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Neuroscience and Culture: A Virtue Centred Approach

Neurowissenschaften und Kultur: ein tugendbezogener Ansatz

Zusammenfassung

Ausgehend von einer aristotelisch-thomistischen Perspektive werden derzeit verfügbare neurowissenschaftliche Erkenntnisse dahingehend untersucht, inwieweit sie als Fundament einer umfassenderen Bedeutung kultureller Bildung dienen und inwiefern diese irreduzible Normen moralischer Bewertung mitbegründen. Es scheint gut möglich, wenn das Vorhaben einer Harmonisierung tiefergehend erforscht wird, dass dies neues Material liefert und die Hypothese fundiert, wie sehr die Aristotelischen Kategorien zur laufenden Debatte in der Naturphilosophie beitragen können.

Schlüsselwörter: Habitus, intellektuelle Tugend, moralische Tugend, Neurowissenschaften, Naturphilosophie

Abstract

A series of tentative suggestions are advanced from a broadly Aristotelian-Thomistic perspective as to how the available neuro-scientific data may be employed to ground a more comprehensive account of culture formation and how such an account has built into it irreducible standards of moral evaluation. It is speculated that should such an enterprise of harmonization be more widely explored it may help vindicate a growing suspicion that Aristotelian categories have much to contribute to contemporary debates in the philosophy of nature.

Keywords: Habit, Intellectual Virtue, Moral Virtue, Neuroscience, Philosophy of Nature

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Perhaps the most obvious way of evaluating the relevance of neuroscience to culture and vice versa is connected to the manner in which a pervasive intellectual culture within the biological sciences has led to numerous materialist and philosophically naïve "solutions" being proposed to the central questions of human action, consciousness, rationality, language acquisition and sociality. A detailing of this intellectual *via dolorosa* is of clear importance in understanding how the undoubted potential of an enormous increase in empirical data over the past few decades has gone consistently unrealised. A great deal, however, has already been written in this connection, and there *may* even be signs that the multiple dead-ends resulting from reductionist and classical dualist accounts of mind have dented confidence sufficiently to render alternative solutions more palatable.[1] The present paper approaches the question of culture and neuroscience from a somewhat different angle. It advances a series of tentative suggestions as to the way in which the empirical data, when understood correctly, can lead to a more comprehensive account of how culture is actually formed and how such an account has built into it irreducible standards of moral evaluation.

Human Being: a Classical Approach

Underlying these suggestions is the idea that much, if not all, of the empirical evidence collected over the past several decades accords remarkably well with more "traditional" conceptions of the human person, and that it is, in fact, only by integrating this evidence within such a truly personal and interpersonal context that the apparently intractable paradoxes thrown up by standard frameworks of interpretation can be overcome. As R. R. Reno has recently commented:

"We often hear that modern science requires us to reject traditional…views of the human person. The argument goes something like this: If we can see the physical process by which ideas are associated or feelings felt or decisions made, then surely we must admit that human beings are nothing more than physical entities. The concept of a soul, so we are told, is irrelevant…Well, it turns out that science now points us in a different direction. These days, cognitive scientists are doing experiments that use MRI technology to visualize the brain while subjects undergo experiences, solve problems, and make decisions. This approach allows scientists to see and theorize about the significance and sources of patterns in our brains, patterns that shape the way we respond to the world. We are learning about the highway system of neurological movement, which turns out to be decisive for the way our minds work…The new emphasis on patterns of neural activity suggests an important support for the traditional… understanding of the soul. The cutting edge of brain science makes it clear that it is as foolish to say that our brains are just neurons as it is to say that highways are just concrete and asphalt. After all, what matters to the motorist is the way in which the concrete is organized to create an interlocking system of usable roads. The same holds for the gray matter inside our heads."[2]

