Fresh thinking about Neo-genetic and Social Perspectives of Mind Upload capabilities beyond the Biological Human Body

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Abstract

The concept of mind upload into a machine has become a popular topic that has attracted further investigations by both the community of practice and scholarly researchers. Technological advances in artificial intelligence (AI) have enhanced knowledge about mind upload capabilities. The development of these capabilities has reached an important milestone: let the technology advance further without controlled intervention that addresses ethical and sociological apprehensions or balance these developments through the introduction of proper legislation that acts in the best interests of the individual and society, irrespective of culture and geography. This research recommends that more focus should be on finding human mind upload sociological issues and the laws and regulations associated with these. Involved parties must engage in more effective and visible collaboration and co-operation to put the interests of individuals and society first during the development of mind upload options and solutions.

Keywords: Mind Upload, Cognitive Architecture, Theory of Mind (TOM), Manipulation, Privacy, Discrimination, Human Rights, Societal Survival, Personal Gain Misuse

1. Introduction

1.1 Problem Introduction and Exploration

Recently conducted research suggests that theoretical exploration and speculative science enquiries drive the human mind upload. The arrival of enhanced AI capabilities has driven the quest for developing a robust workable solution to transfer a human mind into a machine to the next level of evolutionary change. Based on the current development trend, this capability has the potential to be reality by the year 2045 (Kurzweil, 2012). Such a massive and complex undertaking raised ethical and sociological concerns. These typically include apprehensions about influencing and manipulating individuals prior to and following a mind upload, the retention of the identity of individuals and keeping personal privacy and data protection (regulating the processing of information relating to individuals). Worries about free will and choice together with personal gain misuse are further sociological anxieties of concern. There appears to be a consensus that proper and workable moral, social, and legal solutions need resolution. An extensive literature review proved what was already known about the topic under scrutiny and how the results from the research could bring theory and practice closer together. The split research consisted of three sub-domains: 1. Mind and Brain, 2. Consciousness and the Human Mind, and 3. Social Implications.

The research objectives of this research were:

- To summarize what is known about mind uploading.

- To find the strongest ethical, moral, and social concerns about mind upload.

- To encourage fresh thinking and approaches to develop mind upload capabilities.

- To present practical applications to address social concerns.

This research adopted the following definitions of presented topical concepts:

Mind Upload:

Transferring information and content of a human mind including memories, thoughts, and an individual's consciousness into a digital or synthetic medium (Travers, 2023).

Cognitive Architecture:

A cognitive architecture is a supposition about the fixed structures that provide a mind, whether in natural or artificial systems, and how they work together – in conjunction with knowledge and skills embodied within the architecture– to yield intelligent behavior in a diversity of complex environments (USC, 2024), including thinking, remembering, and using language.

Emergent Properties:

The human mind is an emergent (arising) property of the brain, generated from and dependent upon neural activity, but separate from it (PubMed, 2024). This includes events that occur when neuronal networks self-organize.

Artificial General Intelligence:

Artificial general intelligence (AGI) is the intelligence of machines that allows them to understand, learn, and perform intellectual tasks just like humans. AGI emulates the human mind and behavior to solve any kind of complex problem (Spiceworks, 2024).

Glial Cells:

These provide support and protection for neurons, often referred to as 'supporting cells' of the nervous system (Byjus.com, 2024).

1.2 Knowledge Gap

Technological advances in Artificial Intelligence (AI) have supported the further development of mind upload capabilities. Missing is knowledge about the social implications for humankind that this potential innovative technology creates. The purpose of this research is to find connected and interrelated social concerns these developments carry.

Next is the introduction of a literature review that includes the research questions from this research. The Methodology, Results, Discussion and Conclusion sections follow.

1.3 Literature Review

1.3.1 Mind and Brain

According to Gellatly & Zarate (1998), the human mind has developed and evolved driven by a need to do so. This adaptation process suited certain environments and how people lived their daily lives at any given time. Both the human brain and the human mind have evolved, particularly as the brain is driving the mind. Both brain and mind evolved through necessity, for example, to solve rising problems, finding food, or reproducing. Early philosophers such as Plato (c.427-348 BC) and Aristotle (c.384-323 BC) purport that the human mind is a space that accommodates thoughts, intentions, and desires. This so-called psyche later changed to mind. It is still not clear what the human mind is. But ideas have evolved what the human mind does. It allows people to see the world and act within it. Sensations such as seeing, hearing, and touching all happen within the mind. Differences of opinion existed of what makes a mind. Plato suggests that all sensation, thought, and control live within the brain. In contrast, Hippocrates (c. 460-377 BC) considers that the psyche/soul consisted of three distinct parts:

1. Reason and feeling in the head.

2. Courage and pride in the heart and lungs.

3. Greed and lust in the liver and guts.

Much later, neuroanatomists such as Gall (1758-1828) and Spurzheim (1776-1832) suggested that the brain is the organ of the mind and that various mental and moral faculties exist in specific cortical regions. Gellatly and Zarate argue that it is necessary to clearly understand whether mental functions can be associated with specific brain areas, especially the use of language. The same applies to another area-how the human mind (and brain) deal with space. And finally, consciousness and mind often mean the same thing. They refer to a state of wakefulness or simulation or sensory and emotional experience.

Sigman (2015) argues that it all starts with sensory experience. This drives human beings' cognitive development. With language developed it will be possible to adapt the subtle differences of meaning that make up the more complicated aspects of human thought, such as friendship, morality, and love. The human being's decision-making machinery is known as a theory of mind. It consists of an interrelated number of parts that form specific functions. Sigman suggests that Sigmund Freud's (1856-1939) position of what constitutes consciousness (1.2.2) is of paramount importance. Freud purports 'that the human mind is built on a foundation of unconscious thought' (p. 100). Human beings access consciously any results emanating from unconscious thought. Freud made this discovery by simply seeing distant and incidental traces of consciousness. Things have changed since then. Nowadays, it is possible to see unconscious cerebral processes, clearly and without latency. In addition, Freud developed the notion that 'the psychic processes as quantitative states determined by distinguishable materials of the nervous system '(p.101), adding that the particles that make up the human mind, are neurons. Understanding the arrangement and working of the brain and its neural network aids the understanding of thought.

