DAVID HUME'S CRITIQUE OF INDUCTIVE REASONING: IMPLICATIONS FOR SCIENTIFIC INVESTIGATION

Bonaventure Chike ANETOH, PhD
Department of Philosophy and Religious Studies, Tansian University Umunya
Email: anetobonaventure@yahoo.com
&
Anthony Uzochukwu UFEAROH, PhD
Department of Philosophy, Nnamdi Azikiwe University, Awka
Email: au.ufearoh@unizik.edu.ng; tonito2006@yahoo.co.uk
ORCID: 0000-0003-2617-6808

ABSTRACT
Inductive reasoning is one of the methods of reasoning, and it is completely opposed to deductive reasoning. In inductive reasoning, a general conclusion is inferred from observed or examined particular instances. It is commonly used in scientific investigations. However, some scholars have criticized inductive method of reasoning, insisting that it can't always guarantee true and valid conclusion. Among the scholars that were not comfortable with inductive reasoning is David Hume. The fundamental questions are: What is inductive reasoning? What are the problems associated with inductive reasoning? What are the major criticisms Hume levelled against inductive reasoning? Could it be said that Hume is right in his criticisms of inductive reasoning? Why does science employ inductive method in its investigation of phenomena in the universe? What are the implications of Hume's critique of induction for scientific investigations? Is there any method that can be better and more efficient than inductive method in scientific investigations? These and other related issues are the major focus of this article, and are to be given scholarly and detailed attention. Employing basically analytical and critical methods of philosophical enquiry, this article examines Hume's critique of induction and its implications for scientific investigation. This article argues that despite the shortcomings of inductive reasoning, it is still the most appropriate method for scientific investigations. Science has, through inductive reasoning, recorded remarkable progress especially in the modern and contemporary periods, and has contributed immensely towards the improvement of the human condition of existence in the universe.
Key Words: **Induction, Reasoning, Hume, Science and Investigation**

INTRODUCTION
Induction is the method of reasoning in which one infers a general conclusion from observed or examined particular instances. It is opposed to deductive reasoning that moves from general statement to particular conclusion. Though induction is widely used in the scientific arena as a good method of reasoning, it cannot be said to be a perfect tool. It has got some weaknesses. Hence, some scholars like Karl Popper (2005); David Hume (1748); and others are not comfortable with induction, and have criticized it in many ways. Karl Popper argues that deductive inferences are safer than inductive inferences, and maintains that scientists should employ deduction in their investigations. On his part, David Hume argues that inductive inferences are not justifiable rationally. However, this article focuses specifically on examining David Hume's critique of inductive reasoning and its implications for scientific investigation.
Science attempts to offer explanation of phenomena in the universe and at the same predicts future occurrences. In such attempt to explain phenomena in the universe, science employs mainly inductive reasoning. Science investigates phenomena empirically, using the methods of experimentation and observation. By studying or examining some samples of the entire

population, science makes inductive generalization. However, David Hume's critique of induction has devastating implications for scientific investigation. The basic questions that are scholarly very pertinent in this article are: What actually is inductive reasoning? Does the premise of inductive argument guarantee a valid conclusion? What are the problems associated with inductive reasoning? What are the major criticisms David Hume levelled against inductive reasoning? Could it be said that Hume is right in his criticisms of inductive reasoning? How and why does science employ inductive method in its investigation of phenomena in the universe? Has inductive reasoning been beneficial to science? What are the implications of Hume's critique of induction for scientific investigations? Is there any method that can be better and more effective than inductive method in scientific investigations? These questions and other related ones are very necessary in this discourse, and are to be given detailed as well as scholarly attention. This study employs mainly analytical and critical methods of philosophical investigation to examine Hume's critique of inductive reasoning and its implications for scientific investigation.

This article is partitioned into four sections. The first section clarifies the concept of inductive reasoning. The second section discusses Hume's critique of induction. The third section examines the implications of Hume's critique of induction for scientific investigation. The fourth section is the evaluation as well as the conclusion of the article.