Perhaps the most influential of the "traditional views" referred to here, and the one that will frame the present discussion, is that put forward by Thomas Aquinas. Drawing upon the insights of Aristotle, this embodies a conception of the human being as a functionally irreducible whole manifesting powers that are, and those that are not, circumscribed by space and time. This hylemorphic account of the human being gives due weight *both* to the material and to the immaterial aspects of human experience in a manner that renders them at once harmonious and mutually explanatory. Now, without going into the more intricate philosophical explanations required fully to vindicate such claims, the fact that both these aspects are integrated into a deeper – personal – unity means that any physical changes within the brain that can be attributed to deliberate human action will inevitably and simultaneously also symbolise a more profound personal transformation. This is, of course, accounted for by the inherently symbolic nature of the human body in general. Indeed, since lower functions are integrated into a hierarchy in which

they are co-opted, governed and thereby specified by the distinctively human powers of intellect and will, and since these distinctively human powers are of an immaterial nature, this is also the basis upon which material changes can be taken as certain evidence of deeper, immaterial changes.

Powers and Habits

More could be said at this point about how a Thomistic approach might help organise recent research into the neuro-biological and neuro-systemic correlates of various human capacities. It is not this dimension of explanatory compatibility, however, that I want to focus upon. Instead, I want rapidly to move to a consideration of research into the area of habit-formation, since it is particularly in its well-known account of habit formation and virtue acquisition that the Thomistic interpretation seems to find striking confirmation in contemporary research.

Here, it is useful to make a preliminary conceptual distinction between innate powers, acquired dispositions and particular actions. The powers of the human being can be described as those of its capacities for action it possesses precisely in virtue of its nature as human. In contrast, whereas a "power" is a capacity for action, an "act" is a concrete exercise of a power on a given occasion, and is thus the concrete bringing to expression of what is merely potential in the power of which it is such an expression. Finally, between a "power" and an "act", a "habit" is an intermediate state which, whilst predisposing a person to exercise a power in a particular way, falls short of the actual exercise of that power.[3] It "is a durable characteristic of the agent inclining him to certain kinds of actions and emotional reactions, [but] not the actions and reactions themselves." Accordingly, the defining characteristics of habits have recently been summarised by a leading researcher into their neural correlates/neuro-systemic bases in the following manner:

"First, habits (mannerisms, customs, rituals) are largely learned; in currently terminology, they are acquired via experience-dependent plasticity. Second, habitual behaviours occur repeatedly over the course of days or years, and they can become remarkably fixed. Third, fully acquired habits are performed almost automatically, virtually non-consciously, allowing attention to be focused elsewhere. Fourth, habits tend to involve an ordered, structured action sequence that is prone to being elicited by a particular context or stimulus. And finally, habits can comprise cognitive expressions of routine (habits of thought) as well as motor expressions of routine."[4]

Overall, Graybiel concludes, these various characteristics suggest that "habits are sequential, repetitive, motor or cognitive behaviours elicited by external or internal triggers that, once released, can go to completion without conscious oversight." This holds obvious functional benefits in terms behavioural efficiency, since it enables a person to focus attention on that small portion of his behaviour which he consciously seeks to shape and direct at any point in time, by presupposing a whole back-ground of previous experience he need not laboriously revisit. Indeed, it has been the signal contribution of Graybiel and her co-workers, to have thrown considerable light on some of the underlying neurobiological processes involved in this well documented dimension of universal human experience.[5] Thus it now seems that:

"[d]ifferent basal-ganglia based circuits appear to operate predominantly in relation to different types of cognitive and motor actions....[and that] many of these basal ganglia based subcircuits participate during the acquisition of habits, procedures, and repetitive behaviours. [Thus, m]any of these...behaviours, whether motor or cognitive, are built up in part through the action of basal ganglia-based neural circuits that can iteratively evaluate contexts and select actions and can then form chunked representations of action sequences that can influence both cortical and subcortical brain structures."[6]

More particularly, research has charted a shift from "evaluation-driven circuits" to circuits implicated in "performance" as being of crucial importance in the process of habit formation.

