An Exploration into the Nature of the Making of Human and Artifcial Intelligence and the Qur'anic Persepctive

Mahmoud Dhaouadi

The ongoing controversy over artificial and human intelligence is characterized by open disagreement. Some researchers believe that artificial intelligence has the potential to become equal to or even superior to human intelligence, while others say that such a development is impossible. The thesis of this paper is that the gap between human and artificial intelligence is bound to remain considerable, both in the short term and in the long term. The concepts of human cultural symbols and the Qur'anic vision of human intelligence are introduced in support of this thesis. Humanity's ability to manipulate cultural symbols, upon which the phenomenon of human intelligence depends, is a uniquely human characteristic. And this uniqueness, according to the Qur'an, is the direct result of a divine decision, not of evolution. As such an ability and many of the mysteries of that power, are hardly accessible to humans, how would human researchers be able to include them in the design of artificial intelligence machines?

In the last two decades, research in the field of artificial intelligence (hereinafter referred to as AI) has made considerable headway on both the theoretical and the applied levels. The input into the field has not been restricted only to cybernetics and information process experts; neurophysiologists, cognitive psychologists, philosophers, and sociologists[1] have also been interested in human intelligence (hereinafter referred to as HI) and AI. As AI infrastructures and authority continue to expand in modern and postmodern societies, specialists in other areas will have to become involved.

For scientists, basic and applied research into AI constitute an exciting

Mahmoud Dhaouadi is a sociologist with the Faculté des Sciences Humaines et Sociales, Université de Tunis I, Tunis, Tunisia.

---

[1] W. Buckle, *Sociology and Modern Systems Theory* (Englewood Cliffs, NJ: Prentice-Hall, 1967).

challenge for two reasons: a) Continued improvement of AI machines will relieve individuals of performing many tedious tasks. Furthermore, the increasing speed and quality of numerous human actions and transactions are bound to become major characteristics of those societies that have entered the Information Age. For example, the widespread use of credit cards has improved and eased all financial transaction services; and b) Basic research into AI will force researchers and others to follow Socrates' admonition to "know thyself," for AI and HI are intimately linked. AI enthusiasts such as Feigenbaum[2] and Simon state that AI eventually could be a real match for, if not actually superior to, HI. Opponents, such as Dreyfus[3] and Searle,[4] view this as wishful thinking.

The isssue of human intelligence remains central to both sides. As AI machines today are manifestly inferior to HI, researchers are forced to ask: Why is HI superior? What does HI have that AI does not? Answering such questions will ultimately lead to a better understanding of ourselves. A good knowledge of ourselves, and of HI in particular, should be of great help in designing more intelligent machines.

The Artificial Intelligence Controversy

The causes of AI's inferiority vis-à-vis HI are the subject of heated debate. Searle believes that AI will come close to HI only if biochemical hardware is actually placed within the AI hardware itself. He also argues that plain symbol manipulation (he calls this strong AI) by machines, computers, and robots cannot raise AI to the level of HI, for while they can manipulate the symbols, they cannot attach any meaning(s) to them.[5] This, in his words, is the big difference between AI and HI.

Enthusiasts such as P. M. and P. S. Churchland believe that AI machines do not necessarily need biochemical hardware (infrastructure) to bring their intelligence up to the level of humans. What is needed, they claim, is the designing of machines that can function like a human brain. This raises another fundamental, and still unanswered, question, which has been the subject of debate for the last three decades: Can a machine

---

[2]E. Feigenbaum and P. Cohen, *The Handbook of Artificial Intelligence*, vol. 3 (Reading, MA: Addison Wesley, 1982).

[3]G. Pessis-Pasternak, *Faut-Il Brûler Descartes?* (Paris: Découverte, 1991), 213-26.

[4]J. Searle, "Minds, Brains and Programs," *The Behavioral and Brain Sciences* 3 (1980): 417-57.

