

# Physiological and Psychological Foundation of Virtues: Thomas Aquinas and Modern Challenges of Neurobiology

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**Abstract.** This article regards the field of neuroscience and indicates on the proper or erroneous functioning of the human brain. Intellectual virtues, especially practical wisdom (*prudence/ prudentia*) play a significant role in capturing the truth and implementing it in life. The agile formation of the cognitive function of man encompasses both his reason as well as the sensual judgment of utility with all the bodily backup (*vis cogitativa*). The brain possesses great plasticity in the production of neuronal connections. Habit as a permanent wont utilizes the reactions being developed to the construction of often inappropriate mechanisms, that in turn are not easy or completely impossible to eliminate. When practical reason is introduced into a false ethos, the brain responds by forming “ruts” of neuronal connections which seem difficult to consider as something appropriate. The reparation of the existing situation and the removal of the wrong habit require relevant virtues so as to unblock the psychological resistance that is deeply rooted within the physiological neuronal substrate. The learning about the virtues of St. Thomas Aquinas is the best warranty not only for theoretical explanations, but also for the practical application of virtues in dealing with the arisen situation. Only well-formed virtues give the opportunity to correct the false instinctive cognition and liberate from erroneous actions.

**Keywords:** virtue ethics; brain; neuronal connections.

Modern neurological brain research has located an organ which is responsible for taking moral decisions. Walter Glannon, a professor of neuroethics at the University of Calgary, Canada defines it as *ventromedial prefrontal cortex* (VMPFC). The ethics of neurobiology goes as far as to claim that external, environmental and social factors dynamically contribute to the creation and transmission of neuronal connections in the brain, which are responsible for moral conduct of man.

Thus, shall we abandon the idea of free will and confine in neurons? Does being free equal the wish to have all physical and chemical powers on our side, serving our nervous and somatic systems? Is the conviction that we make decisions ourselves only an illusion? Contemporary neurobiologists, e.g. Michael S. Gazzaniga<sup>1</sup>, Antonio Damasio<sup>2</sup>, Joseph E. LeDoux<sup>3</sup> or John Terrence Cacioppo<sup>4</sup> claim that the basis of human behaviour is rooted in neuronal interactions and that human convictions, thoughts and desires evolve on behalf of brain activity. At the same time they exert influence on our decisions regarding to what kind of actions we take. They search for both new terms and a new understanding of personal responsibility in this new world of basic physiological, neuronal as well as neurosocial activities of the brain. Thus, a question arises concerning the uniqueness of man which actually is the main determinant of human “self”, especially if we are so strongly defined by our habits determined by neuronal connections in our brain (Gazzaniga 2013, 14–42). Another question focuses on the sufficient reasons of human life and whether the deterioration in quality

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<sup>1</sup> Michael S. Cassaniga, the head of the new SAGE Center for the Study of the Mind at the University of California, Santa Barbara and the president of the Institute of Cognitive Neuroscience.

<sup>2</sup> Antonio Damasio, a Portuguese professor of behavioral neurology at the University of Southern California where he is head of the Brain and Creativity Institute.

<sup>3</sup> Joseph E. LeDoux, an American neuroscientist whose research is primarily focused on the biological underpinnings of emotion and memory, especially brain mechanisms related to fear and anxiety. He is a professor of science at New York University and director of the Emotional Brain Institute.

<sup>4</sup> John Terrence Cacioppo co-founded the field of social neuroscience and is a professor at the University of Chicago and Director of the Chicago Center for Cognitive and Social Neuroscience.

of life which causes damage to human consciousness is enough to decide about life termination (Glannon 2011, 165–173).

Undoubtedly, the human brain has its own plasticity and neuronal connections that are in fact responsible for the reactions which assess the usefulness of the subject known by senses. Thomas Aquinas was also convinced of this but nonetheless believed that although the brain is located in the skull it is not equivalent to the mind even though it is a necessary basis of it. The brain is placed within the person who experiences various influences, that are incompatible or consistent with nature. In this situation, man does not lose his human dignity.

It appears that the teaching of Thomas Aquinas on virtues may, to a certain extent, answer the question concerning disorders which originate from the appetitive and sense powers that prevent or impede the creation of moral faculty. Frequently, bodily injuries cannot be eliminated, nevertheless psychological obstacles which block moral virtues on the emotional level can be unblocked although they may be a proverbial “thorn in the flesh” which enslaves man throughout his entire life.

