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THE CONFRONTATION OF THE (CAUSAL) EXPLANATIONS OF EMOTIONS:PHENOMENOLOGY VS. NEUROBIOLOGY

O CONFRONTO DAS EXPLICAÇÕES (CAUSAIS) DAS EMOÇÕES:FENOMENOLOGIA X NEUROBIOLOGIA

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ABSTRACT
In this paper we will look at research by the philosopher of the mind João Fernandes Teixeira in "Uma nota sobre Sartre e Damásio ou as emoções entre a Fenomenologia e a Neurobiologia". From this we will analyze the theory of emotions of Jean-Paul Sartre in "*Sketch for a Theory of Emotions*" and of the neurobiologist António Damásio " *Looking for Spinoza: Joy, Sorrow and the feeling Brain* ". We will briefly discuss the theory of emotions of Jesse Prinz and neuroscientist Robert Lent. Finally, we will propose that the synthesis for the quest to identify the meaning of emotions, as Sartre wanted, should involve combining different causal approaches to emotional phenomena to better understand them.

KEYWORDS: Emotions, Phenomenology, Neurobiology, Causal explanations, Science.

RESUMO:

Neste trabalho nos debruçaremos em investigações do filósofo da mente João Fernandes Teixeira em "*Uma nota sobre Sartre e Damásio ou as emoções entre a Fenomenologia e a Neurobiologia.*" A partir deste analisaremos a teoria das emoções de Jean-Paul Sartre em o "*Esboço para uma teoria das Emoções*" e do neurobiólogo António Damásio *"Em busca de Espinosa*". Abordaremos brevemente sobre a teoria das emoções de Jesse Prinz e do neurocientista Robert Lent. Por fim, proporemos que a síntese para a busca de identificar o sentido das emoções que queria Sartre, deveria supor a combinação de diferentes abordagens causais sobre os fenômenos emocionais para maior compreensão destes.

PALAVRAS-CHAVE: Emoções, Fenomenologia, Neurobiologia, Explicações causais, Ciência.

Introduction:

Approaching the studies of António Damásio, João Fernandes Teixeira wrote in *Filosofia da Mente, Neurociência, Cognição e Comportamento* (2005) about the impossibility of this to separate emotions from cognitive capacities, this idea is developed in several works of Damásio, mainly in *Looking for Spinoza: Joy, Sorrow and the Feeling Brain* (2003). The importance of studying the role of emotions in cognition refers both to questions that reveal about psychic life, as well as biological in an impossibility of separating them. In this way, we have seen how much Sartre's work anticipates this important moment in which Phenomenology and Neuroscience meet. The description of structural phenomena of consciousness, such as imagination, emotion, and perception, remains a method for science, and Sartre, among other phenomenologists, pointed in this direction.

Damasio's main concern as a neurobiologist is to find and describe the functions for emotions, Teixeira said. But functions on a biological level, not as a phenomenologist who tends to approach the phenomenon in the situation, from socially situated cognition. The purposes or ultimate causes of phenomena can clearly be studied on two levels, physical and psychic, material and formal. We can find in the work Sketch for a theory of emotions (2014) that Sartre also proposed something similar, but his focus was clearly on understanding the phenomenon from the description of behavior:

> We cannot understand an emotion unless we look for its signification. And this, by its nature, is of a functional order. We are therefore led to speak of a finality of emotion. This finality we can grasp very concretely by the objective examination of emotional behaviour. (Sartre, 2014, p. 28)

This passage from Sartre refers to a search for psychological and phenomenological meaning for emotions, a kind of teleological explanation of emotions. According to Teixeira, Damasio's approach to emotions "*seems to oscillate between a Darwinian and a physicalist psychology, sometimes bordering on eliminative materialism.*" (Teixeira, 2005, p.38) Sartre, on the other hand, approached the role of emotions from different perspectives, first making a summary of the most classical theories, then moving on to a psychoanalytic and phenomenological and anthropological meaning, and finally defending the description of emotions as an empirical necessity.