[5]J. Searle, "Is the Brain's Mind a Computer Program?," *Scientific American* (January 1990): 26.

think? Church and Turing defend the thesis that AI machines can think if they are provided with certain infrastructures: ". . . a standard digital computer, given only the right program, a large memory and sufficient time, can compute any rule-governed input-output function. That is, it can display any systematic pattern of responses to any environment whatsoever."[6] To prove their point, Church and Turing argue that such AI machines can think, because they are able to pass the so-called Turing Test for Conscious Intelligence. The test in question consists of entering conversational questions and remarks into the symbol manipulation machine (SAM). If the AI machine's typed responses cannot be distinguished from those of a real person, the machine is said to have passed the test and therefore to possess conscious intelligence.[7]

Simon and Feigenbaum have suggested that thinking machines can solve problems and adopt a rational manner in formulating a solution to them. But they and others have also discovered that certain elements intimately associated with HI (i.e., intuition, mood, and emotions) have no place in an AI scheme. Thus a rational thinking machine does not "think" in the human sense of the term. Feigenbaum admits that for a machine to think like a human being, it must possess a) learning competence, b) common sense experience or general problem-solving skills, and c) a natural language that permits it to understand and manipulate its environment.

Many scientists and scholars, such as Dreyfus, Searle, and Penrose, assert that machines cannot think like human beings. They oppose the idea that a computer is a metaphor of the human brain. Dreyfus believes that an individual's knowledge cannot be broken down into a finite number of facts and rules, for a mind knows unutterable truths that are not algorithmic and therefore cannot be programmed.[8] Searle argues that as computers simply follow algorithms, they cannot deal with important factors like meaning and content. Computers are, for him, syntactic and not semantic beasts. Penrose views the idea of AI with suspicion and contempt, for he seems to be strongly convinced that there is something special about human thinking.[9] His key argument is that there are "non-recursive" problems in mathematics, by which he means that they cannot

---

[6]Ibid., 32.

[7]Ibid., 31-3.

[8]Pessis-Pasternak, *Faut-Il Brûler Descartes?*, 213-26.

[9]R. Penrose, *The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics* (Oxford, UK: Oxford University Press, 1987).

be solved through the use of algorithms. Yet people somehow are able to solve them, which means that the human brain must be doing something nonalgorithmic. He therefore insists that the human brain possesses a "mysterious quality" giving it a direct link to eternal truths which have some kind of prior ethereal existence. Penrose's "mysticism" has not pushed him out of the scientific orbit. Johnson describes Penrose's situation this way:

> So, going way beyond Dreyfus and Searle, he tries to find some conceivable scientific explanation for what amounts to communicating with a kind of Platonic planton zone. Instead of invoking Heidegger and Wittgenstein, Penrose calls on Niels Bohr, Werner Heisenberg, Max Planck, Erwin Schrodinger, the inventors of quantum theory. For quantum theory shows that at the roots of reality things are acausal, indeterministic, nonlocal—*everything a computer is not.*[10]

Thus scientists and scholars are faced with two issues: a) the dispute over whether AI could one day equal HI, and b) that HI, the human mind, and human thinking are still little understood and therefore remain a mystery for modern science and knowledge. Given that symbol manipulation by AI machines and human beings is the crucial factor on which depend the level and quality of intelligence, research into the nature of human cultural symbols can lead to a better understanding of HI, the human mind, and human thinking. Humans are, after all, the most distinct and sophisticated cultural-symbol manipulators.

The Concept of Culture in the Social Sciences

What distinguishes humanity from other species and from AI machines is the phenomenon of culture. According to White, "Man is unique: he is the only living species that has a culture. All peoples in all times and places have possessed culture; no other species has or has had culture."[11] However, it has not been easy to define culture, for, as Ogburn has stated, ". . . culture is one of those large concepts, like democracy or science, a definition of which seems very bare and inadequate to convey

---

[10]G. Johnson, "New Mind, No Clothes: Book Review of *The Emperor's New Mind*," *New Encounter* (April 1988): 48.

[11]L. White, "The Evolution of Culture," in *Theories and Paradigms in Contemporary Sociology*, eds. S. Denisoff, O. Callahan, and M. Levine (Itasca, IL: F. E. Peacock Publishers, Inc., 1975), 224-5.

its rich meanings. Different students will emphasize different aspects of culture as most significant, and in the future important new ideas about culture may be discovered."[12] The definition most often quoted by social scientists is still that of Tylor: "Culture is that complex whole which includes knowledge, belief, art, morals, custom, and other capabilities and habits acquired by man as a member of society."[13]

