

John Locke's Notion of Representational Realism and its Implications for Knowledge Representation in Artificial Intelligence

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Abstract

This study titled John Locke's notion of representational realism and its implications for knowledge representation in artificial intelligence, examined the intersection between Locke's epistemology and how artificial intelligence employs symbolic systems, semantic network to encode and process knowledge. Symbolic AI has made progress in representing facts, rules, and relationships; however, it still struggles with grounding these representations in the real world. This has led to problems such as ambiguity, context-dependence, and misinterpretation. John Locke's representational realism on the other hand, posits that human knowledge arises from mental ideas that represent the external world. Locke's theory raises philosophical questions about the accuracy and reliability of representation. The relationship between Locke's epistemological framework and modern knowledge representation in AI has not been fully explored by scholars in the field of philosophy and computer science. As a result, this gap limits our ability to design AI systems that can better mirror reality. There is therefore the need to investigate how Locke's theory of representational realism can provide a conceptual framework for addressing the problem of accurate knowledge representation in AI. The main objective of this study was to examine Locke's representational realism and its implications for artificial intelligence. To achieve this objective, this study employed the comparative and analytic methods to highlight how Locke's theory of ideas sheds light on the gap between abstract representation and real-world reference in artificial intelligence. The study found that Locke's theory of representational realism parallels knowledge representation in AI. Furthermore, the problem of representational accuracy in Locke's theory is also a limitation to knowledge representation in AI. The study concluded that integrating the insights from the theory of representational realism will deepen our understanding of the limits of AI and this, in turn,

will enable humans to design better systems that can better mirror the world.

Keywords: Representational Realism, Knowledge Representation, Artificial Intelligence, Ideas.

Introduction

The initial context of Locke's work is the assumption that there is a real physical world that we can in fact come to know about. This context is of extreme importance to Locke's epistemology as it bounds the problems to be overcome and the aims of the epistemological methods. In Locke's point of view, epistemology is an inquiry into the possibility of a science of nature. Locke divides his account of knowledge into three parts, and in each part there is a knowledge which is related to the science of nature. The three parts are the extent of human knowledge, the degrees of knowledge, and the grounds of probability. For Locke, the first part is very important to explain the quality of human knowledge compared to the knowledge of things.

Locke's Method for Analysing Ideas.

It was Locke's belief that before we go ahead to start making comments about the world around us: of God and soul and material things, whatever is the enquiry, an understanding of the human mind and its operations must be first understood. The understanding of the human mind and its limitations therefore became the subject of Locke's inquiry. In the book *An Essay Concerning Human Understanding*, Locke tells us what inspired him; 'Five or six friends meeting at my chamber, and discussing on a subject very remote from this, found themselves quickly at a stand, by the difficulties that rose on every side. After we had awhile puzzled ourselves, without coming any nearer a resolution of those doubts which perplexed us, it came into my thoughts that we took a wrong course; and that before we set ourselves upon inquiries of that nature, it was necessary to examine our own abilities, and see what objects our understandings were, or were not, fitted to deal with? (Locke, p. 10). From what we can tell, the discussion apparently concerned morality and religion. It became clear to Locke that he and his friends were attempting to construct the top floor of the edifice of knowledge without first attending to the foundations. He realised that first one had to examine the ground work of human understanding and then see if it could support enquiry at the higher level of human concern (God and ethics) (Lawhead, 2002, p. 280). It was Locke's belief then, that before we enquire about anything, that we understood what can be known, how it can be known, and the limits of what can be known. In the age that produced thinkers such as Boyle, Sydenham, Huygenius and Newton, Locke sees himself as an under-labourer in clearing the ground a little, and removing some of the rubbish that lies in the way to knowledge (Locke, 2014 p. 13). Locke's task will be to inquire into the origin and extent of human knowledge and be contented with what we can know. For Locke, he thinks what we can know is enough to serve us in this life. So his method was simple, he sets himself three tasks; First, I shall inquire into the original of those ideas, notions, or whatever else you please to call them, which a man observes, and is conscious to himself he has in his mind; and the ways whereby the understanding comes to be furnished