INDUCTIVE REASONING: CONCEPTUAL ANALYSIS

Inductive reasoning and deductive reasoning are opposed to each other. While deductive reasoning moves from general premise(s) to particular conclusion, inductive reasoning moves from particular instances (premises) to general conclusion. However, the major concern of this article is inductive reasoning or induction.

Etymologically, the term 'induction' is derived from the Latin word 'inducere' which means 'to lead into'. Hence, from etymological perspective, induction means to lead one into something. Max Black as cited by Ogbozo (2014) notes that the Latin word 'inducere' was derived from the Greek word 'epagoge*'* (pp.232-233). Explaining what the Greek word 'epagoge' means, Ogbozo (2014) states that:

> The word "*epagoge*" is the noun-form of the Greek verb, "*epagein*" meaning "to lead on". In philosophical parlance, as was the case with Aristotle's use, the term *epagoge* refers to 'the act of leading oneself or others to some general concepts or some universal truth from less general or particular cases falling under them.(p.233)

Induction has to do with the process of leading one from something or particular things into another thing or something else. It entails the movement from things that have been examined or observed to things that have not been examined or observed. In inductive reasoning, one infers a general conclusion from particular premises. In the attempt to define induction from its etymological perspective, Black (1967) states thus:

> The name 'induction', derived from the Latin translation of Aristotle's *epagoge*, will be used here to cover all cases of non-demonstrative argument, in which the truth of the premises, while not entailing the truth of the conclusion, purports to be a good reason for belief in it. Such arguments may also be called "ampliative", as C.S. Peirce called them, because the conclusion

> may presuppose the existence of individuals whose existence is presupposed by the premises (p.169).

Inductive reasoning is based on the presumption that the observation of some particular members of a group gives one the knowledge of all the members of the group. It is also based on the assumption that the unobserved things will definitely behave like the observed ones or be similar to them given the same or similar circumstances.

Inductive reasoning has been the major concern of many scholars. Hence, many scholars have described induction in different but related ways. Skyrms (1995) describes induction in two senses. He distinguishes between two different, but related senses of induction, viz., narrow sense and broad sense. According to him:

> Induction, (1) in the narrow sense, inference to a generalization from its instances; (2) in the broad sense, any ampliative inference-that is, any inference where the claim made by the conclusion goes beyond the claim jointly made by the premises. Induction in the broad sense includes, as cases of particular interest: argument by analogy, predictive inference, inference to causes from signs and symptoms, and confirmation of scientific laws and theories (p.368)

Though these two senses of induction are slightly different, they point at the same thing, that is, the conclusion of an inductive argument is not explicitly contained in the premises. The conclusion of inductive argument gives new information, and this brings out the ampliative nature of inductive reasoning. In agreement with Skyrms' (1995) description, Ogbozo (2014) defines induction thus: "For the moment and in a very broad sense, we can explain induction as 'an inference from particular instances in sensible experience to some general or universal conclusions or laws" (p.233). This definition demonstrates the empirical nature of induction. In inductive reasoning, the premises provide evidence for the conclusion, but such is not conclusive. The conclusion of inductive reasoning is quite probable. This stems from the fact that it is based on the examined limited data samples.

Furthermore, Okasha (2002) is one of the scholars that gave detailed attention to inductive reasoning. According to him, "In inductive inference, or inductive reasoning, we move from premises about objects we have examined to conclusions about objects we haven't examined…" (p.19). This is rooted on the presumption that the unexamined objects will not be different from the examined ones. However, one should not forget the fact that there is possibility that the unexamined objects may not be the same with the examined objects. Hence, in inductive reasoning, even if the premises are true, the conclusion may not be true. Hawthrone (2021) argues that "In a good inductive argument, the truth of the premises provides some *degree of support* for the truth of the conclusion, where this *degree-of-support* might be measured via some numerical scale" (para. 1). It becomes obvious from the foregoing that the evidence provided by the premises of an inductive reasoning is not conclusive. Consequently, the truth or falsity of the premises may not guarantee the truth or falsity of the conclusion.

