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The Origin of Somatic Markers: A Suggestion to Damasio's Theory Inspired by Dewey's *Ethics*

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Damasio vs. Dewey

My goal is not to propose a criticism of Damasio's theory, but to suggest how it might be possible to carry it further, to wipe out even more efficiently the traditional dualism opposing our reason and emotions. Damasio's theory of somatic markers is for me a very efficient means of exposing the importance of emotions on the workings of reason, but my fear is that it might lead a few to replace the old dualism opposing an efficient reason to disruptive emotions by a new one overemphasizing the power of emotions on a weak influenced reason.

An important part of Dewey's *Ethics* deals with this dualism. I suggest that, although Damasio's experiments can be seen as providing amazing clarity and precision to Dewey's philosophical intuitions, Dewey's elaboration on the reciprocal influence of reason and emotions goes one step further in questioning whatever supposedly opposes them.

Dewey's *Ethics*

Since Dewey's *Ethics* is probably much less known today than Damasio's *Descartes' Error*, let me start by presenting what interactions Dewey imagines between our emotions and our reason.

For Dewey, when we think we are making a choice between following our emotions, or following our reason, reality is always more complex:

while there is conflict, it is not between desire and reason, but between a desire which wants a near-by object and a desire which wants an object which is seen by thought to occur in consequence of an intervening series of conditions, or in the "long run". (1932)

When facing a new situation, when are emotions necessary if thought must lead us to action? Dewey's first intuition is that emotions provide the necessary starting point of reflection, or the energy necessary to its activity:

Unless there is a direct, mainly unreflective appreciation of persons and deeds, the data for subsequent thought will be lacking or distorted. A person must feel the qualities of acts as one feels with the hands the qualities of roughness and smoothness in objects, before he has an inducement to deliberate or material with which to deliberate. (1932)

Dewey also thinks that any outcome of a thinking process must be emotionally "appreciated," otherwise it would not stir us to action. I quote *Ethics* again: "no matter how elaborate and how rational is the object of thought, it is impotent unless it arouses desire".

At this point, we might wonder two things. Are the emotions which stimulate reflection and those which motivate action of the same kind? And doesn't Dewey overemphasize the importance of emotions, by giving them a crucial role at the beginning and at the end of the process of thought?

In the fourteenth chapter of *Ethics*, Dewey works on distinguishing valuation, as a judgment of value, in which reason evaluates an object by its consequences, and valuing, as an immediate emotional reaction. For Dewey, valuation and valuing are not opposed, but linked: "We esteem before we estimate, and estimation comes in to consider whether and to what extent something is worthy of esteem [...]. All growth in maturity is attended with this change from a spontaneous to a reflective and critical attitude". (1932)

Therefore, even if emotional reactions always come first, reason can and should have an effect upon later ones: "judgments of value are not mere registrations [...] of previous attitudes of favor and disfavor, liking and aversion, but have a reconstructive and transforming effect upon them by determining the objects that are worthy of esteem and approbation". (1932)

Dewey thus distinguishes between primary emotions, which one has at the beginning of one's life, and adult emotions. These ones are of two different kinds: the spontaneous ones, which are immediate, but probably the result of past value judgments, and the transformed emotions, which have just evolved, as an effect of a new value-judgment.

Therefore, to go back to my two questions, we can conclude that Dewey ends up giving emotions an important influence on reason, and the two kinds of emotions he imagines in this regard might coincide with the two kinds of emotions he had noticed as necessary to reflection. The emotions providing energy to the thought process might be the spontaneous ones, occurring before the thought process, and the transformed emotions, produced by valuation, might be the ones necessary to act.

If one accepts this interpretation, we could conclude that in front of a situation, Dewey imagines that our reaction follows a pattern similar to this one: a new situation *provokes* spontaneous emotions *which stimulate* reflection *which produces* a value-judgment and a transformed emotion *which enable us to act*.

What suggestion will this theory enable us to make on Damasio's theory of somatic markers?

Damasio's Theory of the Somatic Markers

The starting point of Damasio's research is Elliot, a reasonable and intelligent man, who, because of a brain tumor, became unable to take any sound personal decision.

After running a series of tests, Damasio became convinced that Elliot was still able, in front of most situations, to imagine different action plans, but that he was never able to choose the right one in practice. To link his lack of emotions to his inability to assign values to the different plans he is still able to produce, Damasio proposes his theory of the somatic marker.

