Biology's Gift: Interrogating the Turn to Affect

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Abstract This article investigates how the turn to affect within the humanities and social sciences re-imagines the relationship between cultural theory and science. We focus on how the writings of two neuroscientists (Antonio Damasio and Joseph LeDoux) and one developmental psychologist (Daniel Stern) are used in order to ground certain claims about affect within cultural theory. We examine the motifs at play in cultural theories of affect, the models of (neuro)biology with which they work, and some fascinating missteps characterizing the taking up of scientific literature. While neuroscience frames the affective as part of a system of regulation that makes both self and social coherence possible, in cultural theory's narratives, by contrast, affectivity becomes a placeholder for the inherent dynamism and mutability of matter. The article interrogates the consequences of cultural theory's strange borrowings from neuroscience and developmental psychology in their institution of a model of subjectivity preoccupied with a lived present in excess of the hold of habit and embodied history.

Keywords affect, biology, cultural theory, interdisciplinarity, neuroscience

Good Theory

'Here are a few things theory knows today' – so began Eve Sedgwick and Adam Frank's introduction to their collection of writings on affect by the psychologist Silvan Tomkins (Sedgwick and Frank, 1995: 1). 'Today' denoted the mid 1990s, and Sedgwick and Frank were keen to announce, in order then to challenge, some

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of the assumptions with which 'theory'[1] operated when sketching the relationship between subjectivity, culture and societal change. Their list comprised the following:

- The distance of any such account from a biological basis is assumed to correlate near-precisely with its potential for doing justice to difference (individual, historical and cross-cultural), to contingency, to performative force and to the possibility of change.
- Human language is assumed to offer the most productive, if not the only possible, models for understanding representation.
- The bipolar, transitive relations of subject to object, self to other, and active to passive, and the physical sense (sight) understood to correspond most closely to these relations, are dominant organizing tropes to the extent that their dismantling as such is framed as both an urgent and an interminable task . . .
- Correspondingly, the structuralist reliance on symbolization through binary pairings of elements . . . has not only survived the structuralist moment but, if anything, been propagated even more broadly through . . . critique that reproduces and popularizes the *structure*, even as it may complicate an understanding of the *workings*, of the binarisms mentioned above . . . (Sedgwick and Frank, 1995: 1–2)

Sedgwick and Frank's list highlighted some of the reigning orthodoxies in the humanities and certain arenas within the social sciences in the mid 1990s: the ousting of biology, the prioritization of language and symbolization for interpretation, and the foregrounding of binary pairings (most centrally, that of nature/culture). Those orthodoxies were necessitated by and, in turn, gained energy from, one of the prime aims of 'theory' as the *lingua franca* of the humanities and of a good part of the social sciences: to provide a model for political and social transformation. Drawing close to biological explanations immediately ran the risk of landing one in the contaminated terrain of essentialism, and essentialism was posited as an enemy of accounts of cultural and political change. Of course, this list was itself schematic, compiled for the express purpose of being broken asunder by Sedgwick and Frank's attentiveness to psychologist Silvan Tomkins' work on affect.

Things have certainly changed since 1995. In the remapping of the conceptual terrain of theory in the last decade – a remapping which Sedgwick and Frank's own book heralded to a significant extent – the turn to affect and to an embracing of a particular kind of biology has been central.[2] At the heart of this article, then, lies an interrogation of how the inauguration of the affective turn has recalibrated the relationship between (cultural) theory and 'science'. We will be preoccupied

in particular with how and for what purposes the writings of a distinct set of scientists are drawn upon both in order to ground the *content* of theorists' claims (about what affect is and does, that is) and to reposition where theory sits in relation to the world with which it engages. We will demonstrate that the turn to affect in cultural theory has not only been accompanied by a dependency on particular citations from neuroscientific and developmental psychological literature, but that these citations are part of a strange and partial (mis)translation of complex scientific models into the epistemologically distinct space of the humanities and social sciences.

Through theory's turn to affect, each one of Sedgwick and Frank's characterizations of theory's assimilated axioms has been not simply displaced but, arguably, turned on its head. Below, for example, is part of another list, one produced by the cultural geographer Nigel Thrift almost a decade after Sedgwick and Frank's, with the aim of sketching where things stood in theory's corner at that moment. Among his seven principles of, to use his phrase, 'good theory', we find the following two:

1. Distance from biology is no longer seen as a prime marker of social and cultural theory. It has become increasingly evident that the biological constitution of being . . . has to be taken into account if performative force is ever to be understood, and in particular, the dynamics of birth (and creativity) rather than death.

. . . .

3. Human language is no longer assumed to offer the only meaningful model of communication . . . (Thrift, 2004: 59)

Thift's commentary mirrors that of Sedgwick and Frank's, in fact, to an extraordinary degree. The difference, of course, is that the guiding principles within the first list are explicitly rejected in the second – with the corollary assumption that 'good theory' in 2004 is a good deal better than the superseded theory of 1995. And at the heart of that 'good theory' lies a prioritization of the biological constitution of being, and of the centrality of affect to understandings of sociality. For the purposes of this article, we do not wish to investigate whether either description is an adequate representation of the projects that were, and are, being conducted, under the umbrella of theory, between the last decade of the 20th century and the first of the 21st. Rather, we shall assume that the dramatic shift in theory's moorings represented by the juxtaposition of Thrift's account to that of Sedgwick and Frank refers to a shift in what John Guillory (2002) – following Althusser – has dubbed the 'spontaneous philosophy' of an academic community. Spontaneous philosophy, on Guillory's account, represents what is generated as

a kind of complex and enabling 'common sense' within an academic community, both in the context of its everyday practice and during times of epistemological crisis (2002: 476). Guillory's use of the phrase was directed towards cultural criticism in the 1990s, an era that he – in a description comparable to Sedgwick and Frank's depiction of theory's 'heuristic habits and positing procedures' – characterized as one in which '[p]ostmodernist thought passed into U.S. literary and cultural criticism transformed into "theory," which by virtue of an alchemy of dissemination made very complex arguments available in the form of touchstone-like position statements' (Guillory, 2002: 477). (The most touchstonelike – and impoverished – position statement was undoubtedly that centring on the 'social construction' of whatever object or phenomenon was under analysis.) If, as Nigel Thrift's new principles of 'good theory' imply, the spontaneous philosophy of cultural theory has experienced something of a metamorphosis in the last few years, it is important to reflect upon how that metamorphosis has been effected. We consider, then, the current turn within theory from a concern with the social construction of identity categories to a reassertion of the 'biological constitution of being', which, because yoked to 'birth and creativity', is seen to provide a new kind of foundation for cultural theory. Our focus will be on the crucial place that affect holds in both embodying and instantiating those shifts in theory's moorings. By using the loose monikers 'affect theory' and 'affect theorist', then, we want specifically to connote conceptualizations of affect that in some way function in the service of this new spontaneous philosophy.[3]

As Patricia Clough makes clear, the 'affective turn invites a transdisciplinary approach to theory and method' (2007: 3). One of the strongest manifestations of such transdisciplinarity is the use within affect theory of certain scientific claims, models and experimental results. In the next part of this article, we consider some of the motifs and tropes that emerge (and, indeed, that circulate and repeat) in the staging of the affective turn, the citations through which these tropes are enabled, and the particular ways in which different scientific texts are read together to produce this 'transdisciplinary approach'. In accounts of how affect enlivens bodies, biology has been radicalized, we argue, in the sense that it is imagined as a fluid and dynamic spatiality.[4] But we also argue that there is a telling disjunction between this playful and unpredictable biology and the rhetoric of revelation and evidence that characterizes how scientific texts are introduced and put to work. Ours is certainly not a plea against the use of scientific research in theory. Rather, we believe that any interdisciplinary work necessarily mobilizes a number of assumptions regarding the relative value of different disciplines, the choice of frames of reference and the relative validity of language and method. We claim, then, that battles for legitimation are central to the understanding of the interdisciplinary spaces thus produced.