For Teixeira, the importance of emotions in Damasio's theory points to "*a role that is linked to the physical and mental preservation of organisms, and, if possible, that this preservation is accompanied by an additional element: well-being.*" (Teixeira, 2005, p.38) We can see that Teixeira's interpretation of Damasio's theory, when approaching emotions, comes from a kind of Darwinian understanding and writing:

> Emotions provide a natural means for the brain and mind to evaluate the environment within and around the organism, and respond accordingly and adaptively. Indeed, in many circumstances, we actually evaluate consciously the objects that cause emotions, in the proper sense of the term "evaluate."" (Damásio, 2003, p. 54)

However, we can try an approximation and comparison between Sartre and Damasio when they discuss the role of emotions, but on the other hand the latter appeals to their "*neural correlates*" (Teixeira, 2005, p. 38), something that Sartre criticized as a kind of incomplete explanation of emotions. Damasio, even before attempting a description of the phenomenon, wanted to raise an ontological hypothesis about the role of emotions in human life, saying that they define what we once understood as a more primary and fundamental consciousness. He explained this by pointing to the location of the activation of emotions in older parts of the nervous system. On the other hand, for Sartre, emotions are fundamental in affective relations, and their manifestations refer to the *evidence of the factitious character of human existence*". (Sartre, 2014, p. 64)


Louis-Léopold Boilly, (1761-1845) Meeting of 35 expressive heads. (There are studies that point out that there are innate emotions and the study is done based on facial expressions, e.g. studies by Paul Ekman)

Teixeira vs. Damasio.

Damasio's theory of emotions separates the feeling, i.e. the sensation of the emotion, from what would be the activation of it, as if the body could feel before, so that after the feeling the emotion becomes conscious. In this view, our brain would provide the entire mechanism, as Teixeira commented on Damasio's explanation:

> Emotions are neurological representations of bodily states; to have emotions you need a brain complex enough to accommodate these representations, otherwise, as happens in simpler organisms, it is possible to have emotions without feeling them. (Teixeira, 2005, p. 39).

The importance of feeling our emotions is suggested for a better modulation of our actions. Damasio's theory of emotions echoes that of William James, the same one Sartre was confronted with. Damasio writes that the stimulus of emotion appears first in a world-brain relationship and then in a physical emotional response, the world-brain relationship is not first than that of perception/world, because we are always situated, engaged in some activity. There is the body in situation, as Damásio pointed out in his text:

> The appearance of an emotion depends on a complicated chain of events. Her e is how I see it. The chain begins with the appearance of the emotionally competent stimulus. The stimulus, a certain object or situation actually present or recalled from memory, comes to mind. (Damásio, 2003, p. 57)

The mind is in the brain to Damásio and the most fundamental is world-brain relationship to explain emotions is memory, and this would be a brain activity, on the other hand we understand that emotions as memories are faculties of perception, as Aristotle stated memory is also in the senses. The brain-world relationship exists only in the language and description of neuroscience. For Damasio, when stimuli are received, there is a process of representing them, and this involves cognitive work that involves several parts of the brain. In addition, the capture of brain images by technological means to consider the mapping of activated regions in the brain and linked to the phenomenology of emotions. The activation of parts of the brain, some more activated than others, as a kind of explanation that could lead us to map and identify some kind of causal explanation. But pinpointing the location of brain activation and such an emotion does not define the function of the emotion. Thus, the brain would shape different contents and evoke emotional responses that could *"reverberated and amplify itself, or shrivel away and close down"* (Damásio, 2003, p.58). The point is that Damásio seems to fall into the frontal criticism that led Sartre, when writing about psychology, to adopt a scientific language to explain emotions. Teixeira wrote of the importance that Damasio gives to emotions to explain action, for example fear as an emotion that would have the function of preserving and conserving us. Descriptions at a more animalistic level, clearly in line with the ontological approach of Damasio's research, defending the parts identified with the activation of emotions in the brain are the most primitive parts of the brain. But still dealing with explanations of emotions not to address the particularity of each emotional phenomenon, Damasio in transferring the explanation of the phenomenon, which would be subjective, to a language of neuroscience, thus pointed out Teixeira:

> It is as if, for Damasio, the explanatory gap does not exist, and a tacit physicalism or eliminative materialism can easily be professed. We could reduce all our visual experience, in Technicolor, to the activity of the gray matter of the brain. Or Van Gogh's painting of the dilation of some ventricles of the brain. Something that, at least at first, seems bizarre and unacceptable. (Teixeira, 2005, p. 40)

Teixeira's critique is the same as Sartre's; the phenomenon of emotion must also be described from a perspective beyond materialism. On the other hand, Damasio showed how stimulation in the brain of a patient with Parkinson's disease, described as being able to modify states of sadness, or even impute, such manipulation of a circuit of the brain could simulate some control of emotions in the future,

according to the author. In this way, Damasio replaced an explanation from popular psychology with an explanation from neural activity, its "neurobiological correlate". (Teixeira, 2005, p. 40) This raises the important question of whether Damasio would be a physicalist reductionist even if he appreciated the interaction of emotions, in short, Teixeira asks:

> Well, wouldn't we be here before the explanatory gap that refuses to be forgotten? That is, the old claim of the philosophers of mind that knowledge of the neurophysiology of pain does not allow me to imagine anything like feeling pain? (Teixeira, 2005, p. 40)

The denial that the quality of experience is perceptual, as well as emotions, cannot be proven true, and Teixeira seems to recognize, as well as phenomenologists, the convergence and ambiguity of particular and universal aspects when it comes to studying such phenomena, emotions as perceptions.

Sartre vs. Damásio

For Sartre, the meaning of emotions is not given by relevant facts that refer to this kind of so-called positivist investigation, in a scientific language. We can find in his text a strong criticism of psychology when it is seduced by this form of knowledge production, i.e. neuroscience. For the phenomenologist, this does not explain the phenomenon of emotion. We can also add what Simeão Sass (2007) wrote to interpret Sartre's text and that somehow the same text confronts the way Damasio understands emotions:

> We can admit that the physiological reaction is the serious side of emotion. But that is the first aspect; the second is that it is an immediate experience of consciousness. For Sartre, emotion is a degradation of consciousness, a form of falling asleep. The physiological symptom alone is insignificant because it does not reveal the essential sense of emotion. (Sass, 2007, p. 44)

As Sass pointed out, the physiological fact would be the scientism of emotion, but this is an aspect that does not explain to us how the event appears in essential relation to the world and the subject. Thus, the positivist psychology that Sartre criticized in the *Sketch for a Theory of Emotions* (1939/2014) is similar to the neurobiological research carried out by Damasio regarding his study of emotions. To experience the phenomenon, not to reduce it to a kind of brain mapping. Mapping the brain and its activations does not explain a phenomenon, but material changes. Emotion only reveals its meaning, its essence, when it is shown, when it is described through the subject-world relationship, when the focus is on trying to understand the role of emotion in behavior. Ferretti (2013) also notes and comments on Sartre's text:

> Fascinated by this model, psychology aims to be positive and seeks first of all the facts. Because it believes that these correspond to what "[...] must be found in the course of research" (Sartre, 1939/2010, p. 8, emphasis added), psychology does not care what such facts mean. For it, the question of their meaning does not matter, just as the question of the meaning of the attraction between bodies according to Newton's law does not interest the scientist (Sartre, 1939/2010, p. 16); it's a fact that means nothing: it just is. This is how the psychologist treats his object, the psychic fact, considered as a natural given. (Ferretti, 2013, p. 131)

The facts presented in this scientific way for Sartre do not give us the synthesis of their meaning, nor would a collection of all the facts offered explain the phenomenon to us, it is a conjecture. Teixeira wrote that "*for phenomenological psychology, to explain is not to reduce*" (Teixeira, 2005, p. 40), and it would be important to explain the laws of emotions in the processes themselves, to collect data on emotions, and even to point out that the new technologies of the brain do not explain them. As Sartre said:

> To wait upon the fact is, by definition, to wait upon the isolated; it is to prefer, positively, the accident to the essential, the contingent to the necessary, disorder to order. It is to discard, in principle, the essential as something in the future – 'that is for later on, when we have collected enough facts'. The psychologists do not notice, indeed, that it is just as impossible to attain the essence by heaping up the accidents as it is to arrive at unity by the indefinite addition of figures to the right of 0.99. If their only aim is to accumulate observations of detail there is nothing to be said, except that one can see little interest in the collectors' labours. But, if, in their modesty, they are animated by the hope, laudable in itself, that they will eventually realize an anthropological synthesis upon the basis of their monographs, then their aim is completely self-contradictory. They may say that this precisely is the method and the ambition of the natural sciences. (Sartre, 2014, p. 4)

Sartre attacked the theory of William James and Damasio embraced it. Teixeira wrote that Sartre identified the paradox of James's theory, according to which emotion cannot exist as a bodily phenomenon alone, since it is a consciousness that gives meaning to these sensations. Thus, a theory of emotions cannot be separated from a theory of the valuation of perception, whether at basic levels such

as the pursuit of pleasure and the avoidance of pain. For Sartre, "*the meaning of emotion comes from the world and not from ourselves."* (Sartre, 2014, p. 58), would be for the author our body's responses to the world, to other bodies, "*emotion is not an accident, it is a mode of our conscious existence, one of the ways in which consciousness understands (in Heidegger's sense of Verstehen) its Being-in-the-World.*" (Sartre, 2014, p. 61)

Teixeira explained that the semantic confusion would be at the level of "*if emotions were bodily states, it would be legitimate to attribute to them both physical and mental properties, which would produce meaningless sentences like 'my body is now afraid' or 'my body is happy'*" (Teixeira, 2005, p. 41). But we do not need to be dualistic in understanding the description of the emotional phenomenon, which is described only by separate spheres, physical and psychic. Like William James, Damasio worked with psychic facts in an atomic way, let's say with a more physicalistic approach. Teixeira brought up a counterexample from Sartre:

> Sartre draws our attention to an obvious counterexample: the pathological cases of hospitalized patients who fluctuate between anger and happiness in a matter of seconds. These two emotions have nothing to do with each other, although we know that the physiological changes corresponding to anger differ from those of joy only by a small margin of intensity. (Teixeira, 2005, p. 41-42)

The criticism of these classical theories, such as that of William James, where there is no logical organization, as Teixeira states, "*certainly the logic of emotions does not follow the logic or sequence of neurobiological phenomena that occur in the body and are represented in the brain.*" (Teixeira, 2005, p. 41) In Sartre's counterexample, what would be the logic of emotions? An explanation of the activation of brain areas? How can we understand that one state resorts to another, in what way does one contain the other? These are questions that conflict with Damasio's reductionism, which does not explain the phenomenon. A neuronal reduction does not tell us about the logical confusion of the phenomenon in its facticity.

Who gets emotional is the consciousness that emerges from the brain?

This question leads Damasio to conclude that the brain is the primary shaper of consciousness. Teixeira says that his thesis seems to assume a kind of tenement-thalamic sensitivity, and of course Sartre would not agree with this and already responds in the *Sketch*:

> I cannot see that the corticothalamic sensitivity, recently invented by the same people who made these criticisms of James, provides a satisfactory answer to the question. First of all, the peripheric theory of James had one big advantage: it took account only of

> physiological disturbances directly or indirectly discernible. The theory of cerebral sensibility appeals to a cortical disturbance that is unverifiable. (…) these experiments taken by themselves prove *absolutely* nothing. (Sartre, 2014, p. 17)

Damasio's instances present it as if the brain could represent and process the whole phenomenon and still command the results for a body. His theory suppresses the notion of embodied consciousness and seems to emphasize the opposition of peripheral and central function. Teixeira relates his work to James's theory:

> James speaks of a change in consciousness that precedes a physical change (I am sad because I am crying), but without risking any hypothesis about the mind-brain problem that could clarify for us what this consciousness would be. It would be an immediate given, a flow that should be taken as the starting point of any psychology, but in his work, we do not find specific ontological considerations about the nature of this flow. (Teixeira, 2005, p. 42)

The major importance that Teixeira places on the Sartrean and Damasian discourse is that one is in the first person and the other in the third. Emotions have a meaning for the subject who feels them, *"they are not pure and ineffable qualities, because they have a meaning, they mean something to my psychic life"* (Teixeira, 2005, p. 43) and this is one of the applications of Sartre's theory against that of James, which applies to that of Damasio, because he also neglected how emotions constitute a magical behavior in the world, modifying the world and cognition itself. It is necessary to emphasize an embodied, integrated, situated consciousness that feels and is moved in relation to the world.

Emotions drive action

Jesse Prinz (2004) is a philosopher of mind who, like Sartre, has taken up the importance of emotions in perception by examining how they influence action. Emotions can motivate or inhibit action. When we perceive them, we change the way we perceive the world and the way we act. Prinz wrote:

> I have said out that emotions are motivating. They impel us to act. Being afraid can usher in an urge to flee, and being angry can usher in an urge to fight. In contrast, there is nothing very moving about seeing a red patch or hearing a tone. When paradigm cases of perception are motivating, it is usually in virtue of inciting an emotional response. (Prinz, 2004, p. 228)

Prinz also pointed out that responses to actions may not be directly influenced by emotions, but they can initiate appropriate actions by preparing our bodies for action. Again, in the previous quote, is

not so simple, if the red patch suggests something like blood, and the sound we hear is something like a scream or a grunt, the responses can clearly be more emotional, so we need to consider the contextual role of emotion in perception. Emotions can also be seen as the perception of affordances, for example, when we feel the changes in our body caused by emotions, certain responses are required and admittedly generate behavior that may lead to an expected response to such a stimulus. In this sense, the relationship between emotion and action cannot be ignored. The motor responses given to the perception of emotions can culminate in an action. Prinz wrote that emotions are related to action partly through their valence markers, which would be more subtle when we perceive bodily changes and act, in which case we don't always register these states and action can come as an imperative. We see this more clearly in the text itself:

> Valence markers are another story. They do not register bodily states. Their content is best understood as imperative. It can be glossed by the instruction "More of this!" in the case of positive valence, or "Less of this!" in the case of negative valence. Valence markers are internal commands to sustain or eliminate a somatic state by selecting an appropriate action. Valence markers are not perceptual states. They are not states in our somatosensory systems. They can become decoupled from embodied appraisals, and they can be affixed to other kinds of mental states. I concede, then, that emotions contain a nonperceptual component. (Prinz, 2004, p. 229)

Although Prinz claims that there may be a non-perceptual component to emotions, he argues that it is perfectly acceptable to say that emotions are perception[1], and that these emotions can compel us to act. This echoes the Sartrean notion of emotional action invading us, the magic of emotions dominating us and driving our behavior. Action has meaning for the subject who acts, and we even explain the motivations for our actions in terms of our emotions. And body movements contain and can contain an emotional charge. As we already know, there are real smiles and "yellow smiles" without emotion, and we know this without having to explain how we know it. The memory of an emotion can transform our entire perception, our heartbeat, the rhythm of our actions. In this sense, neuroscience is addressing emotional functions and restoring their importance, which often takes precedence over rational processes. We'll see more about this in the final topic.

[1] Aristotle also understood emotions as part of the perceptive faculty and wrote in *De anima* that there is no affection that is exclusive to the psyche: "In most cases, the soul does not seem to be affected or to produce any affection without the body, for example, becoming angry, being bold, feeling appetites and perceiving in general." (See DA 403a5-30.)

The language of science (objective language).

The language of science (objective language).