Grossberg (2021) suggests that it has taken time for humans to even begin to understand how a human brain can develop or create a so-called mind. To understand how this has been possible, it was necessary, first, to introduce new scientific pattern or model that could further discover s new concepts and mathematics to enhance the understanding of how nonlinear, nonlocal, and nonstationary laws that connect a brain to a mind, work. Mind and brain science has a need to develop new intuitions and mathematics to improve this understanding. Grossberg quotes Crick (1994) who claims that all human being mental phenomena stem from activities of human beings' nerve cells and neurons that form part of the brain. This hypothesis shed new light and insight on earlier thinking that did not even consider that the human brain is what makes the human mind. Human beings are aware of their own behavioral experiences but there is an education requirement at school about the key players in the human brain: neurons. Despite this education, there appears to be no association between nerve cells and people's daily experiences. Grossberg proposes that for neurons to work at their best, it is necessary for neurons to be able to interact with each other in appropriately designed neural networks. In turn, this will produce so-called adaptive behaviors. Without these considerations, any species 'could not surprise evolution's challenges' (p.54). Any evolutionary theory that links the brain to the mind needs to include the development of computational levels that drive brain mechanisms to control behavior success, called emergent properties (not properties of individual neurons taken in isolation). Due to the complexity of the diverse levels of description (behavior, neural networks, and individual neurons), Grossberg contemplates that the use of a mathematical language could convey the various levels of description in a direct and obvious way.

Grossberg's suggested model of discovery is based on the notion that it is not possible to derive the root of the whole brain in one step. Like the human beings' biological evolution developing over millennia, the theoretical cycle of Grossberg's method includes a theoretical linked to conceptual evolution. In turn, this leads to the discovery of neural models that shed more light on the finer levels of what brain architectures and dynamics look like, including deeper

explanations and predictions of these. It is also a necessary requirement to incorporate the fact that the human mind can, on its own, adapt to changing environmental conditions. Human brains look the way they look 'to be able to achieve autonomous adaptation in real time of individual behavior to a changing world that is full of unexpected events' (p. 57).

Kurzweil defines the human brain (as an organ) responsible for thought control, emotion, memory, touch, motor skills, vision, breathing, temperature, hunger, and any other process to regulate the human body. It is something made up of a set of faculties (an inherent mental or physical power) responsible for so-called mental phenomena such as language. These faculties include thought, imagination, memory, will and sensation. Human consciousness originates in the brain. The mind directs and influences mental and physical behavior. 'It is an emergent property of a complex system' (p.203). The human mind is a conscious mind. Demetriou et al. express a different view of what makes a human mind, suggesting that the human mind is emanating from the known arrangement and role of the human brain. The architectural theory is based on three associated concepts that are correlated to the explanation of what is meant by the human mind:

1. Architectures of mind and brain (brain networks-mental functions driven by brain networks that are continuously changing due to cross-level interactions in areas such as brain function, cognitive processes, and behavior.

2. Mental and brain processes-creating meaning through the creation of mapping representations within the brain's interactive and syntactic processes (meaning-making process that involves letters, words, and sentences).

3. Mental and brain changes-meaning-making and behavior form part of a beneficial purpose to develop the intellect through the broadening of neural networks by integrating 'recycles' intellectual cycles through the concept of neuroplasticity.

Demetriou et al. point out that it is still not known 'what is meant is truly general and what is truly specific in both the brain and the mind' (p. 36). In addition, not all cognitive functions and their corresponding brain structures and networks are fully known. In the absence of all knowledge about the human mind and brain, it is not possible to map all matters mind and brain successfully. Byjus.com (2023) claims that the human brain exercises control over important and essential functions such as swallowing, breathing, and eye movement. In addition, it controls voluntary and involuntary functions. Without a brain, there is no metabolism within the human body. As a direct result, the organism cannot survive.

Unacademy.com (2023) defines the human brain as a physical entity made up of neuronal cells and blood arteries. The mind, unlike the brain, is not recognizable. It is not possible to touch or see the mind. It generates energy by thinking, feeling, and selecting. It does not exist physically. The brain is a red internal organ, the mind is not. Britannica.com (2023) suggests that the human brain is a mass of nerve tissue in the anterior end of an organism. The brain integrates sensory information and dissects motor responses. It can also be the center of learning. Wikipedia (2023) reports that the human mind is a faculty that manifests itself in mental phenomena like sensation, perception, thinking, reasoning, memory, belief, desire, emotion,

and motivation. Table 1 summarizes considered definitions of what is meant by the human mind.

