

Language Is Much More Than A Medium for Communication - A Discussion Based on Andy Clark's Work on Extended Mind

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Abstract: This article discusses the contribution of language to human cognition based on Andy Clark's theoretical framework of the extended mind. For most of the research, language has been used as a communication system, and another aspect of language, the facilitation of cognition and extended mind, has been neglected. This article therefore draws on Andy Clark's theory of extended mind to demonstrate that language can also be seen as an external thinking or even an external artificial tool to help share the burden of thinking and facilitate cognitive development. In particular, the article discusses in detail the theoretical framework of expanded thinking and concludes with two main functions of language: language as a tool for expanding external memory and as a cognitive and computational spatial transformer of the brain. This supports the argument for language as a tool for extended mind.

Keywords: Extended mind, Language, Andy Clark, Language Learning, Cognitive Development.

1. Introduction

What is the role of language for human beings? This is one of the questions that will always arise as we build the history of the development of our minds and thoughts. In the classical cognitive science view, language itself is simply a system of communication, and human use of language is a pure act of using symbols to communicate (Mirolli & Parisi, 2009). From such a viewpoint, language does not seem to have a real impact on cognitive processes. The reason for this is that in traditional cognitive science, thought itself is seen as have the capacity to shape and maintain linguistic norms through formal processes. In recent years, however, the core assumptions of traditional cognitive science have been challenged by a number of fields and ideas (see Brooks, 1990; Clark, 2001, etc.). The dynamic interaction between agent and environment, which may include both artefacts and other agents, is key to the process of adaptation, which, according to this widely held view, is an important part of the cognitive process (Clark, 2001). Andy Clark (2012) has advanced the idea that language is an external artefact that expands human thought. This seems an incredibly counter-intuitive view, as it is at least evident that contemporary and modern humans are immersed in language from birth and learn to communicate in the language of their surroundings almost automatically as they grow up. As a result, most contemporary research on cognition has focused on one aspect: the use of language as a means of communicating ideas. Language as a channel for the flow of information between agents is one example, as is the study of grammar, the parsing and use of words and phrases, and the implied meanings within them. However, one can make a convincing argument, supported by evidence, that language is a means by which ideas may grow outside of themselves. For Clark (2006, p. 293) "public language as a complementary resource that works with the more basic machinery [of the brain] ..." is an important point. This thesis agrees to a limited extent with Andy Clark's work, saying that it lends itself to the study of another dimension in which language may be utilised as a tool to facilitate cognitive

growth and expand thinking, particularly in reshaping and simplifying computational processes. The article is divided into two parts, the first of which explores the origins of language and the idea of 'extended thinking'. The second part delves into Andy Clark's ideas about the role and importance of language beyond simply being a medium of communication. The acceptance, application and development of the concept of extended thinking may have a huge enhancement and impact on human cognition.

2. The Function of Language

2.1. Why does language emerge?

When trying to figure out what language is and how we should understand it, it makes sense to first ask the seemingly irrelevant question of 'how did it come about'. Logan (2007) responds to this topic by arguing that a new form of language developed as a response to the disorder of information overload generated by the previous generation of language forms. Using this as a springboard, we can speculate that the development of language is another direct response to disorder and information overload. In Donald's (1998) view: "The principle of similarity that links mimetic actions and their referents is perceptual, and the basic communicative device is best described as implementable action metaphor." (p.61). In the aftermath, the increasing complexity of human social structures and activities underpinned this shift from mimetic culture to linguistic communication. Living in primitive grasslands and woodlands and being preyed upon by a variety of predators, early humans learned to make fire, sharpen stone tools, organise into groups, and coordinate their hunting strategies. As a result of these advances, societies became more organised and complex. Initially, this complexity could be learned through perception-based imitation; however, as life became more complex, this method of learning became insufficient. Thus, based on this premise, a new mode of information transmission and abstract order emerged in the form of speech and writing, despite the overload and confusion generated by the continued growth of

information.

From this perspective, each new language has evolved from previous forms of language in order to process and take over the information overload that previous forms of language could not handle, and thus achieve a higher degree of order. Just as each represents a different type of language and a different line of language development from oral, writing, mathematical, scientific, computer and eventually the current Internet, so too do their respective semantics and syntax (Logan, 1995, 2000). For example, Logan (2007) argues that science has led to organised information overload, which in turn has led to the development of computers. Just as once upon a time farmers needed the amount of tribute paid to the priests in the form of produce and thus developed their own form of verbal communication, writing and mathematical symbols were created and developed when the overload of quantity led to brain overload (*ibid.*). However, what process enabled this change to take place?