with them. Secondly, I shall endeavour to show what knowledge the understanding hath by those ideas; and the certainty, evidence, and extent of it. Thirdly, I shall make some inquiry into the nature and grounds of faith or opinion: whereby I mean that assent which we give to any proposition as true, of whose truth yet we have no certain knowledge. And here we shall have occasion to examine the reasons and degrees of assent (Locke, 2014 p. 23). Locke's description of his project shows he shared Descartes's thirst for certainty. However, Locke tempered it with humbleness and lowering of expectations that would become a trademark of empiricism tradition (Lawhead, 2002 p. 280). Through this method, Locke believes we can find out what the human mind can know with certainty and what it can only guess about. Understanding what the human mind can know with certainty keeps us from making bold claims about things it cannot know. That there are things the human mind cannot know with certainty should not bring despair. Our capacity to know is suited to our state and concerns. For Locke too, knowledge of our mental capacity cures scepticism and idleness. As Locke puts it; It will be no excuse to an idle and untoward servant, who would not attend his business by candle light, to plead that he had not broad sunshine. The Candle that is set up in us shines bright enough for all our purposes (Locke, 2014, p. 24). When we know our own strength, we shall the better know what to undertake with hopes of success; and when we have well surveyed the powers of our own minds, and made some estimate what we may expect from them, we shall not be inclined either to sit still, and not set our thoughts on work at all, in despair of knowing anything; nor on the other side, question everything, and disclaim all knowledge, because some things are not to be understood (Locke, 2014, p. 25).

Critique of Innate Ideas

Locke carries out his task of finding out the origin and extent of human knowledge by first criticising a doctrine that has grown from Plato to Descartes; the notion that there are certain knowledge which the mind holds that are innate. These kinds of ideas or knowledge do not come from experience but are naturally imprinted into the mind at birth. The great divide in Early Modern epistemology is rationalism versus empiricism. The Continental Rationalists believe that we are born with innate ideas or innate knowledge, and they emphasize what we can know through reasoning. By contrast, Locke and other British Empiricists believe that all of our ideas come from experience, and they are more sceptical about what reason can tell us about the world; instead, they think we must rely on experience and empirical observation (Rockwood, 2010). For Locke; It is an established opinion amongst some men, that there are in the understanding certain innate principles; some primary notions,...characters, as it were stamped upon the mind of man; which the soul receives in its very first being, and brings into the world with it (Locke, 2014, p. 27). It is this theory that Locke wants to demolish before setting up his own theory of knowledge. Proponents of the innate idea theory insist that certain principles like the law of identity A is A , and the law of non-contradiction are universal, thus, innate in nature. Locke does not think these principles are innate and even if they are universal does not prove that they are innate. Locke claimed that that line of argument has no force. He held that all ideas (except those that are "trifling?") can be explained in terms of experience. Instead of attacking the doctrine of innate ideas directly, however, his strategy was to refute it by showing that it is explanatorily otiose and hence dispensable (Priselac, 2023). For Locke,

children and Idiots are not aware of such principles so those principles cannot be said to be innate. For Locke, if an idea is innate, the mind should always be aware of it. He thus criticises those who suppose that innate ideas can exist in the mind without the mind being aware of it. First, it is evident, that all children and idiots have not the least apprehension or thought of them. And the want of that is enough to destroy that universal assent which must needs be the necessary concomitant of all innate truths: it seeming to me near a contradiction to say, that there are truths imprinted on the soul, which it perceives or understands not: imprinting, if it signify anything, being nothing else but the making certain truths to be perceived. For to imprint anything on the mind without the mind's perceiving it, seems to me hardly intelligible. If therefore children and idiots have souls, have minds, with those impressions upon them, they must unavoidably perceive them (Locke, 2014, p. 29).

Concerning knowledge of the universals and particulars, Locke was even more radical. He believed that the mind has knowledge of particular things first before having knowledge of universals. The process the mind comes to know universal or general truth is that the senses at first let in particular ideas, and furnish the yet empty cabinet and the mind by degrees growing familiar with some of them, they are lodged in the memory, and names got to them. Afterwards, the mind proceeding further, abstracts them, and by degrees learns the use of general names. In this manner the mind comes to be furnished with ideas and language, the materials about which to exercise its discursive faculty. And the use of reason becomes daily more visible, as these materials that give it employment increase. But though the having of general ideas and the use of general words and reason usually grow together, yet I see not how this any way proves them innate. (Locke, 2014, p. 35) Plato, one of the proponents of innate idea, argued that knowledge is a recollection. This will mean, they are ideas in the mind or in our memory that is brought to our awareness by recollection. Locke criticises this idea, thus, for him, whatever comes to exist as a memory must have come through experience.

