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Mechanical Models of Habits and Aesthetic Perception in Descartes and Gassendi

GIULIANO GASPARRI

Università degli Studi di Urbino “Carlo Bo”
giuliano.gasparri@uniurb.it

Abstract. The early modern age saw an increasing use of mechanical models in order to explain sense perception, imagination, emotions, memory, and habit. René Descartes and Pierre Gassendi tried to innovate music theory in the light of such models. Thus, the bodily mechanism of habits accounts for the skill in playing music, singing, and dancing, but also – to a certain extent – for the perception of beauty and the shaping of taste.

Keywords. History of aesthetics, Habits in aesthetic perception, Early modern philosophy, Descartes, Gassendi

1. Introduction

Within the studies on the history – or rather *pre-history* – of aesthetics, there is a growing interest in René Descartes’ thought. Although Descartes did not develop a comprehensive theory of beauty and art, and although aesthetics does not feature in his classification of philosophical sciences (what he calls the “tree of philosophy”), in some passages of his early *Compendium Musicae* of 1618 and his 1630 correspondence with father Marin Mersenne, also on music theory, we find opinions

which seem to point to the idea of the subjectivity of aesthetic judgement that will come into the foreground in eighteenth-century theories of beauty¹.

The recognition of this subjectivity crops up in the context of the physiological study of the bodily basis of sense perception, emotions, and behavior according to mechanical models – a context in which a new conception of habit plays an important role.

This paper will touch on the following points: it will briefly introduce what we may call the physical turn in the study of habits which takes place in early seventeenth century, and see how Descartes applies a mechanized theory to artistic creativity and taste. Secondly, Descartes' ideas will be compared with those of one of the most important philosophers of his time, Pierre Gassendi, who also had a physical, mechanistic approach to the study of sense perception and emotions, but contrary to Descartes did not come to recognize the relativity of aesthetic judgement. Lastly, it will give a philosophical explanation of the reasons why the so-called “rationalist” Descartes, even though within given limits, was able to acknowledge such a relativity, whereas the so-called “empiricist” Gassendi, together with the great majority of their contemporaries, was not.

2. *Descartes*

Descartes' early theory of music takes shape at the time of his friendship with Isaac Beeckman, the Dutch atomist scientist to whom Descartes offered his 1618 *Compendium Musicae*. Like Beeckman, Descartes had begun to treat sound and musical consonances from a physical point of view, performing experiments and measurements on the frequency of vibrations (“*secousses*”, “jolts”) transmitted by the air from an instrument string to the ears. These studies were innovative compared to the merely mathematical approach of the Pythagorean tradition in music theory. At the same time, Descartes started to think of the perception of beauty, or agreeability of music, as something irreducible to the objective features of sound, or composition (that is, the object of aesthetic perception), but rather something dependent on the varying bodily structure and personal history of the listening subject. In the *Compendium Musicae*, on one hand, Descartes still has the traditional conception of beauty in mind, focusing on the harmonic characteristics inherent to the work of art², and he tries to find rules to help composers write their music. But at the same time, he proves to be aware that the objective features of a work of art do not suffice to explain why we take more or less pleasure in it.

The virtues of consonances in bringing about our emotions, Descartes writes, «are so various, and rely on such intangible circumstances, that a whole volume would not be enough to treat them thoroughly» (Descartes [1964-1976]: X, 111).

Coming back to the same issue in his 1630 correspondence with Mersenne, the philosopher openly states that it is practically impossible to determine the principle which makes a piece of music – or any other object – “beautiful”.

Some scholars see the subjective turn marked by Descartes’ aesthetic thought as a consequence of the general tendency of modern philosophical enquiry to shift from the object of knowledge to the subject of knowing. While this is certainly true, Descartes’ views on this specific topic depend, in particular, on his physical, material and mechanical approach to the study of sense perception, an approach based upon atomistic premisses. In the same period when they were studying the physics of sound and music, Descartes’ friend Beeckman developed mechanical explanations of the perception of flavours. He derived from Lucretius the idea that we find food more or less tasteful according to the degree by which the shape of food particles conforms to the shape of the pores of our tongue and palate. This conformity (“*convenientia*”) is compared to that of a key to its lock³.