There is a consensus among scholars of culture that humanity's use of symbols is human culture's most striking feature. The sociological school of Symbolic Interaction bases its premises, as well as its explanations of human individual and collective behaviors, on the symbolic skills of social actors.[14] The symbolic abilities of humans are the yardstick by which White defines the nature of humanity: ". . . we thus define man in terms of the abilities to symbol and the consequent ability to produce culture."[15] He identifies language as the most important cultural symbol: "But perhaps the best example of all is articulate speech or language; at any rate, we may well regard articulate speech as the most characteristic and the most important form of expression of the ability to symbol."[16]

These observations enable us to assert that a) the human species is decisively cultural-symbolic by nature, and b) that this ability to use cultural symbols makes it radically different from all other species and AI machines. Those behavioral social science theories and paradigms that fail to take these claims into account are doomed to failure. However, many Western researchers still ascribe HI's superiority to a human being's possession of a biochemical body, emotions, common sense, and the ability to behave according to illogical and irrational laws. Others say that what is really missing is an efficient neural network. But can the development of an artificial neural network really raise AI to the same level as HI?[17]

Hardly any philosopher or social scientist has raised the issue of culture and its relationship to artificial intelligence. If one seeks a true understanding of HI, the realm of human cultural symbols must be studied.

---

[12]O. D. Duncan, ed., *William Ogburn on Culture and Social Change* (Chicago: The University of Chicago Press, 1964), 3.

[13]E. B. Tylor, *Primitive Culture* (London: Murray, 1871).

[14]J. G. Manis and B. N. Meltzer, eds., *Symbolic Interaction: A Reader in Social Psychology* (Boston: Allyn and Bacon, 1968).

[15]L. White, "The Evolution of Culture," 220.

[16]Ibid.

[17]G. Johnson, "New Mind, No Clothes," 49.

Morin,[18] a leader in the scientific exploration of the world of ideas and the creation of thought, has elaborated a sort of ecology of ideas. Among the many questions he raises is: How do we create ideas and how do they, in turn, create us? In an earlier work,[19] he dealt with the complexity of human thought and its subtle mechanisms and dynamics.

The ability to manipulate cultural symbols in thought-complexity or idea-creation processes is more than crucial; it is fundamental for the acquisition of reliable knowledge about the processes of cognition and semantics. Cognitive psychologists and other specialists agree that there is currently little knowledge in this field. It is our contention that this partial absence of a corpus of solid knowledge on cultural symbols constitutes the missing link in the ever-growing body of knowledge on human and artificial intelligence. Building a solid foundation in this domain is imperative, for how can researchers speak of the shortcomings of AI machines as regards learning (i.e., no common sense and no natural language[20]) without reference to why HI is superior? Such disinterest is a major weakness that can only confuse the researcher's understanding of HI's originality and render many of his/her hopes and promises illusory.

Cultural Symbols and the Making of the Human Mind

Philosophers, thinkers, and scientists, despite their persistent efforts, have not yet been able to fully disclose the nature of the human mind. Descartes, Leibnitz, and Kant viewed it as made of something incorporeal: spirit, pure thought, or soul.[21] By 1950, psychology began to liken it to an intellectual machine, seeing it as an extremely sophisticated information processing mechanism.[22] Further exploration established a distinction between the brain and the mind: the mind is the brain's programs or the brain's total set of symbol manipulation. Put another way, the brain.

---

[18]E. Morin, *La Methode IV: Idées* (Paris: Le Seuil, 1991).

[19]E. Morin, *Introduction à la Pensée Complex* (Paris: ESF editeur, 1990).

[20]Taken from a Canadian Broadcasting Corporation ideas program (18-19 January 1988) on artificial intelligence.

[21]M. Hunt, *The Universe Within: A New Science Explores the Human Mind* (New York: Simon and Schuster, 1986), 54.