What kind of science is favoured in affect theory? The domains from which cultural theory has borrowed comprise, broadly speaking, non-linear biology, quantum physics, cognitive science, and cognitive and affective neuroscience, as well as the related social science discipline of developmental psychology.[5] It is important to stress, however, that these disciplines are not taken up *tout court*: rather, it is a select number of scientists who find favour. Those who have been taken up include the neuroscientists Antonio Damasio, Joseph LeDoux and Vilayanur Ramachandran, the developmental psychologist/psychoanalyst Daniel Stern, the physical chemist Ilya Prigogine (frequently in collaboration with the philosopher Isabelle Stengers), and the biologists Humberto Maturana and Francesco Varela.[6] (It is also important to bear in mind that the research of many of those figures is subject within the natural sciences to significant debate and contestation.) Some of this scientific scholarship is in itself remarkable for attempting to construct a composite language that crosses very different domains of analysis. (The biologist Francesco Varela, for example, brought together a molecular dynamics with discussions of experience and temporality in phenomenology, or those of selflessness in Buddhism [Maturana and Varela, 1980; Varela, 1999; Varela et al., 1993]; Antonio Damasio's recent work engages with Baruch Spinoza's philosophical writings on emotions [Damasio, 2004]. Indeed, a number of neuroscientists are intensely interested in, and contributors to, philosophical debates concerning the implications of their scientific research.) Moreover, those scholars identified with 'the affective turn' are themselves positioned within a variety of disciplinary contexts and maintain diverse theoretical commitments. There are, then, several different genres of 'affect' writings that have borrowed from different parts of the scientific canon. (For example, those indebted to Silvan Tomkins' cybernetic writings on affect do not necessarily see eye to eye with those indebted to Francesco Varela's work on open systems and autopoiesis.)[7] In this article, we restrict ourselves to cultural theorists' uses of two neuroscientists (Antonio Damasio and Joseph LeDoux) and one developmental psychologist (Daniel Stern). Before turning to specific uses of those scientists in the latter half of this article, we present a wider overview of the biological vision threading its way through affect theory.

Biology's Gift

While the affective turn foregrounds the importance of biology, this return to biology constitutes a distinctly afoundational gesture. By this we mean that while biology is envisaged as a kind of 'ground' for culture, at the same time, it is simultaneously decisively positioned as far as possible from the model of biology-as-destiny that was such a target in the previous regime of cultural theory. The

biology that is glimpsed through bodies' affective experiences is essentially presented as a creative space, a field of potentiality that, crucially, *precedes* the overwriting of the body through subjectivity and personal history.

Much of the current investment in affect in cultural theory is motivated by a desire to address intimate aspects of life through attending to an enfleshed understanding of action and thought. In so doing, affect theory works to compensate for an assumed neglect of the body's materiality in earlier paradigms dominating the humanities and social sciences. Through such paradigms, it is argued, the body was considered only insofar as it was subjectivized and had become discursively meaningful. 'Affect theory' may thus be seen to emerge out of the perceived inadequacies of constructionist models of the subject in dealing with how embodied experience might contribute to a certain kind of agency that is not reducible to the social structures within which subjects are positioned (Hemmings, 2005; Shilling, 2003).[8] By contrast, the body in affect theory is addressed through its biological specificity, and in its 'subindividual . . . capacities' (Clough, 2004: 3). To that effect, affect theory draws upon various propositions from the composite discipline of neuroscience, not least the claim that the Cartesian distinction between body and mind is inadequate in the face of findings concerning the origins of perception, thinking and behaviour in general. In this new, and increasingly influential, dispensation, affects are positioned in the pre-linguistic space between a stimulus and reaction, and between reaction and consciousness. The turn to affect is thereby a turn to that 'non-reflective' bodily space before thought, cognition and representation – a space of visceral processing. Importantly, this non-reflective space is not without intelligence: although it is characterized by a certain kind of automaticity, this does not equal dumbness but is understood to be a 'different kind of intelligence about the world' (Thrift, 2004: 60). Affect thus names an inherent dynamism of the body, a biological productivity that undoes the mind–body distinction.

For the political theorist William Connolly, for example, a turn to affect allows recognition of the '*compositional* dimension of body-brain-culture relays' (2002: xiii), and thereby the transformative powers of bodies' material engagement with the world. In this context, the force and specificity of such material engagement is usually deemed 'affective' rather than 'emotional'. This is most clear in Brian Massumi's well-known essay 'The Autonomy of Affect' in which he emphasizes that 'emotion and affect – if affect is intensity – follow different logics and pertain to different orders' (in 2002: 28). Emotion, on Massumi's account, is 'qualified intensity' or 'intensity owned and recognized' (2002: 28); it emerges as 'subjective content' and through 'the sociolinguistic fixing of the quality of an experience which from that point onward is defined as personal' (2002: 28).

Affect, in contrast, is 'unqualified', and, as such, 'not ownable or recognizable' (Massumi, 2002: 28). The privileging of affect over feelings or emotion is shared by numerous scholars in the affective turn (Anderson, 2006: 735; Probyn, 2005: 25; Shouse, 2005) and is crucial for theory's ambition to engage with the body's creative potential: here 'affect' stands for that mode of being in the world that subtends our reflection on our experience as well as our subjective habits of representing that world. In this sense, affect is seen as proceeding *directly* from the body – and indeed *between bodies* – without the interference or limitations of consciousness, or representation: for this reason, its force is, strictly speaking, pre-personal.

The work of philosopher and cultural theorist Mark Hansen illustrates the stakes of this current engagement with bodies' affective dynamics. Hansen has based his analysis of the potentialities of digital media around a hypothesis of bodies' openness to an affective intensity coming from the other, an openness that Hansen terms 'affectivity' (Hansen, 2004a, 2004c).[9] His arguments are set in the context of what he describes as: 'the current consensus in neuroscientific research that thinking is constructive and emergent and that it encompasses richly embodied processes of autopoietic self-organization' (Hansen, 2004a: 593).[10] Crucially, Hansen turns to affectivity because of what he sees as its emancipatory potential: indeed, he defines affectivity as 'the capacity of the body to experience itself as "more than itself" and thus to deploy its sensorimotor power to create the unpredictable, the experimental, the new' (2004c: 7). Aspects of our experience of the world, he argues, are able to escape the pull of our embodied habits and our enculturated engagement with that world: affectivity – in its transmission of intensity from one body to another – is able to undo our corporeal habits and embodied memory, and penetrate the ideological hexis (the pull of bodily habits)[11] through which bodies are turned into subjects. It is clear, then, that for Hansen affectivity names the body's foundational dimension of creativity: it is a conduit for the transformative potentiality of lived experience – or the '*compositional* dimension of body-brain-culture relays', to return to William Connolly's phrase.

Cultural theory's borrowing from neuroscience is enabled, then, insofar as certain writings in neuroscience describe a fluid materiality of excitable neural networks, capable of disturbing the role of foundations in general and the distinction between nature and culture in particular. This new materiality is presented as disturbing familiar hierarchies (most obviously that in which the 'mind' is positioned as the executive director of the body), depending instead on a novel micro-geography of synaptic connections, cellular interactions and electrochemical flows that operate in a dispersed fashion and below the level of

consciousness. As such, this materiality testifies to a 'nature' set adrift from 'natural law' in the sense of iron-clad regularities. In this model of the biological, neurons, cells and signals have emergent qualities; that is, their scope and connections are not simply there at birth, but emerge as elements of a developing and unpredictable geography. The biology welcomed in by cultural theory is a radically open system that is in itself incomplete and that must therefore plug into the social world to function; its logic is not systematic and predetermined. In other words, here is a vision of nature with no fixity, one that can no longer be counted on to prop up calls to order, be they political or religious. Instead, such a vision lends itself as the paradoxical foundation for a politics of change, providing a blueprint of sorts for the emergence of new cultural forces.

The (neuro)biology that is summoned in the turn to affect is, as we can now see, a helpmeet for a distinctly *political* project. In this context, affect theory provides the language for an imagining of a biology that, since shot through with 'the dynamics of birth and creativity' (Thrift, 2004: 59), can act as a prototype for a certain progressive politics, a spatiality that precedes and trumps all manner of calls to order. In its previous incarnation, theory offered a hope that modes of interpretation, or indeed praxis, could contribute to a vitalized social reality. But in affect theory, an emancipatory and optimistic dynamic exists already in the present, in the various contours of biology to which attention has now turned. As Elizabeth Grosz emphasizes in the opening of her monograph *The Nick of Time*:

> . . . [b]iological organization, whose morphological structures engender life in all its forms, instead of ensuring that life conforms to existing social categories, boundaries and limits, instead of containing existence to what is and has been, opens up and enables cultural, political, economic and artistic variation. (2004: 1)

In what follows, we examine the rhetoric through which this turn to biology is effected.

