

Abstraction

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ABSTRACT: This text elaborates an understanding of abstraction as fundamental to how we think from a closer look at relationships between abstraction, movement, materiality and lived experience. Starting from Whitehead-inspired reflections on abstraction by Alberto Toscano and Brian Massumi, the differences between their respective readings of his work are shown to be indicative for their different conceptions of the relationships between abstraction, the concrete, and lived experience. The text then continues to elaborate how Alva Noë's enactive approach to perception illuminates the central role of movement and sensorimotor skills in the emergence of abstractions from the continuity of process that is reality, and could contribute to further understanding of the relationship between movement and abstraction as what Massumi describes as the incorporeal dimension of the real. Finally, this text reflects on the potential of movement practices (including dance) and technology to become part of how abstraction is achieved.

KEY WORDS: lived abstraction, movement, materiality, embodiment, incorporeality, techniques of existence, prehending, enactive cognition

The abstract is lived experience. I would almost say that once you have reached lived experience, you reach the most fully living core of the abstract. . . . You can live nothing but the abstract and nobody has lived anything else but the abstract. (Deleuze 1978: n.p.)

Abstraction has a history of being understood in terms of rigidity and separateness, of being lifeless and detached from the real world, and therefore at odds with materiality, embodiment, dynamism, and vitality as fundamental to new materialist approaches. Abstraction, Derek McCormack observes, "is often framed as an epistemological process through which the rational mind, facilitated by the terms of the Cartesian mind-body

split, withdraws itself from the lively, chaotic and unpredictable energies of the sensate world in order to better understand this world from a distance” (2013: 165–66). As such, abstraction is associated with regulation, with the imposition of techniques that harness the surplus value of real bodies and actual contexts, and with the “failure to recognize the lived reality of everyday corporeal difference as it is experienced” (McCormack 2013: 166). Could there also be a different way of thinking abstraction?, McCormack wonders. A way of thinking that affirms abstraction as fundamental to how we think while also acknowledging such thinking to be embodied and grounded in lived experience. He refers to Alfred North Whitehead’s observation that “you cannot think without abstractions; accordingly, it is important to be vigilant in critically revising your modes of abstraction” (Whitehead 1967a: 69; quoted in McCormack 2013: 184). Rather than dismissing abstraction in favor of an appeal to the immediacy of experience, Whitehead calls our attention to the importance of “cultivating an affirmative critique of abstraction—as simultaneous process, concept and technique” (McCormack 2013: 185). This is an understanding of abstraction as generative rather than imposed. McCormack refers to Isabelle Stengers’s observation that Whitehead’s abstractions “are not ‘abstract forms’ that determine what we feel, perceive and think, nor are they ‘abstracted from’ something more concrete, and finally, they are not generalizations” (Stengers 2008: 95–96; quoted in McCormack 2013: 185). Rather, abstractions have a positive role insofar as they “act as ‘lures’ drawing attention toward ‘something that matters,’ vectorizing concrete experience” (McCormack 2013: 185). McCormack elaborates such an affirmative critique with which he draws attention to the intimate connection between movement and abstraction as immanent process rather than an ideal form.

McCormack is not the only one arguing for the need to rethink abstraction in relation to lived experience. According to Alberto Toscano (2008), renewed concern with the link between materiality and conceptuality points to the need to replace an understanding of abstraction as cold, disembodied, and detached with what he proposes to term *warm abstractions*. Although Toscano does not explicitly define what he means by this term, his text suggests that he refers to an understanding of abstractions as entangled with material and embodied practices rather than detached from these. Also referring to Whitehead (and Stengers’s reading of Whitehead), he too argues that abstractions should be conceived of as immanent to the construction of experience. The very opposition of abstract and concrete, he points out, is actually part and parcel of the problem. What is needed is to rethink the abstract and the concrete in terms of how they are related, and as inseparable. Brian Massumi (2002) points in a similar direction when he observes that “the problem with dominant models in cultural and literary theory is not that they are too abstract to grasp the concreteness of the real. The problem is that they are not abstract enough to grasp the real incorporeality of the concrete”