[22]Ibid., 74.

is what is and the mind is what the brain does.[23]

Studies on the mind continue to explore its numerous activities and components. Memory has been looked at as an intellectual muscle, as a writing-recording department, and as a working reference encyclopedia.[24] Research by modern cognitive scientists shows that logical reasoning is not the usual practice of humans. Wason and other cognitive scientists have concluded that human beings tend to find it much more natural to look for proof than to look for disproof.[25]

The mind's advanced thinking cannot materialize without the use of cultural symbols. This conclusion is explicitly stated by Hunt:

> Advanced thinking depends on the mental manipulation of symbols, and while nonlinguistic symbol systems such as those of mathematics and art are sophisticated, they are extremely narrow. Language, in contrast, is a virtually unbounded symbol system, capable of expressing every kind of thought. It is the *prerequisite* (our emphasis) of culture which can't exist without it or by means of any other symbol system. It is the way we human beings communicate most of our thoughts to each other and receive from each other the food of thought. In sum, we don't always think in words, but we could do little thinking without them.[26]

Any discussion of the mind's mental activities raises the question of the origin of intelligence and its relation to the culture-mind connection. In the case of a computer, its so-called intelligence is the result of an information processing system run by a flip-flop (on-off) system. A human brain, however, consists of innumerable neurons, each of which has thousands of linkages to other neurons. It is therefore far from being limited to the on-off system.[27] Hunt summarizes the difference in information processing between the computer and the human brain as "the computer deals with information serially, in a single line. The brain does so via millions (even trillions) of parallel channels, each capable of acting

---

[23]Ibid., 81.

[24]Ibid., 93.

[25]Ibid., 127.

[26]Ibid., 227.

[27]"Artificial Intelligence: A Debate," *Scientific American* (January 1990): 31.

at the same time as the others."[28] Compared to other beings and AI machines, the human mind is a super mind,[29] for only it has the ability to manipulate the cultural symbols found, for example, in language, thought, knowledge, values, and religious beliefs. Modern psychological and sociological studies have highlighted the negative affects of social deprivation on human intelligence, thereby indicating that intelligence is strongly dependent on the cultural symbols that permit the socialization of human beings to take place. As pointed out earlier, Searle argues that the human mind is partially a biological phenomenon.[30]

Two Views of Human Thinking

Contemporary studies by cognitive scientists of culture, the mind, and human ideas have adopted two points of view: (1) the enlightenment view and (2) the romantic rebellion view. The first holds that the mind is "intendedly rational and scientific, that the dictates of reason are equally binding for all regardless of time, place, culture, race, personal desire, or individual endowment, and that in reason can be found a universally applicable standard for judging validity and worth."[31] The romantic rebellion view states that "ideas and practices have their foundation in neither logic nor empirical science, that ideas and practices fall beyond the scope of deductive and inductive reason, that ideas and practices are neither rational nor irrational but rather non-rational."[32] Voltaire, Spinoza, Frazer, Tylor, Chomsky, Levi-Strauss, and Piaget belong to the enlightenment perspective, while Goethe, Schiller, Levy-Bruhl, Whorf, Sahlins, Feyerabend, and Geertz are associated with the romantic rebellion view. The latter group says that culture, the mind, and intelligence should not be measured by the yardstick of empirico-positivism, reasoning, logic, and rationalism alone, for, claims March, ambiguity, apparent inefficiency, and apparent inconsistency are "not necessarily a fault in human choice to be corrected but a form of intelligence."[33]

---

[28]M. Hunt, *The Universe Within*, 322.

[29]Ibid., 319.

[30]"Artificial Intelligence," 31.

[31]R. Shweder and R. Levine, *Culture Theory* (London: Cambridge University Press, 1989), 27.

[32]Ibid., 28.

[33]Ibid., 38.

Cognitive research inspired by the romanticist outlook has opened new vistas by replacing the rigid, narrow, and unidimensional vision of empiricism, positivism, logic, and rationalism. Shweder writes:

> Don't knock the mystical, the transcendental, or the arbitrary. In recent years, cognitive scientists have advanced our understanding of the type of ideas underlying nonrational action, and it has become more and more apparent that language, thought, and society are built up out of ideas that fall beyond the sweep of logical and scientific evaluation, ideas for which there are no universally binding normative criteria.[34]

The enlightenment and the romantic rebellion views are extremely relevant to the AI debate. Simon and Feigenbaum believe strongly that the basis of HI is rational, logical, and step-by-step. Basing themselves on this enlightenment view, they believe that the creation of machines that think (i.e., follow rational, logical, and step-by-step procedures) either at the same level or above that of humans is only a matter of time. Adherents of the romantic rebellion view regard human intelligence and thinking as not having a purely rational and logical nature, for they are affected by irrational and nonrational human factors. Prime examples of this are emotions and intuition, which are basic components in human intelligence and thinking.[35] According to Dreyfus, "the best performing computer and the most powerful of all can't understand a story which a four-year-old child can, because the latter has common sense, while the computer functions only through logic. Having no physical body, no emotion, no language, the computer can't understand even those things which are considered by us the most simple."[36] In this view, human intelligence is a combination of rationalism, order, logic, irrationality, intuition, nonrationality, imagination, and disorder. Only a technique which incorporates those elements can unlock the secrets of human intelligence, the mind, and thinking.