2.2. The Notion of Extended Mind

At the outset, I state Andy Clark's (2012) theory that language functions as more than a means of communication; it also acts as a computational tool and information processing system that helps the brain to resolve cognitive difficulties. The concept of extended mind, first introduced to the public by Andy Clark and David Chalmers in 1998, is helpful in grasping this idea. In simple terms, extended mind refers to "the mind ain't just in the head" (Clark, 2004). According to the traditional tenets of physical mentalism, the mind can only move as far as the brain or body allows. The idea that the mind is an independent, self-contained, first-person creature originated in Descartes' *Meditations* (Ryle, 1949; Avramides, 2001). What happens in my brain is me, and only I know what is happening there. The people around me can see my external environment, but they cannot see inside my brain. This is the famous 'cogito ergo sum' argument in Descartes' philosophy - 'I think, therefore I am'. A person may know without a doubt that he or she exists, but others do not. Descartes' view is the one that arguably forms the basis of almost every other approach to the study of the mind in the philosophy of psychology (Avramides, 2001).

However, Andy Clark has changed this conventional wisdom by casting doubt on such claims. They put forward the theory that people may work with their environment to spread their consciousness beyond the confines of their bodies in subtle and overt ways (Clark & Chalmers, 1998). However, few would argue that people cannot use their environment to facilitate their cognitive processes; for example, many people prefer to use paper and pencil for mental arithmetic. On the other hand, proponents of extended theory of mind argue that the two-way interaction between the human organism and external entities is not merely an aid, but an integral part of the body's cognitive processes, in the same way that our brains use specific brain lobes or neurons. If an external entity is taken away, a person's ability to act is reduced, just as if a piece of the brain were taken away.

However, some scholars have criticised the presence of functionalism in the point that humans use external tools to assist cognition. In its broadest sense, functionalism can be seen as the capacity of a thing and the outcomes it leads to, regardless of what it is made of (Polger, 2017). Similarly, in functionalism in the philosophy of mind, mental states are identified only as what they do, not as what constitutes (*ibid.*). In the early years, kids use their fingers to add and subtract,

but as they become older, they turn to electronic calculators for more complicated math. It is of little practical consequence how the outcome of a computation was arrived at, so long as the conclusion is reported. The Tetris-like game described by Kirsh and Maglio (1994) requires the player to quickly place falling geometric objects in a predetermined pattern before time runs out. Rotating a form 90 degrees with the computer's buttons takes two seconds, but doing it in mind and then changing it takes 10 seconds. In addition, Alan Turing (1950) stated that a computer is functionally equal to a human mind, and that any machine that can pass the Turing test may be considered to have consciousness. However, the theory of extended thinking is not a suggestion like the Turing test; rather, it seeks to rethink and reorganise the very concept of mind itself. Earlier, we established that conventional wisdom holds that only processes internal to the brain, such as the nervous system, may be deemed mental (e.g., Ryle, 1949; Avramides, 2001). However, if I have to write a note or make a memo on my phone to remind myself of my daily agenda, then the note or memo serves a similar purpose to my biological memory. There is a functional link, as even Andy Clark would acknowledge. However, it is not just functionalism, because notes and memoranda are not mental states in and of themselves, or, more precisely, representations of my mind.

This can be illustrated by the old giant pendulum clock. The many functional competitors of the pendulum clock which could replace it include sundials, wristwatches, alarm clocks and other timepieces. Furthermore, theoretically, the components of a pendulum clock could be replaced with other things that serve the same purpose. Changing the dial and hands of a pendulum clock from one type to another (for example, from metal to marble or plastic). This does not change the function of the dial or hands in any way, so one can be replaced by the other. In other words, different materials are used, however, ultimately they all amount to the same thing because they serve the same purpose. However, think of an extreme concept, like replacing a pendulum with a baguette that has been left for so long that it has become hard and heavy and is perfectly capable of replacing the pendulum's function. In this respect, the baguette serves the same purpose as the pendulum and should be regarded as an equivalent. Perhaps we are put off by the great contrast in the materials used. No one would mistake an aged baguette for a pendulum, nor would they try to use it as such. However, if we compare a pendulum clock with a metal dial, metal hands and an ordinary pendulum with a pendulum clock with a marble dial, marble hands and a baguette swinging at the same speed, we are still unable to distinguish: the baguette has no effect on the timing of the clock.

