

TOWARDS A THEORY OF INTEGRATED EMOTIONS: ANTONIO DAMASIO AND CONCEPTUAL BLENDING

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By merging in some crucial aspects, Damasio's somatic markers hypothesis, his theory of consciousness as feeling, and the network model for conceptual blending can contribute to a more integral view of emotion cutting across body, brain, mind and culture. Meaning construction is present throughout the neural representations of stimulus, body and self as described by Damasio. Fauconnier and Turner's model of network thinking eliminates the tension between juxtaposing the components of emotion and blending them into an integrated experience. Emotionally competent objects acquire affective meaning within a conceptual integration network. Somatic markers constitute a crucial input to the blending process. Selective perception of bodily feelings, just like external perception and proprioception, is part of the conceptual process and anchors conceptual blends, facilitating and driving the construction of meaning. Emotion and cognition, feelings and conceptual integration, are inextricably intertwined. Meaning is naturally affective.

I. DAMASIO'S THEORY OF EMOTION: 'SHIFTING GEARS' FROM NEUROSCIENCE TO MEANING

Emotion interests many different disciplines, although none of them will claim it as its own or give it a central role. This interdisciplinary panorama is somewhat deceiving: in most cases, each of the scientific areas involved (psychology, philosophy, anthropology, linguistics, literary

studies, history, cognitive science, neuroscience, etc.) simply adopts a self-contained approach, dealing with the aspects of emotion that are most related to the main concerns of the discipline. Many bridges between them are still needed if we are to turn multidisciplinary into interdisciplinarity.

Some of the most ambitious theories of emotion in recent times come from affective neuroscience. They intend to provide comprehensive accounts of the phenomenon by exploring the implications of brain research for the general study of emotion. This field, with Charles Darwin and William James as points of departure, has experienced an enormous development in the last two decades, thanks to the work of pioneers like Joseph LeDoux, Jaak Panksepp and Antonio Damasio.¹

Damasio's blend of neuroscience and philosophy has had a tremendous impact in the neuroscience of emotions and consciousness, as well as outside the field. His account of mind and affect rejects Descartes' dualism and connects the neural correlates of emotion with their social dimension. Damasio and his collaborators have shown that crucial aspects of social cognition, including reasoning, planning, and decision making, are inextricably linked to emotion. At the same time, Damasio acknowledges that there is a fundamental gap in scientific knowledge when it comes to explaining how neural patterns become mental images.² He also recognises the crucial role of culture and cognition in shaping emotional experience.³ However, he has not accompanied his neuroscientific research with an articulated theory of meaning. Lacking an adequate narrative of how affective meaning is created in a cultural context

¹ J. E. LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life* (New York: Simon & Schuster, 1996); J. Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions* (New York: Oxford University Press, 1998); A. Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York: Harper Perennial, 1995); A. Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York, San Diego & London: Harcourt Brace, 1999); A. Damasio, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (Orlando: Harcourt, 2003).

² Damasio, *Looking for Spinoza*, p. 198.

³ Damasio, *Descartes' Error*, p. 126; *Looking for Spinoza*, p. 53.

constitutes a major obstacle for the extension of emotion research across disciplines. The arguments from neuroscience, in special, are often rejected as reductive by researchers in the Humanities and the Social Sciences.⁴ On the other hand, disciplines like rhetoric or philosophy, which have a long tradition of emotion research, have not still provided an interdisciplinary theory analogous to Damasio's.⁵ Damasio has identified a sound biological basis for the relation between emotion and thought, and exposed the intimate connection between feelings and the cognitive abilities that allow us to make sense of our existence, consciousness included. No theory of meaning should neglect such findings.

To be able to 'shift gears' in the transit from affective neuroscience to psychological, social and cultural accounts of the emotions (and vice versa), we need a comprehensive theory of affective meaning. Only then will we be able to reach an adequate overview of the integrated process that constitutes emotional experience. Research on conceptual integration can contribute to bridge the gap between affective neuroscience and meaning construction, at least in some crucial aspects like the interaction of the components of emotion, the assignment of emotional value to stimuli and mental imagery, and the role of body feelings in the enactment of mental simulations.

II. BLENDING THEORY

Conceptual Integration Theory, or Blending Theory, by Gilles Fauconnier and Mark Turner, provides a model of how meaning is constructed by selectively projecting materials from *mental*

⁴ See, for example, D. M. Gross, *The Secret History of Emotion: From Aristotle's Rhetoric to Modern Brain Science* (Chicago: University of Chicago Press, 2006), especially pp. 31-35.