(ibid.: 5). The tendency to understand abstract and concrete as diametrically opposed—and to associate abstraction with the disembodied mind and thinking, and concreteness with the body, materiality, and experience—obscures how the body is inseparable from dimensions of what Massumi (2011) describes as *lived abstractness* constitutive of perception, experience, and thinking. Massumi too takes his inspiration from Whitehead, as well as from William James and Gilles Deleuze, and, following Michel Foucault, he suggests that we may understand abstraction as a material yet incorporeal dimension of reality as process or event. And, like McCormack, he draws attention to the intimate connection between movement and abstraction understood as immanent and generative process rather than an ideal form.

Toscano and Massumi present different, and at points complementary, approaches to abstraction and to how to conceive of the relationships between abstraction, the concrete, and lived experience. Toscano (2008) is interested in how Whitehead's thinking may contribute to a critique of abstractions (abstraction here used to denote a particular type of entities or forms), in particular those of capitalist society. He finds inspiration in Whitehead's understanding of the role of theory and of the philosopher as a critic of abstractions that have become fixed and rigid, and are mistaken for concrete. This task of the philosopher, "rather than merely policing the legitimate use of abstractions," is to be "permanently vigilant as to their tyrannical ossification" (Toscano 2008: 65). He elaborates how Whitehead's analysis of modes of abstraction characteristic of the modern scientific worldview, in combination with a Marxist analysis of real abstractions, may contribute to an understanding of abstractions as *warm* in the sense of being entangled with social processes and part of concrete, lived experience, rather than existing separate from materiality, embodiment, and experience.

Whereas Toscano focuses on relationships between culturally and historically specific abstractions and material and embodied practices, Massumi looks at abstraction understood as practice, or technique. His aim is not to rethink specific abstractions (and their relationship to material and embodied practices) but to elaborate an understanding of abstraction as itself a practice—an embodied material practice—that is immanent to lived experience. Doing so, Massumi's elaborations on Whitehead (and others) contribute to a de-ossification, not of abstractions that have become fixed and rigid, but of dominant and ingrained modes of understanding abstraction characteristic of the modern scientific worldview. Ossified modes of understanding abstraction that at points also seem to guide Toscano's own understanding of abstraction (including his reading of Whitehead's approach to abstraction), for example when he argues:

By systematically investigating the manner in which the social forms of capitalism may be understood as 'practically abstract' . . . the Marxist elaboration of the idea of abstraction permits us to appreciate the limits of any

(voluntaristic or idealist) attempt to transform our practices of abstraction which does not fully grasp their embeddedness in mechanisms of social reproduction and the formidable political, and not *merely epistemic*, challenges that dislodging them might entail. (Toscano 2008: 59; italics added)

Toscano thus presents a Marxist analysis as the solution to what he perceives as a voluntarist or idealist attempt to transform practices of abstraction presented by Whitehead, an approach that, as he argues, addresses abstraction as a mere epistemic challenge and overlooks the embeddedness of abstraction as a doing in material, embodied, and social practices. Massumi's reading of Whitehead offers a different perspective. He foregrounds the onto-epistemological implications of Whitehead's approach to abstraction in which abstraction is not merely a part of the ways of knowing the world but fundamental to our way of being in the world, and central to Whitehead's explanation how it is from this way of being in the world that we come to know the world.

In the following, I will first trace the Whitehead-inspired reflections on abstraction by Toscano and Massumi to explore their potential for new materialist conceptualizations of abstraction. After that, I will come back to McCormack and his elaboration of the relation between movement and abstraction via the work of Henri Lefebvre and the practice of dance.