TYPES OF INDUCTION

There are different types of induction as identified by some scholars. These different types are just variations or nuances of induction. Despite the variations, they share the common features of inductive reasoning, which differentiate them from deductive reasoning. Max Black as cited

by Ogbozo (2014) identifies the following types of induction, viz.: Elaborated induction and Proportional induction. Explaining the meaning of Elaborated induction, Ogbozo (2014) states:

> This kind of inference "consists of more or less sophisticated variations of induction by simple enumeration". It would involve positive and negative information on instances pertaining to the subject matter. Since its credibility lies on quantity of evidence collected, Francis Bacon accuses Aristotle (known to have used this method of simple enumeration) of failing to distinguish the essential data from the accidental in scientific investigation. This kind represents the oldest form of induction which goes back to Aristotle… (p.242)

Elaborated induction, which is attributed to Aristotle, could be said to be induction by simple enumeration. This entails getting sizeable evidence by gathering information from a big number of instances of the phenomenon under investigation. Elaborated induction may be said to be the main type of inductive reasoning. It is different from Proportional induction which argues from the perspective of frequency of occurrence of things. Articulating what proportional induction is all about, Ogbozo (2014) states:

> This refers to an "inference from the frequency of occurrence of some character in a sample to the frequency of the same character in the parent population". The thesis of this kind of induction can be illustrated with an example like this: if in every ten years within a period of thirty years in a particular family, one person was insane, it means that there were three insane persons throughout the thirty years' period. From here, it could be inferred that a closer frequency of five years interval of insanity happened in the parent population (i.e. counting backwards). The way that the closer frequency of five years was calculated was based on the logic that the more frequent parents give birth to offspring, the more their genes in the offspring get weaker. (pp. 242-243)

Be that as it may, proportional induction draws conclusion on the unobserved things based on the examined things in the same area.

Outside the above listed types of induction, there are still other different, but related kinds of induction. In this direction, Brian Skyrms (1995) identifies two other kinds of induction, viz., a narrow sense induction and a broad sense induction (ampliative induction). Let us at this juncture examine them one after the other. A 'narrow sense induction' could be said to be a restricted kind of induction. It is also known as 'mathematical induction'. This infers general conclusion from particular instances. According to Ogbozo (2014):

> The narrow sense induction is a kind of inference from particular instances to a general law. According to Skyrms, this kind of induction concerns one extreme case that is not ampliative, namely mathematical induction… Explaining further, Skyrms maintains that mathematical induction involves two basic aspects: methods of definition and of proof. By method of definition is when a collection of objects is made and defined inductively, whereas the method of proof refers to a situation where 'all members of the objects collected are shown to have a particular property' (p. 244).

A narrow sense induction is different from a broad sense induction, though they are related. Such relationship stems from the fact that they are two different sides of a particular coin. Certainly, a broad sense induction is not restricted as the narrow sense induction. In a broad sense induction, the conclusion gives new information that is not contained in the premises. Skyrms as cited by Ogbozo (2014) explains broad sense induction thus:

> Skyrms explains this second form of induction as follows: "any inference where the claim made by the conclusion goes beyond the claim jointly made by the premises". According to him the argument by analogy, predictive inference, inferences from signs or symptoms to causes, confirmation of scientific laws and theories are all examples of the ampliative kind of induction (p.245).

He brings out very clearly the synthetic and ampliative nature of inductive reasoning. Furthermore, in his book *Choice and Chance*, Skyrms distinguishes between strong induction and weak induction. He averres that, "An argument is inductively strong [considering the evidential relation between its premises and its conclusion] if and only if:

a. Its inductive probability is high.
b. b. It is not deductively valid." (21)

It ought to be noted that the different types of induction do not contradict one another, rather they complement one another. Each of them throws light, from its own perspective, on what inductive reasoning is generally all about. Hence, each of them contributes, from its own perspective, to the general understanding of the meaning of inductive reasoning.

DAVID HUME'S CRITIQUE OF INDUCTIVE REASONING

Inductive reasoning or induction is a controversial method of reasoning, and has attracted barrage of criticisms from some scholars like David Hume, Karl Popper, Carl Hempel etc. It becomes very obvious that some scholars are not comfortable with induction. According to Skyrms, "the Scottish philosopher David Hume first raised this problem, which we shall call the traditional problem of induction, in full force. Hume gave the problem a cutting edge." This section focuses specifically on David Hume's critique of inductive reasoning.