⁵ The best work in this direction probably comes from cognitive science. The Communicative Theory of Emotions is a good example. See Keith Oatley and P. N. Johnson-laird, "Towards a Cognitive Theory of Emotions," *Cognition & Emotion* 1, no. 1 (1987): 29 – 50.

spaces, small conceptual packets built as thought and discourse unfold.⁶ These materials (cultural frames, embodied schemas, relations, contextual knowledge) are integrated into new wholes or *blends*, which retain the links to their inputs, thus forming a network of mappings and projections. There are different levels of complexity in blending, depending on the number of inputs in a given network, and on how they differ in structure. Conceptual blending can range from the simplest meaning construction, like assigning names to roles in a typical situation ('Paul is the father of Sally'), to the blending of non-matching structures producing meaningful conceptual clashes, as in some poetic metaphors ('death is the mother of beauty'). Conceptual integration of the highest complexity, also called double-scope blending, is a defining human capacity underlying all major operations and products of meaning construction: metaphor, analogy, language, ritual, religion, art, etc.

Conceptual integration pursues some definite cognitive goals: compress what is diffuse, obtain global insight, strengthen vital relations, come up with a story, and go from many to one. These goals are geared towards achieving meaningful mental simulations that provide representations at human scale, thus becoming easily manipulable within a network of mental spaces held in short-term memory. Generic integration patterns also become entrenched in long-term memory. Conceptual integration networks are formed by activating a number of mental spaces that are connected by a shared generic structure, as well as by matching and counterpart connections. These mental spaces serve as inputs to a blended space, where the integrated simulation is run. In the blend, emergent meaning not present in the inputs is achieved by means of composition, completion and elaboration.

⁶ For mental space theory see G. Fauconnier, *Mental Spaces: Aspects of Meaning Construction in Natural Language* (Cambridge: Cambridge University Press, 1985) and G. Fauconnier, *Mappings in Thought and Language* (Cambridge: Cambridge University Press, 1997). For conceptual blending see G. Fauconnier & M. Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (New York: Basic Books, 2002).

Compressing, enhancing and manipulating vital relations have been identified by Blending Theory as crucial procedures of meaning construction. Imagine an advertisement with three children, dressed up as surgeons, standing by an operating table, and the legend: ‘they will be performing your bypass’. You are prompted to compress all the years of study that separate the children from becoming doctors into a single moment, while keeping active the input space in which they are still children. The incongruence is meaningful and suggests that today’s children might not become good doctors if they do not have a high quality education *from now*—that is the rhetorical purpose of the advertisement.⁷ Since conceptual blending operates mainly in backstage cognition, all the appropriate mappings and integrations can be performed in a fraction of a second, thus giving us the impression that self-contained thoughts miraculously pop out into consciousness.

The main implications of Blending Theory for philosophy of mind and emotion are, in my view, the following:

- (1) The blending model is a model for *network thinking*. Thinking in networks of conceptual mappings is the standard procedure of meaning construction.
- (2) By selective projection of some of their elements, these networks produce integrated mental simulations, which typically compress vital relations across the network and come up with novel, emergent structure (like children operating instead of surgeons, which causes fear, concern, etc.).
- (3) Both the network of mappings and the integrated simulations are held active as the thought process unfolds.

⁷ Fauconnier & Turner, *The Way We Think*, 65-67.

- (4) Crucially, meaning emerges as a result from the whole network. It does not reside in the blend alone, neither in the inputs and the mappings between them before the integration is performed.
- (5) Most of the process is unconscious or only potentially available to consciousness. Thus blending is mainly not available to introspection. Instead, it hides the intricacies of the process from consciousness, and produces full-fledged narratives that give us the impression of having effortlessly ‘stepped into the light’, to use one of Damasio’s expressions for the self.
- (6) Cultural frames and conceptual structure are not the only inputs to conceptual integration. Perceptual information also constitutes an input to blending, since selective perception is also a conceptual process. Thus, conceptual integration networks are often anchored by sensory information.

In the following sections I propose how the blending model can complement Damasio’s theory of the emotions in crucial aspects: network thinking and integrated experience, emotion as the construction of affective meaning, and the anchoring of reasoning in bodily feelings.

III. JUXTAPOSITION OR INTEGRATION?

Damasio’s theory of emotion is based on the correlation of three main processes: the perception of an adequate stimulus (also called *emotionally competent object*),⁸ the neural representation of the body, and the neural representation of the self (or consciousness). In Damasio’s theory, these components are not blended, but juxtaposed, although the whole experience is ‘integrated’. This poses fundamental problems. In the first place, enormous feats of

⁸ Damasio, *Looking for Spinoza*, p. 91.

integration need to be performed in order to come up with a perceived or mentally simulated scene, a representation of the body, or the self. Take the self, for example. Damasio himself has given us a detailed account of the complex neural mechanisms underlying consciousness, and of how they are intertwined with emotion.⁹ His notions of *extended consciousness* and *autobiographical self* rely on the recruitment of vast amounts of knowledge from memory to build a coherent, integrated narrative. This narrative is assembled with no apparent effort, but that is deceitful: situating the autobiographical self or remembering a past self in a past situation require complex imaginative work and sophisticated social cognition.¹⁰