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For Toscano (2008), Whitehead's relevance for rethinking abstraction is given in his understanding of the philosopher as critic of ossified abstractions, as well as in his understanding of modes of abstraction as changing over time. This possibility of modes of abstraction to change over time points to relationships between abstraction and cultural and historical, material and embodied, contexts. Toscano is interested in particular in Whitehead's observations (in *Science and the Modern World*) about the emergence of new modes of abstraction as part of the modern scientific worldview and how these may provide a perspective on the relationships between ossified abstractions and social practices in capitalist society.

In *Science and the Modern World*, Whitehead (1967b) explains how with the emergence of modern science, abstraction transforms from an experimental practice of grasping unobvious connections (which Whitehead still sees at work in Galileo's modes of abstraction) towards the generalization of the Galilean model. This change manifests itself in (among others) an understanding of materiality as governed by abstract principles that can be separated from it, and of materiality as in itself senseless and purposeless, brute and dumb. This mode of abstraction of modern science is reflected in what Whitehead describes as the "Ionian fallacy" or the "fallacy of misplaced concreteness," with which he describes the error of

mistaking what is actually abstract for being concrete. An example of this fallacy elaborated by Whitehead is the assumption that physical objects in the universe possess the character of simple location without reference to their relations to other objects. In fact, however, location is an abstraction that is achieved from grasping relationships. Understanding location as a concrete matter of fact is mistaking an abstraction for a concrete reality (Whitehead 1967b: 59).

Fallacies of misplaced concreteness are also Toscano's (2008) concern, in particular the misplaced concretenesses that Marxist theory refers to as "real abstractions": abstractions like "money" or "the bourgeois elite" that are part and parcel of the social operations of capitalist society. "Much of the force of the Marxian theoretical matrix is founded on its depiction of capitalism as the culture of abstraction *par excellence*, as a society that is *really* driven, in multiple and often unexpected ways, by *actual* abstractions" (Toscano 2008, 67; italics in original). These abstractions, therefore, do not exist in a realm separate from concrete experience but are lived as if they were concrete. Critical engagement with such real abstractions requires an approach that can explain the relationship between these real abstractions and the concrete operations of capitalism. Toscano refers to Žižek's observation that "the secret of real abstraction is precisely *an open secret*, to be gleaned from the operations of capitalism themselves, rather than from an ideological preoccupation with a true concreteness or hidden essence that the abstractions of capital may be deemed to conceal" (Žižek 1989: 11; quoted in Toscano 2008: 71).

Whitehead's analysis of the modes of abstraction characteristic of the modern scientific worldview suggests the possibility of understanding the real abstractions of capitalist society as actually being instances of misplaced concreteness and as manifestations of modes of abstraction characteristic of modern science. Vice versa, Toscano argues, a Marxist analysis of "real abstractions" may complement Whitehead's analysis of abstraction in the modern scientific worldview with an in-depth understanding of how "rigid, intolerant and lifeless abstractions are woven into the fabric of our social relations" and are "not merely a matter of historically sedimented mentalities, or narrow ecological attitudes" (Toscano 2008: 72). A Marxist approach to real abstractions may thus contribute to overcoming what he perceives as limitations to "Whitehead's pedagogical wish to reform our culture of abstractions" (*ibid.*: 57). For, Whitehead, as a critic of abstractions, Toscano argues, remains an engineer aiming to reform our habits of mind without paying enough attention to "the resilience of abstractions that are really, practically 'out there,' operating in a manner that a merely conceptual therapy leaves unaffected" (*ibid.*: 59). In a similar vein he observes that "[w]e cannot be faithful today to his call for a revision of our modes of abstraction without investigating the role of real abstractions, abstractions which, rather than mere sports of the history of ideas,

are woven into the very actions (of labor, exchange and valuation) that produce and reproduce contemporary society” (ibid.: 73).