Ideas and their Origin

To carry out his project, Locke gave the word 'Idea' a unique definition. Idea for Locke is whatsoever is the object of the understanding when a man thinks, I have used it to express whatever is meant by phantasm, notion, species, or whatever it is which the mind can be employed about in thinking; and I could not avoid frequently using it. I presume it will be easily granted me, that there are such ideas in men's minds: everyone is conscious of them in himself; and men's words and actions will satisfy him that they are in others. Idea for Locke will be the image in our mind that represents the object outside our mind. The football, the cup, the person, or child we see, does not exist in our mind; these things exist independently and outside our minds. We do however, carry images of them with us in our mind, these images representing these external objects is what Locke calls ideas.

These ideas are the building block of the knowledge we have of things. So the question comes up, how do we come about ideas of things? How does the mind come to possess these ideas seeing they are not innate as Locke will have us believe? It is at this point that Locke introduces his theory of the blank slate to answer these questions. He started:

Let us then suppose the mind to be, as we say, white paper, void of all characters, without any ideas: how comes it to be furnished? ... To this I answer, in one word, from experience. In that all our knowledge is founded; and from that it ultimately derives itself. Our observation employed either, about external sensible objects, or about the internal operations of our minds perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge, from whence all the ideas we have, or can naturally have, do spring (Locke, 2014 p. 87).

The mind is empty at birth, and for Locke, whatever idea we find in it must have come there through one route: experience. This experience is of two kinds: sensation and reflection. All ideas come from experience and through sensation or experience. The metaphor of the blank slate to describe the mind is significant to Locke's epistemology as a whole. For Lawhead, Locke and his fellow empiricist were attempting to emulate Newton's science of physical particles by discovering the laws that govern the motion of mental particle. For Locke, there is a direct relationship between his own "physics" of the mind and Newtonian physics (Lawhead, 2002 p. 282). He envisions the infant consciousness as a formless intelligence, originally devoid of innate knowledge or, therefore, any natural evil that receives information and learns to process it purely by the inscription of sensory input (Pinker, 2003 p. 5).

So we come to know things through sensation and reflection. Through sensation we come by those ideas we have of yellow, white, heat, cold, soft, hard, bitter, sweet, and all those which we call sensible qualities and through reflection or the operation of our minds, we get the idea of such are perception, thinking, doubting, believing, reasoning, knowing, willing, and all the different actings of our own minds (Locke, 2014 p. 88). It is through these methods we get all our simple ideas according to Locke. Locke then put forth a challenge and asks anyone to show him any one idea that does not come through these two sources. Let anyone examine his own thoughts, and thoroughly search into his understanding; and then let him tell me, whether all the original ideas he has there, are any other than of the objects of his senses, or of the operations of his mind, considered as objects of his reflection (Lawhead. 2014, p. 88). The combination of simple ideas by the operation of the mind produces complex ideas. We do not just experience simple ideas like the color white, we experience things like beauty, man, an army, gratitude etc. Locke says it is through the combination of simple ideas by the mind that we are able to experience them. He calls it complex ideas. The three operations the mind conducts to produce complex ideas are compounding, relating, and abstraction. Simple ideas, whether they are ideas of perception or ideas of reflection, may be combined or repeated to produce "compound ideas," as when the compound idea of an apple is produced by bringing together simple ideas of a certain colour, texture, odour, and figure. Abstract ideas are created when ideas taken from particular beings become general representatives of all of the same kind (Stroll, 2017)

Though the qualities that affect our senses are, in the things themselves, so united and blended, that there is no separation, no distance between them; yet it is plain, the ideas they produce in the mind enter by the senses simple; and unmixed. For, though the sight and touch often take in from the same object, at the same time, different ideas; as a man sees at once motion

and colour; the hand feels softness and warmth in the same piece of wax: yet the simple ideas thus united in the same subject, are as perfectly distinct as those that come in by different senses (Locke, 2014 p. 101-102) Locke also made a distinction between quality and idea, for Locke, Whatsoever the mind perceives in itself, or is the immediate object of perception, thought, or understanding, that I call idea; and the power to produce any idea in our mind, I call quality of the subject wherein that power is. Thus a snowball having the power to produce in us the ideas of white, cold, and round the power to produce those ideas in us, as they are in the snowball, I call qualities; and as they are sensations or perceptions in our understandings, I call them ideas; which ideas, if I speak of sometimes as in the things themselves, I would be understood to mean those qualities in the objects which produce them in us (Locke, 2014 p. 116-117). Of this quality, we have primary and secondary quality. Primary quality would be objective experience like solidity, extension, shape, motion or rest, and number of objects while secondary quality will be subjective experience like colour, sound, taste, odor, warmth and so forth. Significantly, Locke's primary qualities are the ones that can be qualified and studied in physics (Lawhead, 2002 p. 284). Locke then defines Knowledge as the perception of the agreement or disagreement of two ideas. Knowledge then seems to me to be nothing but the perception of the connexion of an agreement, or disagreement and repugnancy of any of our ideas. In this alone it consists. Where this perception is, there is knowledge, and where it is not, there, though we may fancy, guess, or believe, yet we always come short of knowledge. (Locke, 2014 p. 515) in other words, obtaining knowledge we are observing how our ideas fit or do not fit together. A true proposition is one in which the ideas are properly related. (Lawhead, 2002 p. 284)