"Chronic multi-electrode recordings suggest that within the habit production system, as habits are acquired, neural activity patterns change dramatically and eventually settle into chunked patterns…This process may be critical to allow the emergence of habitual behaviours as entire structured entities once they are learned."[7]

This begins to account for the why some forms of habit are so difficult to acquire and others to change. It seems to describe a complex set of processes which Jonathan Cohen has seen fit to characterise as a sort of neuro-biological vulcanisation whereby certain dispositional sets, being of a relatively enduring character, make it harder but never impossible to alter ingrained patterns of behaviour and the attitudes to which they give rise.[8] These patterns of behaviour thus become "natural and enduring through long practice"[9], making an individual, in one way or another, who he is. This is to vindicate the typical Thomistic claim that the overall collection of habits with which a person is endowed – his overall state of habituation or *habitus* – constitutes for him a sort of second nature. Moreover, it is precisely these sets of dispositions, building upon the huge potential for diversity in concrete human action, which account for the gradual building up of differing styles of individual and collective behaviour together with the distinctive mentalities that such behaviour implies. This confers upon embodied human existence its irreducibly narrative, and indeed historical, structure according to which all that is in the past somehow comes to be implicated both in the present and the future.[10]

This will be returned to in a moment. Before doing so it is necessary to track two further distinctions. The first consists in the fact that habits, like acts, can contribute either to the development or to the corruption of the human powers of which they are specifying expressions. Insofar as they contribute to the development of those powers, they are called virtues, and insofar as they contribute to their corruption (or, systematic misdirection), they are called vices. In this sense, "virtues" are nothing more than stable dispositions to act well, whereas "vices" are stable dispositions to act badly.[11] Although it is not possible to go into the many philosophical subtleties of the Thomistic position, it is important to note here how its understanding of the good in general and thus of the good-life of man in particular is essentially a functional one. Thus there is a real sense in which it understands virtue in terms of proper or optimal functioning and vice in terms of dysfunction.

The second distinction, that between the possession of a capacity to act, on the one hand, and the employment or use of that capacity, on the other, helps more fully to explain the scope and implication of this view for the human action-system. It corresponds to a distinction Aristotle and Aquinas draw between virtues of the intellect and those of the appetite. By doing so they point to the fact that it is possible to develop both intellectually and morally. It is possible to develop intellectually by acquiring "a more refined capacity to reason to conclusions from…[the first] principles [of a science], a deeper understanding of life, a more discerning sensitivity in making practical judgments, and a more adept skill at making things".[12] It is possible to develop morally by developing habits such as those of treating people justly and of responding appropriately to one's various desires.

Thus, because intellectual virtues, whether those of the theoretical intellect, or of the practical intellect, confer "only aptness to act", not the "right use of that aptness", they are correctly taken to be virtues only in a relative or analogical sense, whereas, virtues of the appetite are virtues properly so called or virtues without qualification.[13] "Only habits that dispose appetite give both capacity and the bent to use that capacity well:"[14] indeed the tendency to act well is precisely the capacity that they are said to confer. It follows from this that any human action capable of being "appraised technically can also be appraised morally" (ibid), and that these two appraisals remain analytically distinct. In particular, whereas moral appraisal relates to the good of the whole person, technical appraisal

relates only to the good of the particular work done or of a particular capacity or ability. As Jacques Maritain once put it:

"Making is ordered to such-and-such a definite end, separate and self-sufficient, not to the common end of human life; and it relates to the peculiar good or perfection not of the man making, but of the work made."[15]

Thus, although there is an important overlap, indeed fuzzying of the edges so to speak, when it comes to the whole sphere of psychiatric disorder, a moral dysfunctionality is intimately connected to the type of active plasticity that can be affected, no matter how hard that might prove to be in practice, by the deliberate action of the agent, where as non-moral dysfunctionality is not.