Based on the above illustration, the same example can be carried over to mindfulness. Consider Otto, a high-functioning Alzheimer's patient, as in the case hypothesised by Clark and Chalmers (1998). Due to his own brain's physiological deterioration of memory function, Otto uses a notebook filled with facts to help him recall and organise his life (Clark & Chalmers, 1998). When Otto learns anything new, he writes it down in his notebook. When he wanted to recall something from the past, he could use the index in his notebook. People without cognitive impairment are more likely to consult their own memories rather than go to their notebooks to find information if they think that they can easily get the knowledge they need in their minds. For the same activity, Otto, on the other hand, has to refer to a notepad,

which is similar to the usual disbelief in knowledge in the organism's brain (Clark & Chalmers, 1998). It may be that Clark and Chalmers' interpretation of this case, like their interpretation of the previous examples, has a heavy functionalist dimension. If method A is X, and method B produces the same useful output, then method B should also be X. Let us suppose that this person can walk normally on two feet, but they lose one foot in a car accident and have to replace it with a prosthesis. We would not say that what they are doing is functionally similar to walking, we would say that they are walking. The man is still able to walk, but he has a prosthetic device implanted to help him in the process. Clark and Chalmers (1998) agree with the earlier assertion that Otto lacked belief before consulting his diary. However, Otto's notebooks, like his memories, were an integral part of his existence, guiding his decisions and actions in various situations (ibid.). In the same way that unfulfilled beliefs disappear, so do the records in the notebooks. Thus, whether written in a notebook, on scrap paper or in one's head, the data is available and can be retrieved when necessary.

Proponents of extended mindfulness argue that in certain situations external objects (which are essentially cognitive in nature) can be integrated into one's mind. Many functional connections have limitations and therefore the importance of the 'particular situation' must be kept in mind in such cases. The material in a well-organised notebook is integrated into Otto's cognitive processes because he can reliably identify and make use of it, whereas a computer with internet access cannot. For this reason, the nature of the external entity and the depth of its connection to the mind is crucial if the latter is to function as an extended mind (Clark & Chalmers, 1998; Levy, 2007).

3. Language as A Tool for Extended Mind

As the process of extended mind actually plays an ongoing role in learning, the brain may be transformed by individual learning of extended mind over the course of a person's lifetime. The same applies to a wide range of tangible artefacts, including computers and memory aids, which are often used in educational settings with the aim of promoting intellectual and cognitive growth. A prime example of this is language, as we are immersed in it from birth and naturally use it as a trusted resource for the brain's cognitive growth (Clark & Chalmers, 1998).

Some developmental psychologists have focused slightly more narrowly on the role of language as a means of communication. For example, the Soviet psychologist Lev Vygotsky (1962) suggested that the interaction between language, learning and social experience has a significant impact on cognitive development. Furthermore, even basic human cognitive talents may be elevated to special heights through language-mediated engagement (Vygotsky, 1962). Vygotsky (1962) linked language and scaffolded action to describe this shift. When an action or project is referred to as 'scaffolded', it signifies that it requires help from outside to succeed. Tools and resources, both concrete and intangible, such as the expertise of others, can provide this help. You need a circle gauge or other circular instrument to draw a perfect circle, pilots and navigators rely on computers to design paths or maps, and newborns need the support of parents or nurturers to develop properly. Vygotsky (1962), who was primarily concerned with how children learn, suggested that