Table 1. Summary of Definitions of the Human Mind

Mind Definitions	Source/Author
Mental functions driven by brain networks that are continuously changing. Mental and brain processes and changes.	Demetriou et al. (2016). *Mapping mind-brain development*. In Farisco, M. & Evers, K. (eds.). Neurotechnology and Direct Brain Communications, 21-39, Explorations in Cognitive Psychology Series, Routledge
Reason and perception (in the head), courage and pride in the heart and lungs, greed and lust in the liver and guts.	Hippocrates (c.460-377 BC), Greek physician
All that relates to the subjective feeling of being alive, from feelings to thoughts, from intellectual ideas to inner sensory immersions before and beneath words, and how people feel about connections to other people and planet Earth.	Kurzweil, R. (2012). *How To Create A Mind-The Secret Of Human Thought Revealed*, Duckworth
A state of wakefulness or simulation or sensory or emotional experience.	Gellaty, A. & Zarate, O. (1998). *Introducing Mind & Brain-A Graphic Guide*, Clays Ltd., Elcograf S.p.A.
The human mind is an information processor. This is based on the concept of having representations of something and then transforming this representation into something comprehensible. This could include the coding of events and memory storing and retrieving, leading to behaviors driven by moving from perception to reasoning.	Gazzaniga, M. (2004). *The cognitive neurosciences 3*, Cambridge, M.A.: MIT Press
The mind is just a result of the neuronal activities of the human brain.	Qz.com (2023), Available: https://www.qz.com, Goldhill, O., (20 December 2023).
The human brain is the source of the human	Graziano, M. (2014). *Consciousness and the social brain*, New York, NY: Oxford

mind.	University Press
The mind is the brain and its activities. This includes thoughts, emotion, and behavior.	Cacioppo, J.T. & Freberg, L.A. (2013). *Discovering psychology: The science of mind*, Belmont, C.A.: Wandsworth
The human mind's three basic functions include thinking, feeling, and wanting. Successful transfer to a cyborg/humanoid is essential during mind downloads.	Katz, B.F. (2008). *Neuro-engineering The Future-Virtual Minds and the Creation of Immortality*, Infinity Science Press LLC
A space that accommodates thoughts, intentions, and desires. Originally referred to as the psyche. This changed later to mind. It is not clear what the human mind is.	Plato (c.427-348 BC) and Aristotle (c.384-323 BC), Greek philosophers

1.3.2 Consciousness and the Human Mind

Wikipedia suggests that consciousness is an awareness of internal and external existence that includes cognition (self-awareness), either continuously changing or not. According to Descartes (1596-1650), consciousness and mind are synonymous. In contrast, Lazarus (2023) reports that there is a strong agreement within neuroscience that consciousness forms part of the human brain. Once the human brain has died, both the mind and consciousness have also died. The argument is that without a human brain, consciousness cannot exist. Fenwick & Fenwick (2008) hold the view that consciousness continues to exist after death. This is based on the outcome of extensive research and an associated position that consciousness exists independently and outside of the brain, being a part of what is known as the Universe, like entities such as dark matter/energy or gravity. Fenwick & Fenwick purport the view that the human brain does not produce consciousness but that it filters it. The prevailing argument is based on a comparison of related analogies such as the human eye and the human ear. Both appear to be filtering and interpreting, for example, only a small part of the electromagnetic spectrum (eye) and a limited range of sonic frequencies (ear). Therefore, the brain also filters and perceives just a small part of intrinsic consciousness. When the human brain dies, consciousness continues to exist outside the human brain as an external property of the universe. After death, the experienced consciousness merges with the Universe's overall consciousness. It is therefore only possible after death to become fully conscious. It is not possible to verify this hypothesis.

Descartes considers that it is not possible to prove consciousness. It is something that is difficult to describe scientifically. Descartes purports that an immaterial soul exists that is separate from the human brain. All sensory inputs reach the immaterial spirit via the pineal gland (providing a hormone called melatonin to regulate the human body's circadian cycle or internal clock to help control sleep and awakening. The idea of an immaterial soul is easy to imagine but difficult to defend in the face of neuroscientific evidence. According to Eagleman

(2015), contemporary neuroscience is trying to show the exact relationship between neural activities and states of consciousness. This requires the development of new discoveries and theories in the young field of neuroscience. Goldhill (2016) supports that the mind is the origin of consciousness, it is everything that makes a human 'being'. Without a mind, a person is not alive. It appears that at first, scientists defined the human mind as a conscious product driven by and made up of active neurons. New evidence suggests that the mind exceeds the physical workings of the brain.

Siegel (2016) defines the human mind as something that does well beyond the human shell or body. After a discussion with scientists from across disciplines (including physicists, neuroscientists, and sociologists), they decided that a key part of the mind is: 'the emergent self-organizing process, both embodied and rational, that regulates energy and information flow within and among us' (NYCS, 2023). This revelation purports that the human mind extends beyond the physical selves. A key point is that the human mind is not simply a feeling of experiences, but that the mind consists of these experiences (Fig.1). Siegel reports that the human mind's motivation is dependent on the brain and social and cultural interactions.
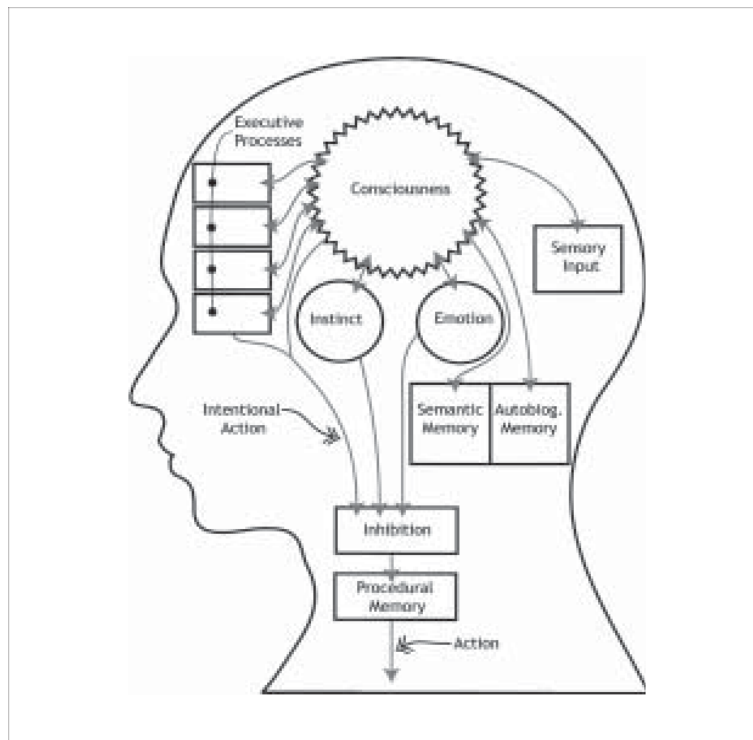