The fact about emotions is that they are accompanied by physiological changes and generate behaviors, it is in this area that this type of scientific approach would enter. Also because, as many researchers say, including the famous philosopher of mind Daniel Dennett, supports something like "we are not interested in the subjective character of experience, it is not an aspect relevant to science"[2], something that Aristotle otherwise indicated in Metaphysics: there is no science of the particular[3], on the other hand, also identified the ambiguous character between what is particular and universal in the experience of perception, of emotions. Given this, what neuroscientists are currently trying to establish is a description of the relationship between "*organic and behavioral manifestations*" (LENT, 2003, p. 715). Three functions that neuroscientists ascribe to emotions have been highlighted: *"(1) individual survival; (2) species survival; and (3) the communication.*" (LENT, 2003, p. 715) The first point refers to responses that are admittedly defensive and aggressive behaviors, such as fear and anger, and even a maturation of emotional

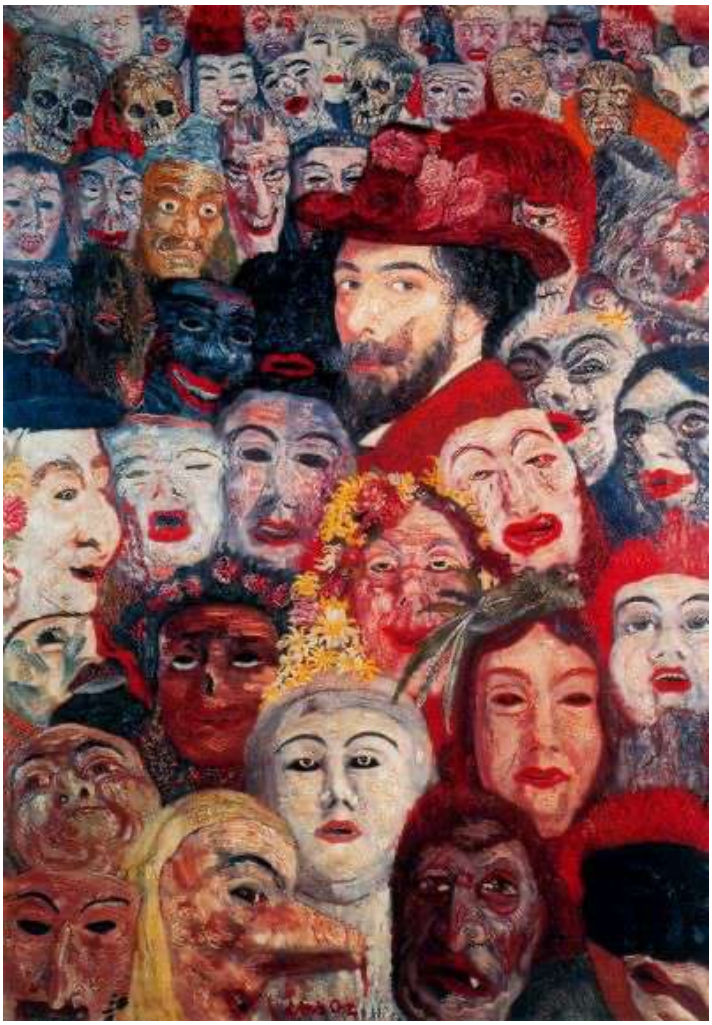
[2] Dennett (1991) insisted on a neutral description so that science can be objective, and from third-person descriptions, and that perhaps it could somehow do "*justice to the most private and ineffable subjective experiences"* (p. 72), in short, for the author subjectivity, or the quality of experience cannot be explained by physical or biological processes. See In The Method Of Heterophenomenology, In *Consciounsess Explained.*