To explain what he means by a "somatic marker," Damasio asks his reader to imagine himself as an owner of a large business, "faced with the prospect of meeting or not with a possible client who can bring valuable business but also happens to be the archenemy of your best friend, and proceeding or not with a particular deal" (1994).

For Damasio, using a cost/benefit analysis of all the scenarios you imagine is not going to work; at best, it would take you too long to make a decision. However, he thinks that without reasoning about it, some of the options you imagine are automatically eliminated. If, from experience, a connection has been made between a specific response option and its bad outcome, a somatic marker will be activated. This marker would then operate either outside consciousness, by inhibiting a tendency to act, or consciously, by letting you experience an unpleasant gut feeling, thus convincing you to avoid this option.

Damasio's Theory as an Explanation of Dewey's Intuitions

Before going any further, I would like to suggest that Damasio's theory can first be read as an explanation of Dewey's relatively vague notions. When Damasio writes, "a somatic state, negative or positive, caused by the appearance of a given representation, operates not only as a *marker for the value of what is represented, but also as a booster for continued working memory and attention*" (1994), it can easily be read as an explanation of what Dewey meant when he wrote that emotions provide reflection with "material with which to deliberate," and "an inducement to deliberate" (1932).

The Origin and Evolution of Somatic Markers

Somatic markers are, according to Damasio, what enable us, in new circumstances, to experience feelings before we start evaluating the situation rationally. For Dewey, these "intuitions" which are necessary for reflection because they provide its material and its motivation, are in the long run the product of our value-judgments. Thus, he estimates that our emotions are as necessary to our reason, than our reason to our emotions.

I think that Damasio considers that only emotions are at the source of somatic markers. Since he sees them as necessary to the thinking process, it leads him to conclude that our reason is based on our emotions, but he forgets to consider whether our emotions are influenced by our reason.

At this point, my goal is to question Damasio's apparent one-sided view on the reason/emotions interaction. My first remark is simply theoretical. Following Damasio's experiments, I think we can reach different conclusions. For him, when a chosen option leads to a negative outcome, the consecutive somatic state (the painful emotion) allows a new marker to be created. Damasio thus insists on the fact that emotions are what create somatic markers.

However, I think it is just as logical to conclude that, since we also use our reason to choose an option, our reason is also an important cause of the resulting somatic state, and thus of the new marker. In other words, if our reason had enabled us to make a better choice, the final emotion would have been different, and therefore the new marker would have been different.

I think Damasio does consider reason as an important step in the decision-making process. Yet, because his experiments led him to re-evaluate the importance of emotions, he stopped at the conclusion that emotions are the foundations of reason, and it might be asked whether we should not also consider that our emotions might be just as much the products of our reason.

My second remark is about Damasio's main experiment. I think that Damasio ends up giving emotions such a one-sided influence on reason because the experiments he works from are cases in which the role of emotions is much more important than any conscious evaluation, in the production and the evolution of somatic markers. I will try to analyze the "gambling experiments" proposed in chapter 9 of *Descartes' Error*.

I think it may be necessary to distinguish between two different processes: the production, and the evolution of somatic markers. My point is not to suggest that these two processes are totally distinct, but

rather than the second one progressively distinguishes itself from the first. If these two processes are thought of as different, I think we can consider how much Damasio's experiments do reproduce real-life decision-making circumstances, and how much they differ from them.

Damasio's experiments consist of asking his patients and "normal" individuals to gamble, playing with four decks of cards, two decks giving out high rewards but also high penalties, and thus leading the players to bankruptcy, and two other decks, causing lower rewards but also much lower penalties, enabling the players to win the game. These experiments are a success since they enable Damasio to distinguish patients, who lose the game, from normal individuals, who win, because they learn to avoid the bad decks of cards.

If we consider how somatic markers are created, which means if we consider a limited number of the same kind of experiences, I think Damasio's gambling experiments reproduce what happens in real life. An experience which leads you to a success, produces a positive marker which will be activated in the future if the same circumstances are experienced again (in this case, decks C and D); whereas an experience which ends as a failure produces a negative marker (as for decks A and B).

However, if we consider the way in which markers evolve, I think these gambling experiments only allow us to study a limited category of our real-life experiences. If we consider "normal" individuals, after a few cards have been turned down, when the question comes up again to choose a deck of cards, the different stages of the decision-making process are the following. After the different response options have been produced (in this case, there will be four options, since there are four decks of cards), the negative marker associated with two of the four options allows them to be eliminated quickly, and then a choice has to be made between the two remaining ones, either automatically, or consciously. When the decision is made, the player picks up a card, experiences an emotion (positive or negative, depending on the efficiency of the preceding markers), the emotion then makes the marker evolve, reinforcing it, if the bet was successful, or modifying it, if it was not the case.

