Can Culture form part of the Extended Mind?

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Abstract. The hypothesis of extended cognition asserts that human cognitive processes might also include constituents external to the human body, that is, elements in its environment. This essay argues that if we can accept that the mind extends to resources outside the brain, culture might be seen as a case of extended mind. I explore cognitive activities that utilize agent's biological resources exogenous to the brain; by allowing the concept of cognition to encompass embodied processes, intra-cranial chauvinism might be overcome.
I then present ideas that support the active role played by the environment in cognitive processes. Culture and its artefacts, be they physical or not, do not simply scaffold cognition but have the capacity of actively affecting it, enough to make the culture-mind system distinctly different were the constituent elements not to be coupled. Thus, cultural environments form structures that may regulate and restrict the behaviour of agents, dictating their scope of action.

1) Introduction. The hypothesis of extended cognition supports the idea that human cognitive processes might also include constituents external to the human body, that is, elements in its environment. This essay argues that if we can accept that the mind extends to resources outside the brain, culture might be seen as a case of extended mind.
In their paper of 1998, Andy Clark and David Chalmers defend a theory of active externalism of mind; they assert that the environment plays a role in affecting cognitive processes. Different versions of externalism - semantic, natural kinds and social - share the notion that the mental contents of a subject are dependent partly on environmental features that are distinctly external to the cognitive processes of the subject. Examples can be Putnam's twin-water in his Twin-Earth thought experiment (Putnam, 1975, p.701) as well as Burge's relevant linguistic community (Burge, 1979, p.77) - both not constituting part of the subject's mental processes. In striking difference, active externalism proposes the environment as an active participant in the constitution and direction of cognitive processes.
To illustrate their theory, Clark and Chalmers ask us to imagine two separate fictional characters**,** Otto and Inga. Both want to go to the Museum of Modern Art in New York City. Inga refers to her memory and recalls the address of the museum. With that information she sets off to see the desired exhibition. Otto, however, an Alzheimer's patient has been finding it hard to remember certain things of late. He uses a notebook where he writes down all the things he considers he might need and brings it with him wherever he goes, also writing down new information he learns. When Otto needs to go to the museum, knowing he had written the address in his notebook, he consults it. His notebook

plays the same role as Inga's biological memory. Information in both cases lays latent, reliably available to consciousness, ready to be accessed and guide action.

In the presented thought experiment, both Otto and Inga believed they had access to the address even before accessing the information either by recalling it from memory or by looking it up in the notebook. For Clark and Chalmers this is a case of belief embedded in memory. The only difference, they claim, is that Inga's memory has been internally processed by the brain, whereas Otto's mind has been extended into his environment and includes his notebook. In terms of function, the notebook is equivalent to biological memory. If mental representations stored in the brain are part of the brain, then so can be those that only happen to be stored somewhere else, in this case a notebook.
This approach to cognition rejects the notion of a person as being complete contained on its own and unconnected to its environment. It distances itself from an idea of the mind solely as an internal action of data processing and regulation of human activity and favours the possibility of minds forming cognitive systems transcending the skin/skull barrier. Their "parity principle" - as in Otto's notebook – states that if the external element plays the same role as an undisputed cognitive one, it is part of the system (Clark and Chambers, 1998, p.16).

Critics Adams and Aizawa suggest that Clark and Chalmers commit the so-called coupling-constitution fallacy, that is the mistaken idea that because something couples with a mind it might constitute part of it. (Adams & Aizawa, 2010, p.67).
Advocating for extra-cranial illegitimacy in cognition, they view external elements as unable to realize cognition and hence of becoming a constituent part of the cognitive operation. Another concern is that the consequences of admitting some external processes as part of cognition might make it impossible to delineate a boundary where to stop, allowing for processes that are clearly not cognitive to slip though; this is known as the cognitive bloat objection (Rowlands, 2009, p.2). A further criticism put forward is that the differences between the internal and external processes are too big to be surmounted in trying to reduce them to a single psychological kind (Rupert 2004).

In the next section I shall present reasons to accept a wider definition of cognition; one that includes processes happening outside the brain and that might assist in overcoming the biological chauvinism present in some criticisms. Then I move on to explore the idea of culture as a case of extended mind.