Another important idea that Beeckman drives from ancient atomism (and particularly from book 2 of Lucretius’ *De rerum natura*) is the idea that sensibility can arise from non-sensitive things. Therefore, although being extremely subtle and complicated, at least theoretically, sensibility can be studied in physical terms, without taking into account any immaterial mind. The advantage of this approach is that physio-mechanical processes can be represented by human imagination as analogous to sensitive and measurable macrophenomena that we encounter in our common experience. In contrast to ancient atomists, of course, Descartes believes that human beings hold an immaterial soul, but he is aware that mechanical models bear a higher explicative power than abstract speculation on the spiritual substance, so he follows this research path together with his empiricist colleagues. He is thus led to deduce the subjectivity of aesthetic perception from the different features of the physical perceiving subjects, and not from the metaphysical *ego*.

From these observations Descartes derives the conclusion that perfection (for instance in the case of a perfect consonance, i.e. the most simple, or sweet) does not necessarily coincide with beauty, given that even a dissonance can sound more agreeable than a consonance, depending on its position in the whole of the composition. He therefore does not establish a correspondence between given sound consonances and given emotions of the soul. Descartes develops these ideas in his 1630 letters to Mersenne, comparing musical pleasure to the experience of finding food more or less tasteful, or something more or less beautiful to our sight (Descartes [1964-1976]: I, 108, 126).

In the letter dated 18 March 1630, Descartes writes:

You ask whether one can discover the essence of beauty [...] But in general “beautiful” and “pleasant” signify simply a relation between our judgement and an object; and be-

cause the judgements of men differ so much from each other, neither beauty nor pleasantness can be said to have any definite measure [...].

To explain what I meant [in my treatise on music] by «easy or difficult to perceive by the senses» I instanced the divisions of a flower bed. If there are only one or two types of shape arranged in the same pattern, they will be taken in more easily than if there are ten or twelve arranged in different ways. But this does not mean that one design can be called absolutely more beautiful than another; to some people's fancy one with three shapes will be the most beautiful, to others it will be one with four or five and so on. The one that pleases most people can be called the most beautiful without qualification; but which this is cannot be determined. (Descartes [1984-1991]: III, 19-20)

These views are compatible with the detailed psychology of perception and emotions that Descartes will expound in his final work, the *Passions of the Soul* (1649), devoted to the interaction between mind and body. In fact, the pleasure we feel when looking at something we find beautiful, or when listening to music, is a “passion of the soul”, that Descartes calls “*agrément*”. It arises in connection with some movements of the “animal spirits” (subtle particles of matter) from the sense organs, through the nerves, into the pineal gland at the base of the brain. Beauty, thus, pertains to the domain of the union of body and soul: it implies not only a judgement of the mind, but also an impression in the brain, and that is why, contrary to intellectual truth, it cannot be precisely determined in rational terms.

In the same letter to Mersenne, Descartes mentions the influence of memory of past experiences on the emotions evoked in the subject by music:

Secondly, what makes some people want to dance may make others want to cry. This is because it evokes ideas in our memory: for instance, those who have in the past enjoyed dancing to a certain tune feel a fresh wish to dance the moment they hear a similar one; on the other hand, if someone had never heard a galliard without some affliction befalling him, he would certainly grow sad when he heard it again. This is so certain that I reckon that if you whipped a dog five or six times to the sound of a violin, it would begin to howl and run away as soon as it heard that music again. (Descartes [1984-1991]: III, 20)

The comparison with the dog at the end of this passage makes it clear that Descartes is talking about the effects of a bodily mechanism (since he holds that animals do not have a rational soul), that is, a sort of bodily memory, which acts on an unconscious level. He mentions an analogous mechanism relating to sight in a letter to Hector-Pierre Chanut from 1647, where he recalls his inclination to like cross-eyed persons, due to the fact that he had once been in love with a young girl who had a similar defect, thus the impression caused by the sight of a cross-eyed person was connected in his brain to the impression which gave rise to the emotion of love in his soul (Descartes [1964-1976]: II, 56-58).