Conversations, or the Logic of Interdisciplinarity

Most of those who draw upon recent scientific research on affect have grown up with the insights of Michel Foucault, Donna Haraway, Thomas Kuhn and Bruno Latour, and would therefore be expected to engage with scientific texts as particular types of regulated statements. William Connolly notes, for example, that his aim in his book *Neuropolitics* is not 'to derive the logic of cultural activity from neuroscience. [But] . . . to pursue *conversations* between cultural theory and neuroscience' (2002: 9). However, the manner in which 'science' is often invoked in cultural theory texts testifies to a desire for a certain kind of revelation that

science will be able to satisfy. Connolly himself, in a recent article, considers how one of Damasio's experiments '*reveals* how much of perception and judgment is prior to consciousness' (2006: 73, italics added), whereas Teresa Brennan asserts that 'experiments *confirm* that the maternal environment and olfactory factors . . . shape human affect' (2004: 21, italics added), and Brian Massumi reassures us that 'the time-loop of experience has been experimentally *verified*' (2002: 195, italics added). Even as affect theory shows how a biology of afoundational foundations can be imagined, the language through which the findings of neuroscience are invoked by cultural theorists is, paradoxically, often the language of evidence and verification, a language offering legitimation through the experimental method. It is through the old foundational language, in other words, that the afoundational biology is appropriated.[12]

A recent article on affects and the molecular by the cultural geographer Derek McCormack (2007) provides an exemplary instantiation both of the affective as the emancipatory, and of a kind of afoundational-foundational biology. The article merits attention insofar as it not only describes but also stages a changing relationship between cultural theory and natural scientific texts. McCormack begins by positioning the molecular as the key scale through which current biomedical discourse increasingly understands the human. The article then traces a brief genealogy of this discourse, discussing how, for example, the development of pharmaceutical 'solutions' for depression produces and sustains a biochemical definition of experience as constitutive of the way individuals engage with the world (2007: 360–4). Like a good genealogist, McCormack highlights how the forging of a link between 'molecular chemistry of brain' and 'contours of affective experience' becomes possible through the invention of psychotropic drugs. This model of the body-brain as 'a living laboratory' (2007: 364) relies, for McCormack, on a positing of agency and self as constituted by molecular forces working below a threshold of representation. It is at this point in his discussion that we find the following passage:

> I want to explore an alternative, if also complementary, line of thinking, through which molecular affects might be understood not only as processes to which critical attention is paid, but also as contingent processes through which attention takes place or, more accurately, as processes through which the shape and sensibility of thinking takes on a kind of consistency. (2007: 365)

While at the beginning of this sentence, affects fall within the set of phenomena appropriate for critical-theoretical consideration ('processes to which critical attention is paid'), by the second half, we have shifted to another plane altogether, where, by a strange anamorphosis, our erstwhile critical object is now said to have

produced our own methods (affects are 'contingent processes through which attention takes place'). In the process, the position of the theorist – and by extension that of the humanities and social sciences – moves from one preoccupied with critique and interpretation to one receptive to molecular explanations of the genesis of thinking. Not only has affect shifted to a position external to critical-theoretical discourse; the implication is that it is neuroscience, through its focus on affect at a molecular level, that can establish what makes critical-theoretical practice possible. Neuroscience emerges, in other words, as a kind of mainspring of cultural theory, capable of accounting for its method, if not its very existence.

What would such an emphasis on attention do, then, to the practices of humanities scholars and culturally oriented social scientists? McCormack's article does not propose that social scientists become more scientific, but that an emphasis on the molecular would undo the foundations of social science, humanities and science alike: he suggests that 'encounters with molecular affects . . . might open up the style of thinking in the social sciences and humanities to the complexity of more than rational processes' (2007: 365). McCormack's 'good theory', then, is a turn to a science rendered strange.[13] Indeed, the turn to affect often explicitly stages itself as an attempt to step closer, to attune itself more sensitively, to the hitherto unremarked or invisible. Attending to affect, then, is about stepping closer to lived, 'fleshed' experience, a stepping closer that is frequently regarded as a kind of re-enchantment.

These insights lead us to approach William Connolly's exhortations concerning conversations between cultural theory and neuroscience with caution. Were we to heed them, we may wonder how and in which language a *dialogue* could take place if, as in McCormack's account, the traditional methods and modes of proceeding of one of the interlocutors in that dialogue (cultural theory) have been radically demoted. Nor is it clear what the quality of such a dialogue might be like given that – figuratively, if not literally – there appear to be relatively few neuroscientists in the room interested in participating in those 'conversations'.[14] One response to our scepticism concerning the likelihood of dialogic discussions between cultural theory and neuroscience has already been offered by Brian Massumi in his defence of 'thefts from science for the humanities' (2002: 19). He embraces the practice of 'shameless poaching', arguing against any tendency towards a simple and deleterious *application* of the results of science to the humanities. Massumi's aim, indeed, is similar to that of McCormack:

> . . . to borrow from science in order to make a difference in the humanities. . . . [B]ut also to make them differ from the sciences in ways they are unaccustomed to. . . . [T]o put the humanities in a position of having continually to renegotiate their relations with the sciences – and, in the process, to rearticulate what is unique to their own capacities. (Massumi, 2002: 21)

Massumi is open about the fact that the sciences, for their part, will feel little need to negotiate, given their much greater economic and institutional power. But then Massumi lets slip what is really at stake in his turn to the sciences: the 'fact of the matter is that the humanities need the sciences – entirely aside from questions of institutional power *but rather for their own conceptual health* – a lot more than the sciences need the humanities' (2002: 21, italics added). Massumi does not explicate further his bleak vision concerning the vital signs of the humanities. But his statement allows us to discern what is usually disavowed in the apparent *rapprochement* between (neuro)science and cultural theory. For let us note that the current regime of theory sets itself apart from its predecessor in part through no longer being held hostage to the so-called 'science wars'. Elspeth Probyn, for example, in her turn to Silvan Tomkins and his work on affect, refers to 'the silly splits between science and humanities' (2005: 25), as if all that childish silliness can now be laid to rest in this new dispensation of interdisciplinarity and mutual borrowing. But Massumi's description of the humanities needing the sciences 'for their own conceptual health' is an indication of how *little*, rather than how well, cultural theory has resolved one of the central features of the science wars, namely the concern with the legitimation of the kind of knowledge that cultural theory produces. In Guillory's powerfully argued account of the science wars, the cultural disciplines' antagonism to science 'expresse[d] the fear that criticism [i.e. interpretation] will be relegated to mere *opinion*, a discourse that cannot claim to be knowledge' (2002: 479). That cultural theory no longer needs to express its hostility to the sciences but instead needs to receive a shot in the arm from them does not indicate that its insecurity concerning its claims to knowledge has been resolved.

Damasio, LeDoux and Cellular Time

There are, of course, numerous researchers defining the terrain of this new neurobiology. It is the work of Antonio Damasio (1994, 2000, 2004) and, to a lesser extent, Joseph LeDoux (1996) that cultural theorists most often cite.[15] Maria Angel, for example, commends Damasio's neurobiological account of thinking for 'its distributed nature, the impossibility of locating thought or mind in any one organic structure or pathway' (2005: 336). Indeed, for Angel, Damasio's 'body-minded brain' succeeds in 'deconstruct[ing] the opposition between the ontological choices of either organism (biology) or environment (culture)' (2005: 337). Both Damasio and LeDoux have worked extensively on the neural production and circulation of emotions. In so doing, they have ventured a reconceptualization of the place of emotions in thinking and have therefore subverted the

conventional marginalization of emotions in Western thought, philosophy and science (Dixon, 2003). Both Damasio and LeDoux study how emotions relate to thinking, arguing that emotions are a non-cognitive system of bodily response to environmental stimuli that forms the biological substratum of consciousness. Through emotions, they claim, the organism adapts to environmental change, via changes in the chemical milieu of the body's viscera and autonomic nervous system. LeDoux, for example, claims that fear as a response to environmental danger is not always and not necessarily mediated through a cognitive appraisal (that is, a mental representation) of the fearful stimulus, which would necessitate an engagement of the prefrontal cortex (one of the sites centrally implicated in cognitive functioning). Such a cognitive appraisal requires about half a second – an awfully long time for human chances of survival. In LeDoux's account, well before that time has passed, an automated response involving the amygdala kicks in to ensure survival (1996: 164). (The amygdala comprises a pair of almond-shaped structures within the medial temporal lobes that are regarded as central to emotional processing and memory.) LeDoux calls this the 'low road' to the amygdala. In this account, the temporality of affectivity is of a scale such that it cannot be perceived by our senses. For Damasio and LeDoux, then, emotions constitute a pre-reflective domain of affectivity that pre-exists our lay understanding of 'self', forming what we would call the body's adaptive automaticity.

Damasio's work has taken a more self-consciously radical turn, attempting as it does to undo Cartesian distinctions, including those between reason and emotions. In a series of best-selling books, Damasio has presented an integrated theory of thinking in which he claims that emotions are central both to our ability to 'reason' as well as to the maintenance of our sense of self. In *The Feeling of What Happens* (2000), Damasio distinguishes between what he calls our 'extended' and our 'core self'; the former corresponds to what we generally understand as our self or identity, and involves language use, memory and our habits of being in the world, whereas the latter entails a sense that we are alive, experiencing, in the present moment. Damasio describes the core self as a transient, dynamic feeling of experience-in-the-present, which flickers into existence as we position ourselves in relation to objects in the world. This 'core self of each lived instant', modified through our interactions with others and subsisting as the flicker of 'ephemeral emergences', is nevertheless posited as the foundation for our consciousness and functions as the pre-cognitive font through which, paradoxically, our 'extended self', that is, our sense of continuity and identity emerges (2000: 172–3). For cultural theory, then, Damasio's work on the emergence of consciousness works well as an instantiation of an afoundational biology insofar as it unsettles the prioritization of cognition, language and memory in conventional psychological conceptualizations of self.