Since AI's inferiority as regards HI is due to its narrow logical-rational-logarithmic structural design, a design that does not take into account any points raised by the romantics, there are serious questions raised. For example, how credible is the empirico-positivist paradigm, as

---

[34]Ibid., 40.

[35]R. Penrose, *The Emperor's New Mind*.

[36]Pessis-Pasternak, *Faut-Il Brûler Descartes?*, 215-6.

two of its fundamental elements are logic and rationality? Two implications of such a realization are that humans are more than just logical and rational thinkers, and that HI's superiority comes from such intangible and subjective traits as irrationality, emotionality, and intuition. In other words, researchers studying this phenomenon need to move beyond the traditional empirico-positivist view by beginning to consider the transcendental dimensions of cultural symbols—studying human cultural symbols and their manipulation from within.

Cultural Symbols and the Meaning of Transcendence

Human cultural symbols, as defined above, have metaphysical-divine characteristics. This transcendental character does not seem to have captured the attention of modern social-behavioral scientists. This situation persists despite the tremendous theoretical and empirical explorations of anthropologists and sociologists, beginning in the nineteenth century, of the phenomenon of culture. Consequently, the following reflections are but the result of a continuing personal research effort on the nature of human cultural symbols.[37]

Human cultural symbols are, in their own way, eternal. The symptoms of the latter can be displayed in tangible and measurable terms: a) Human language, preserved through writing, permits an individual's symbolic existence to survive beyond his/her physical death. In the absence of a written language to preserve human thought, the ideas of Aristotle, Ibn Khaldūn, Shakespeare, Marx, Einstein, Sartre, and others would never have come down to us intact; b) On the oral level, human beings often use the spoken word in their meditation, contemplation, and their addresses to their gods or to anything else they believe is eternal or sacred. Thus, unlike other living organisms, human beings can establish contact with the metaphysical realm; c) On the audiovisual level, increasing technological sophistication has made it possible for an individual's image and voice to last forever.

McLuhan's famous statement, "The planet has become a small village," requires some qualification in this regard. What has brought about this development is the attainment of a level of technological innovation that allows the almost instantaneous transmission of human cultural symbols (i.e., the written word, speech, pictures) to almost any place in the world. This transmitability makes cultural symbols unique, because other

---

[37]M. Dhaouadi, "An Operational Analysis of the Other Underdevelopment in the Arab World and the Third World," *International Sociology* 3, no. 3 (September 1988): 219-34.

elements, such as smell or the physical body, cannot be handled in the same manner. Thus cultural symbols, no longer bound by time and space, have taken on a quasi-metaphysical quality and are now part of a world whose logic and order defy the logic and order of the sensory world. Cultural symbols also possess intrinsic aptitudes for freedom and independence, which noncultural symbols do not, as they are not confined to the boundaries of the human body.

Based on the above discussion, it is clear that language, the most important human cultural symbol, is transcendental in nature and fundamental to the development of human intelligence. Attempts by positivist researchers to deny or marginalize its role is counter to the true neutral scientific spirit and also hinders the establishment of a credible scientific corpus on language.

Given the strong relation between language and HI, the study of language might help to explain some of the nonrational components of human intelligence (i.e., irrationality, intuition, illogic) which are at least partially affected by language's transcendental (nonrational) nature. One example is the study of consciousness, which, according to Penrose, is determined by nonalgorithmic ingredients.[38] If researchers are to understand such transcendental phenomena, they need to go beyond their faith in the unidimensional causality of such phenomena. AI specialists have largely confined themselves to algorithmic, rational, and logical materialistic structures, a limitation which has allowed them to produce AI machines that remain vastly inferior to HI.