[3] Aristotle wrote we can't define a particular reality, so it's the same difficulty to define and find the meanings of emotions. *"Therefore, in terms of definition, when someone tries to define a particular reality, they should not ignore the fact that it can be eliminated. In fact, it cannot be defined*." METAPH. 1040ª5 (Trad. Tomás Calvo Martinez). Just as there is no science of what is accidental, that is, not necessary: "*It is clear for the moment that there is no science of accident. All science refers to what is always or most of the time: if it were not so, how would it be to learn or teach others?*" Metaph. 1027ª20 (Trad. G. Reale) One does not make science of the individual man, Socrates for example. Otherwise, he shared one of the difficulties of such an investigation (psyche) and wrote in De Anima "*perception in activity is of particulars, while science is of universals*." (Aristotle, DA 417b20)

behavior is addressed in terms of the good of the species. And of course, our enumerated list of emotions is much richer. As the author wrote:

> We can identify pairs of opposing emotions, such as joy and sadness, love and hate, but also unique experiences for which there are no clear opposites: enchantment, agony, contempt, despair, panic, envy, and so many others. This diversity makes it difficult to classify them: they have little in common. It can be said that some have positive value, and so the behaviors they produce tend to be repeated. Others have negative value, and the behaviors they provoke are aimed at eliminating them. Positive or negative, the various emotions can elicit motivated behaviors, leading some authors to suggest that the only common element among them is reinforcement, that is, a positive (pleasant) or negative (unpleasant) stimulus that results in motivation by prolonging or interrupting the emotional experience. (Lent, 2003, p. 716)

There is also another way of classifying, in addition to negative or positive valence, and there are three groups: the primary emotions, the secondary emotions, and the background emotions - the latter defined by Damasio as a kind of emotional background of consciousness that is something that the person carries with them and in some way characterizes the "self". And so the self might determine the primary and secondary emotions. The primary ones would be innate (joy, sadness, fear, disgust, anger, surprise) and the secondary ones would be social, cultural (guilt, shame, pride), many of them are called moral emotions. (Lent, 2003, p. 716).



James Ensor (1899) Self-portrait with masks. (An analogy between real emotions and other social "the masks.")

The theory of William James, which Sartre criticized for suppressing subjective emotional experience, since such emotions would be described and caused by physiological and behavioral manifestations, resembles Damásio's approach. For Sartre, the subjective character of emotional experience could not be ignored if it were not the most important. Thus, the descriptions of neuroscientists focus on various basic emotions such as fear, anger, pleasure, joy, and the manner of explanation is always in the third person, according to such and such a region of the brain, such a stimulation, such behavior. A chain of facts, but which at the same time relate consciousness with perception, behavior, differentiation from self-awareness, and even the unconscious, while who coordinates everything, of course, it would have to be the brain. There are, however, dualistic neuroscientists and many other materialist proponents of reductionism. As Lent notes: "*Reductionism is no longer as widely accepted as an explanation by neuroscientists, but it remains a very fruitful method for studying neural properties."* (Lent, 2003, p. 736) Nevertheless, the language of philosophers and scientists together could

form a larger synthesis, for many neuroscientists are aware that the "complete explanation" is not found only in scientific and neurobiological language:

> Despite its relevance, the controversy between philosophers and neuroscientists is far from settled. Everything indicates that the negativist positions seem to be losing ground: the mind can indeed be studied, and the brain mechanisms that accompany it can be elucidated by neuroscientists. This does not necessarily mean that the whole explanation of mental phenomena can be found in the operation of the brain's neurons. (Lent, 2003, p. 737)

Neuroscientists and philosophers with more reductionist, materialist perspectives may agree that all descriptions of physical and material causes are entirely necessary for the study of emotions. A physicalist will clearly investigate physical causes, there are no causes that are not physical, Aristotle once wrote. Material causality is one kind of explanation, but what else tells us about what a thing is, and what would emotions be? As the stagirite wrote, emotions are forms in matter, affections, alterations. And the point here, the kind of explanation that addresses material causality, and as seen in Damasio, physiological causality in the brain-world relationship, but there is no such relationship, is a cut of science, the naivety of understanding what would be mental by separate parts in the body, there is no ghost of the machine, the captain on the ship, the mind in the brain or in the head, let alone the emotions.

