408/iu.v10i1.32289.

[40] Efi Tri Astuti, "Filsafat Ilmu Pengetahuan Sebagai Arah Pengembangan Berpikir Yang Konstruktif: Telaah Pemikiran Pragmatis Charles S. Peirce," *At-Tajdid: Jurnal Ilmu Tarbiyah* 9, no. 1 (2020).

consequences. Accordingly, inductive findings remain provisional and open to correction in light of new experience.[41]

Within his pragmatist framework, Peirce developed the principle of 'probability as propensity,' according to which probability reflects an objective tendency inherent in reality. Probability is thus understood not merely as a subjective measure of human ignorance but as an expression of regularities inherent in the universe.[42] This view reflects Peirce's realist commitment to the existence of laws and regularities in reality that can be understood through scientific inquiry.

Among these three forms of inference, abduction occupies the most fundamental position because it functions as the logic of discovery. Abduction is a form of reasoning that enables human beings to generate new hypotheses to explain particular phenomena. When confronted with a surprising or unexplained fact, the mind seeks the most plausible explanation for it. Abduction is thus a source of scientific creativity and the starting point of inquiry.[43]

Peirce's basic model of abductive reasoning can be presented as follows:

A surprising fact, C, is observed.

If hypothesis A were true, it would explain C.

There is therefore reason to suspect that A is true.[44]

Through this model, Peirce shows that abduction does not yield certainty but produces a plausible hypothesis worthy of further investigation. An abductively formed hypothesis is therefore tentative and must be tested through deduction and induction. In this sense, abduction is not merely random intuition but an inferential process with a logical basis.

Peirce argued that all scientific activity rests on the belief that the universe is intelligible—that is, that human beings can understand it rationally.[45] Researchers should therefore avoid hypotheses that foreclose further inquiry, or 'block the road of inquiry.' This principle indicates that science must always remain open to questions, revision, and alternative explanations.

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[41] Anderson, *Charles Sanders Peirce's Philosophy of Signs: Essays in Comparative Semiotics*. 278.

[42] Fisch, *Peirce, Semeiotic, and Pragmatism*. 196.

[43] Mustaqim, "Pragmatisme Dalam Filsafat Kontemporer: Analisa Atas Pemikiran Charles S. Peirce." 200.

[44] Mustansyir, *Bahasa Ilmiah Dalam Perspektif Charles Sanders Peirce*. 108.

[45] Peirce, "The Essential Peirce." 283.

In this connection, Peirce developed the doctrine of synechism, a metaphysical view holding that reality is characterized by continuity rather than absolute discontinuity. The universe is understood as a network of interconnected relations governed by certain laws and regularities. Abductive reasoning should therefore give preference to explanations that account for continuity rather than leave brute facts unexplained. This position demonstrates the close relationship among logic, metaphysics, and epistemology in Peirce's philosophical system.

Peirce's model of abductive reasoning operates through three principal stages that form a cycle of scientific inquiry. The first stage is hypothesis formation, or abduction (also termed retroduction). At this stage, researchers attempt to formulate a possible explanation for a phenomenon. Abduction is associated with Firstness because it involves possibility, intuition, and creativity in understanding experience.[46]

The second stage is deduction, the process of deriving logical consequences from a formulated hypothesis. At this stage, the hypothesis is clarified by deriving testable empirical implications. Deduction is associated with Thirdness because it involves conceptual mediation and the formulation of rational laws. Here, researchers relate a hypothesis to various consequences that could be observed in reality.

The third stage is induction, in which predictions derived by deduction are tested empirically. Induction is associated with Secondness because it involves factual experience and empirical observation. When observations support the predictions, the hypothesis gains provisional empirical support. When they do not, the hypothesis must be revised or replaced.[47] Peirce's cycle of inference can be summarized as follows:

Abduksi → Deduksi → Induksi → Abduksi Baru

Through this model, Peirce emphasizes that scientific inquiry is an unending process moving from experience to hypothesis, testing, and the formation of new knowledge. Scientific inquiry does not end with inductive testing but continues through the search for alternatives and the formulation of new hypotheses. Human knowledge is consequently dynamic, open, and continually developing.

Peirce's model of abductive reasoning is highly relevant to the development of contemporary Islamic epistemology, particularly to the renewal of methodologies of ijtihad and religious interpretation. Some

[46] Murphey, *The Development of Peirce's Philosophy*.

[47] Riana Hoseani and Fenti Mariska Yohana, "Analisis Sistem Tanda Di Pusat Perbelanjaan Berdasarkan Semiotika Charles Sanders Peirce," *Human Narratives* 2, no. 1 (September 28, 2020): 39–49, https://doi.org/10.30998/hn.v2i1.578.

approaches to Islamic epistemology have been dominated by deductive models moving linearly from normative premises to legal conclusions. Such approaches may leave insufficient room for intellectual creativity and for the complexity of contemporary social realities.