Thomas Aquinas was neither a physician nor a psychiatrist but against the background of his teaching on virtues, especially the virtue of temperance and fortitude (those which interact with *appetitus irascibilis* – irascible appetite and *appetitus concupiscibilis* – concupiscible appetite) he presents a certain mechanism of their formation or resistance in their shaping which may serve as a foundation for a possible discussion on modern neurobiology. A natural environment for the development of those virtues is the environment of cognitive as well as appetitive powers, the human free will and human emotions. For Thomas, man is a psycho-somatic unity and thus human moral abilities are formulated on a psycho-physical and cognitive-appetitive reaction where internal senses of cognitive powers (the sense which accumulates the sensations of external senses, memory, imagination and judgment about utility using senses, *vis cogitativa* in a man) as well as the mental sphere of reason and will, irascible passions (hope-despair; courage-fear, anger) and concupiscible passions (love-hate, desire-avoidance, joy-sorrow) play an important role. It can be clearly stated

that according to Aquinas, the inception of moral virtues also depends on the physiological characteristics of the individual.

In his exhortation *Evangelii Gaudium* Pope Francis, by relying on Thomas' teaching on virtues mentions the erroneous process of intimistic growth and the "art of accompaniment" of suffering people.

In no 171, Pope Francis writes that the main issue in communication with another person is the openness of heart which makes closeness possible because without it genuine spiritual encounter does not exist. Listening helps us to find the right gesture and word which shows that we are more than simply bystanders. Only through such respectful and compassionate listening we can enter the paths of true growth and awaken a yearning for the Christian ideal: the desire to fully respond to God's love and to bring to fruition what he has sown in our lives. But this always demands the patience of one who knows very well what Saint Thomas Aquinas was teaching: 'that a person can have both grace and charity, but yet falter in the exercise of virtues because of persistent «contrary inclinations»' (*S. Th.*, I–II, q. 65, a. 3, ad 2: *propter aliquas dispositiones contrarias*). In other words, even though forms of conditioning may hinder the operations of those virtuous habits the organic unity of virtues always and necessarily exists *in habitu*. Hence the need for "a pedagogy which will introduce people step by step to the full appropriation of the mystery" (John Paul II 1999, 20). In order to reach a level of maturity where individuals can make truly free and responsible decisions time and patience is indispensable". At the end of this paragraph on the process of growth and the art of accompaniment Pope Francis adds: "This is clearly distinct from every kind of intrusive (intimistic) accompaniment or isolated self-realization" (Francis 2013, 173).

Pope Francis suggests the teaching of Thomas Aquinas on virtues for accompanying people in their numerous afflictions, distinguishing it from an intrusive (*intimistic*) accompaniment, which according to him is wrong. It is possible that we will learn more on this issue during the synod which will take place in 2017 and will be devoted to personal accompaniment in processes of growth.

Thomas Aquinas was convinced that certain disorders may occur in grasping practical truth and instead of moral faculty, undesired habits might appear. Thus, the understanding of the process of habituation gives the opportunity to overcome and uproot undesired behaviour (Roszak 2014, 110).

Some habits might be permanently inscribed in us creating a certain fixed “path” in our mental space, whereas in the brain fixed neuronal connections might become simple habits absolutely contrary to the intentions of virtue. It is easy to identify such a habit with our own *habitus*, a virtue as a moral faculty. However, we are dealing here with an intimistic process which Pope Francis mentions. The term intimism<sup>5</sup> derives from a French word *journal intime* which might be referred to as an “intimate journal”. Hence, in literature we speak of intimism. In English, *journal intime* denotes a diary and therefore there are two parallel terms, namely intimistics and diaristics. Some theologians and spiritual directors suggest that writing a journal as a spiritual training encourages self-discipline and develops moral awareness. This practice originated from a conviction that writing in a journal daily awakens a sensitivity of the Christian’s conscience, serves the development of self-control, and good examination of conscience and confession. In the context of neuronal record intimistics appears to be a specific singular record in the brain and in using Aquinas’ language the sensitive power of apprehension. It is no longer an external description of personal and private life registered in the form of a journal, notes or notebooks but an internal result of actions and personal decisions as well as external influences creating fixed neuronal connections by encompassing many regions of the brain. The ones that are mainly located in the brain areas are responsible for sense reactions and assess the usefulness of the known subject qualifying it as pleasant or unpleasant. Habitual disorders most often lead to distortions of sensory movements which may impede the growth of a virtue. Senses on the other hand, instead of supporting a moral disposition become an blocking obstacle (Giertych 2015, 56–61).