However, I think we can wonder whether this process does not permit survival only if one repeatedly faces the same sets of circumstances (a hundred cards have to be turned down, for the experiment), in which the possible response options are always exactly the same (make a choice between four decks of cards), and in which response options have very similar consequences. Is it the case in real life? Survival in our societies might require much more complex decision-making processes. Damasio was obviously trying to simplify a typical decision-making experience when he devised

these gambling experiments. However, these experiments probably do not enable us to consider the importance of another "typical" decision-making experience, where conscious evaluation has a much more decisive role.

In other words, we might suggest that as long as an environment is stable, human needs do not evolve, and thus the situations or the objects that humans look for are always similar. Their survival is much more easy to achieve if an automatic process (like the action of somatic markers, if we accept Damasio's theory) enables them to predict the outcome of familiar experiences. Yet, in a constantly evolving environment, in which many experiences are unique, an automatic decision-making process might not always be the most efficient one.

Another difference seems essential between Damasio's experiment and life. Damasio says from the beginning that this game is like life because chance rules it. Then, to explain why this test enables him to measure so well his patients' errors in decision-making, he writes that, like in real-life, this test gives the possibility to make choices, but the player does not know neither how, nor when, nor what to choose.

These two passages are for me very surprising, and I think Damasio would agree with me that an individual successful "at the game of life" does not always make a good poker player, and vice versa. Why? Because successes and failures in life usually have a cause, whereas in the experiment they do not. Successes and failures in life can be analyzed, whereas the rules of the gambling experiment, because they are arbitrary, by nature resist analysis. When going through Damasio's experiment, it is necessary to choose the "wrong" decks several times before being cautious because nothing can explain that choosing a particular deck will be, on the whole, a bad option. The only way to persuade oneself is to repeat the mistake.

In life, failures probably encourage analysis a lot more easily. It is not necessary to burn oneself many times to be cautious with fire or hot objects. The first time a child burns himself, he can learn only to never touch again the same kind of object. However, the second time, he has to wonder what it is that these two objects have in common, that makes them objects to avoid.

What is it that enables us to learn from experience, in all experiences where chance is not the strongest element? Our ability to compare experiences, to analyze them, to deduce rules of behavior from individual occurrences, in a word, our reason, even if it is motivated by somatic markers.

To summarize my position, I would say that these gambling experiments are a success because they are an efficient test to distinguish normal individuals from patients. Moreover, skin conductance tests show that it

is probably because a somatic state is activated in normal individuals before they make a decision, that their actions are beneficial on the long term. These experiences thus verify that the activity of somatic markers is a necessary condition if decision-making processes are to help the organism survive. The patients do not succeed at this game, as they do not succeed "in life," because they are unable to produce new somatic markers.

However, these games do not prove that emotions are overall a more important factor than reason in influencing the evolution of somatic markers. The patients might lose the game because their emotions do not produce markers, but they might make wrong decisions in life because their emotions and value-judgments combined do not produce somatic markers either.

The Limited Value of Intuitive Appraisals

Decisions made automatically or unconsciously, on which reason does not have any influence, appear to me as of a limited value, to repeat Dewey's words.

There is a permanent limit to the value of even the best of the intuitive appraisals [...]. These are dependable in the degree in which conditions and objects of esteem are fairly uniform and recurrent.

They do not work with equal sureness in the cases in which the new and unfamiliar enters in. (1932)

The mechanism Damasio describes is probably the one which is at work in his experiments, and in all real-life experiences which have to be undergone in order to survive. (Or at least his book convinced me that this was the case). In these experiences, an automatic learning process can take place, and this mechanism probably enables us to avoid the mistakes we already made.

But what are the processes that enable us to make decisions, when survival is secured? What is the role of conscious reasoning in those processes, probably the last to have appeared in evolution, and still the least important in quantity, that enable us to imagine a solution to a new problem, or a new solution to an old problem, a melody, a new energy?

If I insist on the importance of conscious reasoning on the evolution of somatic markers, it is not to suggest that Damasio does not sufficiently consider the share of conscious reasoning in each experience, but rather to reevaluate the influence of past value-judgments on the unconscious processes that each experience activates.

I do not oppose any element of the somatic marker theory. I only suggest that Damasio might have undervalued the importance of reason in the long-term evolution of somatic markers, and therefore in our subjective experience, probably because he mostly wanted to demonstrate how limited the influence of

reason was on the short-term, when we choose to act in response to a situation.