Generally speaking, the mechanical approach in the study of sense perception goes along with an analogous approach in the study of the bodily basis of

memory and habits. Scholastic tradition conceived habits as qualities or dispositions inherent to the soul, or superposed to the soul and endowed with their own reality. During the first half of the seventeenth century, especially within the current of empiricism, even intellectual or spiritual habits begin to be thought of as effects exerted upon the activity of understanding and will by the very same brain mechanics that produces bodily habits, in human beings as well as in animals. We acquire both bodily habits and spiritual habits by virtue of repeated acts, which produce the impression and disposition of given traces, or folds, in the brain. According to Gassendi, for instance, habits are determined by “phantasms”, that is, nothing but configurations impressed in brain matter. They do not pertain to understanding, a power of an immaterial substance lacking the rigidity, which is necessary to the impression of “phantasms”. Even the fact that we are quicker or slower in understanding something does not depend on mind, but on the disposition of our organs (meaning a certain relation among bodily parts; whereas mind has no parts).

According to Descartes, habits depend either on body, or soul and body together. In fact, contrary to what a stereotypical image of Cartesian dualism might suggest, Descartes is well aware that human soul depends on body for most of its functions. When we act according to a habit and at the same time by will, this means that our will is following an inclination (similar to a natural inclination), which is caused by a given emotion, thus by a given movement of animal spirits, in turn dependent on the complexion of the body and the disposition of the brain. Experience can cause the association between certain movements of the body and certain thoughts, so that animal spirits are almost automatically determined to flow through the same pores and nerves through which they had previously flown, thus causing a seeming reaction, or action. Nevertheless, given that Descartes radically distinguishes soul from body, and conceives soul as a simple substance, then the functioning of intellectual habits cannot be explained by any comparison to material things (the same problem arises with memory). This is the reason why some of the so-called *petits cartésiens* – the numerous minor philosophers who followed Descartes’ teaching – shifted the focus onto the physical ground, going as far as to identify habits with brain mechanics itself (as Gassendi and his followers did). So for example Pierre-Sylvain Régis, whom we might describe as a Cartesian empiricist, claims that memory, bodily habits, and spiritual habits all depend on the same principle, the only difference being that bodily habits (for instance the aptitude for singing, or dancing) depend mainly on the easiness by which animal spirits flow through outer parts of the body in order to move them, whereas spiritual habits (for instance the aptitude for studying, or meditating) depend on the easiness by which the spirits go through little paths which took shape in white matter of the brain in order to move from one trace to another. Therefore, it is wrong to think that spiritual habits are called “spiritual”

because they do not depend on body (something impossible as long as soul and body are joined): they just depend on it in a more subtle, and less sensitive manner (Régis [1691]: 331-332).

Descartes applies the notion of habit to an extremely wide range of phenomena. Habits influence perception, and the whole of human behaviours, including the interplay of emotions and moral virtue, of both thought and action. Indeed, Descartes does not depart from the Aristotelian tradition in that he holds that virtue is nothing but habit. As for artistic practice, it should be noted that arts differ from sciences, first of all, precisely because sciences «consist solely in mind knowledge», whereas arts «demand some exercise, and some *habitus* of the body» (Descartes [1964-1976]: 10, 359), where “*habitus*” means the disposition, acquired through habit, to accomplish a certain kind of actions (the Aristotelian “*hexis*”). Even poetical skills depend on bodily mechanisms: in a 1649 letter to Descartes, princess Elizabeth of Bohemia asks the philosopher the reason why she felt the impulse to write verses while she was ill, and he answers that this is the result of a strong excitation of animal spirits, which would entirely disturb the imagination of those who have a tender brain, whereas it warms up the imagination of those who have a firm brain, and inclines them to think (Descartes [1964-1976]: V, 281). Władysław Tatarkiewicz observed that this physiological explanation of poetical gift is quite far from the classic aesthetics of Descartes’ times, as it demands no theoretical knowledge of the rules of the art of poetry (Tatarkiewicz [1968]: 31).

As mentioned before, notwithstanding these original remarks on the subjectivity of pleasure feeling, and on the relativity of the judgement based thereupon, Descartes did not develop an aesthetics in the sense of the empiricist theories of taste of the eighteenth century. Why? He probably had no interest in doing so, precisely because, contrary to the domains of physics and metaphysics, the domain of arts did not offer any clear and distinct truth, but only pleasure, something which would hold a secondary rank in the life of a philosopher, compared to what he considered proper wisdom.