2) The limits of cognition. Cognition can be defined as the activity of information processing, regulation and coordination of states and selection of effective actions. It includes processes like knowledge acquisition, memory storage and retrieval, problem solving, decision-making, computations, evaluation and judgment amongst others. If we accept that cognition is embodied, that is, involving not only brain processes but also processes occurring in the rest of the body, for example, facial feedback (Strack et al, 1988), (Hennenlotter et al, 2009), (Havas et al, 2010) and morphological computations (Pfeifer et al, 2006), (Müller & Hoffmann, 2017), then the first barrier for extension of cognition may have been conquered.
The facial feedback hypothesis describes how feedback from people's facial activity affects their emotional experiences and behaviour. Facial expressions are not only the product of emotions but are also capable of influencing them without people having to be aware of their expressions. Only the physiological mechanisms may be enough to produce affective reactions. In this way involuntary or non self-perceived facial expressions are shown to be playing a causal role in the appraisal and generation of emotion (Strack et al, 1988, p.768). Emotion might then not be generated or initiated solely or exclusively in the brain.

In the notion of morphological computations we also encounter cognitive processes that do not have their origins in the brain. Control and cognition is facilitated by the body in contribution to overall coordination and implementation of intelligent behaviour. Morphology might facilitate control, perception and computation proper, where the body is actually used for computation. One example can be the eye-of-the-fly case study where the morphology of the insect's eye, with its precisely defined input-output mapping performs a valuable preprocessing function that otherwise would have had to be done subsequently in the brain.
Another example cited is the nonhomogeneous arrangement of photoreceptors in the human eye, which have been optimized in aid of acuity instead of motion detection. For Müller and Hoffmann, these ideas can prove useful in the design of adaptive robotic systems and the study of neuroscience. Going further than the known idea that intelligence requires a body, morphological computations provide a deeper notion of the implications of the connection of the physical and environmental cues processing by connecting body, brain and environment (Müller & Hoffmann, 2017,p17).

Cognitive processes are then not circumscribed to the brain but might be coupled with the physical/biological tools of the agent. Clark points out that intelligent processes are those that meander through brain, body and the environment (Clark, 2001, p.132). There is a difference in

complexity between the extra and intra-cranial tasks, however, that is not the concern here but the fact that some cognitive activity indeed happens physically outside the brain. Having accepted this, further extension to other external resources does no longer seem untenable.

However, not all resources that can be used in cognition must be physical. The use of conceptual tools like mathematical objects or the everyday use of language not only aid but enhance cognition in a way that makes agents that use them highly distinguishable from those that don't. For Clark and Chalmers there could have been a sort of adaptation of the brain to the relationship with external resources. Language, they say, might have evolved - in a certain degree - to enable the extension of cognitive resources in the context of coupled systems. Thus, the brain itself develops in ways that will aid and factor in the complementation with external resources, showing that extension of cognition is an integral part of cognition itself (Clark & Chalmers, 1998, p.12).

Not everyone accepts this. Even though Sterelny accepts that resources such as language and arithmetical notation can better our cognitive capacities (Sterelny, 2010, p.471) he thinks these resources only show an environmental support of cognition, but they cannot be reasonably treated as constitutive of minds. (Sterelny, 2010, p.466). He proposes the scaffolded mind hypothesis, where human cognitive abilities rely on and have been transformed by resources in the environment; human agents often control and structure their environment in order to preserve and enhance their cognitive capacities. Furthermore, for him parity of function of the external resources, this is when the external element plays the same role as an undisputed cognitive one, does not imply that such element constitutes part of the cognitive system. That we can externally process food in ways that makes it more easily digestible does not mean that we can talk about an extended theory of digestion, for example. While it can clearly be said that digestion is aided or scaffolded by these acts of manipulation, a soup pot, food processor or other cooking paraphernalia cannot be said to be part of the digestive system (Sterelny, 2010, p.468). Even though some external actions might resemble those of digestion - chopping can be compared to chewing, or fermenting to the break down of food in the stomach - they are however not the same as digestion as a whole.