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<sup>5</sup> Intimism describes something related to intimacy, privacy, especially the depiction of quiet domestic scenes in literature or art.

According to Thomas, when reason grasps directly practical truth, it does not act on a purely rational logic but is linked with the *vis aestimativa* (a form of judging whether some particular thing when perceived is beneficial or not – estimative power), in man called the *vis cogitativa* (the cogitative power) or *ratio particularis* (particular reason). This estimative power is based on senses and possesses its own physiological place in the brain. It might appear that it is a spiritual power of reason as it instinctively correlates reasons relying on the *sensus communis* whereas together with memory (*memoria*) and imagination (*imaginatio*), namely the remaining internal senses,<sup>6</sup> identifies the meaning of the thing that is known through the senses. Depending on the quality of the *vis aestimativa* and its agreement with the fundamental purpose of nature it encourages the formation of a virtue or of a simple habit. The neural habit in the brain may become irreducible practical knowledge, which Thomas calls *industria*. The fully prudent perception of our reason which cooperates with the human will and is supported by the sphere of human emotions becomes reduced to particular reason. The role of the human intellect with its intellectual knowledge inscribed in the sphere of freedom (the will) which can testify of the dignity of virtue becomes somehow “slimmed down” and reduced to the level of “natural prudence”. We are here dealing with a habit and not a virtue where a person is “skillful” and possesses “mental acuity” through which he might be praised, even if he is not morally good. Only virtue and not the habit brings out moral goodness in man. “Slimmed down” prudence may become a leading norm of conduct and that type of prudence, although

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<sup>6</sup> It must be remembered that according to Thomas, mental cognition is not given in the form of notions, judgments or inborn reasoning. Man must work it out and discover what constitutes the essence of mental understanding. This is an Aristotelian orientation where cognition depends on senses. The outer senses are touch (*tactus*), taste (*gustus*), smell (*olfactus*), hearing (*auditus*) and sight (*visus*), whereas the inner senses are common sense (*sensus proprius/communis*), passive and active memory (*memoria passiva et activa*), imagination, (*imaginatio*), phantasy (*phantasia*), sensitive power of estimation, which in man due to intellectual knowledge and the influence on senses is called *vis cogitativa* and particular reason (*ratio particularis*). The powers of the sensitive appetite are passions (*passiones*) of the irascible (*irascibilitas*) and concupiscible (*concupiscibilitas*) sphere.

it is difficult to apply this term here, is presented in Aquinas' reflections in his *Commentary on the Nicomachean Ethics*.

In Thomas' thought we can encounter a certain area of "mental acuity" ("diligence") called *industria* which has to do with what is practical, experimental, physiological and psychological, namely what is possible to be known directly and experimentally. It may acquire the shape of a "slimmed down prudence", and appears as inner "shrewdness", just as a stream of water finds the most convenient and pleasant current flow.

In his *Commentary on the Nicomachean Ethics* Thomas says: "there exists a certain potency (*potentia*), namely an operative principle (*operativum principium*), called *deinotes*, a certain form of agility or acuity (*quasi ingeniositatem quamdam sive industria*), that possesses the quality thanks to which man may do acts that are subordinated to a chosen intention (*per eam homo possit operari ea quae ordinantur ad intentionem quam homo praesupponit*) whether it will be good or bad, so that he can achieve the aim through the things he does. If the intention is good, *deinotes* is praiseworthy but if it is bad, it is called shrewdness *vocatur astutia* which has a negative connotation, in the same way as prudence has a positive connotation. As *deinotes* is common for both of them, thus we call people that are both prudent and shrewd (*tam prudentes quam astutos*) *deinoi*, that is ingenuous and diligent (*id est ingeniosos sive industrios*).

Thomas does not reprove human *industria*, on the contrary, he demonstrates that this diligence or mental acuity can be used in a positive way. In his *Commentary on the Sentences of Peter Lombard* he observes that it might constitute a certain foundation of prudence.

In *Scriptum super Sententiis* he writes: "Man has a certain innate inclination towards a prudent act (*inclinatio quaedam naturalis ad actum prudentiae*), described as a natural virtue (*quae virtus naturalis dicitur*), called by the Philosopher *dinotica* [*deinotes*], which may be defined as wise effort (*quam nos industriam dicere possumus*); it can be directed towards the good or bad and is therefore not a virtue; a virtue is such a disposition which inclines and allows man to fulfill a task in a good and proper manner. Thus, if this inclination should lead to its constantly correct judgement, it is necessary

to connect it with something that excludes every kind of error (Super Sent., lib. 3, d. 36, q. 1, a. 1c).