Even as the work of Damasio and LeDoux has been enabling for the emergence of affect theory, it is our claim here that this role is made possible through a very selective reading of their arguments. While Damasio and LeDoux both prioritize a set of pre-cognitive functions as the body's intelligent automaticity, this prioritization requires a supplementary hypothesis that is not often discussed in their humanities and social science appropriations. This is the hypothesis that the body's affective automaticity is in fact part of a pre-set array of responses that has remained essentially the same across a significant stretch of evolutionary development. LeDoux presents his 'fear response' as an example of such embodied memory, which, having solidified during human prehistory, forms the basis of cognition (1996: 161–5). And Damasio, too, claims that 'the brain is prepared by evolution to respond to certain Emotion Competent Stimuli with specific repertoires of action' (2004: 53). In short, while for the cultural theorists – such as Mark Hansen – who have adopted neuroscientific models of embodiment, affectivity testifies to the body's aleatory bio-logic, for Damasio and LeDoux by contrast, the body's non-cognitive dimension is at least in part pre-adapted to initiate very precise, constrained courses of action (such as running away from certain types of stimulus). Crucially, such a pre-adaptation is possible because of what LeDoux sees as the intransigence of emotional conditioning: for LeDoux, once the amygdala has been habituated to respond to a stimulus, no amount of effort can extinguish that response. To that effect it is impossible to 'wip[e] clean . . . the amygdala's memory slate' (1996: 250).

As should be clear from the argument so far, the neuroscientific models of the human engage several temporalities of very different scales: Damasio, for instance, writes that our 'self' is positioned 'between cellular time, and the time evolution has taken to bring us here' (2000: 127): while neural processing works in the hyper-fast 'cellular time', which is below our human sensorium, the body's affectivity as such is structured – and thereby constrained – through the operations of evolutionary time. Thus, while Damasio argues that '[w]hat is played out in the body is constructed anew, moment by moment' (1994: 158), this in no way counters his commitment to seeing emotions as 'stereotyped patterns of response' on the level of evolutionary time scales. Thus Damasio suspends our sense of self between these two very different time scales and suggests that what appears as an open system on the micro-level turns into fixity on the macro-level. By contrast, the privileging of 'cellular time' in affect theory carries with it the implication that an afoundational biology also produces an afoundational subjectivity and a politics of the afoundational, an implication that cannot be sustained through the neuroscience that is brought into play.[16]

Daniel Stern and Attunement

The neuroscientists Damasio and LeDoux tend to be used, we have argued, because they endorse a more integrated way to think about affect 'as a kind of corporeal thinking' (Thrift, 2004: 67). But it is the specific domain of developmental psychology, with its study of interactions between infants and caregivers, that holds out the promise of understanding what affect is and how it works in a space seemingly cleansed of the complicating and duplicitous patterns of language and of cultural imperatives concerning 'appropriate' affective display. Indeed, for many developmental psychologists (including Schore, 1994; Stern, 1985), observation of the bodily rhythms and facial expressions of an infant is observation of unadulterated affect. In the infant, behaviour and mental state are said to coincide: the infant is regarded as incapable of dissimulation, as well as lacking the means to represent its internal states symbolically. For these developmental psychologists then, affect is an important object of study insofar as it is seen as a hardwired biological dynamic in the infant, and is therefore distinct from the emergence of the psychological/subjective realm which it precedes and founds.[17]

It is a book that was published by a developmental psychologist and psychoanalyst over 20 years ago – extraordinarily long ago by the standards of neuroscience – that has become a favoured reference point for a number of cultural theorists working on affect.[18] Daniel Stern's monograph *The Interpersonal World of the Infant* (1985) has been taken up, we argue, because of two specific concepts: those of *attunement* and the *vitality affects*. Both seem to promise a means of moving, once again, beyond the constraints of cognition, insofar as they offer a vocabulary for an affective dynamic that diverges from qualified, recognizable and subjectivized emotions.[19] Attunement behaviours are, for Stern, a mother's way of communing with her baby's internal states – in other words, they are an exemplary indication of the intersubjective sharing of affect. Attunement operates not through imitation but by means of the mother's 'largely cross-modal' matching of her infant's behaviour. ('Cross-modal' means, for Stern, that 'the channel or modality of expression used by the mother to match the infant's behavior is different from the channel or modality used by the infant' [1985: 141].) One of Stern's examples concerns a 9-month-old infant reaching for a toy:

> As she grabs it, she lets out an exuberant 'aaaah!' and looks at her mother. Her mother looks back, scrunches up her shoulders, and performs a terrific shimmy with her upper body, like a go-go dancer. The shimmy lasts only about as long as her daughter's 'aaah!' but is equally excited, joyful, and intense. (1985: 140)

Notably, '[a]ttunements occur largely out of awareness and almost automatically' (1985: 145). Vitality affects are those 'dynamic, kinetic qualities of feeling that

distinguish animate from inanimate and that correspond to the momentary changes in feeling states involved in the organic processes of being alive' (1985: 156); the self experiences vitality affects as dynamic shifts or patterned changes within itself or within others.

It is through turning, once again, to the work of Mark Hansen, theorist and philosopher of new media, that the value of attunement and vitality affects for theory today can be most clearly identified. We choose to discuss Hansen's work because it is a complex, thoughtful and sustained engagement with a number of scientific and philosophical registers. In this, his represents one of the most ambitious enunciations of affect theory, while his arguments allow us to glimpse the emancipatory dimensions of affect theory with great clarity. One of Hansen's central examples for his argument about the affective engagements provided by new media is the work of video artist Bill Viola; here we discuss Hansen's analysis of Viola's *The Passions* (from 2003) in two related essays (Hansen, 2004a, and 'Body Times' in Hansen, 2004c). *The Passions* is a series of wall-mounted digital flat panels that depict, in extraordinary slow motion enabled by digital technology, the movement of strong emotions across the faces and bodies of staged figures. The slowing down of the video means that the panels initially resemble stills; indeed, a significant part of the impact that the video art can have on the viewer is through her dawning realization that the figures are indeed moving. Each scene incorporates clear references to Western religious paintings (by Hieronymus Bosch, Dürer, Pontormo and others) in their forms, colours and emotional intensities. What follows are two moments in which Hansen turns to the developmental psychology of Daniel Stern:

> Stern's work with affective attunement between mother and infant provides a helpful insight for understanding the resonances Viola's work establishes with the viewer. . . . Lacking the vocabulary and experiential precedent to cope with this presentation, we are effectively in a position akin to the infant who must learn through the mechanism of (preverbal) bodily response. . . . [W]hereas the infant learns to synchronize with another being through the medium of affect in a process that prepares him or her for social life to come, we learn just how much the modality of affectivity continues to work beneath perception in its normal function, as it were, and we also learn that our constitutive vitality or feeling of being alive, the substance of the living present, has its source in this normally imperceptible experiential modality. . . . We use technology [here the medium of digital video] to extend our own subjectivities simply by attending to the subtle, supersaturated affective shifts on the faces of the represented figures and responding to them in the only way we can – via the richly nuanced resonances they trigger in our bodies. (2004a: 613)

> Without a doubt, the experience afforded by this work can be described as one of affective attunement: by presenting what psychoanalyst Daniel Stern has called 'vitality affects' (as opposed to 'categorical affects' or emotions) – that is, normally imperceptible facial cues that signal the very fact of the body's aliveness – the affective shifts on the faces of the represented figures trigger richly nuanced resonances in the body of the viewer. (2004c: 261)

Attunement, which for Hansen occurs through 'affective contagion', works through the viewer being presented with the vitality affects that slowly course through the faces and bodies of the figures on the screen. The viewer, on Hansen's account, does not possess the language or the previous experiences through which to understand the super-slow expression of affects that pass across the faces of the filmed actors.[20] Perception is of no use: instead, the 'only way' we can respond to these art works is through triggered resonances that are directly felt within the body. Notably, Hansen describes the experience of viewing *The Passions* as 'incredibly intense', one that leaves you 'deeply moved'. (It is worth noting that it is not only in the work of Hansen that today's media viewer is conceived as a kind of Sternian infant. Brian Massumi, and various scholars indebted to him, have argued that the media's grasp on the viewer operates through a different channel from that of the ideological message [and its grounding in representation and interpretation] – namely, through an affective triggering of the body that describes 'the unmediated participation of the flesh in the image' [2002: 66].) This intense experience, moreover, is for Hansen one that 'extends' our subjectivity by virtue of those very triggered resonances. Hansen uses, and positively valorizes, the verb 'extend' because his account of Viola is indebted to his reading of philosopher Gilbert Simondon. Hansen argues that affectivity, for Simondon, 'names the capacity for the body to be radically creative' – and this because whereas the faculty of perception, through habituation, traps the subject 'within fixed constraints', affectivity 'comprises the faculty of the new' in its ability to 'open to the nonlivable, nonfactual, and imperceptible' (Hansen, 2004c: 266–7). What, for Hansen, is necessarily an intensely affectively freighted experience – one that not simply *The Passions* but also certain other digitally manipulated art works can produce – indicates for him how the computer has the 'potential to catalyze an affective heterogenesis – an expansion of the range of affectivity beyond its already embodied, habitual function' (Hansen, 2004c: 159).