Some true believers, such as Simon and Feigenbaum,[39] insist that AI can equal or surpass HI by maintaining the logical-rational principles in the new or modified designs and structures of AI machines. This rigid stand reminds us of Russel and Whitehead, both of whom tried to place mathematics on a completely logical basis. Gödel's incompleteness theorem came as a response, for he believed that there would always be mathematical results that could be constructed but not deduced within the system of axioms and logic. The same is true of human cultural symbols. Modern psychology and AI research have accomplished very little in their attempts to explain and understand the nature and the functioning processes of HI, for they do not give due importance to the cognitive process as a fundamental feature of human behavior.

Research on AI and HI must not follow a rigid and narrow formula, for human behavior is a complex phenomenon whose roots are to be

---

[38]*The Globe Mail* (Toronto, Canada), 15 September 1990, 4.

[39]Pessis-Pasternak, *Faut-Il Brûler Descartes?*, 213-9, 229-37.

largely found in HI itself. This makes HI, by definition, a complex phenomenon. The concept of intelligence has undergone substantial transformations since Binet's time. Gardner's recent findings on HI are just one example.[40] The growing participation in the field of AI/HI by specialists in physics, cybernetics, neurophysiology, cognitive psychology, philosophy, linguistics, and sociology, for example, ought to be considered a healthy and promising sign.

The Making of Human Intelligence in the Qur'an

Revealed texts are hardly consulted on the subject of HI by modern researchers. This is due to the West's experience of the Renaissance, which bypassed the Muslim world, and the usually hostile relationship between religion and science. As such a situation is unknown in Islam, it is logical for a Muslim researcher in the field of AI/HI to consult the Qur'an, where he/she learns the following:

The Transcendental Nature of Human Intelligence. The term "intelligence" is of modern origin and is strongly associated with modern psychology. With Binet (1857-1911), intelligence became a measurable phenomenon.

In the Qur'an, HI is indicated by other terms and particular traits: "Verily We honored the children of Adam. We carry them on the land and the sea, and have made good provision of good things and have preferred them above many of those whom We created with marked preferment" (17:70). The phrases "honored the children of Adam," "preferred them," and "whom We created with marked preferment" all appear to refer directly to HI as a distinctly human thought ability (skill) possessed by no other creation. There is a striking similarity between the old and the new definitions of HI: both stress that thinking is the characteristic distinguishing humans from nonhumans. Classical Greek philosophers described humans as rational (thinking) beings, while more recent definitions of intelligence consider thought processes as the basis of intelligence: "Intelligence has gradually come to mean the higher level abstract thought processes, as opposed to the simpler sensory or perceptual processes."[41]

A second, less direct, Qur'anic verse is "Surely We created man (the human being) of the best stature" (95:4). In anthropological terms, the

---

[40]M. Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1985).

[41]H. B. English and A. C. English, *Encyclopedia of Psychology* (Guilford, CT: The Dushkin Publishing Group, Inc., 1973), 129.

"best stature" is the upright stand and the greater size of the human brain. Obviously, the second is far more important than the first, for the human brain's larger size is the crucial determinant factor that has made humans superior to nonhumans: "But above all man owes his astonishingly rapid evolution to the growth of his brain. It would not be too much to say that the history of mankind is the history of the human brain."[42] The Qur'anic verse means that humanity is superior only because it can think.

A third verse specifies HI's roots and its very nature: "When thy Lord said unto the angels: Lo! I am about to create a mortal out of mire. And when I have fashioned him and breathed into him My Spirit, then fall down before him and prostrate" (33:72-3). While interpretations of the meaning of the breathed divine spirit may differ, there is a strong consensus that it should include the thought processes, which includes human cultural symbols, that apparently separate human beings from all other creations, including the angels.

According to these Qur'anic verses, it is HI (i.e., the ability to think and to manipulate human cultural symbols) that sets humanity apart. The Qur'an's strong emphasis on the thinking process as the fundamental pillar of HI is compatible with the findings of modern AI and HI research. However, the origin of HI is sharply disputed. The Qur'an views HI as coming from a divine, metaphysical source, while Western science remains staunch in its belief that HI is the result of sensory and tangible objective factors. This view is then subdivided into the neuron connectionist and the information process models of the brain, both of which see HI as the outcome of a long evolutionary process. There is no room in such a view for any subjective, spiritual, or metaphysical dimensions.