It is clear that *industria* is neither prudence, nor a virtue of practical wisdom as it is not anchored in the full dynamism of human rationality nor free will where moral virtues are “formed”.

It is confirmed in Thomas’ *Commentary on the Nicomachean Ethics* where he says that “prudence is not the ability...” (the words of Aristotle from his *Ethics* 1144a28). He shows this by demonstrating that prudence is not fully the same as abovementioned *deinotes*, although it cannot exist without it. However, in the soul such an eye [*visus*], namely the cognitive principle which is *deinotes*, does not acquire characteristic features typical for prudence without the usage of a moral virtue, which always inclines towards the good.

The *industria* cooperates in a natural way with man who is submerged in virtue, that is, has the principles of good inscribed in him in order to focus on the good. A good and virtuous man is given the possibility of doing things with an impulse to progress further with joy towards the good and determined aim. A man who relies on habits uses his skilfulness and mental acuity without orientation towards an adequate aim. Instead of *finis* there is *terminus*. This becomes a reason for dishonesty even towards oneself because it contradicts further cognition in facing the ultimate goal. In such a case, man uses his natural faculties, like sharpened ingenuity, sensitivity to time, colours, quick understanding of the sequences of events, mental acuity in technical solutions, etc not for the ultimate good but for an empty glory (*inanis gloria*) of the present moment.

Thomas knew well that errors in *vis cogitativa* that may occur through habits of sense reactions inscribed in the plasticity of bodily reactions (today we may say inscribed in the localized organ responsible for making moral decisions which W. Glannon defines as *ventromedial prefrontal cortex*) contradict a full rational judgment. In the *Summa* I–II, q.31, a.7 Thomas asks about unnatural pleasures (*delectatio innaturalia*), such as some improper sexual acts but also in eating soil, coals or finding pleasure in cannibalism. To this he answers that it happens due to reason (*quantum ad rationem*) or



due to actions of the body (*quantum ad corporalis conservationem*). Such corruption sometimes originates directly from the body where illness is the reason for it and therefore what seemed to be sweet turns out to be bitter and vice versa. Or it may originate from the soul as a result of not being in unity with what is part of the body: *propter malam complexionem*. Such an error creates on a bad habit its own new *quasi-habitus*. An old habit, deeply rooted in the psyche may appear as “connatural” with the human being as its purpose although in reality it is contrary to it. The correction of such an error is almost impossible if *vis cogitativa* together with practical reason incorrectly understand the subject of pleasure and when the entire collection of human emotions creates a safety barrier of this habitual error. A wrong disposition of unity in habits when referring to a mutual action of body and soul on the level of brain functioning can turn a permanent principle of moral conduct into an error of sense habit. Thomas clearly states that “in man it is of importance to consider both reason as well as natural temperament of the body” (*S. Th.*, I–II, q. 46, a. 5, ad 1). Because of his nature man possesses a certain balance of the body and due to it no powers of the soul have an excessive domination over others. It is different with animals, because they are not free but determined and do not act in accordance with virtues only according to their habits.

Only virtue as a moral faculty indicates that the unity of soul and body is balanced (*complexio*). It also signifies that only virtue has this good disposition of unity between body and soul from which qualitative acts originate, corresponding to human nature. Virtue is well-disposed to *res* which is the human nature, consisting of both soul and body. Thus, virtue as a quality possesses a concrete and proper category of references to the soul and body, called by Aristotle “position” *situs*. A virtuous man acts in accordance with adequate dynamism of reason, will, senses and his own body. Virtue appears when there is a unity of action. Moral virtue acts in a similar way to nature in the duality of soul and body harmonizing their mutual connectivity, subjecting it to the assessment of the intellect, in accordance with the decision of will (*cum assensione cogitare*). The habituation for a virtue and a habit is different.

Virtue is a certain natural disposition (*ex quadam naturali dispositione*), that is different when the habituation to act originates from something “only acquired by habituation” (*per consuetudinem acquisita*) (*S. Th.*, II–II, q. 141, a 1).