Locke also identified the three degrees of knowledge available to the human mind; intuitive knowledge, demonstrative knowledge and Sensitive knowledge. The intuitive knowledge is the most certain form of knowledge because it leaves no room for doubt. For Locke, the mind is presently filled with the clear light of it. Types of intuitive knowledge will be three is more than two, triangles are not circles etc. Locke stated that the different clearness of our knowledge seems to me to lie in the different way of perception the mind has of the agreement or disagreement of any of its ideas. For if we will reflect on our own ways of thinking, we will find, that sometimes the mind perceives the agreement or disagreement of two ideas immediately by themselves, without the intervention of any other: and this I think we may call intuitive knowledge (Locke, 2014 p. 520). The second degree of knowledge is demonstrative knowledge. Here, the connection between ideas is not immediate but is established by forming a chain of logical steps as mathematical proof.

Demonstrative knowledge gives us certainty, if we are careful in forming each link in the logical chain. Here, the mind perceives the agreement or disagreement of any ideas, but not immediately. Though wherever the mind perceives the agreement or disagreement of any of its ideas, there be certain knowledge; yet it does not always happen, that the mind sees that agreement or disagreement, which there is between them, even where it is discoverable; and in that case remains in ignorance, and at most gets no further than a probable conjecture. ... In this case then, when the mind cannot so bring its ideas together as by their immediate comparison, and as it were juxta-position or application one to another, to perceive their agreement or disagreement, it is fain, by the intervention of other ideas, (one or more, as it happens) to discover the agreement or disagreement which it searches; and this is that which we call

reasoning (Locke, 2014 p. 521). However, since it is possible to make a mistake in our reasoning process, this form of knowledge is not quite so "clear and bright, not the assent so ready, as in intuitive knowledge (Lawhead, 2002 p. 285). The third degree of knowledge is what Locke calls Sensitive knowledge. This is knowledge about the external world. Knowledge of the external world is not achieved through thinking about the definitions of our terms or comparing ideas that we have already acquired. Knowledge of the external world doesn't rest on any proof of the external world. Instead, knowledge of the external world is achieved in sensory experience. It is through the entrance of an idea into our mind through the senses that we have knowledge of the external world. (Priselac, p. 2013) Locke writes, "Tis therefore the actual receiving of ideas from without that gives us notice of the existence of other things and makes us know that something doth exist at that time without us which causes that idea in us? (Locke, 2014 p. 624). Locke thinks the degree of knowledge is less certain than intuitive and demonstrative knowledge.

Artificial Intelligence

In the section about Artificial Intelligence, we are going to discuss three issues; artificial intelligence, knowledge representation and machine learning. Artificial intelligence (AI) can be described as a field of computer science devoted to the development of systems that carry out tasks that would normally require a human being. Artificial intelligence can be classified under four groups according to Arend Hintze, these are; Reactive machines: The machines you see beating humans at chess or playing on game shows are examples of reactive machines. A reactive machine has no memory or experience upon which to base a decision. Instead, it relies on pure computational power and smart algorithms to recreate every decision every time. Limited memory: A self-driving car or autonomous robot can't afford the time to make every decision from scratch. These machines rely on a small amount of memory to provide experiential knowledge of various situations. Theory of mind: A machine that can assess both its required goals and the potential goals of other entities in the same environment has a kind of understanding that is feasible to some extent today, but not in any commercial form. Self-awareness: This is the sort of AI that you see in movies. However, it requires technologies that aren't even remotely possible now because such a machine would have a sense of both self and consciousness. In addition, instead of merely intuiting the goals of others based on environment and other entity reactions, this type of machine would be able to infer the intent of others based on experiential knowledge (Arend Hintze, accessed 31 August, 2025).