Hansen's turn to Daniel Stern is crucial to his argument for two reasons. First, attunement operates at a distance from the axis of perception-cognition-symbolization (thereby buttressing Hansen's argument that the viewer is not engaged/affected via perception). Second, the vitality affects are understood by both Stern and Hansen to be different from the categorical affects (the so-called 'innate' Darwinian basic emotions).[21] This, crucially, allows the vitality affects to escape from the strictures of hard-wired fixity: as Stern argues, the 'subjective intensity' or 'objective fullness of display' of 'the feeling flow patterns that make up vitality contours' can 'vary widely and can take many different temporal paths of formation and dissolution' (Stern, 1999: 71).[22] Hansen, in fact, muses in a footnote that affectivity would presumably *not* be extended 'beyond its already embodied,

habitual function' if 'the affective states utilized are those of the so-called categorical affects' (2004b: 294).

But Hansen's use of the work of Daniel Stern involves several missteps or slippages that, we argue, can help clarify what is at stake in cultural theory's turn to affect. Notably, those missteps bear similarities to the difficulties we previously described in affect theory's taking up of Damasio and LeDoux. We concentrate on three missteps here.[23]

First, Hansen, in his analysis of the viewer of Viola's figures, places the viewer 'in a position akin to the infant', thereby positioning the video art as the mother. In Stern's account, the attunements between mother and infant are said to prepare the infant's entry into language and its assumption of a sense of self. Consequently, for Stern, an adult viewer can never be in a position comparable to that of the infant. It is only the infant who is, on Stern's account, truly 'before language' and therefore able to manifest unadulterated affect. Stern's focus is on the highly particularized and motivated responses of an adult mother to her infant who as yet has no developed sense of self, whereas Hansen creates a scenario in which an adult with a fully developed sense of self somehow has that self undone through attunements to a pre-recorded video (clearly, an odd sort of attunement in that it is only one-way: the filmed actors' emotional displays cannot interact with the individual looking at them). This is a highly improbable scenario, since the adult viewer cannot help but bring to her engagement with Viola's videos a panoply of memories, fantasies and recollections – not least those relating to the rich religious iconography on which Viola's videos are based. In this regard, what does it mean for Hansen to argue that the only way in which we can respond to this video art is via triggered, bodily 'resonances'?

Second, while Hansen wants to present attunements as operating through affect contagion and bypassing the viewer's subjectivity, Stern's text is much more ambivalent about the extent to which attunement itself is a non-cognitive and automatic process. The adult in Stern's vignettes is always 'the mother', and so the choreography Stern describes is very specific to an infant–mother relationship.[24] Because of this specificity, he introduces attunement as a biologically programmed response, ensuring the infant's survival and well-being. Unadulterated affect occurs either in the pre-verbal infant or, if in the adult, if embedded through evolutionary time as a kind of basic bodily mechanism. But, even so, Stern modifies his position when he comes to account for the possible misfiring of attunements. There, he remarks that attunements have their own specificity, insofar as they 'are also one of the main vehicles for the influence of parents' fantasies' (Stern, 1985: 207). And so even as Stern wants to posit that attunements resonate directly in one type of adult – the mother – he still has to admit to their

weighting by mental representations. Again, this weighting disappears in Hansen's appropriation of Stern, in the service of the former's argument that new media technologies (such as those used by Viola) can extend our bodies' potentialities through a resonance with our affectivity.

Third, and of greatest significance, Stern's concept of attunement operates in the service of hexis rather than that of Hansen's 'the new'. Parents attune, according to the developmentalists, *so that the child may gradually be enabled to regulate affect*, thereby constructing a sense of inner stability – of self – through such regulations. Indeed, if one follows the developmentalist narrative, insofar as the viewer has a self, then she also has, as neuroscientist Allan Schore emphasizes, patterns of affect regulation which integrate a sense of self across state transitions, thereby allowing for a continuity of inner experience (Schore, 1994). Such patterns are by no means imagined as flexible and provisional, or open to continual remaking; indeed the very opposite is the case in this literature. The mother's regulatory functions, Schore argues, 'not only modulate the infant's internal state, but also indelibly and permanently shape the emerging self's capacity for self-organization' (Schore, 1994: xxx).

For Damasio, too, a self depends primarily on a series of 'innately set regulatory actions' (2000: 23) that are non-conscious and automatic. Indeed, what has become non-conscious and automatic is, for the adult, the self itself. In the stories of both neuroscientists and developmental psychologists, attunement in our earliest months leads to behaviours and affective modalities that become so ingrained that it is enormously difficult to transform them beyond childhood: attunement leads to the consolidation of a set of habits and ways of being in the world, equivalent to Bourdieu's bodily hexis. In this context, the sudden triggering of intense affect in the adult's present – a triggering that *undoes* hexis – is far more likely to be associated with a radical undoing of the person's very sense of reality, with devastating consequences. The missteps involved in Hansen's taking up of Stern serve to underplay, if not significantly loosen, the relationship between affects and the production of selves that is so characteristic of much of the developmental psychological and psychoanalytic literature.

Concluding Comments

'Good theory' today imagines that attention to affect can contribute to the production of an afoundational biology capable of destabilizing the pull of language and subjectivation upon our bodies. In so doing, the 'spontaneous philosophy' characterizing such theoretical practices shares many of the political commitments of its predecessor: the desire to understand and do justice to performative

force, contingency and the emergence of the new is the same in both. 'Affect theorists' have used scientists' research on affect to buttress their call to think beyond the accumulation upon the body of an ideological hexis. Affect comes to name the inherent dynamism and mutability of matter. This conceptualization of affect involves, we have argued, significant distortions of the neurobiological and developmental psychological literature. While there is a growing tendency in some corners of neuroscience to consider affectivity as the root of subjectivity, the dynamism of affective bodies in neuroscientific models is arrested at one end through the supplementary use of evolution (in the hypothesis that reflexes are pre-set to ensure survival) and at the other through the assumption that the self emerges – and is only able to survive – through the acquisition of patterns of regulated affect, which constitute its hexis. In the accounts of developmental psychology, the infant's potentialities can come to organize a stable self only insofar as the mother can regulate the infant's internal space and assist in the production of a multimodal, behavioural, homeostatic system in the infant. To put it differently, if for neurobiologists and neuroscientists, life is being redefined as self-organizing, extended networks, as processual and dynamic, these re-definitions have tended to point to the neural *infrastructure* of consciousness (Damasio's 'cellular time') and *not* to our experience of the lived present ('subjective time').[25] We have argued that cultural theory's engagement with the neurobiology of affect occludes the centrality of *affect regulation* in neuroscientific writings and, unwittingly, envisages the subject as a kind of preverbal Sternian infant. In these readings, it is as though the biological status of the organism is constantly reset at infancy.

While affects have come to take a much greater role in neuroscience, they do not necessarily work in relation to an emancipatory script. Affect theorists seek to enlist affectivity in the service of the body's creative potential, thereby frequently choosing to ignore affect's central role in the regulation of the self. LeDoux's formulations concerning the 'low road' of neural processing do not necessarily have any consequences for the way that we are subject to particular ideologies. The logic of neuronal firing does not necessarily imply that our bodies have the capacity as such to circumvent the internalization of particular discourses or ideologies about the self.