Figure 1. Functional Diagram of the Human Brain (Research Gate, 2024)

Keizer & Sabien van Erp (2023) claim that prolonged disorders of consciousness (PDOC) lead to serious brain injuries. They raised concerns about minds in a damaged brain. The brain produces the human mind. Events in neurons drive human beings' thoughts, emotions, and sensations. Consequently, it is possible to deduce that a damaged brain will produce a damaged mind. Cerebral damage leads to mind damage, often caused by PDOCs. Strawson (1996) suggests that the so-called sense of self includes seven elements:

-it is a thing

-it is mental

-it is the subject of experience

-it is single

-it is distinct

-it is an agent, it does things

-it has a certain character or personality

This raises the question of what might happen if a damaged mind transferred into a cyborg/humanoid. Each brain has its own map. It also raises the question: would a human mind map transfer successfully during a mind download? It is necessary to apply neurophysiological techniques to detect what makes a person's complex self.

1.3.3 Social, Philosophical, Ethical, Technological, and Neuroscientific Implications

Katz argues that soon human beings will be able to have their mind transferred into a machine. This process involves the termination of the human body's existence during a human mind transfer into a robot-body (cyborg, humanoid). This raises important questions such as:

1. Will the person in the new entity be the same or like the original person?

2. Will the new entity have the same sensations as previously?

Any such operation must achieve that the new entity feels real pains, real joys, and real sensations. Future neural technologies must address the issue of consciousness. The personal identity of a human being must be the paramount concern during any transfer of personal identity to another identity. Katz suggests that the brain states cause mental states (supervenience). According to this principle, different thoughts require different minds. Mental states are dependent on the human brain to realize these. Without a human brain, the human mind cannot exist. Any receiving vessel must be capable of sustaining consciousness and sustaining the same consciousness.

Cobb reports that researchers consider that the human mind is an operating system that is functional within the neural network. The human mind is a computational state, having the potential to be 'uploaded onto some device or into another brain' (p. 376). A working materialist hypothesis suggests that brains and minds in human beings are identical. This argument is based on the notion that neurons and supporting processes (including consciousness) are the same. Brains and minds connect, they differ from, for example, how computer software and hardware are separate entities. In contrast, the non-materialist position is that minds are floating within the human brain, and it is therefore possible to transfer these to a different human head or replace them with another mind. Cobb argues that the existing perceptual and analytical tools are not adequate for the task of explaining and confirming how it may be possible to transfer these to another human being. These current knowledge limitations hinder the discovery of theoretical breakthroughs that have the potential to end these restrictions. More simulation projects require completion to evaluate hypotheses so that

it is possible to gain new insights into how the human brain really functions and works.

Bron (2023) suggests that gradual neuron replacement is an alternative brain upload method that focuses on replaying the biological neurons with artificial neurons step-by-step. The advantage of this approach is that the individual will maintain their personal identity and keep well psychologically. Another choice is to create a digital copy of a person's mental states such as memories and personality traits. The focus is just on what makes an individual mind. Concerns using this approach include questions about the nature of personal identity and ensuring the correct transfer of an individual's mental states. Philosophical, ethical, and social implications /concerns include the following:

1. Is the consciousness of a downloaded human mind the same consciousness as it was before the download?

2. Does the transfer of a human mind to a cyborg or humanoid guarantee the correct transfer of the individual or will there be a new identity?

3. Does an uploaded mind still have the same ability for free will and choice, or will the applied programming and algorithms figure out free will and choice?

4. Could an uploaded mind be easier influenced and manipulated, thus affecting the concept of free will?

5. Can a downloaded mind truly replicate the personal experience of consciousness? Would an uploaded mind be a genuine continuation of the original individual prior to the upload?

6. Individuals must have the right to decide for themselves, through free will, whether they want to go ahead with their mind's upload. They must give their consent autonomously.

Bron argues that religious beliefs (afterlife, spiritual notions), cultural values and personal preferences of immortality require consideration to attain preferred personal preferences. It will be necessary to consider medical and legal implications, including whether the uploaded mind forms a new legal entity. Vital is also the role healthcare professionals will play before, during, and after the whole upload process. The development and application of adequate safeguards must be in place to maintain the autonomy and well-being of individuals. Privacy and data protection concerns exist such as the potential of hacking into the uploaded mind, getting access to the individual's thoughts, memories, and subjective experiences. The same applies to unauthorized surveillance that could lead to exploitation and manipulation of personal information such as thoughts and experiences. At the social level, social and economic equalities could widen. Individuals with sufficient funding might be able to afford modern technology more easily, thus creating disparities in areas such as education and job opportunities. It is feasible to amplify existing social inequalities. This would affect employment and labor markets negatively. Increased automation and a wider application of AI technology has the potential to reduce the demand for human labor. This, in turn, could lead to higher unemployment levels. It will be necessary to develop appropriate guidelines

and regulations to address these major concerns.

Benedikter et al. (2017) report philosophical and social implications of mind upload capabilities introduced by a project known as HEAVEN. This case study's focus is on an international group of head transplant surgeons. The goal is to transfer a human mind (or head) into a non-biological medium such as a robot or humanoid. This approach endures due to growing efforts of contemporary societies to improve mind and body by mixing different entities such as mind and humanoid to produce hybrids. The idea is to move from a humanistic (moral and philosophical) to a transhumanist or neo-humanist stadium (allow technology beyond biological limitations). This places the endeavors of the new anthropo-technological developments into strong opposition to classical humanism (application of established standards such as traditions, practices, and values). It questions the future of the human body, mind, and being, as created by the heritage of rationality and enlightenment, originated by current societies.