Through abductive logic, Peirce offers a model of reasoning that is more open to possibilities, interpretation, and the formation of new hypotheses. In Islamic studies, this approach can encourage more context-sensitive forms of ijtihad that respond to changing circumstances. [48] Contemporary questions concerning bioethics, the environment, digital technology, and social pluralism require not only deductive reasoning but also exploratory and investigative epistemological approaches.

Moreover, Peirce's fallibilism and cycle of inference suggest that religious knowledge should also be understood as an interpretive process open to correction and further development. This does not imply that revelation itself is relative; rather, it acknowledges that human understanding of revelation is a dynamic intellectual activity. Peirce's model of abductive reasoning can therefore make an important contribution to a contemporary Islamic epistemology that is more dialogical, critical, and adaptive in responding to the challenges of modernity.

The Relevance of Peirce's Thought to Contemporary Islamic Epistemology

Charles Sanders Peirce's account of logic developed alongside his epistemological project to reconstruct the foundations of modern knowledge. As explained above, Peirce's starting point was a critique of Cartesian epistemology, which emphasizes individual certainty as a foundation for knowledge. In Peirce's assessment, René Descartes's method of skepticism, originally advanced as a criticism of medieval ecclesiastical dogmatism, created new epistemological problems. Cartesian skepticism sought to reject every belief lacking absolute certainty, yet in doing so it became entangled in a new form of dogmatism marked by pessimism about the human capacity to acquire reliable knowledge.[49]

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[48] Muhammad Taufiq, "The Role of Ijtihad in the Renewal of Islamic Thought," *Al-Hikmah: International Journal of Islamic Studies and Human Sciences* 5, no. 6 (December 30, 2022): 99–114, https://doi.org/10.46722/hikmah.v5i6.331.

[49] Rodliyah Khuza'i, *Dialog Epistemologi Mohammad Iqbal Dan Charles S. Peirce* (Bandung: PT Refika Aditama, 2022). 64.

In this context, Peirce identified an epistemological dilemma between dogmatism and skepticism. Dogmatism assumes that human beliefs are certain and incapable of error, whereas extreme skepticism holds that human beliefs cannot fundamentally be trusted. Both positions are problematic because they can obstruct rational progress in knowledge. [50] As an alternative to both positions, Peirce proposed fallibilism: the view that all human knowledge may contain errors but can nevertheless be corrected and improved through scientific inquiry.

Through fallibilism, Peirce redirected epistemological attention from the individual to the community of inquiry, or cognitive community. In his view, truth cannot be attained through isolated individual reflection but through dialogue, criticism, and critical examination within a community of inquirers. Knowledge advances because collective work enables the correction of individual errors. [51] Peirce's theory of knowledge thus has a strongly social and intersubjective character.

This conception of a community of inquiry is among Peirce's important contributions to modern philosophy. According to some contemporary pragmatist thinkers, the idea offers a solution to the Cartesian dilemma between absolute certainty and radical skepticism. For Peirce, truth is not something individually possessed in a final form, but the anticipated outcome of sustained collective inquiry. It can thus be understood as the 'opinion that would ultimately be agreed upon by a community of rational inquirers.'[52]

In addition to criticizing Cartesianism, Peirce critically reworked Immanuel Kant's transcendental philosophy. He considered Kant's treatment of knowledge too focused on the structure of subject–predicate judgments, even though not every form of experience can be explained through that model. Peirce responded by developing the logic of relations, which treats relations as fundamental constituents of knowledge.[53] This relational logic significantly broadened modern logic beyond the categorical propositions of the Aristotelian tradition.

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[50] Khuza'i. 67.

[51] Syarifuddin, "Konstruksi Filsafat Barat Kontemporer," *Substantia: Jurnal Ilmu-Ilmu Ushuluddin* 13, no. 2 (2015): 78–90, https://doi.org/http://dx.doi.org/10.22373/substantia.v13i2.4827.

[52] Peirce, "The Essential Peirce." 279.

[53] Syaiful Dinata, "Epistemologi Kritisisme Immanuel Kant," *Kanz Philosophia A Journal for Islamic Philosophy and Mysticism* 7, no. 2 (2021): 217–36, https://doi.org/https://doi.org/10.20871/kpjipm.v7i2.183.

Another criticism of Kant concerns the distinction between noumena and phenomena. According to Kant, human beings can know only phenomena, whereas things as they are in themselves cannot be known directly. Peirce rejected this epistemological dualism because he regarded it as creating an excessively rigid separation between reality and human knowledge. Within his semiotic framework, Peirce held that reality is, in principle, intelligible through signs and human experience (Short, 2020).

Rather than maintaining a dichotomy between noumena and phenomena, Peirce distinguished between reality as something knowable over the long term and actual cognition, which always remains limited and liable to error.[54] Human knowledge may never achieve absolute certainty, but it can nevertheless advance toward increasingly adequate understanding through continued inquiry.