What are the Consequences of Each Theory?

Damasio's theory can be summarized very briefly as: emotions are what enable us to produce markers, make them evolve, and thus emotions are the necessary conditions of the functioning of our reason.

We can conclude, with Damasio, that emotions have a crucial role, worry that they are given so much importance when their mechanisms are not yet understood: "What worries me is the acceptance of the importance of feelings without any effort to understand their complex biological and sociocultural machinery," and want the fragility of the "foundations" of reason to be recognized:

The idea of the human organism outlined in this book, and the relation between feelings and reason that emerges from the findings discussed here, do suggest, however, that the strengthening of rationality probably requires that greater consideration be given to the vulnerability of the world within. (1994)

Or, with Dewey, we can estimate that if emotions do have a great influence on the workings of reason, our reason can also influence our emotions. Our rationality is probably fragile, because it is based on emotions, but it is "constructible," since our conscious choices probably have in return a strong influence on the evolution of our emotions.

This process might even be just as automatic as the first one. Our valuations end up modifying our tastes. Without even wanting to change, we do not always like as adults what we liked as children. However, Dewey thinks that some of our "intuitions" (we could probably say: markers) resist analysis:

The very fact of the early origin and now unconscious quality of the attendant intuitions is often distorting and limiting. It is almost impossible for later reflection to get at and correct that which has become unconsciously a part of the self. (1932)

To conclude on this, I would like to suggest that the task Dewey assigns to reason, that of evaluating if our spontaneous emotions are the result of sensible evaluations, may be a feasible one if one follows the precautionary measure given by Damasio. I suspect that from education we might be able to learn either to mind our somatic states and analyze their causes, or to ignore them.

For example, in the situation imagined by Damasio where you wonder if you should meet a potential client, who happens to be the enemy of your best friend, I think that if one asks himself the question consciously, it may be possible to perceive one's somatic states, and

thus to decide whether to "follow their advice" or not. However, if one pretends to ignore them, instead of diminishing their influence, and let reason work freely--according to those who think that we should not let emotions interfere with reason, their influence will probably be even more important. If an organism learns to ignore its somatic states, the markers will influence the decision-making process anyhow, but without giving reason a chance to influence the decision.

Two Definitions of Reason

In the end, their contrasted definitions of reason seem to be what prevents Dewey and Damasio's theories to coincide. What is reason?

For Damasio, reason seems to be a faculty. When Damasio takes the example of choosing whether to meet your best friend's enemy or not, he opposes his somatic marker hypothesis, to a "pure" reason hypothesis. This is the passage I want to analyze here. For Damasio, pure reasoning will at best enable us to make a decision, but after "an inordinately long time" (1994). However, he thinks that in most cases, a decision will be impossible to make for two reasons.

First, Damasio evokes the limits of our attention and working memory. However, this does not seem to be a sufficient argument, otherwise it would suggest that the patients Damasio works with could solve their problems if they only took a paper and pencil when they need to make a decision. Their cases would probably not have inspired so many ideas to Damasio, if the solution to their problems was that simple.

His second argument is simply that reason's strategies can often be defective. What "strategies" does he have in mind? The answer is for me very surprising, it is the "humans' devastating ignorance and defective use of probability theory and statistics" (1994).

Do we mostly face pure chance? Are probability and statistics calculations our only way to evaluate how others behave, or how society works? Is the reflection on the causes of what happens to us, which should enable us to predict the consequences of what we will choose to do, an impossible task? Because somatic markers enable us to assimilate automatically and to a certain extent the recurrences of reality, can reason only face the "rest," which would be pure chaos?

Shouldn't we consider that after many experiences, we retain not only new somatic markers, which when activated will be able to arouse future somatic states, but that we also retain "markers" of a different kind, which might enable us to make positive choices, and that we call, for lack of more scientific terms, ideas, conscious value criteria?

Why doesn't Damasio write about reason's acquisitions? His theory seems to oppose not only conscious reasoning and the automatic unconscious

selection process, but also reason as an empty faculty, and emotions as a content, which can be modified by experience.

Yet, this opposition seems to be more linguistic than proved experimentally. Reason is usually defined (in French as in English) as a capacity, and emotions as states, and it seems that Damasio ratifies this dualism. The fact that his patients are unable to learn from experience may prove that the memory of conscious ideas depends on the activity of somatic markers, but it does not prove that it does not exist in normal individuals.