Laakasuo et al. (2018) consider that the transfer of a human mind has serious implications in areas such as human existence and ethics. It will be necessary to examine the implications of any innovative technology to evaluate any moral effects this may have on their current modus vivendi where human beings apply intuitive tendencies to separate the mind from matter.

Understanding the moral cognitions of groups of people is paramount to any successful introduction of innovative technology such as mind upload. As a direct result, new norms for modern technologies can be set to enhance successful introductions within certain communities in the world.

Siegel (2017) points out that the human mind is more than intellect and logic or thought and reasoning. The mind encapsules both personal and interpersonal experiences with others and people's consciousness. It is also possible that a larger process forces the mind to connect people to each other and the world they live in. Included in this position is the notion that information processing is not contingent upon awareness. Siegel suggests that scientific disciplines that looked at the concept of the human mind, have not proven what a human mind is. In future, human beings will understand how matter becomes mind. The mind can sometimes change the brain through the application of mind training, and vice versa. According to Erneling & Johnson (2005), on the one-hand side the human mind is a social function, on the other hand, it is a neural function. Siegel's early definition of what the human mind is includes that the mind is 'a function of a system comprised of energy and information flow' (p. 26). Energy and information flow are the fundamental elements of a system that are responsible for the creation of a mind. Flow happens inside human beings, between people and others, and the world.

Siegel considers that the concept of self-organization is an inherent element of the human mind (Fig.2). It appears to focus on maximum complexity, thus creating more system-related unfolding, reshaping itself regularly, by making open-moments fixed. It is possible to experience and direct the mind, but it is not always possible to control it. In this context, Siegel reports that the human mind is 'a self-organizing emergent property of energy and information flow happening within you and between you, in your body and in your

connections with others, and the world in which we live' (p. 50). Combining differentiated parts achieves maximum complexity. Integration, in this context, means the addition of parts but keeping their functional links to one another. For example, the hippocampus that connects widely scattered memory areas to each other, the corpus callosum that links the left and the right differentiated areas of the brain, and the prefrontal regions that connect executive functions such as planning, decision-making, and working memory with the social world. Siegel argues that a healthy human mind generates integration within and between. The integration of consciousness is how human beings systematically understand the concept of knowing in contrast to the concept of known, and then link these as the focus of attention is more on the various elements of the known (Fig.3).
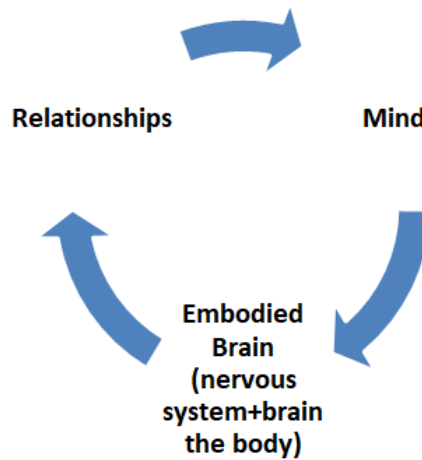

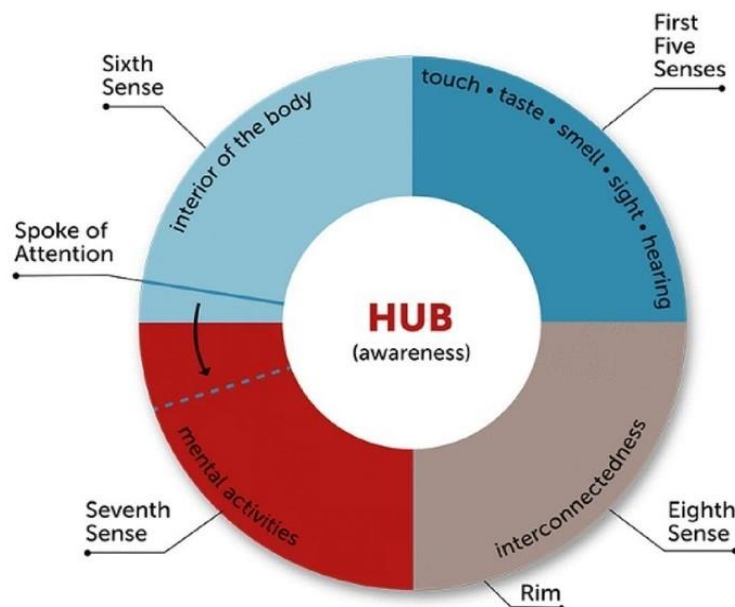Figure 2. Self-organization of the Human Mind (Siegel, 2017)

Figure 3. Wheel of Awareness (Siegel, 2017)

Ash et al. (2023) report that the debate of what makes a person includes discussions that

consider moral, social, and legal issues associated with this topic. What is a necessary condition is the possession of a mind. It is this mind that provides specific mental properties (Baker, 2000; Irwin, 1986; Olson, 2019) such as the ability to plan, make decisions, feel, and experience hunger. Early philosophers such as Aristotle considered that two kinds of agents exist-those who act and cause events and those who experience these causes and events. In this context, for example, robots or AI systems appear to be strong in acting and causing things to happen, while human beings have elevated levels of direct experience and often lack the desire to act or cause events. The outcome of their research confirmed that both causes/actions and experiences evolved over two centuries and that these reflect human perceptions on both dimensions.