Peirce's rejection of Kantian dualism is also reflected in his criticism of the distinction between regulative ideas and moral postulates. For Peirce, scientific inquiry is not merely a theoretical activity; it is also a genuine moral and social practice. Scientific research has an ethical dimension because it requires a commitment to the collective and open pursuit of truth. Logic therefore cannot be separated from ethics and human social life.

In this regard, thinkers such as Karl-Otto Apel argued that Peirce effected a semiotic transformation of Kant's transcendental logic. Whereas in Kantian philosophy the synthetic unity of consciousness grounds knowledge, in Peirce's philosophy this role is assumed by an interpretive community, or 'logical socialism,' which makes the pursuit of truth possible through communication and collective inquiry. Rationality is thus understood not as merely individual but as dialogical and social.[55]

Peirce's thought is increasingly relevant to contemporary global society. Globalization has produced a world that is ever more interconnected and complex. Developments in information technology, digital communication, and global mobility have made geographical and cultural boundaries increasingly fluid. Under these circumstances, no

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[54] Theguh Saumantri, "Konsumerisme Masyarakat Kontemporer Menurut Herbert Marcuse," *Media (Jurnal Filsafat Dan Teologi)* 3, no. 2 (October 1, 2022): 162–77, https://doi.org/10.53396/media.v3i2.113.

[55] Lailatul Maskhuroh, "Aliran-Aliran Filsafat Barat Kontemporer (Postmodernisme)," *Urwatul Wutsqo: Jurnal Studi Kependidikan Dan Keislaman* 10, no. 1 (April 10, 2021): 87–99, https://doi.org/10.54437/urwatulwutsqo.v10i1.258.

single intellectual tradition can independently address every human problem. Dialogue, collaboration, and the exchange of ideas have become fundamental requirements for addressing modernity, pluralism, and global crises.

Peirce's conception of a community of inquiry is highly relevant to the development of contemporary Islamic epistemology. Some traditions of Islamic thought have tended to concentrate epistemic authority within relatively closed schools, institutions, or groups. This may restrict epistemological dialogue and make it difficult to respond to rapid social change. Through the concept of a cognitive community, Peirce offers a more open, participatory, and dialogical paradigm of knowledge.

Within Islamic epistemology, Peirce's approach can strengthen collective ijtihad involving dialogue among Islamic scholars, scientists, and members of society in addressing contemporary issues. Religious knowledge is no longer regarded as a finished product immune to criticism but as an ongoing interpretive process open to further development. [56] Peirce's thought therefore makes an important contribution to efforts to construct a more inclusive, rational, and contextual Islamic epistemology.

Peirce's fallibilism also has significant ethical value for contemporary Islamic intellectual life. Recognizing that human interpretations may be mistaken can foster an attitude of greater epistemic humility, tolerance, and openness to different perspectives. In today's pluralistic and interconnected world, such an attitude is particularly important for building dialogue among knowledge traditions and strengthening peaceful and democratic social life.

Conclusion

Charles Sanders Peirce's thought demonstrates that logic functions not only as a formal instrument for testing the validity of arguments but also as an epistemological foundation for scientific inquiry and the formation of knowledge. By criticizing traditional logic and Cartesian epistemology, Peirce developed a pragmatic and dynamic paradigm of knowledge open to revision. Within this perspective, the

[56] Abd Basit, Anwar Sanusi, and Theguh Saumantri, "Rationality in Religious Epistemology: An Analysis of Abdul-Karim Soroush's View on the Transformation of Contemporary Religious Thought," *Afkaruna: Indonesian Interdisciplinary Journal of Islamic Studies* 21, no. 1 (2025): 167–180, https://doi.org/https://doi.org/10.18196/afkaruna.v21i1.26724.

meaning of an idea is better understood through its practical and empirical consequences than through the mere pursuit of absolute certainty. This perspective underpins fallibilism, according to which human knowledge is open to error yet can be refined through collective inquiry. Furthermore, Peirce's development of the logic of relations and the theory of signs (semiotics) linked logic closely to the interpretation of signs, while abductive reasoning emerged as a logic of discovery that makes possible the formation of new hypotheses and the exercise of scientific creativity.

In the context of contemporary Islamic epistemology, Peirce's ideas are particularly relevant because they offer a more dialogical, open, and contextual paradigm of knowledge. Fallibilism, the community of inquiry, semiotics, and abductive logic may provide foundations for methodologies of ijtihad and Islamic hermeneutics that respond more effectively to social change and advances in modern science. Peirce's thought therefore not only contributes significantly to modern logic and epistemology but also offers a new perspective for developing Islamic thought that is more critical, inclusive, and adaptive in addressing the increasingly complex challenges of a pluralistic global society.

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