Keeping the components of emotional experience completely apart also seems problematic. There is a latent contradiction in claiming that our unitary feelings result from the mere addition of separate elements. This conceptual tension can be observed in the following passage: “It might be appropriate to use the term superposition for what seems to happen to the images of body proper and ‘something else’ in our integrated experience. The idea that the ‘qualified’ (a face) and the ‘qualifier’ (the juxtaposed body state) are combined but not blended helps explain why it is possible to feel depressed even as one thinks about people or situations that in no way signify sadness or loss, or feel cheerful for no immediately explainable reason.”¹¹ ‘Combined but not blended’ seems hardly compatible with ‘our integrated experience’. One of the most impressive assets of Damasio’s theory is its identification of a variety of brain and mind processes that are indispensable for humans to have feelings. Throughout his works, Damasio makes it clear that none of the components in isolation can produce affective meaning, or

⁹ See especially *The Feeling of What Happens*.

¹⁰ Any narrative cognition involving a former self as agent—including narratives that extend to the present—blends present and former self, and comes up with a former self capable of full cognition and emotion. Producing a memory of ourselves or situating our autobiographical self requires the integration of conceptual materials differing in structure, that is, double-scope blending. See M. Turner, ‘The Mind is an Autocatalytic Vortex’, in J. Schlaeger, (ed), *The Literary Mind, REAL: Yearbook of Research in English and American Literature*, 24 (Tübingen, 2008).

¹¹ Damasio, *Descartes' Error*, p. 146 .

conscious feeling. Full-fledged emotional experience emerges as a result of their coordination. To use a metaphor that Damasio himself might like, emotion (conscious feeling) is the music played by an orchestra including the neural representations of object, body and self—as well as culture and other types of knowledge. As an organic response, that music is distinct from the players and instruments. The process results in an ‘integrated experience’, presenting features that are not to be found in its components.

Superimposition or juxtaposition are always insufficient to explain emergence. Damasio’s *qualified* and *qualifier* need to meet in an integrated mental simulation, so that they are experienced as part of the same narrative. *I (the self) feel this feeling (the body) at perceiving this object or forming this mental image*. Conscious feeling is this full, integrated experience, plus the perception of ‘the modified style and efficiency of the thought process’, as that process unfolds.¹² This new mental image has rich emergent structure that is not present in any of the inputs. Neither causal relations nor event structure are to be found in any of the separate representations (object, body, self), but rather in the integrated affective meaning, that is, *in the blend*.

However, as Damasio points out, the inputs also need to remain independent to a great extent. Human beings are perfectly capable of separating them in the emotional experience—the self, the emotionally competent object, and the feeling are not usually confused—and also of coming up with feelings that do not match the thoughts or situation being experienced. The passage quoted above reflects that tension between blending and juxtaposition. It might seem that you cannot have both integration and distinctly separated components at the same time. But, in fact, you can. That is what conceptual integration is all about. That is, to a great extent, what makes the human mind human. Research in conceptual integration has repeatedly shown that thought

¹² Ibid., 148.

and discourse proceed in networks of concepts or mental spaces. While performing an integration that produces emergent structure, we hold the whole network of conceptual mappings together. Meaning does not result from the integration only, but from the whole network. Running a complex integrated simulation and simultaneously keeping its inputs separate is, in fact, the standard procedure.

The following example seems especially appropriate to illustrate this *affective network thinking*: “A man is participating in a wedding. (...) But while he is fulfilling his role in the wedding story, he is remembering a different story, which took place a week before in Cabo San Lucas, in which he and his girlfriend, who is not present at the wedding, went diving in the hopes of retrieving sunken treasure. Why, cognitively, should he be able to inhabit, mentally, these two stories at the same time? There are rich possibilities for confusion, but in all the central ways, he remains unconfused. He does not mistake the bride for his girlfriend, for the treasure, for the shark, or for himself. He does not swim down the aisle, even as, in the other story, he is swimming. He speaks normally even as, in the other story, he is under water. (...) we connect two stories that should be kept absolutely apart, and we then blend them to make a third story. The man at the wedding, for example, can make analogical connections between his girlfriend and the bride and between himself and the groom, and blend these counterparts into a daydream in which it is he and his girlfriend who are being married at this particular ceremony. This blended story is manifestly false, and he should not make the mistake, as he obediently discharges his duties at the real wedding, of thinking that he is in the process of marrying his girlfriend. (...) Running two stories mentally, when we should be absorbed by only one, and blending them when they should be kept apart, is at the root of what makes us human.”¹³

¹³ M. Turner, ‘Double-scope stories’, in D. Herman, ed., *Narrative Theory and the Cognitive Sciences* (Stanford: Center for the Study of Language and Information, 2003), pp. 117-142.