As HI is transcendental, a methodology recognizing this fact must be employed if researchers are to gain an accurate understanding of this phenomenon. As the Western empirico-positivist method does not recognize HI's transcendental nature, it is hardly a suitable approach. What is needed is a thoroughly nonbiased approach, one that considers all possibilities, be they logical, rational, empirical, or otherwise.[43]

Thinking and Human Intelligence. The mystery of human thinking, despite its primary place in modern scientific research, is still a great puzzle for modern science. The Qur'an attaches a great deal of importance to thinking, for it views thinking as the most important component and indicator of HI. Many verses emphasize the need for humanity to ponder

---

[42] J. White, *Anthropology* (London: The English Universities Press, 1967), 23.

[43] "L'Autre Sociologie," *Cahiers de Recherche Sociologique* 5, no. 2 (Automne 1987).

and think: "Such as remember Allah, standing, sitting and reclining, and consider the creation of the heavens and the earth (and say) Our Lord! thou createst not in vain. Glory be to thee"(3:191); "And He hath constrained the night and the day and the sun and the moon to be of service unto you. And the stars are made subservient by His command. Lo! herein indeed are portents for people who reflect" (16:11); "Have they not pondered upon themselves? Allah created not the heavens and the earth, and that which is between them, save for truth and for a designed end" (30:8); and "Have they not travelled in the land, and have they hearts where with to reason and ears where with to hear? For indeed it is not the eyes that grow blind, but it is the hearts which are within the bosom that grow blind" (22:46).

Human Intelligence, Language, and Learning. Modern AI and HI research stresses the importance of being able to learn and to use language as two crucial features that predispose human and nonhuman beings, as well as AI machines, to the acquisition of intelligence. The Qur'an has numerous verses that refer specifically to language use and the ability to learn as two distinct human characteristics: "He hath taught him (the human being) utterance" (55:4); "And among His signs is the creation of the heavens and the earth and the difference of your tongues and colors. Lo! herein indeed are portents for men of knowledge" (30:22); "He hath taught Adam all names" (2:31); and "Who teacheth by the pen, teacheth man that which he knew not" (96:4-5).

Human Intelligence and the Act of Creating. The capacity to create and to invent is seen in the Qur'an as a strong manifestation of intelligence. The superiority of divine intelligence over all other forms of intelligence lies in God's ability to create what humans and nonhumans cannot create. The creation of living beings from the most simple to the most complex strictly falls within the range of the divine power: "Lo! those on whom ye call besides Allah will never create a fly though they combine together for the purpose. If the fly took something from them, they could not rescue it from him. So weak are (both) the seeker and the sought" (23:72). This verse ridicules the worship of nonintelligent idols by intelligent human beings, portraying such an act as an affront to the dignity of human intelligence. How can an intelligent being worship that which has no intelligence? This is unacceptable. As God is the most intelligent being of all, only He is fit to be worshiped by intelligent beings.

Human beings are practically the only living beings that can "create" in the larger sense of the term. The phenomena of civilization and culture are uniquely human, for they are the outcomes of the human act of creation. Nonhuman living creatures and AI machines are involved in very

limited acts of creating, but they can do this only because of their in-
stincts and genetic programs, not through any conscious decision making
or choice on their part. The role of HI in a human being's act of creation
is essential, a fact recognized by the Qur'an but largely ignored by cur-
rent AI and HI research. As pointed out before, researchers commonly
measure intelligence by such things as the ability to deal effectively with
abstract concepts and to learn and adapt to new situations.[44]

From a Qur'anic outlook, the act of creating must be viewed as a fun-
damental and crucial component of intelligence. An articulate understand-
ing of the differences among the divine, the human, the animal, and arti-
ficial machines cannot be achieved without taking this into account.

Humanity's Status as God's Khalīfah and Human Intelligence. Like the
human act of creating, humanity's role as the *khalīfah* (vicegerent) of
God, which entails the management of the material realm, is another
indication of its superior intelligence. According to the Qur'an, such an
intelligence comes from the divine breath that endowed humanity with
thought, reasoning, and the ability to use symbols and create. All of these
are needed in order to carry out this task successfully. The Qur'an singles
out humanity, who possesses this intelligence, as the only suitable can-
didate for this role: "Lo! We offered the trust unto the heavens and the
earth and the hills, but they shrank from bearing it and were afraid of it.
And man assumed it. Lo! He has proved a tyrant and a fool" (33:73-77).