Rosenberg (2022) suggests that futurists claim that soon, it will be possible to transfer a human mind into computer systems. This invention is weak. It assumes that it is possible to imitate the human brain if sufficient computing power is available. The focus of mind uploading, specifically, is not about transferring human minds collectively but about the transfer of unique minds, making sure the correct transfer of their unique neurons and connections. To ensure the correct transfer of the one hundred trillion brain connections, it will be necessary to have a computer system that can simulate these connections plus associated interactions. Artificial Intelligence (AI) technology will have this capability which is theoretically possible. Rosenberg points out that any copy of a mind, for use in a simulation, would create its own memories. It also has the potential to interact with the world through computer interfaces. In the meantime, the original mind would continue to create its own memories. This would affect skills, knowledge, and understanding. The copy of the mind would be individual. Mind uploading is not about living forever. The concept will create a competitor mind that feels entitled to own the original identity, including claims to own the original name, being married to the wife/husband, and being the parent of any children. Legal challenges could ensue.

Johnson (2023) argues that the idea is not to make the human body external but to make it obsolete. Mind and brain appear to be the same and it makes what a person is and stands for, including thoughts, emotions, memories, and complexity. This aligns with current scientific approaches. Copying a brain has the potential to also copy a person's 'self' and copying such complexity is an enormous task. The brain, for example, has over one hundred trillion neuronal connections. Each human being has their own unique connections, and therefore a plethora of workable connections and fundamental changes. Current Magnetic Resonance Imaging (MRI, medical test that shows details of the internal human body structure such as blood vessels and organs) scanners need higher resolution levels to be able to capture synapses (electric nerve impulse between nerve cells) accurately. This is vital requirement to capture the true 'self' of an individual. The presume digital afterlife continues to be a technical possibility.

Laakasuo et al. (2021) purport that the concept of mind upload (making a digital copy of a human mind or part of a human brain) could be the answer to eternal human life and provide the means to end human suffering. This sets the scene to move towards the concept of Artificial General Intelligence (AGI). The creation of AGI through uploading a human mind

carries one major concern/risk: the misuse of this new technological advance by individuals for their personal gain. It is necessary to consider such antisocial misuse during the development phase of such groundbreaking technology. The results of their research suggest that most interviewed people favor the progression of this technology, despite raised concerns about potential misuse/abuse by a minority of people. Quoting Bostrom (2005) and O' Connell (2017), researchers suggest that human beings have not reached the end state of their evolution. It is, therefore, necessary to focus attention on improving human capabilities through the application of technological, political, and educational advancements. This includes concepts such as mind upload, gene-editing, cryogenics, cybernetics, and brain-machine interfaces. How does mind upload work?

Laakasuo et al. report that, for example, in whole brain simulation, both neurons and glial cells (neuroglia or glia) are digital copies of using silicon-based platforms. As both neurons and glia are necessary for proper brain function, such mapping of the brain is essential to collect and analyze brain function data to aid this process. The main concerns raised by the public range from social pressure and safety to fairness (Koverola et al., 2020; Castelo et al., 2019). In contrast, positive implications include the reduction of human suffering (La Torra, 2015) and extending human life (Bostrom, 2003). There is an intricate link of these considerations to utilitarian ethics (maximizing utility, minimizing suffering (Greene, 2003). There is a possibility that concern for the greater good of people (utilitarianism) outweighs a major disregard for the value of human life (Paulhus & Jones, 2015). The outcome of this research suggests that utilitarian moral principles were high on the list of human mind upload approval. In addition, a considered personality trait such as Machiavellianism was acceptable in the context of mind upload. Manipulative and calculative self-interests were acceptable by the research audience. Expressed caution stressed that mind upload may appeal to people who suffer from antisocial and/or morally corrupt behavior. This could lead to exploitation for personal gain of future AGI developments.

Le Doux et al. (2023) point out that people, through speech, can share their experiences. Automotive consciousness (self-awareness) is reflective. It is an ability to find a person's current experience by being able to find current experience as part of the wider life experience, covering both past and future. This includes an ability to apply innovative ideas/outlines to existing perceptions and then create knowledge from there. It includes, for example, feelings of what is right or wrong, and comfortable/uncomfortable evaluations based on experiences. AI systems are already capable of producing these types of self-narratives, too. All this is possible without having base layers of unarticulated and/or unconceptualized feelings. The structure may be quite well developed and suitable, but the foundation is missing upon which any higher levels exist within human beings. The Discussion section contains the serious implications on the development of a mind download capability and its 'life after' Timmermann et al. (2023) suggest considering non-ordinary states of consciousness (NSC). This has the advantage of allowing further investigations to take place in the areas of the so-called plastic and dynamic nature of experience from different angles, including mind, brain, body, and context. This will enhance the understanding of the relationship between experiential and neural dynamics. NSCs appear to

be particularly relevant to this research due to their acute and long-lasting transformation capabilities.

In addition, Lee et al. (2018) purport that so-called social cognition is complex and important for both human and AI-based systems. According to Lee et al., information is available that is concerned with the concept of social cognition in the mind and brain. The authors developed an associated social intelligence framework to fill this gap. Existing social cognitive architectures cannot cope with and process the current understanding of high-level social cognition. This includes, for example, the mental modes of others. Before embarking on developing a computational model of social cognition, for example, in AI-based systems, it will be necessary to build a theoretical level socio-cognitive architecture. Key areas should include meta-cognitive control over the whole social cognition system, including the so-called affect, processes versus knowledge structures' inputs/outputs of all related processes, and actively checking all outcomes. This is an important consideration for developing mind downloading (discussed in Discussion).

According to Zhao et al. (2023), a so-called theory of mind (TOM) is a high-level social cognition that enables individuals to understand and interpret the mental states of others so that they can compute and predict other people's behaviors. TOM is important for the effective interactions that take place between human beings. Where TOM does not exist, individuals make behavioral predictions of others by observing the environment. This affects the predictions of others' future behavior negatively. TOM is a necessary requirement for developing social intelligence for brain-inspired AI, for example, to achieve co-operation and competitive task benefits. This is a vital insight when considering transferring a human mind to a cyborg/humanoid.