Two of the governing principles of conceptual integration are especially relevant here: *web* and *unpacking*. According to the web principle, running the simulation in the blend (marrying your girlfriend at other people's wedding) must maintain the appropriate connections to the inputs. The wedding and diving stories remain distinct while providing elements for the blended story. According to the unpacking principle, the blend by itself should prompt for the reconstruction of the entire network, even if the latter is not fully available from context. No matter how vividly the blended story is experienced, the present wedding and recalled diving inputs are still retrievable: the network is not lost. Of course, these principles compete with others, for example, *integration*, which aims at achieving a blended simulation that is as integrated and autonomous as possible.

The process is dynamic and, if one of the principles is substantially favoured over the others, mistaken representations may arise. If *integration* makes him be too imbued in his fantasy, the guest at the wedding might answer 'Yes, I do!' when the actual groom is questioned, and make a fool of himself. But those mistakes are not the norm and, when they happen, they tend to be meaningful, often in emotional terms. After they take place, the conceptual network is balanced again or abandoned for some other train of thought. The insistence on inappropriate mappings producing web and unpacking failures might be the sign of mental illness.¹⁴ Especially, the incapacity to retrieve the network can make you the prisoner of the blend, a victim of the powerful affective meanings and conceptual clashes taking place in the integrated simulation. Knowing how each element got to the blend, and the relations between them, is the difference between imagination and delusion. Of course, this knowledge only needs to be partially conscious; otherwise the processing time would be too long. The wedding guest, in a normal

¹⁴ For a study of delusions and chronic interpersonal difficulties based on the network model for conceptual integration, see M. Kiang, 'Conceptual blending theory and psychiatry', *Cognitive Science Online* 3, 1 (2005).

state of mind, only needs a fraction of a second to realise that his utterance is out of context. He does not have to undergo minutes of careful reflection to start feeling shame, or to realize that he wishes to marry his girlfriend. Such emotions and insights emerge as flashes from the networks built in backstage cognition.

Damasio's view of human thought as imagistic and embodied is generally in agreement with the research on conceptual integration and grounded cognition.¹⁵ This includes both his general overview of the mind as well as analyses of different cognitive processes, especially his identification of symbols of somatic states, or 'as-if mechanisms', as embodied representations shaped by development and culture.¹⁶ This view is in many ways parallel to the accounts of how perception enters the conceptual integration cycle, as provided by research on perceptual meaning analysis, perceptual symbol systems, and material anchors for conceptual blending.¹⁷

The next sections deal with these points of convergence.

¹⁵ This term seems preferable to 'embodied cognition'. See L. W. Barsalou, 'Grounded Cognition', *Annual Review of Psychology*, 59 (2008), pp. 617-645. According to this approach, the brain does not contain amodal symbols, and cognition is grounded in various ways: simulations, situated action and body states.

¹⁶ Damasio, *Descartes' Error*, p. 184. In a later work, Damasio depicts as-if body mechanisms and emotions as hallucinations taking place in the body's interior sensory system: "Visual hallucinations are highly disruptive and so are auditory hallucinations. There is no benefit to them and they are not enjoyed as entertainment by the neurologic and psychiatric patients who have to suffer them. The same applies to the hallucinated smells or tastes that epileptic patients may experience. Yet body-state hallucinations, outside of the few psychopathological conditions I outlined, are valuable resources for the normal mind" (*Looking for Spinoza*, pp. 118-119). Perhaps 'hallucinations' is not the best term. As we have seen, there is no delusion nor, of course, hallucination here, as long as the inputs in the network and the right mappings between them remain distinct from the integrated simulation, that is, as long as the conceptual blend complies with the *web* and *unpacking* principles. That is why such mental simulations are 'valuable resources for the normal mind'. This is fundamentally different from what constitutes hallucinations. If those principles are persistently violated, the retrieval of the inputs may end up being seriously hampered, and this might result in sustained delusion. Hallucination will also require, as Damasio says, interference with other sensory systems.

¹⁷ Perceptual meaning analysis is a redescription of spatial perception into schematic structures, postulated as the cognitive operation that gets the conceptual system started in early development: J. M. Mandler, *The Foundations of Mind: Origins of Conceptual Thought* (New York: Oxford University Press, 2004) and J. M. Mandler, 'The spatial foundations of the conceptual system', *Language and Cognition* 2, 1 (2010), pp. 21-44. Perceptual symbol systems are unconscious neural representations that underlie perception and constitute the basis of mental simulations in meaning construction: L. W. Barsalou, 'Perceptual symbol systems', *Behavioral and Brain Sciences* 22, 4 (1999), pp. 577-660. Material patterns may serve as proxies for conceptual patterns and thus become inputs in conceptual integration networks, if selective perception is viewed as a conceptual process: E. Hutchins, 'Material anchors for conceptual blends', *Journal of Pragmatics* 37, 10 (2005), pp. 1555-1577.