3. *Gassendi*

Now let us move to the views of Descartes’ contemporary Pierre Gassendi on the same matter.

Like Descartes, Gassendi wrote a treatise on music theory (*Manuductio ad theoriam musicae*, 1636), where he treats sound and music from a mathematical and physical point of view. Other interesting remarks on musical pleasure, taste, and beauty in general can be found in Gassendi’s *Animadversiones* of 1649, where he discusses Epicurean philosophy, and in the *Syntagma philosophicum*,

which is the *summa* of his own philosophy and physics, published in 1658, three years after his death.

In the *Animadversiones*, Gassendi follows Epicurus and Lucretius in explaining why the same sound could be experienced as more or less sweet by different persons, or by the same person at different times, on the basis of a mechanics similar to the one we have mentioned above about the perception of flavours that Isaac Beeckman endorsed likewise:

According to Epicurus, the corpuscles which reach the ear, and affect the organ, are arranged in a particular configuration, and (as it will be said about odors, flavours, and the like)⁴ any sweetness, or harshness of sound results from nothing but the fact that the corpuscles reaching the organ shape and agitate it according to the mode of smoothness, or roughness of their configuration. (Gassendi [1649]: I, 276; my transl.)

In the *Syntagma philosophicum*, Gassendi explains that beauty (“*pulchritudo*”) is what pleases us in an object, and makes us love it. Sense perception depends on the individual bodily constitution, so what one feels as agreeable can be felt as unpleasant by another. This is also evident if we think of the fact that we like different things in different times of our lives, or depending on our health conditions. This diversity, Gassendi says, is due to the habit (“*assuetudo*”) of the sense organs, consisting in the arrangement of their corpuscular texture. In the case of the sense of taste, for instance, it is the shape of the pores of taste organs that changes through time, and makes us enjoy flavours that we did not like before. It is more difficult to explain how pleasures of the mind work, Gassendi admits, because mind is an incorporeal substance. But in our earthly life, mind is embodied, and acts always together with phantasy (that is, brain matter) as if they were a unique principle of action, so that if a species (a “phantasm”, that is an image physically impressed in our brain) is unsuitable for our phantasy, it is also unsuitable for our mind (Gassendi [1658]: II, 488).

All this seems to go in the same direction of Descartes’. But the picture is actually quite different. Contrary to Descartes, Gassendi follows the ancient Greek tradition by holding that beautiful and good are synonyms. Beauty has its own *ratio*, which lies in the symmetry and proportionate measures of the object. These features are best discerned by the senses of sight and hearing. We then transpose them to the objects of our mind – which is like the eye of our soul – and call beautiful such immaterial things as God, the angels, truth, honesty, and so on (Gassendi [1658]: II, 487-488).

Also on the conception of habits, Gassendi seems close to Descartes, but only up to a certain point. According to Gassendi, everyone judges the beauty (or “grace”: in Latin “*decus*”) of something on the basis of their own feeling. Like Descartes, he mentions the fact that even defects, like moles, can please us when they belong to a person we love. This is due to the fact that the habit of receiving

the image of the mole together with the strongly attractive image of the beloved person exerts an influence on the disposition and texture of phantasy, so that the image of the mole will afterwards please us in itself (Gassendi [1658]: II, 491). He gives a similar explanation for the mechanism of habit in the cases of food taste and musical taste (Gassendi [1658]: II, 358 and 365).

Discussing the example of the mole on a person's skin in another passage of the *Syntagma*, Gassendi remarks that although it is true that habit can make us love the mole, when habit is associated with a more perfect conformation our pleasure is certainly greater:

Just as different things please different beings, and everybody judges of the grace of something according to his own disposition, in the same way, generally speaking, it can be said that a form looks beautiful when it lacks nothing in terms of integrity, and conformation. Because when somebody is delighted by a mole, or crooked limbs, this is an effect of habit; but take the same habit together with a more perfect conformation, and the delight will be undoubtedly greater. (Gassendi [1658]: I, 301, my transl.)

This means that in Gassendi's opinion, contrary to Descartes', beauty is still quantifiable in terms of greater or smaller perfection of the object, and perfection is something that goes beyond the subjectivity of individual perception, or judgement.