Conclusion:

Considering that throughout history there has been an incessant search to define what should prevail in human behavior, reason, or emotion. For a long time, the primacy of reason over *"pathos"* or passions prevailed. The place of the passions, from Greece, beginning with Plato, occupied lower parts of the body, more physical and corporeal and less important than the mental and psychological characteristics. Something like how we still find today the privilege of the mind "in the head" commanding the rest of the body, as well as the privilege of neuronal commands, which really seems to refer to the same old hierarchical division, the influence of dualistic theories. Obviously, this changed with Aristotle. We understand that we are a combination, a composition between the material and the formal. Understanding the forms of emotions means describing why they happen, when they happen, to what ends in behavior. The physical and psychological spheres should both be described to try to explain behavior, not to reduce the psychological to material causes, material explanations do not fully explain the phenomenon. In addition to fulfilling biological functions, we are differently situated by perception in the experience of action in a particular body with its own body schema. For Aristotle, emotions are

movements of the psyche, our affections, changes, but they are functions of the psyche in a certain body, so they are not manifestations that could be only physical or only psychic. Affections can be expected responses to such kinds of stimuli, but we can also react in unexpected ways, while at other times we can affect ourselves without being directly involved in such phenomena, as he explained:

> It seems that all the affections of soul involve a body—passion, gentleness, fear, pity, courage, joy, loving, and hating; in all these there is a concurrent affection of the body. In support of this we may point to the fact that, while sometimes on the occasion of violent and striking occurrences there is no excitement or fear felt, on others faint and feeble stimulations produce these emotions, viz. when the body is already in a state of tension resembling its condition when we are angry. Here is a still clearer case: in the absence of any external cause of terror we find ourselves experiencing the feelings of a man in terror. From all this it is obvious that the affections of soul are enmattered accounts. (Aristotle, DA 403ª25-30)

The explanation could be material and formal, for Aristotle, Damasio's explanation would certainly be more of a material kind of explanation, material teleological explanations of the relationship between brain and body, which Teixeira understood as a kind of reductionist materialist. Sartre also recognized this in William James. This shows the limits of the material and reductive explanation of science. Here's how Aristotle described different kinds of explanations for the same phenomenon:

> Hence a physicist would define an affection of soul differently from a dialectician; the latter would define e.g. anger as the appetite for returning pain for pain, or something like that, while the former would define it as a boiling of the blood or warm substance surrounding the heart. The one assigns the material conditions, the other the form or account; for what he states is the account of the fact, though for its actual existence there must be embodiment of it in a material such as is described by the other. (Aristotle, 1991, DA 403ª30- 403b5.)

The formal definition implies understanding and addressing the description of teleological causal laws, just as understanding the form of emotions implies understanding why they happen, not only as a material cause, but from the formal causality that deals with what purpose for action, on behavior. Aristotle held that formal causation explains motion more than just material causes:

> Thus the essence of a house is assigned in such an account as 'a shelter against destruction by wind, rain, and heat'; the physicist would describe it as 'stones, bricks, and timbers'; but there is a third possible description which would say that it was that form in that material with that purpose or end. Which, then, among these is entitled to be regarded as the genuine physicist? The one who confines himself to the material, or the one who restricts himself to the account alone? Is it not rather the one who combines both? (Aristotle, 1991, DA 403b5-10)

Emotions are experiences like perceptions, particular and universal at the same time, and important for us to know about ourselves. One of Sartre's and Teixeira's criticisms was about the primacy of a pretentious scientific and physicalist language that seeks to explain the phenomenon of emotions by ignoring particularity or subjectivity. But as we have known since Aristotle, we are aware that there is no science of the particular, and the challenge is to find a point of balance between what would be particular and universal in the role of emotions for human behavior. Neurobiology, as a way of describing the phenomenon of the brain-body relationship, seeks to identify material causes, and the non-reductionist approach to phenomenology would be an attempt to find the formal and final causes of emotions as a phenomenon of human experience.

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