Conclusion

The concept of HI as developed in this paper allows us to settle two
thorny questions: are humans responsible beings, and are they God's rep-
resentatives on earth?

As to the first question, both religious and secular doctrines agree that
only human beings can be held responsible for their acts, for the responsi-
bility of action requires, by definition, that the actor have the ability to
behave freely. It has been emphasized throughout this paper that HI gives
humanity this ability, and thus whether human beings can be held respon-
sible (i.e., if their intelligence is not impaired) for their actions is no
longer a matter of purely religious-philosophical speculation.

As far as the legitimacy of humanity's role as God's vicegerent, the
issue is decisively settled by its high level of intelligence. Of all of God's
creation, only humanity has been able to develop, modify, and transform

---

[44]H. B. English and A. C. English, *Encyclopedia of Psychology*, 129.

the earth and the world at large. As no other part of creation can do this, humanity is God's representative. The key to this position is the divine spark of intelligence which God breathed into humanity. Thus it is inaccurate to say that a human being is an animal-angel; he/she is an animal-divine entity.

The issue of HI is central throughout the Qur'an. The first verses of the first revealed *sūrah* address this issue directly: "Read: In the name of thy Lord who createth, createth man from a clot. Read: And thy Lord is the most bounteous. Who teacheth by the pen, teacheth man that which he knew not" (96:1-5). Reading, learning, and writing abilities are distinct skills associated only with HI. The verses that invite and urge humans to acquire knowledge and science are estimated to constitute one-sixth of the Qur'an. Without the presence of a well-developed HI, it would be unrealistic to ask human beings to pursue knowledge and science. Likewise, there would be no need for the Qur'an to exhort them to think, ponder, and meditate if they did not possess a level of intelligence that would enable them to carry out these tasks. Such tasks were not placed on other living and intelligent beings, because their level of intelligence was not sufficient. Furthermore, if language use is the source of all human cultural symbols, then the beautiful linguistic Qur'anic text stands as the perfect example to stimulate HI through its authentic Arabic text in style, expressions, metaphors, analogies, and eloquence. The Qur'an clearly states that Adam's creation would have meant nothing without the gift of a correspondingly high level of intelligence. In the absence of such intelligence, there would also have been no need to celebrate the event by ordering the angels to prostrate before him, for he would be just another creation.

From the Qur'anic perspective, the phenomenon of HI did not develop through time and space, as claimed by evolutionists. Rather, it was there at the beginning of creation. It was not the end result of a long process of evolution, but was instead the outcome of a deliberate divine choice and decision. Thus HI has been, since the beginning, the determinant force on which depends everything in this world, including the very existence and destiny of humanity.

As outlined above, HI is a central Qur'anic theme and preoccupation. As modern Western scientists and scholars do not accept information provided in revealed texts, they and Muslim scientists and scholars active in this field have major differences. The root of these differences is epistemological, for Muslims see intelligence as the result of the divine breath imparted to mankind, while their Western counterparts view it as the result of a long evolutionary process. These two views are so far apart that they are, essentially, irreconcilable.

The implications of this epistemological split make the Qur'anic stand

a close ally of those modern scientists and scholars who do not believe that it is possible to raise AI to a level which is either equal or superior to that of human beings. This rapprochement is not, however, exactly for the same reasons. Searle asserts the need for biochemical structures in the design of AI machines, while Feigenbaum and Simon's logical-rational settings claim that the intelligence standard of AI products can eventually be made at least equal to that of HI. Both of these views ignore the main assertion of the Qur'an: AI can never be equal to HI, for God has not imparted to it His divine breath. But just as AI can never reach the level of HI, a human being's level of intelligence can never approach that of God: "They ask you (O Muhammad) about the Soul. Say the knowledge of its nature belongs to my Lord. You (humans) have been given only a little of knowledge and science"(17:85). Thus complete knowledge about the origin of intelligence lies with God and out of human reach. While the Qur'anic perspective can help us to understand this, the empirico-positivist approach, the favorite of the West, is of no use due to its refusal to recognize the transcendental nature of intelligence.