None of what we have argued here should be taken to imply that affectively freighted encounters or experiences can never undo the embodied patterns of hexis. There are indeed numerous bodies of literature that suggest that patterns of affect and affective response can and do shift – through the arduous processes of various kinds of therapy, for example, or the shattering impact of trauma. Nor are we suggesting that a consideration of the affective, or indeed of biology as

such, is inappropriate for cultural theory. Our own disciplinary locations and interdisciplinary backgrounds gainsay a return to secure disciplinary bases: one of us is a social scientist with a humanities background who collaborates with behavioural geneticists and neuroscientists to explore the models of sociality at play in neuroscientific research; the other explores how research concerning memory and subjectivity has migrated across the social sciences, psychoanalysis and cultural studies. Our impetus here comes not from a desire to prescribe the appropriate – the 'good' – objects for cultural theory, but rather to perturb the ease with which the very distinction between 'good' and 'not-so-good' theory comes to be made. In so doing, we seek not to argue that to focus on the role of affect in social life is misguided, but rather to interrogate the prioritization and translation – and mis-translation – of particular scientific knowledge in the concretion of what is becoming known in the humanities and parts of the social sciences as 'affect theory'. Clive Barnett, in his close reading of current 'political ontologies of affect', argues that William Connolly's neuropolitics of affect 'supposes that certain philosophical problems can be cleared up if and when "science" develops the proper understanding of the human brain' (Barnett, 2008: 193). And those philosophical problems are, ultimately, of concern to Connolly because of their ramifications for politics. On Barnett's account, Connolly takes up certain neuroscientific writings (in particular, neurophysiological research on the 'half-second delay' between receiving sensory data and consciously interpreting it) to undergird his model of political transformation, through which interventions upon that 'non-reflective' bodily space before thought and interpretation are able to have much wider political outcomes. Likewise, Hansen's investment in neuroscientific and psychological literature that focuses on how affects work beneath perception is driven by a cultural-political commitment, one in which it is the body itself that has the capacity to 'create the unpredictable, the experimental, the new'. If it is possible, then, to contend that the central drive of 'affect' theory is towards the development of a distinctive kind of embodied politics, it is perhaps not surprising that the translation of scientific knowledge upon which it relies frequently involves mis-steps. For political projects are expert indeed at making good use of all manner of arguments and resources in the service of their cause.[26]

In this regard, both of us share Clare Hemmings' concern that one of the most powerful effects of the turn to affect within cultural theory is rhetorical, whereby the 'positivity' of affect theorists contrasts with the bleak pessimism of social determinists, political economists and discourse analysts, and implicitly attempts to move those sorry souls into 'a more productive frame of mind' (Hemmings, 2005: 551). Here we would do well to turn again to John Guillory's discussion

of the 'spontaneous philosophy' of a disciplinary domain. In his analysis of cultural critics' earlier polemics against the conceptualization of nature in scientific accounts, Guillory claimed that the spontaneous philosophy animating these lay in the assumption that there was a necessary relation between such conceptualizations and a particular reactionary politics (e.g. the marginalization of women, the biologization of race, and so on), that, in other words, 'epistemological positions have a necessary relation to political positions' (2002: 475). In the current emergence of affect theory this assumption remains – though one might need to replace Guillory's focus on epistemology with affect theory's preoccupation with ontology. In short, an essentially dynamic, self-organizing biology/nature is presented as the guarantor for an emancipatory and creative politics.

Finally, the borrowing of concepts from other disciplinary fields is of course not confined to writings on affect and biology. This article seeks to open a space in which the process of cross-disciplinary appropriations can be interrogated. More consideration needs to be given to how distinctions between what are seen as 'legitimate' versus 'illegitimate' – and, indeed, productive versus unproductive – borrowings are effected, and where and with what consequences they shift. The current interdisciplinary traffic between the natural sciences and the already interdisciplinary field of cultural theory cannot be divorced from other current developments in the relationship between the arts and the sciences or, indeed, from the very history of the distinction between humanities and sciences. An analysis of this traffic would need to consider that disciplines have distinct methods for producing 'output' and distinct histories of legitimation. While such distinctiveness is never the result of perfect insulation – the history of the interimplication of the humanities and natural sciences is rich and fascinating – it does nevertheless beg the question of what it would mean for the humanities to 'poach' scientific vocabulary and findings, and to re-contextualize those into their own regulated environments.[27] We have already discussed Massumi's explicit desire to 'poach' scientific concepts – and indeed he informs us that '[s]cientists shouldn't feel threatened by these respectful betrayals' (2002: 21). But what exactly is a 'respectful betrayal'? Clearly, there is no unified or transparent transdisciplinary metalanguage that can act as a conduit for concepts to travel between the humanities and the sciences; as John Cromby comments, in his analysis of the challenges facing the integration of social science with neuroscience: 'different disciplines have their own cultures, frames of reference, methods, objectives and languages' (2007: 150). In this context, the poaching of a concept may demand the forgetting of the discursive system and modes of argumentation that have given rise to it and of the specific network of relations that give it meaning. This

problem is acute in the case of affect: what affect designates *within* neuroscience (let alone in other bordering disciplines) is subject to vigorous contestation, and so if affect theory argues for a non-discursive understanding of affect, how can it afford to do so without acknowledging the contested origins of the very concepts it employs to legitimize this understanding? Particular concepts cannot be simply borrowed across disciplines without mobilizing disciplinary boundary struggles. Thus any encounter with affectivity is also necessarily an encounter with the methodologies and processes of legitimation characteristic of the natural sciences. Any interdisciplinary gesture must explicitly address, rather than wish away, such supplementary traffic.

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The title of the article was inspired by Ruth Leys' critical interrogation of the writing of Terence Des Pres. For Des Pres, 'a biological gift . . . ensured that even under the most extreme conditions [of the concentration camp] men and women tended to preserve themselves in ways recognizably human, just as other animals, plants, and even bacteria tend to preserve themselves' (Leys, 2007: 58). We thank the five anonymous referees whose detailed and challenging comments helped us clarify what is at stake in our article.

Notes

1. Sedgwick and Frank's term 'theory' referred to the shared assumptions guiding research in a number of related disciplines spanning the humanities, history, and parts of anthropology and sociology. They understood theory in the mid 1990s to comprise, therefore, the combined effects of Continental philosophy, Foucault and New Historicism, feminism, and postcolonial and queer studies upon these disciplines. Our use of the terms 'theory' and 'cultural theory' in this article follows Sedgwick and Frank in gesturing to assumptions shared by the disciplines they specify (though we would specifically add cultural studies and cultural geography to the list); we mean, too, for the terms 'theory' and 'cultural theory' to imply the '*routinizing* critical projects of "applied theory"' (to use Sedgwick and Frank's phrase, italics added).

2. We will be preoccupied in this article with a specific set of writings that focuses on affect. This set forms one distinctive part of a much broader, and theoretically and methodologically diverse, engagement in cultural theory with emotion, feelings and affect. (While this engagement encompasses complex discussions concerning the terms emotion, feeling and affect – and their relationship to one another – it is common for the term 'affect' to be used by those attending to the domain of the somatic-biological, in contrast to emotion, which 'tends to be used by those who insist that emotion is social and cultural in genesis' [Probyn, 2005: 25]). Important scholarship that considers emotion and feeling from perspectives different from those considered in our article includes the work of the philosopher Martha Nussbaum (2001), the literary scholars Charles Altieri (2003), Sianne Ngai (2005) and Rei Terada (2001), the sociologists Norman Denzin (1984) and Simon Williams (2001) (see also Bendelow

and Williams, 1998), and cultural/literary studies scholars Sara Ahmed (2004, 2007), Lauren Berlant (1999, 2008; see also Berlant, 2004), Ann Cvetkovich (1992, 2003) and Daniel Gross (2006).

3. The use of 'affect' in cultural theory is, at least currently, by no means as extensive as that of, say, 'social construction' in theory's previous moment. Indeed, many of those working with and on affect no doubt feel that this problematic is still marginal (if not marginalized). Nonetheless, we would claim that affect can be conceptualized as a central feature of a new 'spontaneous philosophy', not least because it is one of the tools used to signal a change in paradigm away from what are seen as the impasses of social construction. The turn to affect is associated with several other theoretical and substantive preoccupations: these include investigations of vitalism; engagements with technoscience (and an increased focus on 'information' as opposed to signification); and reconceptualizations of the organic–non-organic (and the human–animal) distinction. A genealogy of this shift in preoccupations and theoretical touchstones would certainly need to narrate and assess the role that the assimilation of (certain aspects of) Gilles Deleuze's thought into 'theory' has played.

4. See, for example, Elizabeth Wilson's re-reading of hysteria:

> Perhaps all biology wanders. Formulated this way, hysterical diversion is not forced on the throat, legs, or eyes from the outside, it is already part of the natural repertoire of biological matter. A more sustained focus on the biology of hysteria would allow us to see that the proclivity to conversion (diversion, perversion) is native to biochemical, physiological, and nervous systems. (2004: 13)

'Perversion', for Wilson, is now located *within* biology itself, in distinct contrast to the 'perverse' readings (of texts, scientific models, etc.) characteristic of theory in its previous incarnation. Note, however, that the *principle* of perversion retains its positive valence (as that which turns askew, or in unexpected directions).

5. Developmental psychology is now heavily engaged in neuroscientific research, and hence is disciplinarily positioned rather differently from how it was prior to the neuroscientific revolution.

6. For a useful account demonstrating how cultural criticism has engaged several of these scientists, see Clough (2004).

7. Cultural theorists who have engaged with Tomkins include – aside from Eve Sedgwick herself (Sedgwick, 2003; Sedgwick and Frank, 1995) – Anna Gibbs (2001) and Elspeth Probyn (2005); those using Varela include Patricia Clough (2004, 2007), Mark Hansen (2004a, 2004c) and Brian Massumi (2002).