Indeed, in Gassendi's natural philosophy, the word "beautiful" is often attributed to the world. The beauty of the world is seen as evidence that it has been designed by divine wisdom, against Epicure, who claimed that it resulted from the fortuitous encounter of atoms (Gassendi [1658]: II, 287). In other words, Gassendi still sticks to a traditional Pythagorean, Platonic, and scholastic framework, insofar as his idea of beauty is connected to the idea of the harmony of the cosmological order – which, being a work of God, is not only "beautiful", but also "good".

From this point of view, when habit makes us perceive moles on a beloved person's skin as pleasant, it acts as a disturbance of perception. Gassendi mentions the negative role of habit also when dealing with the issue of vegetarianism. He thinks that human body is naturally formed in order to eat vegetables: the shape of our teeth is similar to that of herbivorous animals, and children spontaneously prefer eating fruits rather than meat. It is only by a perverse habit that this natural inclination has been altered (Gassendi [1658]: I, 301-302). While Descartes holds that habits are natural instruments that can play a positive role (not only in the perception of an artistic object, but also in morals), Gassendi opposes nature to habits, and gives the latter the same negative connotations that we find in a wide tradition dating back to Saint Paul, and Saint Augustine. A similarly negative conception of the influence of habits can still be found in eighteenth-century aesthetics, for instance in the entry "Goût" of Jean-Jacques Rousseau's *Dictionnaire de musique* (1768), where the Genevan philosopher does recognize that

perception of beauty is a matter of subjective sentiment, but at the same time sees habits as a source of prejudices which often disturb the good judgement of taste, and «change the order of natural beauties» (Rousseau [1768]: 843)⁵.

3. Conclusions

Let us now try to answer our initial question: why did the idea that beauty could be a merely subjective matter crop up in Descartes' mind, while it did not find a way into Gassendi's?

In Gassendi's view there is an aesthetic pleasure that depends on individual taste, and has a sensitive origin. This varies from one person to another according to the structure of sense organs, the mechanics of imagination, emotions, and habits. But there is also an objective beauty, which pertains to symmetry and proportion in the object of our perception, akin to the symmetry and proportion of the world, which in turn reflects and recalls the divinity of the Creator. It is the same beauty that a scientist often encounters observing with wonder and admiration the skies during his astronomical studies, or while trying to unveil the complicated secrets hidden in the innermost recesses of nature, where the tiniest beings reveal their place within the perfect design of God's ends. Gassendi just cannot question this absolute beauty, since it presents a crucial proof of the existence of God. This does not mean, of course, we should pretend that we can know exactly God's reasons, nor that a human sense of beauty coincides with God's, just as an animal's sense of beauty does not coincide with ours (a bull, for instance, would find any cow more beautiful than Helen of Troy). Nevertheless, according to Gassendi, there exists "some sort of harmony" ("*harmonia quadam*") among the parts of the world, and the best findings of human science, like Kepler's astronomical laws, still bear a "shadow of analogy" ("*umbra quadam analogiae*") with regard to the work of God⁶.

In Descartes' view, on the contrary, there is nothing divine in aesthetics. He also studies nature to find out the laws that make up the order of the world, but he never says that this order, nor the world itself, is "beautiful". He sometimes says that the world is immense, and in this sense it hints at the infinity of God, but this is just to remind us that we will never be able to reach an adequate knowledge of the infinite Creator, nor can we understand what he had in mind when he created this world. So there is no way, according to Descartes, from the beauty of the world to God, just as there is no way, generally speaking, from the world to God. In fact, Descartes' three demonstrations of the existence of God all take place at the metaphysical level of the thinking substance, while he disregards the traditional, more widely accepted arguments used to prove the existence of God from the existence, order, and finality of the world. As Descartes wrote to

father Mersenne in three celebrated letters of the spring of 1630 – a few weeks after the letters on music theory we have quoted above –, God has not created the world according to a pre-existing rational order, i.e. according to a set of “eternal truths” equally intelligible to God and human minds. Rather, he created the world *and* its order arbitrarily, out of his free will: theoretically, being omnipotent, he could have made a completely different world, in which different physical, logico-mathematical, or moral truths would hold (he could have made that two and two made five, or that what has happened in the past had not happened, or even that the love towards God was a sin). God could even change the actual order at any time, even though we do not understand how this might be possible (Descartes [1964-1976]: I, 145-146). The order of the world is contingent upon God’s will, and this makes it impossible to read in the book of nature anything about God’s reason and ends.