These cognitive approaches have mainly focused on external perception. The neuroscientific research on emotions and somatic markers can add a crucial dimension by directing the attention towards bodily feelings. For all these theories the model of network thinking is necessary, if they are to provide an account of how we juxtapose external perception, mental simulation, bodily feelings and self, while simultaneously projecting selected elements from them into an integrated, meaningful experience. Moreover, Damasio suggested quite early that our strong sense of integrated thought might result from a ‘trick of timing’, produced by the concerted action of large-scale systems synchronizing sets of neural activity in separate brain regions.¹⁸ This coordination of independent but connected inputs to produce an integrated outcome is also parallel to Fauconnier & Turner’s model of network thinking.

IV. INTEGRATION RIGHT FROM THE START AND ALL THE WAY THROUGH

In his analysis of the neural process that culminates in our integrated emotional experience, Damasio differentiates between *emotion*, *feeling*, and *conscious feeling*.¹⁹ He also divides the process into five steps:²⁰

- 1) Engagement of the organism by an emotionally competent object.
- 2) Activation of emotion-induction neural sites by the processing of the object’s image.
- 3) Unleashing of the body and brain responses that constitute emotion.
- 4) Emergence of feelings from the representation of changes in body state, via body sensations, simulation, or both.

¹⁸ Damasio, *Descartes' error*, p. 95. For recent related research see, for example, E. Pöppel, ‘Pre-semantically defined temporal windows for cognitive processing’, *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, 1525 (2009), pp. 1887-1896.

¹⁹ Damasio, *Descartes' error*, p. 37, *et passim*.

²⁰ Damasio, *The Feeling of What Happens*, pp. 283-284.

- 5) Changes in the proto-self (consciousness of the 'here and now') and organization of a narrative relating the emotion object and the proto-self.

In this terminology, *emotion* refers to the complex collection of chemical and neural responses that constitutes the body's homeostatic adjustment. *Feeling* is the representation of those responses in the brain. Both emotion and feeling (steps 1-4) are unconscious. Consciousness itself is, according to Damasio, the feeling of a feeling. Conscious emotion, that is, fully human emotional experience, only arises when the body feelings provoked by emotional responses are both felt and known. It is important here not to confuse consciousness, cognition, and meaning construction. The process of meaning construction is only culminated when step 5 is reached. That does not mean that the unconscious process (1-4) is not cognitive: consciousness is only 'the tip of the iceberg' of cognition. Damasio's Somatic Marker Hypothesis proposes that cognition and emotion are inextricably intertwined, especially in what affects planning and decision making. He also suggests that the expression of the bodily response precedes feeling, and that becoming conscious of that feeling is a further step in the process, different from simply having the feeling. Again, this implies that full-fledged affective meaning is only attained when all the elements in the process are integrated into a narrative that combines object, body and self without confusing them. As we have seen, all this is quite compatible with conceptual integration theory.

However, the fact that the complete affective meaning is the result of the network integrating all these components does not exclude meaning construction along the way. Meaning is present right from the very first step of the process. The necessity for conceptual integration seems perhaps less clear for step 1 than for steps 4 and 5. In step 4 there is no relevant distinction between 'body loop' or 'as-if body loop'. No matter whether sensory perception is directly

involved or not, the feeling is represented. This means that, with or without perception, a simulation is run, so that first-order neural maps reflect the changes, regardless of the way those changes were achieved.²¹ The simulation is on its way to becoming completely integrated, and conceptual integration of the body response and the contents of the simulation (including the object) is already in progress. In step 5 the process is culminated, affecting consciousness, and thus modifying the self, for which, as we have seen, conceptual integration is required. However, with or without consciousness, meaning construction is at work in step 1. Otherwise, how can anything become an emotionally competent object at all?

The term *object* is perhaps not the best. Of course, we can be referring to an emotionally loaded object, like cupid's arrow or the wedding dress of your beloved grandmother. A researcher in the Ekman and Damasio tradition will easily think of a face, although the face is a very particular type of object, and it is not easy to separate it from the person. But the object can also be a sign, a text, or a simulated narrative, like the blended story built by the wedding guest in Turner's example. In fact, mental simulations like the one described by Turner might be the most frequent 'object'. Whatever we choose, culture, high-order cognition and complex meaning construction are necessary, in all cases.²² No matter what we think the object is, it is quite evident that it is 'emotionally competent' because it has already entered the meaning construction cycle, and it has already been incorporated into a mental space in a conceptual integration network. Something meaningless can never be an emotional object: it cannot even be 'something', in the first place.

²¹ See note 16.

²² Damasio, *The Feeling of What Happens*, p. 57. Culture is not to be reduced to an independent factor, but rather a continuous interaction with feedback effects. See K. Voegeley & A. Roepstorff, 'Contextualising culture and social cognition', *Trends in Cognitive Sciences* 13, 12 (2009), pp. 511-516.