8. This emphasis on agency is of epistemological and political import: epistemological insofar as social constructionism may be seen as too blunt an instrument to penetrate the lived specificity and material dimensions of social subjects; political insofar as social constructionism may not provide adequate tools for the envisioning of how such lived specificity becomes the place from which social norms are negotiated and transformed.

9. In his discussion of affectivity, Hansen uses the work of the phenomenologist Gilbert Simondon. Many affect theorists turn to phenomenology as well as to neuroscience and/or the life sciences for an account of the texture of experience. It is not possible within the limits of this article to discuss the form that these particular engagements take.

10. In Hansen's footnote for this sentence, he includes references to the work of Damasio, LeDoux and Varela.

11. In the sense that Pierre Bourdieu (1990: 69–70) proposed: 'Bodily hexis is political mythology realized, *em-bodied*, turned into a permanent disposition, a durable way of standing, speaking, walking, and thereby of feeling and thinking.'

12. The recent careful critique by Ruth Leys (2007), from a genealogical-historical perspective, of the empirical-experimental evidence underpinning the materialist approach to the affects (which would include the research of Tomkins, Damasio and LeDoux) gives us pause. She concludes that not only

is a materialist account of the affects conceptually incoherent, but the empirical-experimental evidence is flawed on its own terms.

13. Clare Hemmings, in her powerful critique of the ontological turn effected by many of those preoccupied with affect, has argued that affect seeks to open up a space 'outside social meaning', both in the sense of providing a break in the social itself *and* in critics' engagements with the nature of the social (2005: 565). Indeed, she suggests that what is being proposed is 'a new academic attitude' rather than a new method – 'an attitude or faith in something other than the social or cultural'; such an attitude 'is a useful proposition only if one's academic project is to herald the death of the cultural turn'.

14. In the two years that have elapsed since the writing of this sentence, it has been fascinating to witness the vigorous efflorescence of interdisciplinary forums that bring neuroscientists and social scientists together. Indeed, one of us has been a participant in several of these events. This efflorescence would appear to disprove our claim about there being few neuroscientists interested in a dialogue; we would contend, however, that our central claim – our concern with how and in which language dialogue might take place – stands. We remain sceptical about the extent to which such interdisciplinary forums succeed in staging dialogues between equal partners – dialogues in which there is sustained consideration of the challenges of bringing different epistemological and ontological frameworks into productive friction.

15. That both researchers have published 'crossover' monographs has undoubtedly aided the dissemination of their research within cultural theory. The political theorists William Connolly (2002) and Andrew Ross (2006) draw on Damasio and LeDoux; Brian Massumi (2002, 2005) cites Stern; Mark Hansen (2004a, 2004b, 2004c) cites Damasio and Stern; Anna Gibbs (2001) cites Damasio and Stern; Nigel Thrift (2004) cites Damasio; Ben Anderson (2006) cites Damasio and Stern; Eric Shouse (2005) uses Damasio; Elizabeth Wilson (2004) mentions Damasio and analyses LeDoux.

16. John Cromby, in a recent article on the relationship between social science and neuroscience, makes a similar point, when he discusses Rom Harré's proposal for a 'hybrid cognitive science' (Harré, 2002 in Cromby, 2007: 165–6). As Cromby notes, Harré proposes 'that we … organize claims to knowledge within three grammars or realms of discourse', the first relating to human experience and social interaction, the second to certain potentials of human embodiment that escape habits and intentionality, and the third to the molecular scale of the body's life. For Harré, these three levels or grammars need to be conceptualized as interrelated but distinct, so that they might allow for a fruitful engagement with human activity in both a biological and a social register. It is our claim here that affect theory wishes to use Harré's third grammar as an analogue for the other two. For an alternative approach to affect, which argues that affect be considered as generated across distinct yet interimplicated organic, psychic and social levels, see Stenner (2005).

17. A clarification is in order here: developmental psychology and infant observation are disciplinary projects distinct from neuroscience. Nevertheless, what interests us here is some developmental psychologists' engagement with affect as a *biological* dimension of being: the relationality between mother and infant that they describe is enabled because of this biological dimension and is an extension of it (early notable work in this direction includes Trevarthen, 1993, and Emde, 1983). There are of course powerful strands in developmental psychology that have emphasized the sociality and relationality of infant development (see for example Fivush and Haden, 2003). However, as one of us has shown, the discussion of such relationality is frequently based on a presupposition of a hardwired potentiality, a presupposition that animates the work of both Daniel Stern and Allan Schore, among others (see Papoulias, 2002, 2003).

18. Stern's standing among cultural theorists was undoubtedly increased by Brian Massumi's laudatory footnote: 'For a brilliant analysis of affect in terms of intensity, vitality, synesthesia ("amodal perception"), and nonconscious sense of self, see Daniel Stern, *The Interpersonal World of the Infant*' (Massumi, 2002: 262). Scholars who cite Stern include Anderson (2006, 2007), Gibbs (2001) and Hansen (2004a, 2004c).

19. Massumi, for example, in his analysis of how the terror alert system in the US addresses its citizens, claims that the alerts have no content and address 'not subjects' cognition, but rather bodies' irritability'. Those subjects do not necessarily 'begin to act similarly, as in social imitation of each other', because, as Massumi notes, quoting Stern directly, 'Imitation renders form; attunement renders feeling' (Massumi, 2005: 32).

20. The fact that Viola's *The Passions* involve the filming of *actors* is elided in Hansen's account. This is curious given that, from the point of view of neuroscience and evolutionary psychology, genuine affective displays can never be faked. Staged emotions, insofar as they are consciously 'put on', are said to be lacking in precisely this dimension of micro-movement discussed by Hansen. Cf. Damasio: 'Casual voluntary mimicking of expressions of emotion is easily detected as fake – something always fails, whether in the configuration of the facial muscles or in the tone of voice' (2000: 49).

21. The categorical, or 'basic', affects are those assumed to be universal, in that their physiological facial manifestations are understood not to vary. It is the work of two researchers, Paul Ekman and Carroll Izard (who both worked under Silvan Tomkins, and who are both committed to a certain kind of Darwinianism), that has been most central in promulgating the by now widely accepted model of certain 'basic' and invariate affects. Hansen's turn to Stern's work on the vitality affects therefore entails both a recognition and a putting to one side of the strong evolutionary currents of much of the scientific work on affect favoured by cultural theorists. His account stages a distinction between the 'good' vitality affects ('good' because varied and unpredictable in their manifestation) and the not-so-good categorical affects (not-so-good because hardwired to the brain).

Ruth Leys (2007) challenges the materialist, anti-cognitivist account of affect/emotion – to which Hansen remains committed even as he turns from the categorical affects to the vitality affects – through disputing its model of affects being 'triggered'.

22. In his more recent work Stern refers to 'vitality contours' rather than 'vitality affects': vitality contours point to 'a larger category of phenomena that includes but is not confined to affects' (Stern, 1999: 70).

23. We emphasize that we proceed by assuming Stern's model to be conceptually and empirically coherent, and therefore do not discuss any of the significant critiques that others have made, and indeed we ourselves could make, of many of its elements. For an interesting debate concerning Stern's model (between Stern, the French psychoanalyst André Green and others) see Sandler et al. (2000).

24. Stern's assumptions about the biological programming of mothers are highly contentious and ripe for critique on the grounds of their naturalization of the connection between femaleness and a certain kind of nurturing. For such a critique of Stern's work see Cushman (1991).

25. Our argument is specific to particular research taking place within the neurosciences. Matters are rather different in, say, the work of Francesco Varela, where he specifically engages with the inter-implication of different temporalities from the molecular to narrative memory (see for example Varela, 1999).

26. Our hunch about the turn to scientific literature on affect being driven by political demands was strengthened by an irritated response to an earlier version of this article that we gave at a conference on affect. The respondent protested against what she interpreted as our over-investment in proving the 'misuse' of science within cultural theory. She was not, she argued, interested in whether scientific terms were being used scientifically accurately or not; she was interested, rather, in how scientific terms and ideas could be 'useful' – her own term – for cultural theory, and in how they could help in reformulating what bodies could be and what they could do.

27. Such an inquiry would have to consider the citation trails between neighbouring fields, and explore how particular uses of particular references contribute, over time, to the building of the 'spontaneous philosophy' of a discipline. Finally, the material forces shaping the production of academic writing as a specific type of labour also need closer inspection: these range from the effects of electronic database and Internet search engine research to the current demands for increased productivity and measurable research outputs for social science and humanities scholarship.

References

Ahmed, S. (2004) *The Cultural Politics of Emotion*. Edinburgh: Edinburgh University Press.

Ahmed, S. (2007) 'Multiculturalism and the Promise of Happiness', *New Formations* 63: 121–37.

Altieri, C. (2003) *The Particulars of Rapture: An Aesthetics of the Affects*. Ithaca, NY: Cornell University Press.

Anderson, B. (2006) 'Becoming and Being Hopeful: Towards a Theory of Affect', *Environment and Planning D: Society and Space* 24: 733–52.