Knowledge representation

The definition of knowledge representation has been a major topic of discussion over the years. It can be seen as a method to encode some form of information about the world which is used in symbolic inference about the world. Knowledge representation is a field that focuses on the design of symbolic information to make it usable for inference. For Gupta, Knowledge representation is a fundamental concept in artificial intelligence (AI) that involves creating models and structures to represent information and knowledge in a way that intelligent systems can use. The goal of knowledge representation is to enable machines to reason about the world like humans, by capturing and encoding knowledge in a format that can be easily processed and utilized by AI systems. (Gupta, accessed July, 2025)

It also assumes that the information to be reasoned about is complex and the reasoning processes and the conclusions drawn are to be useful in some real-world task or decision, often in the presence of incomplete or uncertain information. All of these notions have implications on the design of both the knowledge representation formalism and the reasoning methods that will use it. Knowledge representation hypothesis seems to have originated with the philosopher Leibniz (1646-1716):

There is little doubt, however, that Leibniz' ideas, which far outstripped in detail and understanding any earlier hints, were his own spontaneous creation. "While I was yet a boy with a knowledge only of common logic, and without instruction in mathematics, the thought came to me, I know not by what instinct, that an analysis of ideas could be devised, whence in some combinatory way, truths could arise and be estimated as though by numbers" (*Elementa Rationis*). He was thereafter constantly occupied with such notions and attempted to contrive an alphabet of thought, or *characteristica universalis*, which would represent ideas in a logical way, not things in a pictorial way, and would be mechanical in operation, unambiguous, and nonquantitative. (Edwards, 1967, p. 538)

A central goal of research is that computers must somehow come to "know" a good deal of what every human being knows about the world and about the organisms, natural or artificial, that inhabit it. For Israel, "this body of knowledge indefinite, no doubt, in its boundaries---goes by the name "common sense." The problem we face is how to impart such knowledge to a robot. That is, how do we design a robot with a reasoning capacity sufficiently powerful and fruitful that when provided with some body of this knowledge, the robot will be able to generate enough of the rest to intelligently adapt to and exploit its environment? (Israel, 1993 p. 37). knowledge representation simply has to do with writing down, in some language or communicative medium, descriptions or pictures that correspond in some salient way to the world or a state of the world. In artificial intelligence (AI) we are concerned with writing down descriptions of the world in which an intelligent machine might be embedded in such a way that the machine can come to new conclusions about its world by manipulating these symbolic representations ((Levesque, 1986 p. 225)). But for scholars like Davis and Shrobe,

knowledge representation can best be understood in terms of five distinct roles that it plays, each crucial to the task at hand. First, a knowledge representation is most fundamentally a *surrogate*, a substitute for the thing itself that is used to enable an entity to determine consequences by thinking rather than acting, that is, by reasoning about the world rather than taking action in it. Second, it is a set of ontological commitments, that is, an answer to the question, In what terms should I think about the world? Third, it is a fragmentary theory of intelligent reasoning expressed in terms of three components: (1) the representation's fundamental conception of intelligent reasoning, (2) the set of inferences that the representation sanctions, and (3) the set of inferences that it recommends. Fourth, it is a medium for pragmatically efficient computation, that is, the computational

environment in which thinking is accomplished. One contribution to this pragmatic efficiency is supplied by the guidance that a representation provides for organizing information to facilitate making the recommended inferences. Fifth, it is a medium of human expression, that is, a language in which we say things about the world. Understanding the roles and acknowledging their diversity has several useful consequences (17). With this knowledge let us see the connection between knowledge representation and knowledge representation. (Davies, Shrobe, 1993 p. 17)