It is a bit surprising that a leading researcher in the neuroscience of consciousness, and one of the most influential thinkers on the self and emotions, does not devote much attention to the imaginative processes by means of which we build affective meaning, thus assigning emotional value to ‘objects’ that do not have that value intrinsically.²³ We also create our extended self by means of such processes: we recall past selves, interact with them, integrate them in complex narratives, blend them with present and future selves, etc. Just like emotion is crucial to reasoning and planning, it seems evident that conceptual integration is central to emotion. The connection between both could be exposed in detail by such an analysis.

As for the other phases, step 2 requires the processing of the object’s image, and that seems to require conceptual integration again. Step 3, the chemical and neural response, is thus directly motivated by the process of meaning construction. All this does not contradict the somatic marker hypothesis; neither does it attack Damasio’s division of the emotional experience into steps and phases, which seems necessary for the analysis, although not everybody has to agree with his specific partition and terminology. What I am simply pointing out is that, since Damasio himself has shown that cognition and emotion are inextricably intertwined, something should be done about it. The network model for conceptual blending or, if that model can be improved or superseded, the best available theory for imaginative integration and meaning construction, is a necessary bridge between the brain and body processes described by Damasio and the fully creative, social and emotional human mind. Only through an adequate model of meaning as emergent from network thinking can emotional experience be articulated beyond the neural level.

²³ This has been written just before the publication of Damasio’s forthcoming book, *Self Comes to Mind: Constructing the Conscious Brain*, (Pantheon, 2010). My assertion only applies to his works available so far.

V. SOMATIC MARKERS AS INPUTS TO CONCEPTUAL BLENDING

We have seen that affective meaning arises from a cycle involving somatic markers and integrated mental simulations. Conceptual integration permeates the whole cycle. There is no cognitive appraisal, no thinking, and no feeling without meaning construction. However, it is also true that emotion permeates imagination and reasoning. Affective neuroscience shows that no theory of meaning construction should neglect emotion.²⁴ Non-affective meaning does not seem to be the norm for human beings.²⁵ This intimate relationship between emotion and meaning should receive much more attention from researchers in conceptual integration. As we have seen, Damasio's model can be expanded by incorporating the higher-order cognitive operation of blending. On the other hand, Damasio and his collaborators have repeatedly shown that emotion lies at the basis of reasoning, planning and social cognition. This demands an account of how somatic markers enter the meaning construction process. So far, research on conceptual blending has mainly focused on the 'cold mappings' in an integration network, for example, matching you and the groom, your girlfriend and the bride, then and now, etc. The integrated simulations are also described mainly in cold terms, with little reference to the affective meaning. However, affect constitutes both the motor of the process (the ultimate motivation for the mappings) and the core of the meaning: blending is, more often than not, about feeling something as much as about conceptualizing something. In fact, according to Damasio, if deprived from feeling, thinking is dramatically affected, up to the point of becoming severely impaired.

²⁴ For an overview, see T. Dalgleish, B. D. Dunn, & D. Mobbs, 'Affective Neuroscience: Past, Present, and Future', *Emotion Review* 1, 4 (2009), pp. 355-368. The authors point at the interaction between affective neuroscience and the social sciences, as well as the search for a shared psychological model, as major future directions of the discipline.

²⁵ Damasio, *The Feeling of What Happens*, p. 58; *Looking for Spinoza*, p. 214.

At the present stage of development in blending theory, incorporating body responses to the network model is by no means a minor challenge: cold mappings have been privileged over hot mappings so far. Nevertheless, some aspects of conceptual integration research offer a great potential for developing a theory of affective network thinking. For instance, what we could call the semiotics of blending, that is, the application of the model to rhetoric and literature, regularly deals with the manipulation of affective meaning.²⁶ Fictions, narratives and figurative thought are essential to everyday mental life (remember the wedding example again), but perhaps they are most clearly exposed by verbal art, along with its combinations with other artistic modalities. One way to study this phenomenon is to examine the relations between rhetoric goals, governing principles and emotion in more detail. While all governing principles serve the objectives of blending, some of them seem particularly linked to emotion in relation with communicative goals and intentionality. For example, the principles for the *maximisation* and *intensification* of vital relations (cause-effect, identity, similarity, etc.), including the *compression* of one vital relation into another (e.g. change into disanalogy: the autobiographical self into different selves), as well as the *relevance* principle, all seem to a great extent oriented towards affective meaning.²⁷ It is also possible that other principles specifically related to emotion will be discovered.