children can only achieve short-term success in activities with the guidance or assistance of an adult (parent, teacher or peer). The process of internalising one's interactions and connections with adults and more adept peers is crucial to the development of children's cognitive abilities. A child's internalisation process is such that when faced with challenges beyond her current skills, she may seek help from peers or adults, which usually takes the form of verbal or oral communication. In addition, this behavioural form of re-enacting the social language that benefits the adolescent includes having a discussion with oneself, which is the same as the perceived situation of obtaining external assistance, but this time the conversation is more about oneself. Vygotsky (1962) calls this kind of communication as 'private speech'. Furthermore, Mirolli and Parisi (2011) argue that the forms of sociolinguistic support a person receives from others are varied and may include being reminded of important information, being drawn to a particular aspect, and breaking down large complex problems into small manageable steps. When a child repeats what someone says to him or her, the child is using language to help his or her own cognitive development. When adolescents master this strategy, the superficial act of self-talk may disappear; instead, it is internalised and becomes internal language (Clark, 2012). However, both internalised language and self-talk are designed to drive children's actions, to steer them in the right direction or to help them avoid making mistakes. Here, the function of language as a channel for human communication and also as a tool for structuring and controlling behaviour to guide and shape that behaviour is clear. However, if self-directed words and phrases have any effect on a person's behaviour, as Vygotskians claim, then this may be fatally flawed: how does language function as a tool for guiding the self? How does language work in order to have the effect of guiding the ego? is a further mystery. After all, how can we educate ourselves on things of which we are in ignorance?

Clark (2012) examines the function of language more as an external than an internal resource, in contrast to Vygotsky's insistence on addressing the question of whether language has a constitutive role in the production and presentation of ideas. According to Clark (2012), language is more of an external artefact that aids and extends the computational agency of the brain. Clark (2012) categorises linguistic artefacts into six main ways that focus on these two very different aspects of brain completion and enhancement activity. A person's ability to recall information from a memory bank is arguably enhanced by the use of text or language. Artefacts like texts and notes, examples of which I have mentioned before, are easing the mental burden of use. The other is words and phrases in public language which act as mental transformers of cognitive and computational space (Clark, 2012). The latter of these two topics is the focus of this thesis as it is a topic that is often overlooked.

From the point of view of being a cognitive and computational spatial transformer, language contributes first and foremost to the simplification of the environment, often referred to as reducing the complexity of description (Clark, 2012). Language functions by providing a catalogue of labels that can be used as perceptual signals to help identify and distinguish objects in a diverse and sometimes confusing world (Clark, 2009). Various types of signage, such as those seen in public restrooms and along highways, perform this function. One's reasoning and computational abilities can be aided by defining and enforcing certain stable qualities in

their surroundings (McClamrock, 1995). Linked to this, certain abstract ideas may be easier to learn through a language-theoretic lens, and it may therefore be helpful to annotate them along a linear axis. Linguistic annotation of equivalence classes helps students to understand abstract concepts that they would not encounter in everyday life, such as fraud, generosity and the universe (Clark, 2012). The second strategy involves coordination and reducing online negotiation. People who have a lot to do in order to stay on top of things and get everything done sometimes make a to-do list. This clear strategy is an extra-organisational check and balance that allows our efforts to be synchronised (ibid). Animals with limited resources such as ours can be less cognitively burdened online by using a clear framework (Bratman, 1987). The newly developed strategy has some solid foundations. There is naturally a way to adapt our strategies to new information, and we often do (ibid.). Our choices may shift somewhat in general, but we do not re-evaluate our goals every time there is some minor change. Taming path dependency is a third strategy. path dependency means that one cannot go from everywhere to anywhere, and an individual's current location can greatly influence an individual's future intellectual development (Clark, 2012). The formal education system is no exception in this regard; in order to motivate students to learn, educators tend to offer commonly held but problematic beliefs. These ideas seem to provide a framework for more complex thinking in the future. Language, on the other hand, may eventually erase this intellectual niche. This seemingly obvious fact - that language facilitates the storage and transfer of ideas between individuals - acquires meaning when viewed through this particular lens. As a result of this shift, to use a metaphor, the idea can only be generated by Joe's past experiences; it can only flourish in the intellectual niche now occupied by Mary's mind. However, the full potential of an idea may now be realised through travel between agents (Clark, 2012). The amazing matrix of possible paths between agents offered by a linguistically networked society is thus a direct result of the vast diversity of viable intellectual niches that exist in this environment. Allocating time and energy is a fourth strategy. The act of writing down a reminder to do something illustrates this point, as it creates a cycle of external control over our future actions. Listening to verbal instructions is an important part of education. Or we practise such cues mentally as we prepare for our own presentations or performances. Clark (2012) concludes from these findings that verbal representations contribute to behavioural attention, monitoring and control. As for the fifth method, it entails processing and representing the data in various forms. This last benefit is the one that is most closely linked to the material itself. In the case of my essay, for example, I went through a process of accepting certain ideas and rejecting others, rearranging others and coming up with completely new parts. Each time I rearranged and combined material from different sources, the conceptual framework of the essay grew and became more stable (for example, by adding new notes, comments and plans). However, it would be misleading to say that the author's inner monologue was the sole inspiration for this piece. Rather, it is the result of many spiritual conversations I have had with many things outside my physical self. In these cases, real thinking uses mainly external loops and circuits driven by the surrounding environment. This means that our ability to find, store, sort and rearrange data in the actual world of letters and symbols

far exceeds the current capacity of the biological brain (Clark, 2012).