De Swaan (2001) suggests that human beings are dependent on each other for survival. Anything that a person needs but is not able to produce on their own, must materialize from another person. Social arrangements such as families or communities provide the means to resolve this issue. It includes inter-group affinities. Societal conditions such as affection (regard for others) and knowledge (to survive within societies) are of paramount importance to the survival of societies. Giddens & Sutton (2017) point out that members of a society (citizenship)are aligned to make contributions to the society they are a member of such as paying taxes, obeying country laws, and contributing to a national health service, in return for human rights such as right of life, liberty, privacy, and security. Neubeck & Glasberg (2005) argue that the development of a group only happens when there is recurring interaction between a troop of people/individuals. This helps the building of leadership and status differences. The result is that people enter tidy and predictable relationships. In addition, the formation and acceptance of rules leads to norms. The psychological well-being of individuals is dependent on social interactions.

1.4 Questions

The main research questions for this research are:

1. What is the definition of a human mind? What makes a human mind?

2. What are the social implications associated with the concept of mind download?

3. What are the relationships between brain, mind, and consciousness?

4. What is known about dysfunctional mind upload and post-transfer correction?

2. Method

2.1 Methodology

The researcher adopted a qualitative research approach to get close to the topic under investigation rather than conduct a statistical analysis (quantitative). The 'what' and 'why' were of paramount importance, not any statistical details. The researcher collected all data by organizing it into three different sub-domains (1.3.1-Mind and Brain, 1.3.2- Consciousness and the Human Mind and 1.3.3-Social, Philosophical, Ethical, Technological and Neuroscientific Implications). The literature review of what is already known about the subject matter under investigation focused primarily on most recent publications to obtain the latest thinking in the research area (2020-2024). A review of pre-2020 published material presented relevant historical thinking about the concepts of mind, brain, and consciousness. A semi-thematic analysis of the collected data provided the means to find patterns, themes, and relationships (2.1) within the collected data. This produced progressive thinking outcomes relating to the considered topic domains (1.31-1.3.3) and enabled the answering of the research questions (1.4). The adoption of opposing views about the concept of mind upload produced different perspectives that strengthened the validity and reliability of the identified diverse issues affiliated to mind upload capabilities. It helped to find and put together a firm and stable review of the identified research problem (Introduction). The researcher's primary focus was on the human and societal concerns about mind uploading applications. The researcher collected relevant research data from the literature review by adopting a semi- thematic analysis approach (the amount of generated data did not justify the use of coding). Research findings, separated by theme, concentrated on evidence-based analysis and interpretation of the gathered data to reach right conclusions. It enabled the researcher to develop relevant findings, conclusions, and recommendations for practical application by applying subjective experience to interpret the data, thus fostering higher credibility. This approach made it possible to generate further realistic predictions and conclusions about potential future mind upload modus operandi that represent human and societal best interests. Although this produced inferred knowledge within unfamiliar territory, it contributed to the development of reliable and valid insights that allowed the advancement of future practical actions.

3. Results

The findings from this research confirmed that the concept of a human mind upload into a cyborg has made prompt progress. Recent developments in Artificial Intelligence (AI) technologies appear to have accelerated and enhanced the quest for being able to transfer a human mind into a machine. These improvements have the potential to improve the quality of human life but equally provide opportunities for unfair exploitation and misuse. Contrasting views have appeared amongst scholars and the community of practice. Positive implications suggested by subject matter experts include the notion that the quality of human life is possible to improve following mind transfers. Uploading a human mind into a machine is no longer

utopia. It will be possible to achieve this long-term goal soon. As an alternative to mind upload, a concept of gradual neuron replacement (exchange biological neurons for artificial neurons) is a possibility. Both approaches have the potential to lead to eternal life. Negative positions far outweigh the positive views.

Doubts have arisen whether original sensations, for example, will remain in the transferred mind and whether any uploaded mind keeps the qualities of what 'makes' the original mind/person. There are open questions such as whether it is possible to influence a transferred mind, and whether it is possible to manipulate this mind more easily compared to a human mind. Hacking into and changing a humanoid's systems has the potential to steal personal information from its memory. Those with sufficient funding for a mind transfer could create social and economic equalities that affect employment and labor markets through increased automation and expanded use of associated AI technologies. Theory of Mind (TOM) considerations are essential for effective mind transfers. People are social animals, and it is a necessary requirement that effective interactions take place between human beings, for the completion of co-operation and competitive tasks between individuals. Human beings are dependent on each other. Belonging to a family or local community provides the means to resolve these issues. Raised concerns suggest that this vital ability may disappear during human mind transfers. This applies equally to mental states (including perception, pain/pleasure experience, belief, emotion, and memory) and personal identity (including personality, tastes, gender, achievements, social status, and values).

There appears to be a lack of clear and unambiguous understanding whether existing privacy and data protection laws require reviewing and changing to cater for the creation of new human beings through cyborg mind transfers. Definitions are still missing that clearly describe what is meant by a transferred human mind and what the difference is, in legal terms, between a conventional human mind and a future transferred cyborg mind. Human societies consist of members (citizens). These citizens have an obligation to make contributions to the society they are a member of such as paying taxes, obeying laws, and contributing to national health services, in return for human rights such as right to life, liberty, and privacy and security. It is not clear whether transferred human minds are citizens of any society. Table 2 summarises both positive and negative current positions together with a summary of the main sociological concerns about human mind transfer, in priority order.