That said, while research in conceptual integration is extremely relevant to the study of emotion, none of it has attempted to provide a model for how feelings shape mental spaces and enter the blending process. I would like to suggest that Edwin Hutchins' work on conceptual

²⁶ The bibliography in this field is quite rich and keeps growing fast. Just a few references that could be used as an introduction to the topic: M. Turner, *The Literary Mind: The Origins of Thought and Language* (Oxford: Oxford University Press, 1996); L. Brandt & P. A. Brandt, 'Cognitive poetics and imagery', *European Journal of English Studies* 9, 2 (2005), pp. 117-130; B. Dancygier, 'What can blending do for you?', *Language and Literature* 15, 1 (2006), pp. 5-15 (and the whole *L&L* issue); B. Dancygier, *The Language of Stories* (forthcoming, Cambridge University Press, 2011).

²⁷ For an exposition of those principles see Fauconnier & Turner, *The Way We Think*, pp. 324-334.

integration and perception offers a good starting point. As I have mentioned, Hutchins has developed the concept of *material anchors* for conceptual blends.²⁸ He explains how conceptual structure is opportunistically mapped onto material patterns (like a clock or a queue) so that conceptual stability is more easily achieved. Material anchors are not mere signs, for signs only capture a minimal aspect of a conceptual network, which can then be reconstructed from that prompt. Material anchors are direct inputs to the conceptualization; such is the relationship that holds between, for example, a clock, or a similar mechanism, and our conceptualization of time, or between a queue and our conception of certain sequential orders in certain cultural situations. The structure of the anchors is essential to the structure of the meaning. Both perceptual and conceptual knowledge are indispensable to identify an artefact as a clock or a linear arrangement as a queue.

In Hutchins' model, selective perception of material structure is already a conceptual process. Material anchors are mental spaces in conceptual integration networks. The perception-cognition process links material and conceptual structure to provide conceptual stability to a blend. The more stable conceptual structure is, the more easily it can be *enacted*, that is, the integrated simulation can be run more efficiently and the network can be realised with less cognitive effort.²⁹ Enacted multimodal representations are more easily remembered and reproduced than single-mode representations with, for example, only conceptual structure. Material anchors involving external perception are not the only way of embedding mental simulations. Hutchins

²⁸ Hutchins, 'Material anchors for conceptual blends'. See note 17.

²⁹ Enaction is the creation of the organism's own experience and knowledge through action and engagement with the environment. The seminal works on this idea are J. S. Bruner, *Toward a theory of instruction* (Cambridge, Mass: Harvard University Press, 1974) and H. R. Maturana & F. Varela, *Tree of Knowledge*, (Boston & London: Shambhala, 1987). For the relationship between enactment and memory see R. W. Gibbs, *Embodiment and cognitive science* (Cambridge: Cambridge University Press, 2006), pp. 149-151.

also proposes what he calls ‘somatic anchors for material blends’.³⁰ Somatic anchors enact conceptual representations in bodily processes. For example, navigators working on a chart conceptualize movement away from the body as northward, and movement toward the body as southward. In this way, they are using their own bodies and motion as material anchors for integrated mental representations.

Hutchins’ model deals with perception of external stimuli and proprioception, but it seems expandable to internal perception as well. Bodily feelings, that is, representations of emotional responses, can anchor conceptual integration in very much the same way. If we follow Hutchins and grant conceptual status to selective perception, somatic markers should enter the blending process just like perceived material patterns or body movement. Moreover, using external perceptions or the representation of the body as anchors is optional to a great extent, while, as Damasio has shown, the feelings of what goes on inside your body, especially emotional responses, are always there and cannot be avoided—it is only their expression that can be controlled. Emotions inevitably reach consciousness and affect the self and the construction of meaning. Thus feelings presumably embed conceptual blends more easily and frequently than any other sensory information. At the same time, emotional responses, being much less structured than the other perceptions, necessarily receive more structure from conceptual integration.

Such a model from conceptual integration theory could provide a cognitive account of the relationship between emotion and reasoning that Damasio has explained in neural terms, including the spectacular cases of emotional impairment.³¹ The patients with severe brain damage in key areas for emotion also failed to perform well in tasks involving risk evaluation,

³⁰ E. Hutchins, ‘Enaction, imagination, and insight’, in J. Stewart, O. Gapenne & E. A. Di Paolo, (eds), *Enaction: Toward a New Paradigm for Cognitive Science* (forthcoming, The MIT Press, 2011).

³¹ Most impressively described in *Descartes' error*.

planning, decision making, etc. They were also unable to show empathy and to act accordingly. Their theory of mind was deficient too. As a result, their social cognition failed: they could not lead a normal life within their communities. Prior to suffering the damage, they had all been socially competent. After the brain damage, their higher-order cognition seemed normal: they were able to perform complex reasoning, and their language and memory were fine. In sum, they were perfectly capable of double-scope blending. However, it seems that they were only capable of building the conceptual integration networks that do not require *affective anchoring*. In fact, they could even remember and partially re-enact some of the reasoning that led to an adequate affective meaning. Some of them, when presented with explicit emotional stimuli, would realise that something was lacking in their mental state.³² They were able to perform the cold mappings in the network, but not to connect the mental simulation to any feelings from their body, because they did not feel them or because they were not conscious of feeling them.