Although it is still somewhat unclear as to how these distinctions can be made to harmonize with the available evidence in any very precise manner, they do seem partially to map important differences in the way that different forms of learning implicate different regions of the brain. Thus, in addition to the well-known fact that the systems of explicit and non-explicit long-term memory can be traced to different regional substrates,[16] within the sphere of non-explicit memory itself, different regional subsystems have been identified for procedural memory, perceptual representation and emotional conditioning.[17] For this reason it has recently been suggested that "overlapping cortico-basal ganglia networks form a labile hierarchy with three major levels, consisting of the limbic, associative and sensorimotor networks".[18] This is supported by the fact that within the striatum itself, that portion of the brain within the basal ganglia particularly concerned with the formation of habits, that there exist a considerable degree of function specialisation.

"The striatum, based on its cortical inputs, contains three major functional territories, namely: associative, sensorimotor and limbic. These functional domains are largely segregated throughout the striatum. The associative territory almost comprises the whole extension of the CN [Caudate Nucleus], with the exception of the dorsolateral rim of its head and a small medial portion of the CN tail, and the precommissural Put [Putamen]. The sensorimotor domain includes the dorsolateral aspect of the CN head, part of the dorsal precommissural Put and the entire postcommissural Put. The main component of the limbic striatum is the nucleus accumbens, although there are other regions in the so-called dorsal striatum in which the limbic projections overlap with the associative ones: the ventral sector of both the CN head and precommissural Put and the medial rim of the CN tail."[19]

Moreover, it may be speculated that the clear distinctions drawn here between the associative, sensorimotor and limbic would seem to be at least evidentially congruent with traditional Thomist divisions between the habits of the speculative intellect, the habits of the practical intellect cognitive and habits of the will or of the inclinations. What is certain, however, is that the form of training, both moral and cognitive, that the Thomist understanding of the human person seems to allow for, is extremely well attested to in the profoundly plastic nature of the brain as a whole.

Human Society

To complete the picture being sketched here, one further distinction needs to be drawn; that between individual and society. This time, however, it is a distinction drawn in order immediately to be qualified, since as has already been pointed out, on a Thomistic understanding, the individual is personal and, being personal, always necessarily implicates, and is implicated in, the society of which he is a part. Accordingly, both Aristotle and Aquinas place great emphasis upon the inherently social nature of the human person, and each consequently asserts with the greatest possible emphasis the indispensable nature of socially mediated action and interaction in the attainment of human flourishing. "If man is by nature a political animal," states contemporary Thomist, John O'Callaghan,

"it stands to reason that his political life, which necessarily involves communication, is the flower of his more basic vital activities or forms of life....[Thus] [h]is

political life is his flourishing, the 'more perfect existence' that the individual naturally seeks, without which his individual existence is naturally incomplete and naturally less than perfect."[20]

It follows that "[b]eing rational, linguistic, and political are the specifically human ways of being an animal."[21] As Aristotle himself states, "everyone needs to communicate his thoughts to others" and it is communicative action taken in the widest sense, action of which language as normally understood is the central or paradigm case that makes this possible. Once more, the available neurobiological evidence all powerfully confirms this. Thus, the mutual constitution of culture and mind has been demonstrated in a relation to a number of basic psychological processes. These include: the occurrence of "protoconversations" and the complex set of behaviours involved in early language acquisition,[22] the way individuals conceive of themselves,[23] how they make causal attributions,[24] how they attend to and recall objects in their environments,[25] and how they perceive, experience, respond to and predict their own and others' emotions.[26] Many of these phenomena have been linked to the existence and functioning of specific brain neurons, called mirror neurons, which underlie complex forms of mimesis.[27] These have been shown to have an especially crucial role in understanding the intentions behind the others' actions.[28] Finally, a growing number of studies show that "the structure and the function of the developing human brain is shaped both by the environment and by cultural experiences".[29] This includes evidence of significant genetic variation, which suggests that cultural diversity may emerge at many different, interacting, levels.[30]