Locke's knowledge Representation and Artificial Intelligence

The Lockean tabula rasa informs the work of English cryptanalyst and mathematician Alan Turing (1912-1954), who is widely considered the father of theoretical computer science. Turing's postwar writings on artificial intelligence are the founding manuscripts of the modern field, and it is through his work that the tabula rasa enters the computational vocabulary. In a 1950 issue of *Mind*, he wrote: Instead of trying to produce a programme to simulate the adult mind, why not rather try to produce one which simulates the child's? If this were then subjected to an appropriate course of education one would obtain the adult brain. Presumably the child brain is something like a notebook as one buys it from the stationer's. Rather little mechanism, and lots of blank sheets. (Turing, 1950 p. 19) Important in Turing's notion of the tabula rasa is his distinction of mechanism from information: the empty and innocent consciousness he describes possesses no innate knowledge written across its pages, but it does require some minor mechanism to bind them together. The tabula rasa denotes emptiness charged with potential. It is a latent intelligence, a promising void, a machine awaiting its ghost. It has made a long journey through various disciplines and movements in Western thought: the concept originated in philosophy, then wove through various notions of human nature to psychology, where its impact on theories of knowledge and learning brought it ultimately to computer science by way of artificial intelligence (AI). Evidently, Locke's notion of an idea is a far cry from the neural networks and pattern manipulations that are often used in AI models today. But an understanding of these models is largely mathematical and mechanistic, and Locke's clear classification of sorts can provide grounding and direction to the implementation and replication of these models into the various sorts of ideas. We might also note that as a foundational theory of modern soft and hard sciences is that all material should be observable and repeatable, and a system for forming ideas from such material should be methodical and provide clear direction; something which can be criticized as not occurring in many AI models today.

Furthermore, understanding how these different classes of ideas are formed is indeed relevant to developing computer models for idea formation; for at the very least we believe that our machine should be able to replicate a similar process, even if the end result is far from identical. Locke also suggests a certain progression of complexity in the formation of ideas, where he states that simple ideas are unaffected and cannot be changed, and it is only by various combinations of simple ideas and mental operations upon them that complex ideas are formed. This too shows a correspondence to the formation of data structures and algorithms to manipulate them in computer science.

Locke has a very particular definition of an idea as 'whatsoever is the object of the understanding when a man thinks'. This is a very broad term, but he narrows it down by separating between three different types of ideas: sensation (which includes perception and the immediate objects of the senses), reflection (the perceiving of the operations of the mind), and finally simple modes, substances, and relations which are formed by the combining of the other two types, and various operations applied to them. Locke's intention of classifying different levels of abstraction and complexity of ideas is decidedly methodical and scientific, showing a clear semblance to the categorizations and classifications that occur within the modern hard sciences and particularly computer science.

We have chosen to ground our exploration of artificial intelligence in the philosophy of John Locke, for a most specific reason: Locke's epistemology, unlike many others, explicitly outlines the processes of knowledge formation, something crucial when exploring how intelligence processes information. According to Locke, all knowledge is based on human experience and is built upon two basic types of material: the perceptions that come via the five senses from the world around us (which form the basis of empirical knowledge), and material that is 'reflected' from the operations of the mind, which serves as the source of abstract and complex ideas.

Locke's epistemology is called representative realism in today's terminology. Representative realism claims that the mind is directly acquainted only with its own ideas, but that these ideas are caused by and represent objects external to the mind. (Lawhead, 2002 p. 284) we can also see the same notion applied in the field of knowledge representation in artificial intelligence.

Summary/Conclusion

An idea, in Locke's understanding, is "whatsoever is the object of the understanding when a man thinks". With pen poised at the starting line to write *Essay Concerning Human Understanding*, Locke confesses "I thought that the first step towards satisfying several enquiries the mind of man was very apt to run into, was, to take a survey of our own understandings, examine our own powers, and see to what things they were adapted". Such few words reveal that Locke requires a clear tactical distinction between perception and thought, some system which could classify the different 'work' of the mind while awake. This desired distinction can be seen in his classification of simple and complex ideas. The most general definition of an idea is a perception of external objects in the mind which can be represent to one's self so that there is a likeness of the perception in perception. This is, the understanding of an idea is an active thing and ideas are the 'bricks and mortar' from which the mind creates all the rest of knowledge. Locke provides an account of the mind's activities using the analogy of a 'dark room' which we find ourselves in when we begin to understand: 'with only some faint and glimmering idea, knowledge is the putting together ideas so as to form a 'larger'. Knowledge relates to the correctness of the connections and the 'largeness' of the structure compared to the original simple ideas, 'when it leads the mind into all the parts of the complex, and views there the several simple ones'. Requiring a precise notation of significant differences between the things which merely happen to be in the mind as mental acts and are soon forgotten, and those things which are the objects of reflection and are available at some

time in the future, Locke comes to classify ideas as 'nothing but a representation of [an object] it to a person's mind. This led to a full classification of memory as a 'power to revive perceptions in our minds' and an attempt to categorize the experience of all forms of thinking, such as comparing, reasoning, and the like. Locke introduced the concept of the "tabula rasa" or blank slate, arguing that knowledge comes from experience, the potential of artificial intelligence to learn and adapt, and also the importance of the environment and experiences in shaping AI's "knowledge" and abilities can be seen to be in line with Locke's epistemology.

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