David Hume articulated the problems associated with induction in the context of his discussion on cause and effects. Initially, he made a distinction between impression and ideas, and argued that ideas are copies of impressions which are vivid as well as original perception. Hence, Hume denied the authenticity of ideas that do not have corresponding impression. Based on this, he examined the relationship between cause and effect. Consequently, he denied the idea of necessary connection between cause and effect because such idea does not have any corresponding impression.

Hume questioned the use of inductive reasoning, and argued that induction is based on the principle of 'Uniformity of Nature'. This is based on the assumption that nature will not change, but must behave uniformly. Hume's dissatisfaction with inductive inference is very remarkable in the philosophical domain, and it is commonly known as Hume's problem of induction. Ogbozo (2014) articulates David Hume's problem of induction thus: "…it is still part of the central problem of induction to inquire as follows: to what extent is nature constant or regular such we can comfortably use the incident that happened a couple of times in the past to infer the similar happening in the future" (p.241). In his major books, *A Treatise of Human Nature* and *An Inquiry Concerning Human Understanding*, Hume devoted detailed

attention to the critique of inductive reasoning. This demonstrates his dissatisfaction with induction. In the words of Hume (1888):

> Our foregoing method of reasoning will easily convince us, that there can be no *demonstrative* arguments to prove, *that those instances, of which we have had no experience, resemble those, of which we have had experience.* We can at least conceive a change in the course of nature; which sufficiently proves, that such a change is not absolutely impossible. To form a clear idea of anything, is an undeniable argument for its possibility, and is alone a refutation of any pretended demonstration against it (p.89).

Hence, Hume condemns the inductive method of inferring conclusion on the unobserved or unexamined phenomena based on the examined or observed ones. Consequently, he argues that one is not justified in any way to make conclusion about objects one has not observed or examined. This implies that one can make valid conclusion only on objects one has examined or observed. Elaborating on this, Hume (1888) states:

> Let men be once fully persuaded of these two principles, That there is nothing in any object, considered in itself, which can afford us a reason for drawing a conclusion beyond it; and, That even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience; I say, let men be once fully convinced of these two principles, and this will throw them so loose from all common systems, that they will make no difficulty of receiving any, which may appear the most extraordinary. (p.139)

With this argument, Hume attempts to destroy the foundation of inductive reasoning, and at the same time tries to prove that inductive inferences are not justifiable.

Furthermore, Hume argues that the course of nature is not as uniform as inductive reasoning presupposes. He insists that change in the course of nature is quite conceivable. This demonstrates the claim that the future will not always resemble the past as inductive reasoning presumes. According to Hume (1888):

> Here then are two things to be considered, viz. the *reasons* which determine us to make the past a standard for the future, and the *manner* how we extract a single judgment from a contrariety of past events. First we may observe, that the supposition, *that the future resembles the past*, is not founded on arguments of any kind, but is derived entirely from habit, by which we are determined to expect for the future the same train of objects, to which we have been accustomed. This habit or determination to transfer the past to the future is full and perfect; and consequently the first impulse of the imagination in this species of reasoning is endowed with the same qualities. But, secondly, when in considering past experiments we find them of a contrary

> nature, this determination, though full and perfect in itself, presents us with no steady object, but offers us a number of disagreeing images in a certain order and proportion. (pp.133-134)

It is obvious that inductive reasoning is based on the presumption that the future will resemble the past, which for Hume, is unjustifiable and is not founded on any argument. It is rather rooted on our habit of expectation that the future will not be different from the past. Hume maintains that such habit of expectation has no rational foundation.