The six main implications of language as a translator of cognitive and computational space and as an extension of external memory are clear. Language (in all its forms, including public language, oral and written, etc.) has a higher purpose. Rather, the tools of learning, the external extensions and the trajectories of learning are derived from the resources generated by language itself. However, the actual potential of language to transform the computational space experienced by human entities has been neglected.

4. Conclusion

Language is an often overlooked but vital aspect of human communication, not only as a tool for external interaction, but also as a means of communicating with internal communication, WHICH serves as a tool for expanding the mind. There is no indication that any other animal communication system is capable of doing this. One way in which the evolution of human cognition has been profoundly influenced is by the acceptance of language as a reliable tool for expanding thought. It is possible to address higher-level cognitive talents without first considering the cognitive role of language. Without the cognitive function of language, our thought processes might have been fragmented. Or develop into something akin to Cartesian 'inner' thinking - where higher level cognition is largely dependent on internal resources (Clark, 2012). With the development of language, we may now spread this burden and work more widely. In this article, I outline the ways in which Clark's view of language as extended mind has improved human cognitive and computational abilities, and explain the concept of extended thinking. If viewed in this light, language serves to enhance rather than directly reflect our emotional and mental processes, and its role is to extend cognition in ways that on-board devices cannot. As with any new way of thinking about humans, this perspective will face a great deal of debate and require extra effort. However, once the control of the skull is overthrown and the skin barrier is lifted, people may be able to connect themselves to the world in a more authentic way.

References

- [1] Avramides, A. (2001). Other minds, autism, and depth in human interaction. *The Oxford Handbook of Philosophy and Psychiatry*, 275.
- [2] Bratman, M. (1987). Intention, plans, and practical reason.
- [3] Brooks, R. A. (1990). Elephants don't play chess. *Robotics and Autonomous Systems*, 6, 3-15.
- [4] Clark, A. (1989). *Microcognition: Philosophy, cognitive science, and parallel distributed processing*. MIT Press.
- [5] Clark, A. (2001). *Mindware: An introduction to the philosophy of cognitive science*. Oxford: Oxford University Press.
- [6] Clark, A. (2006). Language, embodiment, and the cognitive niche. *Trends in cognitive sciences*, 10(8), 370-374.
- [7] Clark, A. (2012). Magic words: how language augments human computation. In *Language and Meaning in Cognitive Science* (pp. 33-51). Routledge.
- [8] Clark, A., & Chalmers, D. (1998). The extended mind. *analysis*, 58(1), 7-19.

- [9] Donald, M. (1998). Mimesis and the executive suite: Missing links in language evolution. *Approaches to the evolution of language: Social and cognitive bases*, 44-67.
- [10] Kirsh, D., & Maglio, P. (1994). On distinguishing epistemic from pragmatic action. *Cognitive science*, 18(4), 513-549.
- [11] Levy, N. (2007). Rethinking neuroethics in the light of the extended mind thesis. *The American Journal of Bioethics*, 7(9), 3-11.
- [12] Logan, R. K. (2007). *The extended mind: The emergence of language, the human mind, and culture*. University of Toronto Press.
- [13] McClamrock, R. (1995). *Existential cognition: Computational minds in the world*. University of Chicago Press.
- [14] Mirolli, M., & Parisi, D. (2009). Language as a cognitive tool. *Minds and machines*, 19(4), 517-528.
- [15] Polger, T. (2017) Functionalism. <http://www.iep.utm.edu/funcism/>. Accessed Oct 21, 2022.
- [16] Ryle, G. (1949). *The concept of mind*. Routledge.
- [17] Vygotsky, L. S. (1962). *Thought and language*. Cambridge: MIT Press.
- [18] Vygotsky, L. S. (1978). Interaction between learning and development. *Readings on the development of children*, 23(3), 34-41.