For Dewey, our reason works from ideas, acquired through one's personal experience and through communication:

Experience is intellectually cumulative. Out of resembling experiences general ideas develop; through language, instruction, and tradition this gathering together of experiences of value into generalized points of view is extended to take in a whole people and a race. Through intercommunication the experience of the entire human race is to some extent pooled and crystallized in general ideas. These ideas constitute principles. We bring them with us to deliberation on particular situations. (1932)

Just once, Damasio speaks of the necessity of possessing a logical strategy, that would evolve with experience. Was this remark only about our capacity to use statistics and probability better and better?

The primary task of our reason may be to help us reach goals rather than to help us avoid unfavorable situations. It seems probable to consider that in evolution, where one mechanism is sufficient (the somatic markers), a second one does not try to accomplish the same things. At the risk of oversynthesizing Dewey's and Damasio's theories, I think we can suggest that, in case of a failure as of a success, the goal of a thought process will probably be to reach by analysis a plan of future action (better than the one imagined before the just-accomplished action), or even simply to define a set of necessary conditions in hope of attaining this new goal. This would create another kind of "marker," a positive one, which would encourage action, if this set of conditions happens to be experienced in the future. Emotions would then be more efficient at composing a memory of the past, and reason better at building a memory of the future, to quote Damasio's phrase ("memories of the future").

On Strength of Will

Finally, the difference in Dewey's and Damasio's definition of strength of will seems to be very significant of how Dewey considered more than

Damasio the possible consequences of a joint activity of our capacities to reason and to experience emotions.

For Damasio, strength of will is what enables us to endure something painful short term, in exchange for positive consequences on the long term: "Willpower is just another name for the idea of choosing according to long-term outcomes rather than short-term ones" (1994). Willpower can be explained by the action of a positive marker, reason is not evoked.

However, the examples he chooses to illustrate this definition are not decisions one takes easily. On deciding whether to undergo yet another surgery, one might have to decide for it, although it might mean to need to overcome strong negative feelings. The automatic decision-making processes do not seem sufficient in this case.

For Dewey, it is neither reason alone, nor a positive somatic marker, but the product of the union of both, a well thought-of judgment and a "transformed" emotion, that enable us to think in the long term:

In reality "strength of will" (or, to speak more advisedly, of character) consists of an abiding identification of impulse with thought, in which impulse provides the drive while thought supplies consecutiveness, patience, and persistence, leading to a unified course of conduct. (1932)

Anti-dualism

It might have seemed that I was "defending" the primacy of Reason, but it was not my goal. I think Damasio's theory is essential because it brings to light how necessary emotions are to decision-making processes. I did not intend to refute this, and to argue that reason was more important to decision-making than emotions.

It just seemed appropriate to recall its importance so that, doing away with the dualism opposing an efficient reason to disturbing emotions, we would not clear the way for a new one, opposing influent emotions to an influenced reason. Dewey's hypotheses, as vague and intuitive as they are, seem to sketch a more vague but more global scheme of the reciprocal influence of emotions on reason, and vice versa.

The exception to his theory which Damasio evokes in *The Feeling of What Happens*, the pianist Maria João Pires, who can control by will whether she experiences the emotions that music arouses in her, evokes for me the possibility that we might be considering for now only a very slight portion of the possible interactions between reason, or consciousness, willpower, and emotions.

To come back to my remarks on Damasio's theory suggested by Dewey's writings, I do not know what Damasio would think of them. The theoretic starting point of my analysis, on the "not enough" anti-dualist

character of Damasio's theory can seem arbitrary. However, it was precisely the goal of this reflection, to try to show that Dewey's anti-dualism, though a theory, might well be a roundabout way to question reality without being influenced by dualisms handed down to us by culture. Even if we should hope that science will one day have exhausted the hypothesis "resources" of John Dewey's philosophy, I hope I suggested that his anti-dualism can still today inspire scientific research, and thus resolve, if only momentarily, the dualism which so frequently opposes scientific research to philosophical research.

To come back to my fear of seeing a new dualism replace an old one, I will end my discussion by noting that Dewey and Damasio agree in pointing to the dualism opposing mind and body as one of the major sources of (what Stephen Jay Gould calls) "our lamentable tendency to taxonomize complex situations as dichotomies of conflicting opposites" (2000). I think Dewey would have been delighted to hear Damasio correct Descartes' error: "We are, and then we think, and we think only inasmuch as we are, since thinking is indeed caused by the structures and operations of being". (1994)

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