In *An Inquiry Concerning Human Understanding*, Hume (1748) argues strongly that inductive reasoning must be probable. Inductive inference has likelihood of being either true or false. The truth of the premises does not guarantee the truth of the conclusion. Hence, if the premise of an inductive argument is true, the conclusion may or may not be true. This is as a result of the circumstances that surround it. This implies that inductive inferences are not certain. According to Hume (1748):

> If we be, therefore, engaged by arguments to put trust in past experience and make it the standard of our future judgment, these arguments must be probable only, or such as regard matter of fact and real existence, according to the division above mentioned. But that there is no argument of this kind must appear if our explication of that species of reasoning be admitted as solid and satisfactory. We have said that all arguments concerning existence are founded on the relation of cause and effect, that our knowledge of that relation is derived entirely from experience, and that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past. To endeavor, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle and taking that for granted which is the very point in question. (pp. 49-50)

Inductive inference is probabilistic because it draws conclusion about a population based on few instances. It is certain that probability is opposed to certainty. Anything that is probable cannot be certain at the same time. Obviously, the probabilistic nature of inductive inference questions our confidence in inductive reasoning. Furthermore, Hume (1748) argues thus:

> Now, where is that process of reasoning which, from one instance, draws a conclusion so different from that which it infers from a hundred instances that are nowise different from that single one? This question I propose as much for the sake of information as with an intention of raising difficulties. I cannot find, I cannot imagine any such reasoning. But I keep my mind still open to instruction if anyone will vouchsafe to bestow it on me. (p.50)

After series of argument against induction, Hume concludes that inductive reasoning cannot be separated from our belief in the principle of 'Uniformity of Nature' (UN). This is the presumption that things in nature appear and behave in a uniform manner. In the words of Hume (1748): "Our idea, therefore, of necessity and causation arises entirely from the uniformity observable in the operations of nature, where similar objects are constantly conjoined together, and the mind is determined by a custom to infer the one from the

appearance of the other." (p.92) Hume is not comfortable with such presumption that things in nature must always behave uniformly. Hence, he argues thus:

> We must not, however, expect that this uniformity of human actions should be carried to such a length as that all men, in the same circumstances, will always act precisely in the same manner, without making any allowance for the diversity of characters, prejudices, and opinions. Such a uniformity, in every particular, is found in no part of nature. (Hume: 1748, p.95)

Hume insists that we cannot prove the veracity of 'Uniformity of Nature' (UN) assumption. It is just a matter of habit. The inability to prove the veracity of 'Uniformity of Nature' (UN) principle renders invalid and unjustifiable any argument that is based on it. Analyzing Hume's argument on this, Okasha (2002) states:

> But how do we know that the UN assumption is actually true, Hume asks? Can we perhaps prove its truth somehow (in the strict sense of proof)? No, says Hume, we cannot. For it is easy to imagine a universe where nature is not uniform, but changes its course randomly from day to day. In such a universe, computers might sometimes explode for no reason, water might sometimes intoxicate us without warning, billiard balls might sometimes stop dead on colliding, and so on. Since such a 'non-uniform' universe is conceivable, it follows that we cannot strictly prove the truth of UN. (pp.25)

However, even if it is possible to imagine a non-uniform nature, one can easily observe that many things seem to behave uniformly in the universe. It is obvious that we have morning, afternoon, evening and night every day. One also observes that the seasons of the year come up at their appropriate times. In fact, many things seem to be regular in the course of natural occurrences. From this perspective, Uniformity of Nature (UN) argument seems to be true judging from physical occurrences. Nevertheless, Hume is dissatisfied with this method of reasoning. Hence, he argues that such argument begs the question, and it is a circular argument. Re-echoing Hume's argument against 'Uniformity of Nature' principle, Okasha (2002) states:

> To put the point another way, it is certainly an established fact that nature has behaved largely uniformly up to now. But we cannot appeal to this fact to argue that nature will continue to be uniform, because this assumes that what has happened in the past is a reliable guide to what will happen in the future- which is the uniformity of nature assumption. If we try to argue for UN on empirical grounds, we end up reasoning in a circle. (p.25)

From the foregoing, it is evidently clear that David Hume is not comfortable with inductive reasoning. This has necessitated his strong critique of induction. His critique of induction is very popular in philosophy, and has attracted a lot of philosophical attentions. Henderson (2022) summarizes Hume's critique of induction thus:

> Hume asks on what grounds we come to our beliefs about the unobserved on the basis of inductive inferences. He presents an argument in the form of a dilemma which appears to rule out the possibility of any reasoning from the premises to the conclusion of an inductive inference. There are, he says, two possible types of arguments, "demonstrative" and "probable", but neither will serve. A

> demonstrative argument produces the wrong kind of conclusion, and a probable argument would be circular. Therefore, for Hume, the problem remains of how to explain why we form any conclusions that go beyond the past instances of which we have had experience (T. 1.3.6.10). Hume stresses that he is not disputing that we do draw such inferences. The challenge, as he sees it, is to understand the "foundation" of the inference—the "logic" or "process of argument" that it is based upon… (para. 3)

It ought to be noted that Hume's critique of inductive reasoning has a lot of implications for scientific investigation. This stems from the fact that inductive reasoning is used in scientific research and generally, "to frame our expectations of the future on the basis of our knowledge of the past and present" (Skyrms, 1995, p. 28). It is good at this point of the discourse to give scholarly attention to such implications.

IMPLICATIONS OF DAVID HUME'S CRITIQUE OF INDUCTIVE REASONING FOR SCIENTIFIC INVESTIGATION

Scientists make use of inductive reasoning in their investigation of phenomena in the universe, and they believe that they can attain objective knowledge of phenomena in the universe through inductive inferences. Science is empirical in nature, and it studies phenomena through experimentation as well as observation. Scientists make general conclusions based on the limited samples they have studied or observed. Elaborating on the use of inductive reasoning in scientific investigations, Okasha (2002) averres:

> In effect, scientists use inductive reasoning whenever they move from limited data to a more general conclusion, which they do all the time. Consider, for example, Newton's principle of universal gravitation…which says that everybody in the universe exerts a gravitational attraction on every other body. Now obviously, Newton did not arrive at this principle by examining every single body in the whole universe- he couldn't possibly have. Rather, he saw that the principle held true for the planets and the sun, and for objects of various sorts moving near the earth's surface. From this data, he inferred that the principle held true for all bodies. Again, this inference was obviously an inductive one: the fact that Newton's principle holds true for some bodies doesn't guarantee that it holds true for all bodies. (p. 22)

Certainly, most scientific laws or theories were arrived at inductively. Inductive generalization is at the core of scientific research, and it plays significant role in scientific investigation. This stems from the fact that it may not be easy to study all the objects under consideration.

As it is obvious in this article, Hume was completely uncomfortable with induction. Such uncomfortability necessitated his critique of inductive reasoning. Hume's critique of induction has devastating implications for scientific investigation. In fact, it questions scientific investigations and scientific conclusions. Hume's critique of induction casts doubt on scientific conclusions as well as scientific knowledge in general. Judging from Hume's critique of induction, scientific conclusions may not be rationally justifiable. This stems from the fact that they are based on inductive reasoning, which for Hume, is not rationally justifiable. According to Okasha (2002), "If Hume is right, the foundation on which science is built does not look as solid as we might have hoped" (p.27). This stems from the fact that Hume questions the basic method of scientific investigation.

EVALUATION

Inductive reasoning makes conclusions on the unexamined objects based on the examined ones. It is obvious from the discourse above that inductive reasoning is not a perfect method of reasoning. There are problems associated with it. Black (1967) articulates three problems of induction thus:

> (1) The general problem of justification: Why, if at all, is it reasonable to accept the conclusions of certain inductive arguments as true- or at least probably true? Why, if at all, is it reasonable to employ certain rules of inductive inference?
> (2) The comparative problem: Why is one inductive conclusion preferable to another as better supported? Why is one rule of inductive inference preferable to another as more reliable or more deserving of rational trust?
> (3) The analytical problem: What is it that renders some inductive arguments rationally acceptable? What are the criteria for deciding that one rule of inductive inference is superior to another? (p.170)

Inductive reasoning leads to conclusions that are not certain, but rather probable. Obviously, this questions inductive inferences and the reliability on inductive conclusions. It is obvious in this article that David Hume is not comfortable with the use of inductive reasoning, and has formulated scholarly argument against induction. Certainly, Hume's argument against induction is very interesting, and it is quite popular in the philosophical world. In the words of Henderson (2022):