This does not mean that the world was made with no reason, nor that there are no ends in nature; it just means that we cannot understand them, because the arbitrary acting of God goes beyond human teleological parameters. A true philosopher has thus to renounce final causes in the study of nature, and stick to efficient causes, i.e. the kind of causes that operate according to a mechanical model, and are fully comprehensible to our understanding⁷. Yet efficient causes do not tell us anything about God (who acts as an “eminent” cause, meaning that he causes, and is caused by himself, in a radically different manner in comparison with created causes). No analogy can be drawn between the way God reasons and acts, on one side, and on another side the way creatures, including human beings, act⁸.

According to Descartes, we must indeed admit that the universe as a whole, being God’s work, is perfect, inasmuch as it needs perfectly correspond with God’s design; but we cannot know the universe as a whole, because it is immense (Descartes [1964-1976]: 7, 55-56). And we cannot say in which manner the perfection of the universe relates to God’s. Thus no proportion is possible between God’s perfection and the perfection of the universe, nor between the perfection of the universe as a whole, and that of a single part of it. This entails not only that we can say that no object in the world is perfect, but also that we cannot say, of any object in the world, if it is more or less close to perfection – that is, if it is more or less objectively beautiful (perfection, as understood by the above-described ancient tradition, being what the objectivity of beauty is anchored to).

Descartes’ radical position is criticised by Gassendi in his *Disquisitio metaphysica* (the work of 1644 in which he extensively discusses Cartesian *Meditations on First Philosophy*), where he reproaches Descartes for disregarding the use of final causes in physics, and having abandoned the traditional proof of God’s existence, the «royal way indicated by the Holy Scripture and followed by all wise persons, which consists in the contemplation of this wonderful universe» (Gassendi [1644]: 329).

To conclude, Descartes' idea of the subjectivity of aesthetic judgement emerged from his mechanistic physiological approach to the study of music perception, but the *acknowledgement* of this same subjectivity was likely made possible by his peculiar theological views.

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Notes

- 1 From this point of view, paradoxically, Descartes' ideas seem far from matching with the so-called "Cartesian" (i.e. rational, rule-based) theories of music, such as Jean-Philippe Rameau's. See Prenant (1942), Van Wymeersch (1999), Lamouche (2013). On the *Compendium of Music*, see also Frédéric de Buzon's introduction to Descartes, *Abrégé de musique* (Descartes [2016]: 123-148), and Buzon (2019).
- 2 Descartes employs this conception of beauty as harmony and proportion also in a 1628 letter, in order to praise the elegance of Jean-Louis Guez de Balzac's writing style (Descartes [1964-1976]: I, 7).
- 3 See Beeckman (1939-1953): 1, 149-150. The passage is inspired by Lucretius, *De rerum natura*, 4, 617-627.
- 4 On the perception of flavours, see Gassendi (1649): I, 292.
- 5 In contrast, see the like-named entry of the *Encyclopédie*, where both Voltaire and D'Alembert emphasize the positive role habit plays in refining taste (Diderot [1751-1772]: VII, 761-762, 768).
- 6 *Examen philosophiae Roberti Fluddi* (1630), in Gassendi (1658): III, 233. On the limits of Pythagoreanism, see also *Syntagma philosophicum*, in Gassendi (1658): I, 556-557. For Mersenne's opinions on the same subjects, see Buzon (1994) and Buccolini (2024).
- 7 See *Meditationes de prima philosophia*, resp. 5, 4 (Descartes [1964-1976]: VII, 374-375); *Principia philosophiae*, part 1, art. 28, and part 2, art. 2-3 (Descartes [1964-1976]: VIII/1, 15-16 and 80-81); *Entretiens avec Burman*, 1 (Descartes [1964-1976]: V, 158)
- 8 The most well-known study about this "loss of analogy", is Marion (1981). On Descartes' peculiar notion of divine causality, see Carraud (2002).