Table 2. Summary of Considered Mind Upload Perspectives

Positive	Negative	Sociological Concerns: -Priority Order-
1.It will be possible in future to transfer a human mind to a cyborg-Katz (2008)	1.A damaged brain will produce a damaged mind (thoughts, emotions, and sensations)-Keizer& Fabien van Erp (2023)	1.Influence and Manipulation

2.Gradual neuron replacement as a considered workable alternative to mind upload (replacing biological neurons with artificial neurons-Bron (2023)	2.Raised concerns whether any uploaded mind is still the same person. There are doubts whether original sensations will remain-Katz (2008)	2.Identity Retention
3.Mind upload could lead to external life-Laakasuo et al (2021)	3.Limitations exist that currently present the mind upload of one human being to another-Cobb (2020)	3.Privacy and Data Protection
	4.Personal identity and mental states capturing-Bron (2023)	4.Societal Survival
	5. Voiced worries about free will and choice-Bron (2023)	5.Personal Gain Misuse
	6.Raised questions whether it is possible to influence and manipulate a transferred mind easily	6. Damaged Entity Transfer
	Privacy and data protection laws require updating to protect personal information and to eliminate hacking; the creation of social and economic equalities by individuals with sufficient funding-Bron (2023)	
	7.Human existence and ethics: moral effects of mind uploads on people's current modus vivendi-Laakasuo et al. (2018)	
	8.Misuse of innovative technology for personal gain reasons by individuals-Laakasuo et al.	

	(2023)	
	9.Theory of Mind (TOM) is an essential element of any mind upload to ensure effective interactions between human beings and the completion of co-operation /competitive tasks-Zhao et al. (2023)	

4. Discussion

The notion of eternal life has fascinated humanity for centuries. Recent major advances in AI technologies have created realistic prospects for advancing this pursuit and turning fiction into reality. Soon human beings will be able to end their human body and have their mind uploaded into a machine. The technical capabilities to undertake such a task require further investigations. The development of acceptable, proven, and realizable solutions must combine ethical/moral and social impacts of mind uploads on the individual as well as the society they belong to.

Human beings flourish in the company of others. It is a necessary requirement to consider the impact an uploaded mind has on the 'new' person's social life. Social depreciation affects the brain. The separation of the mind and the natural brain creates an invariant point in its social functionality (a value that does not change under a given transformation). Social deprivation affects mental development. A mind transferred to a machine leads to the potential conclusion that the transferred mind cannot develop any further societal improvements, for example, through human interactions. This would have a major negative impact on societal development within local communities. Malishe et al. (2023) argue that it is imperative that human beings find their way through social interactions. To achieve this task, they need to develop an ability to adapt to constantly changing demands from the environment in which they exist. This includes understanding the behaviors of others, including their associated motives that underpin these behaviors, such as people's affective and cognitive states. Empathy and Theory of Mind (TOM) are drivers that enable social interactions. It includes the ability to share the emotions of others and being able to understand that others have originated these emotions. In addition, it is also possible to reason and infer the thoughts, beliefs, or emotions of other people. Empathy and TOM are associated with the brain network. What affects the brain, affects the mind. Is it, therefore, reasonable to assume that a separation of brain and mind could have a serious impact on the social-psychological performance /functioning of an uploaded human mind? The researcher suggests that more research is necessary to prove how an uploaded human mind updates itself with new experienced human interactions, such as interpreting beliefs of others, pain observation, and evaluating the emotions and feelings of others.

The cognitive architecture of the uploaded mind requires careful thought. It allows an intelligent system to perceive, reason, learn, and make decisions. It is an enabler for the

cognitive processes organization and its integration so that associated AI systems can achieve more robust and flexible cognitive capabilities that include perception, memory, attention, and problem-solving. This needs to be a dynamic process to keep an uploaded mind's cognitive architecture contemporary.

Serious social concerns such as influencing and manipulating an uploaded mind, keeping a person's original identity, and privacy and data protection of the individual are concerns that require further action.

Technological advances, when applied without giving due and adequate consideration to social impacts on individuals and society, are not an after-thought. Integrating ethical, moral, and privacy deliberations is vital for advancing mind upload capabilities that provide human beings with maximum confidence in technology and the transfer of mental states and their original identity. Social implications such as the right to decide on a mind upload (free will) and whether an uploaded mind can still have access to, for example, social benefits and pension payments, individually or as part of a family unit, require further debate.

The ability to upload a human mind into a machine is on the verge of becoming reality. Today's fast-paced technological advancements, including the rapid development of AI capabilities, have made it possible to develop and design dynamic solutions that provide the means for the concept of mind upload into a machine to become the de facto standard for preserving human life into eternity. The physical human form transcends in exchange for a digital copy of a person's mind, thus forming digital immortality. Raised sociological issues include mind manipulation and influence, identity retention, privacy and data protection and societal survival. These require urgent attention and action, including clarification if, for example, an uploaded mind's consciousness is the same as the consciousness of the originating mind (is it the same person?). It will be necessary to review and update existing pertinent legislation to safeguard the fundamental rights and freedoms that everyone in each country has a right to, with due concern and emphasis on uploaded human minds. Regular reviews of these require consideration and incorporation into relevant legislation to ensure the timely management of the implications of further technological advances as and when they occur. The complexity and size of developing a human mind upload capability requires world-wide collaboration and co-operation of those engaged in its execution, irrespective of cultural and geographical differences. The common goal of producing a mind upload capability that will work in the best interest of humankind, across boundaries, must be of paramount importance. More practitioner level research in the form of interviews and a focus group meeting will gain more insights from the community of practice and to bring theory and practice closer together. The researcher confirms that this research answered all research questions (1.3).

This limited research included an extensive Literature Review of mostly contemporary publications. Future research should incorporate a minimum of twelve face to face interviews with recognized and respected scholars from the community of practice in philosophy, sociology, neuroscience, ethics, and technology. This will produce relevant, practical, and opposing insights and positions to ease the closing of the identified knowledge gap, including uncharted territory. In addition, a focus group made up of the top five contributors from the

face-to-face meetings are necessary to confirm the outcomes from the interviews as valid/non-valid and generate further insights/views developed during the focus group review meeting.

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