In the *Summa Theologiae*, I–II, q, 56, a. 5 Thomas clearly states that “if there are any powers in the sensory cognitive faculties, they cannot be named virtues, for virtue is a perfect habit, through which only good is done and therefore only mental power which performs the good act can be its subject. Thus getting to know the truth does not take place in the sensory cognitive faculties, for such powers prepare the way only for intellectual knowledge. And therefore a virtue may be found in the mind or in reason but not in sensory powers. Thus, *vis cogitativa* cannot create virtue by itself although it may seem to be *quasi-habitus* (Giertych 2015, 57).

According to Aquinas moral faculty is a certain “condensed experience” which allows to take the right decision in accordance with the inner dynamism of reason and will. Unfortunately, it is often confused with habit which is no more than a certain unconscious action. Moral faculty always retains the freshness of action although certain habitual elements can be found even here. Some people even talk about the “paradox of non-determining habit”. In virtue, “despite a certain learned action, intellect and some element of a conscious choice is preserved” (Zalewski 2013, 129). Jacek Woroniecki OP in discussing the difference between faculty and habit observes that in the formation of habit “the mental factor is reduced to the minimum” (Woroniecki 2008, 133), and where this faculty is complete, namely in a formal virtue, it is rooted in the full dynamism of the intellect. The mental factor seems to be the decisive one which is not equated only with the brain although it is a necessary basis for human intellectual actions. Reason is rooted in the personal nature of man, while virtue supports integration, not exclusion (Huzarek 2017, 237–250).

In answering the question to which is more important: the soul or the brain, we take the side of both the brain and the soul. Both of them with all their powers play an important role in the structure of developing truly human virtues (Horvat 2017, 127–153).

The stance of St. Thomas Aquinas in seeing the danger between the formation of the ethics of habits and morality based on the principles of neurobiology is very clear. It is the reduction of the mental level to the level of senses, where initially there is a weak differentiation between these two levels, their rights and their development. The action of reason and will is limited to lower levels of cognitive and appetitive acts, to *cognitio sensibilis* and *appetitus sensibilis*, instead of *cognitio intellectualis* and *appetitus intellectualis*. Aquinas does not contradict any of them and does not reduce any of these two levels (Woroniecki 1961, 36–42). In analysing the suggestions of I. Kant it can be observed that the protection against mechanization and the ethics of habit leads to the conviction that the teaching about virtue should be limited to the teaching of noble intellectual ideals, without the temptation of letting faculties penetrate the soul mainly by reaching the levels of sensual desires. It may be said that Kant follows Cartesian spiritualism, without seeing a strict, organic and substantive link between soul and body where the entire psychology is limited to one sphere of rationality (Damasio 2011, 272–276). It may as well be the other way around where reduction will take the form of materialistic and sensitive mechanicism e.g. in S. Freud. Habits calm down the movements of drives, keeping them within limits, not allowing them to incline to their subject. In this case, when the movement of sense is interpreted as negative another sense which attempts to “extinguish” the undesired one is instinctively activated. Such an action roots itself in neurotic habits which may result in neuroses and other disorders of sensitive reactions. Sometimes when bodily injuries no longer are to be eliminated, nevertheless psychological barriers of neurotic habits on the level of senses that are susceptible to be unblocked, may be a proverbial “thorn in the flesh” which enslaves man for his entire life. For this reason, Anna A. Terruwe and Conrad W. Baars, Dutch psychiatrists with many years of therapeutic practice, successfully apply Thomistic speculative psychology (Terruwe 1981). They describe the causes, effects and types of treatment of the emotional deprivation disorder, which is an illness discovered by them (Giertych 2006, 228–260).

The solution to the discussed difficulties which appear on the basis of the development of a habit or virtue is the ability to recognize and put into effect a full facilitation of both cognitive and appetitive functions. The thought of Thomas seems to offer a balanced view of the soul and the body and at the same time of the soul and the brain. On one hand, the differences and competences of both are emphasized while on the other hand, a strict, organic and substantial link between those two centres is stressed which allows to discover the richness of spiritual, sensitive, sensory and bodily functions. As it is impossible to act spiritually without the help of bodily organs, it is impossible to build moral virtues without a fully spiritual structure (Milcarek 1994, 153–200). It is therefore necessary to reject both a radically materialistic approach and a radically spiritualistic thinking. By receiving certain habitual functions the virtue shortens the process of thinking; however, it is not a habit, in the same way as a habit is not a virtue (Głowala, 135–207). Nevertheless, in every virtue we discover two principal functions of the spirit: reason and will as well as accompanying sensitive-appetitive factors. The potentiality of the entire soul in its spiritual and bodily sphere is the most striking feature of moral faculties.

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