Crucially, it is important to point out that external resources in coupled systems of extended cognition do not play such a passive role as the soup pot or the food processor. Food manipulation, such as in Sterelny's example, happens exogenously and unconnectedly from the digestive system; extended cognition on the other hand, happens in concert with external resources - allowing for important correlative and dynamical

processes like feedback and modulation. A good example of this can be an artist's manipulation of material as part of the creative process where sketching, sampling and testing is usual practice before arriving to the final piece. The creation process remains very limited if done only via thought processes but acquires an enriched dimension when the artist interacts with the environment. In touching the material, moving it, mixing it, seeing and feeling how it occupies the space, the process of decision-making happens. Clark and Chalmers talk about a drop in the system's behavioural competence if the external component, in this case the artist's materials, is removed (Clark & Chalmers, 1998, p.9).

Kirsh and Maglio call these processes "epistemic actions" and use the game Tetris to explain them. Tetris is a tile-matching puzzle video game where players must move sideways or rotate differently shaped falling tiles to make them fit and build up rows without gaps at the bottom. They present data to support the idea that some cognitive and perceptual problems are more efficiently solved by the performance of actions in the world as opposed to solely in the head. Some of the translations of the tiles done by players can be better comprehended as activities that utilize the world in order to improve cognition. Such actions are used to transform the world so as to make the problem solving tasks easier. They distinguish pragmatic actions, that is those that are performed to get physically closer to our goal, from those epistemic, that is those that are performed to reveal hidden or hard to access information by mental means alone. Achieving the mental rotation of the puzzle pieces takes much longer that when players are asked to actually move physical pieces, but more importantly they also show evidence in support of the idea that moving the pieces physically does not only serve the purpose of positioning the piece but also of defining the right pieces that would be compatible with each other. The physical rotation of the piece forms part of the cognitive process of decision of the right fit (Kirsh & Maglio, 1994, p.513).
Likewise, the artist's interactive process with the materials can be seen as a cognitive one, even if some part is not happening entirely inside the head. Should the external component of the system be removed it would equal to the removal of some part of the physical brain.

In this section I presented ideas that support the active role played by the environment in cognitive processes. External elements do not simply scaffold cognition but have the capacity of actively affecting it. Extended cognition allows for critical dynamical processes like feedback and modulation that a scaffolded theory of cognition does not seem to adequately account for. In the following section I shall point out that in the case of cultural resources the role played by external components is even more active.

3) Mind-culture cognitive systems.

Many ways humans can use information-handling mediums are not transferred genetically but culturally and are necessary to maintain the high levels of achievement the human species has reached. As Clark rightly points out, we distribute and off-load problem solving activities into our environment (Clark, 2001, p.126) but this environment is not only composed by the physical, it also involves the cultural elements we use to aid our cognitive endeavors.
In this way humans might be part of distinct cognitive systems depending on the different cultural settings they might have found themselves in. Cultural context makes members convert information in the same way dictated by the particular system they might belong to. The way we react to them given our particular biological/mental configuration has in turn an effect on culture. Culture is also changed and evolves in parallel to the single agent but as a result of collective consensus.

Thoughts and beliefs are embodied and manifested in cultural artefacts through different semiotic resources that pervade everything from language, education, legal frameworks, standards of behaviour and taste, hierarchies of status as well as the activities of daily life like gestures and prosody. Thus, by regulating behaviour, cultural environment can be seen as part of the cognitive process of individuals and not merely as a scaffold. Cultural elements do not play a passive role; unlike mere tools they come weighted with content that affects cognition. Different languages affect the way neural networks are arranged and the direction of neural connections in information and concept association. Concepts previously thought as universal - such as time - can be perceived differently relative to the language used, transforming the psychological experience of the user. Bylund and Athanasopoulos test what is known as the linguistic relativity hypothesis presented by Whorf in 1956, according to which the structure of a language has an effect on its speakers' appraisal of the world and their cognition. Swedish and English speakers studied were shown to be inclined to think of time in reference to distance whereas speakers of languages like Spanish or Greek did so in terms of volume. Speakers of different languages are then said to represent time in distinct ways and in the same bilingual individuals changing languages has been seen to transform the way they assess the passing of time periods. Spanish-Swedish bilinguals undertaking the same task in both languages presented diverse interference depending on what language they were using (Bylund & Athanasopoulos, 2017). Language not only shows our tendencies to associate mental mappings

of space with time but evidence supports the notion that different languages actually shape the way we think about certain concepts.