Speaking of human society, then, encompasses the totality of human relationships. Not only the fixed and variable relationships between biological organisms – *homo sapiens* – together with all that has been biologically transmitted to them, but also, more significantly, cultural relationships that arise from those distinctively human creations, both past and present, which involve the use and transmission of symbols and artefacts and have involved the active development and successive reconfigurations of human consciousness and of the material world. In this respect, and in the processes of social interaction over time, human beings construct and reproduce relational complexes and institutions which go beyond the individual and which come to obtain a certain autonomy from their original creators. These build upon:

"... sequences of social practices which are widespread, impersonal, subject to, and yet always resistant to control. Practices are shaped in customs, conventions, usages, rituals, styles, manners, fashions, tastes, plans, projects, laws. They are lodged in the world such that people relate to each other in certain material settings with practical ends in mind."[31]

From a Thomistic perspective these diverse structural complexes must ultimately result from the aggregation of concrete individual and collective decisions. Furthermore, because human action takes place within a pre-existent habitual context, so, by extension, it must also be right to speak of a habitual order within which social complexes, cultures and institutions are embodied: an habitual order which finds expression both in the personal *habitus* of individual actors, but also in external social and material environments whose precise configurations are the result of activities the relevant complexes are structured to sustain. It is just such an order that the well-known sociologist, Pierre Bourdieu, has pointed to with his employment of the term *social habitus*, and it is interesting that he only began to use this term after an early engagement with certain strands of scholastic philosophy. Unfortunately, in the course of developing his thought, Bourdieu paid little or no attention to the underlying philosophical context from which he had chosen to borrow the term *habitus*. Thus, whilst pregnant with the promise of how such a Thomistic category could be functionalised, Bourdieu's ouvre fails to realise that promise in a pretty comprehensive way. By re-connecting the *habitus* within its original context, it is the present author's belief that

the concept of a *social habitus* is more satisfactorily operationlised, and to a considerable effect.

Finally, all of this also highlights, of course, the irreducibly moral dimension of every human institution and cultural form, since if such cultural forms are ultimately species of socially embodied habit, they must also possess the qualities of conducing either to virtuous or vicious behaviour depending upon how well they tend to support the flourishing of their members and creators. If well integrated and properly directed towards the real goods of the human person, then the individuals involved in their operation and touched by their activities will acquire a tacit understanding and aptitude for the goods of human flourishing. If, on the other hand, they are in some way dysfunctional, then those same individuals are likely to develop a tacit knowledge of, and aptitude for, acting in accordance with principles that undermine such flourishing.

Conclusion

The foregoing discussion has merely touched upon many deeper-lying philosophical, empirical and inter-disciplinary themes. At the most obvious level, it is hoped that what *has* been said gives at least some indication of how it might be possible to begin harmonizing recent neuro-scientific research with a conception of the person that enables due weight to be given to its bodily dimensions without lapsing into incoherent and crude materialism or into unsustainable forms of Cartesian or substance dualism. In order to render this process of harmonization more complete and thus convincing, it will be necessary to explore the extent to which the fine details of the neurological and neuro-systemic evidence can be made to correspond to the various dimensions of a traditional Aristotelian and Thomistic psychology; and if so, in what manner. It is to be expected that, at the very least, certain important refinements will need to be made in understanding and ordering such evidence and in fine-tuning the parameters of the Aristotelian-Thomistic mind. Alternatively, the possibility must also be allowed for that further reflection will show the entire enterprise of such harmonization to be ill-conceived, having little more than a superficial appeal. It is, however, the present author's strong suspicion that this will not, in fact, be this case. Indeed should the enterprise of harmonization be more widely explored it will be able to draw upon the considerable neo-Aristotelian revival in ethics and action theory. It may also help vindicate a growing suspicion that Aristotelian categories have much to contribute to the formulation of a more adequately integrated philosophy of nature.

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