Not being able to anchor their representations adequately, key operations facilitated by network thinking were deficiently performed: they could not project well into the future, they could not finish what they had planned, they could not anticipate what others were thinking or expecting, they could not cooperate adequately, they could not situate themselves within a community. Just place a map with the north side nearest to your body. If you start gesturing, probably it will not be long until you make some basic mistakes of orientation. Now imagine working with a chart without any somatic anchor at all, that is, without ever knowing where your body is with respect to the chart. Damasio's patients were able to initiate the right integration networks for some affective meanings but, lacking the crucial aid of the right anchors, they could not recruit the appropriate feelings for their mental simulations. The operations of blending were interrupted or inhibited.

³² *Descartes' Error*, 211.

Since crucial mental spaces are missing, the whole process is compromised, and this results in networks that present structural handicaps. It is similar to conceptualizing time without being able to picture a clock, a calendar, or any other material or cultural device facilitating temporal measure. Or figuring out when your turn will be without being able to represent a queue and your place in it. Even if they look simple and straightforward, some conceptual blends cannot be fully performed without the adequate anchor. This happens because complex meaning construction requires some kind of performance of an embodied simulation, what Hutchins terms enaction.

VI. TOWARDS A THEORY OF INTEGRATED EMOTIONS

Emotions are integrated. Affective meaning emerges from complex networks of mental spaces informed by body, self and culture. Antonio Damasio has shown that the process needs coordinated neural activity involving mental imagery and processing of the appropriate stimuli, conscious perception of feelings from the body, and modifications in the self. Gilles Fauconnier and Mark Turner have provided us with a model in which meaning results from a dynamic process of conceptual integration, which includes the concerted enaction of a structured narrative and a network of mappings from both the conceptual system and perceptual information. This essay has tried to show how these approaches can complement each other to reach a better understanding of emotional experience. By merging in some crucial aspects, the somatic markers hypothesis, the theory of consciousness as feeling, and the network model for conceptual blending can contribute to a more integral view of emotion cutting across body, brain, mind and culture.

Meaning construction is present throughout the neural representations of stimulus, body and self as described by Damasio. Fauconnier and Turner's model of network thinking eliminates the tension between juxtaposing the components of emotion and blending them into an integrated experience. The web and unpacking principles of conceptual integration keep the mental spaces both separate and connected while the blended simulation is running. There is no need to choose between juxtaposition and integration to account for the concerted action of the systems involved in emotion. The emotion inducers, what Damasio calls emotionally competent objects, acquire affective meaning within a conceptual integration network. Somatic markers constitute a crucial input to the blending process. Selective perception of bodily feelings, just like external perception and proprioception, is part of the conceptual process and anchors conceptual blends, facilitating and driving the construction of meaning. Emotion and cognition, feelings and conceptual integration, are inextricably intertwined. Meaning is naturally affective.

From Aristotle, cognitive and social theories of the emotions have been making similar claims. Emotion is meaning and arises from the coordinated interaction of multiple cognitive and sensory inputs. This view of the way we feel was well articulated by George Mandler: 'In the emotional situation I have postulated two major sources of input: cognitive evaluations and arousal. Since, in the context of our present discussion, these are necessarily contemporaneous, the meaning of the situation, or its emotional significance, will be the total structure or relationship of these various inputs and their mental consequences'.³³ Theories of meaning and network thinking like the one offered by the blending model constitute an opportunity to bridge the gap between biology and culture. They can help us 'shift gears' in the transition from affective neuroscience to the study of culturally situated emotions. Neuroscientific research provides a crucial empirical background, but not the only one. In order to be useful beyond the

³³ G. Mandler, *Mind and Emotion* (New York: John Wiley & Sons, 1975), p. 73.

brain level, its findings need to be combined with research on cognition and culture, and integrated into a theory of meaning.

Mental imagery results from the activity of intricate, interconnected brain structures shared by reasoning and feeling.³⁴ No theory of meaning should neglect this finding. It suggests, for instance, that the neural correlates of conceptual integration are likely to be intimately linked to those of emotion. So far, affect has not played a major role in embodied approaches to cognition, representation, or language. Perhaps integrated views like the one I am suggesting can contribute a step in that direction. Even if the blending model turned out to be insufficient for this enterprise, the idea that we need one common account of affective meaning is in itself a necessary step. Truly interdisciplinarity in emotion research can only arise if the disciplines are connected by shared models. We will be able to build such models if we approach emotion as an integrated process of meaning construction.

³⁴ Damasio, *Descartes' Error*, p. 93.