Other cross-linguistic differences can be found where language can influence the shaping of nonlinguistic representations. Pitch, the quality of sound, has been shown to map mentally onto vertical space (Casasanto, 2010), in accordance with previous theories of metaphorical mental representation presented by Lakoff and Johnson. Humans tend to mentally represent pitch analogously to vertical space; in this way we find in languages like English talk about high or low pitch. However, different languages utilize different representations, for example, the Kpelle community in Liberia refer to pitch as light or heavy and the Suya people in the Amazon identify high and low pitches as young and old respectively (Eitan & Timmers, 2010).
Those who use different linguistic space-pitch metaphors can be said to be thinking about pitch differently; different language users might think differently even when not making use of language (Dolscheid et al, 2013). The neural paths that allow the connection of concepts with certain representations are all present but the use of different languages strengthens one in detriment of the others. This strengthening supports the idea that language has an important role in shaping someone's psychophysical experience of things like time duration or the way we conceptualize pitch. The same physical experience is mentally represented differently even when language is not being used (Dolscheid et al., 2012),(Walker et al., 2010). At the same time, words are shown to manipulate and influence aspects of the person's prior knowledge and inform top-down modulations; language can be said to be a source of information in the processing of experience (Athanasopoulos et al., 2015), (Lupyan & Clark, 2015).

Furthermore, according to the label-feedback hypothesis discussed by Lupyan, the performance in tasks that were perceived to be non-verbal is actually modulated by language. According to this hypothesis language transforms cognition and perception affording humans the access and manipulation of mental representations in a novel way. Evidence presented supports the notion that the use of language, in particular the practice of labeling can modulate processes of categorization, visual discrimination and also the detection of the presence of a stimulus. Lupyan argues that language modulates cognitive and perceptual processing in a distributed and interactive manner (Lupyan, 2012, p2).

That cultural contexts have distinct effects on their members is not a new idea. With his concept of 'habitus', Bourdieu stated the pervasive interaction of cultural structures and agents, where social norms guide behaviour and thinking. Habitus is thus the manner in which a certain

cultural context affects it's members via enduring and structured dispositions to think, feel and act in a determining way (Wacquant 2005, p. 316, cited in Navarro 2006, p. 16). The notion of 'capital' that he refers to goes beyond the materials assets of a society to also encompass the social, the symbolic and the cultural; social order is encoded in people's minds through unconscious mimesis as a result of the interaction with cultural artefacts (Bourdieu 1986, cited in Navarro 2006, p. 16).

This active role of the environment might prompt us to question how much of our cognitive evaluations and decision making is purely our own and how much is determined by our cultural context. Even our aesthetic appreciation of mating partners seems to be affected; correspondence might have been found between the economic context of a country and the preference for less masculine facial features in men by women (DeBruine et al, 2010). Less desired phenomena outside of volition like automatic stereotyping are also directly linked to cognitive processes heavily affected by culture with psychologists like Bargh arguing that the only way to eradicate cultural stereotyping would be to eradicate the cultural stereotype itself (Frankish, 2010, p. 917).

4) Conclusion.

It would be too ambitious of me to aim at proposing any strong conclusions in this brief and incipient look at the issue but I attempted to highlight reasons to support further contemplation of the subject. Firstly I explored ideas about the role of cognitive activities that utilize agent's biological resources exogenous to the brain; by allowing the concept of cognition to encompass embodied processes, intra-cranial chauvinism might be overcome. Furthermore, if we can accept that cognitive activities extend to resources outside the brain, it might be argued that culture could be seen as a case of extended mind.
Secondly, I presented ideas that support the active role played by the environment in cognitive processes. Culture and its artefacts, be they physical or not, do not simply scaffold cognition but have the capacity of actively affecting it, enough to make the culture-mind system distinctly different were the constituent elements not to be coupled. Cultural environments form structures that may regulate and restrict the behaviour of agents, dictating their scope of action.
I conclude that in terms of cognition it might just be that alongside biology there may also be cultural structures that shape our ends, rough-hew them how we will.

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