Anderson, B. (2007) 'Hope for Nanotechnology: Anticipatory Knowledge and the Governance of Affect', *Area* 39(2): 156–65.

Angel, M. (2005) 'Brainfood: Rationality, Aesthetics and Economies of Affect', *Textual Practice* 19(2): 323–48.

Barnett, C. (2008) 'Political Affects in Public Space: Normative Blind-spots in Non-representational Ontologies', *Transactions of the Institute of British Geographers* NS 33: 186–200.

Bendelow, G. and S.J. Williams (eds) (1998) *Emotions in Social Life: Critical Themes and Contemporary Issues*. London: Routledge.

Berlant, L. (1999) 'The Subject of True Feeling: Pain, Privacy, and Politics', pp. 42–62 in A. Sarat (ed.) *Cultural Pluralism, Identity Politics, and the Law*. Ann Arbor, MI: University of Michigan Press.

Berlant, L. (ed.) (2004) *Compassion: The Culture and Politics of an Emotion*. New York: Routledge.

Berlant, L. (2008) *The Female Complaint: The Unfinished Business of Sentimentality in American Culture*. Durham, NC: Duke University Press.

Bourdieu, P. (1990) *The Logic of Practice*, trans. R. Nice. Stanford, CA: Stanford University Press.

Brennan, T. (2004) *The Transmission of Affect*. Ithaca, NY: Cornell University Press.

Clough, P.T. (2004) 'Future Matters: Technoscience, Global Politics, and Cultural Criticism', *Social Text* 22(3): 1–23.

Clough, P.T. (2007) 'Introduction', pp. 1–33 in P.T. Clough and J. Halley (eds) *The Affective Turn: Theorizing the Social*. Durham, NC: Duke University Press.

Connolly, W.E. (2002) *Neuropolitics: Thinking, Culture, Speed*, Theory Out of Bounds no. 23. Minneapolis, MN: University of Minnesota Press.

Connolly, W.E. (2006) 'Experience and Experiment', *Dædalus* 135(summer): 67–75.

Cromby, J. (2007) 'Integrating Social Science with Neuroscience: Potentials and Problems', *BioSocieties* 2: 149–69.

Cushman, P. (1991) 'Ideology Obscured: Political Uses of the Self in Daniel Stern's Infant', *American Psychologist* 46(3): 206–19.

Cvetkovich, A. (1992) *Mixed Feelings: Feminism, Mass Culture, and Victorian Sensationalism*. New Brunswick. NJ: Rutgers University Press.

Cvetkovich, A. (2003) *An Archive of Feelings: Trauma, Sexuality, and Lesbian Public Cultures*. Durham, NC: Duke University Press.

Damasio, A. (1994) *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Avon.

Damasio, A. (2000) *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*. London: Vintage.

Damasio, A. (2004) *Looking for Spinoza: Joy, Sorrow and the Feeling Brain*. London: Vintage.

Denzin, N.K. (1984) *On Understanding Emotion*. San Francisco, CA: Jossey-Bass.

Dixon, T. (2003) *From Passions to Emotions: The Creation of a Secular Psychological Category*. Cambridge: Cambridge University Press.

Emde, R.N. (1983) 'The Prerepresentational Self and its Affective Core', *The Psychoanalytic Study of the Child* 38(1): 165–92.

Fivush, R. and C.A. Haden (2003) *Autobiographical Memory and the Construction of a Narrative Self*. London: Psychology Press.

Gibbs, A. (2001) 'Contagious Feelings: Pauline Hanson and the Epidemiology of Affect', *Australian Humanities Review* 24, URL (consulted November 2009): http://www.australianhumanities review.org/archive/Issue-December-2001/gibbs.html
Gross, D.M. (2006) *The Secret History of Emotion: From Aristotle's Rhetoric to Modern Brain Science*. Chicago, IL: University of Chicago Press.
Grosz, E. (2004) *The Nick of Time*: *Politics, Evolution, and the Untimely*. Durham, NC: Duke University Press.
Guillory, J. (2002) 'The Sokal Affair and the History of Criticism', *Critical Inquiry* 28(winter): 470–508.
Hansen, M.B.N. (2004a) 'The Time of Affect, or Bearing Witness to Life', *Critical Inquiry* 30(spring): 584–626.
Hansen, M.B.N. (2004b) 'Communication as Interface or Information Exchange? A Reply to Richard Rushton', *Journal of Visual Culture* 3(3): 359–66.
Hansen, M.B.N. (2004c) *New Philosophy for New Media*. Cambridge, MA: MIT Press.
Hemmings, C. (2005) 'Invoking Affect: Cultural Theory and the Ontological Turn', *Cultural Studies* 19(5): 548–67.
LeDoux, J.E. (1996) *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Simon and Schuster.
Leys, R. (2007) *From Guilt to Shame: Auschwitz and After*. Princeton, NJ: Princeton University Press.
Massumi, B. (2002) *Parables for the Virtual: Movement, Affect, Sensation*. Durham, NC: Duke University Press.
Massumi, B. (2005) 'Fear (the Spectrum Said)', *Positions* 13(1): 31–48.
Maturana, H.R. and F.J. Varela (1980) *Autopoiesis and Cognition: The Realization of the Living*. Boston, MA: D. Riedel.
McCormack, D.P. (2007) 'Molecular Affects in Human Geographies', *Environment and Planning A* 39: 359–77.
Ngai, S. (2005) *Ugly Feelings*. Cambridge, MA: Harvard University Press.
Nussbaum, M.C. (2001) *Upheavals of Thought: The Intelligence of Emotions*. Cambridge: Cambridge University Press.
Papoulias, C. (2002) 'The Making of a Cultural Psyche: Memory between the Humanities and the Social Sciences in Post-war America', Unpublished PhD thesis, University of East London.
Papoulias, C. (2003) 'From the Agora to the Junkyard: Social Memory and Unconscious Materialities', pp. 114–30 in S. Radstone and K. Hodgkin (eds) *Regimes of Memory*. London: Routledge.
Probyn, E. (2005) *Blush: Faces of Shame*. Minneapolis, MN: University of Minnesota Press.
Ross, A.A.G. (2006) 'Coming in from the Cold: Constructivism and Emotions', *European Journal of International Relations* 12(2): 197–222.
Sandler, J., A.-M. Sandler and R. Davies (eds) (2000) *Clinical and Observational Psychoanalytic Research: Roots of a Controversy*. London: Karnac.
Schore, A.N. (1994) *Affect Regulation and the Origin of the Self: The Neurobiology of Emotional Development*. Hillsdale, NJ: Lawrence Erlbaum Associates.
Sedgwick, E.K. (2003) *Touching Feeling: Affect, Pedagogy, Performativity*. Durham, NC: Duke University Press.
Sedgwick, E.K. and A. Frank (1995) 'Shame in the Cybernetic Fold: Reading Silvan Tomkins', pp. 1–28 in E.K. Sedgwick and A. Frank (eds) *Shame and its Sisters: A Silvan Tomkins Reader*. Durham, NC: Duke University Press.
Shilling, C. (2003) *The Body and Social Theory*, 2nd edn. London: SAGE.
Shouse, E. (2005) 'Feeling, Emotion, Affect', *M/C Journal* 8(6), URL (consulted November 2009): http://journal.media-culture.org.au/0512/03-shouse.php
Stenner P. (2005) 'An Outline of an Autopoietic Systems Approach to Emotion', *Cybernetics and Human Knowing* 12(4): 57–71.

Stern, D.N. (1985) *The Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology*. New York: Basic Books.
Stern, D.N. (1999) 'Vitality Contours: The Temporal Contour of Feelings as a Basic Unit for Constructing the Infant's Social Experience', pp. 67–80 in P. Rochat (ed.) *Early Social Cognition: Understanding Others in the First Months of Life*. Hillsdale, NJ: Lawrence Erlbaum Associates.
Terada, R. (2001) *Feeling in Theory: Emotion after the 'Death of the Subject'*. Cambridge, MA: Harvard University Press.
Thrift, N. (2004) 'Intensities of Feeling: Towards a Spatial Politics of Affect', *Geografiska Annaler* 86B(1): 57–78.
Trevarthen C. (1993) 'The Function of Emotions in Early Infant Communication and Development', in J. Nadel and L. Camaioni (eds) *New Perspectives in Early Communicative Development*. New York: Routledge.
Varela, F.J. (1999) 'The Specious Present: A Neurophenomenology of Time Consciousness', pp. 266–314 in J. Petitot, F.J. Varela, B. Pachoud and J.-M. Roy (eds) *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Science*. Stanford, CA: Stanford University Press.
Varela, F.J., E. Thompson and E. Rosch (1993) *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press.
Williams, S. (2001) *Emotion and Social Theory*. London: SAGE.
Wilson, E. A. (2004) *Psychosomatic: Feminism and the Neurological Body*. Durham, NC: Duke University Press.

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