> Hume's argument is one of the most famous in philosophy. A number of philosophers have attempted solutions to the problem, but a significant number have embraced his conclusion that it is insoluble. There is also a wide spectrum of opinion on the significance of the problem. Some have argued that Hume's argument does not establish any far-reaching skeptical conclusion, either because it was never intended to, or because the argument is in some way misformulated. Yet many have regarded it as one of the most profound philosophical challenges imaginable since it seems to call into question the justification of one of the most fundamental ways in which we form knowledge. (para. 4)

Though there are problems associated with inductive reasoning, it seems to the present researchers that Hume went to the extreme in his critique of induction. Despite the fact that things in nature may not perfectly behave in a regular manner, they tend to behave more regularly or uniformly than Hume thought.

Also, Hume argues that one is not justified to make conclusion about objects one has not examined. It could be said that he is right to some extent with regard to this, but the problem lies in the impossibility of examining all the objects in a particular group. The point is that the examined objects can provide insight on the unexamined ones, all things being equal. But the problem lies on the degree of certainty. If few members of a certain group fail to share the characteristics of the entire population, such is not enough to deny all the members of the group such characteristics. According to Okasha (2002):

> Some people believe the key lies in the concept of probability. This suggestion is quite plausible. For it is natural to think that although the

> premises of an inductive inference do not guarantee the truth of the conclusion, they do make it quite probable. So even if scientific knowledge cannot be certain, it may nonetheless be highly probable. But this response to Hume's problem generates difficulties of its own, and is by no means universally accepted… (pp.27-28).

Be that as it may, Hume's critique of induction has devastating implications for scientific investigation. It questions the method of scientific investigation, and basically questions the foundation of science as articulated above. Due to the problems associated with induction, the question is this: Is there any better method that should be used for scientific investigation? It seems to the researchers that inductive reasoning is the most appropriate method for scientific investigation. This is basically as a result of the empirical nature of scientific investigation. It is obvious that science, with the use of inductive reasoning, has recorded a lot of achievements through its numerous discoveries as well as inventions, and has recorded a lot of progress especially in the modern and contemporary periods. Such discoveries and inventions have, no doubt, improved the condition and standard of life in the universe. Science has contributed immensely and is still contributing towards the understanding of phenomena in the universe.

CONCLUSION

Scholarly attention has been given to David Hume's critique of inductive reasoning and its implications for scientific investigation. As it is obvious from the discourse, there are problems associated with inductive reasoning. This study maintains that, despite such problems, inductive reasoning seems to be the most adequate method for scientific research, given the empirical nature of scientific research. With the use of inductive reasoning, science has contributed immensely towards the improvement of human condition of existence in the universe through its innumerable discoveries and inventions.

REFERENCES

Black, M. (1967) 'Induction' *The encyclopedia of philosophy*, Paul Edwards (ed.) (pp.169-181) New York: The Macmillan Company & The Free Press.

Hawthrone, J., (2021). 'Inductive Logic' *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL=https://plato.stanford.edu/archives/spr 2021/entries/logic-inductive/

Henderson, L. 'The Problem of Induction', *The stanford encyclopedia of philosophy* (Winter 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford. edu / archives/win2022/entries/induction-problem/>.

Hume, D.(1888). *A Treatise of human nature*, L. A. Selby-Bigge (ed.) Oxford: Clarendon Press

Hume, D. (1748). *An Inquiry concerning human understanding*. Charles W. Hendel (ed.) Indianapolis: Bobbs-Merrill Company, Inc.

Ogbozo, C. N. (2014). *Philosophy of science: Historical and thematic introduction*, Enugu: Claretian Communications.

Okasha, S. (2002). *Philosophy of science: A very short introduction*, New York: Oxford University Press.

Popper, K. (2005). *The Logic of Scientific Discovery*, New York: Taylor and Francis.

Skyrms, B. (1995). 'Induction', *The cambridge dictionary of philosophy*, Robert Audi (ed.) (pp. 368-369) Cambridge: University Press.

Skyrms, B. (1995). *Choice and Chance: An Introduction to Inductive Logic*. Ontario:Wadsworth