Toscano’s proposal to complement Whitehead’s approach to abstraction with a Marxist understanding of real abstractions is a useful suggestion for further development of a new materialist understanding of abstractions in terms of what Karen Barad (2007) so aptly describes as the entanglement of matter and meaning. Yet, at the same time, his dismissal of Whitehead’s approach to abstraction as conceptual therapy and mere sports in the history of ideas is indicative of certain limitations of his reading of Whitehead for a reconceptualization of abstraction in new materialist terms. These limitations can also be seen to be at work in Toscano’s description of what he refers to as “the primal scene of mathematics” as a “blessed separation from mankind’s worldly entanglements” and an “event whereby, in a ‘remarkable feat of abstraction,’ humans become capable of comparing sets of three objects and sets of five objects with utter disregard for their tangible or phenomenological qualities” (Toscano 2008: 60). Mathematical abstraction is thus presented as disembodied and as belonging to a realm separate and distant from the body and concrete experience. This is an understanding of mathematics that from a new materialist perspective is questionable, and that has been questioned and criticized by (among others) Gilles Châtelet (2000), Brian Rotman (2008) and Liz de Freitas and Nathalie Sinclair (2014). Relevant here is also Stengers’s observation that in order to think abstractions in Whitehead’s sense, we might consider the example of a mathematical circle. “Such a circle is not abstracted from concrete circular forms; its mode of abstraction is related to its functioning as a lure for mathematical thought—it lures mathematicians into adventures which produce new aspects of what it means to be a circle into a mathematical mode of existence” (2008: 96). The mathematical circle is an example of abstraction as generative rather than derivative.

Although Toscano embraces what Whitehead understands as “the task of theory in general and philosophy in particular” (2008: 65), namely that of being vigilant to the tyrannical ossification of abstractions, in his elaboration of this task he focusses mainly on how Marxist theory may contribute to understanding already ossified abstractions and their role in material and embodied practices and the construction of experience. He does not address the role of bodies and materiality in how abstractions are achieved, how they are generative, and how such practices of abstraction are immanent to experience. This is the subject of Massumi’s elaborations on abstraction as lived.

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Massumi (2011) approaches the entanglement of the abstract and the concrete from a combination of Whitehead’s process philosophy with James’s radical

empiricism. He elaborates the ways in which abstraction is immanent to experience, starting from a closer look, not at how ossified abstractions become part of concrete experience, but at how abstraction is achieved *in* experience and how we can understand such achievement as material and embodied practice. From this perspective, abstractions are not existing in a realm separated from materiality and practice but rather objects themselves have to be conceived of as abstractions that result from embodied participation in the material world. From this perspective, conceiving of objects as concrete is itself a manifestation of the fallacy of misplaced concreteness. In fact, “objectification itself is abstraction” (Whitehead 1985: 25; quoted in Massumi 2011: 15). Objects are derivatives of processes, and “their emergence is the passing result of specific modes of abstractive activity” (Massumi 2011: 6).

Massumi describes these modes of abstractive activity in terms of lived relations: “What we call objects considered in the ontogenetic fullness of process, are lived relations between subjective forms of occasions abstractly nesting themselves in each other as passed-on potentials. They are the inter-given: the systematic form in which potential is relayed from one experience to another” (Massumi 2011: 15). “Subjective forms of occasion” describes instances of experience preceding objectification. Objectification is the result of bodily and material practices of relating them. An example could be Whitehead’s description of how Cleopatra’s Needle is recognized as an object of perception. This description (that is actually also quoted by Toscano) presents an example of how abstraction is immanent to experience. A closer look at how abstraction is achieved here suggests an understanding of abstraction rather different from Toscano’s account of mathematical abstraction in terms of a blessed separation from worldly entanglements. Whitehead writes:

Amidst the structure of events which form the medium within which the daily life of Londoners is passed we know how to identify a certain stream of events which maintain permanence of character, namely the character of being the situations of Cleopatra’s Needle. Day by day and hour by hour we can find a certain chunk in the transitory life of nature and of that chunk we say, ‘There is Cleopatra’s Needle.’ (Whitehead 1971: 167)

Abstraction is thus presented not as a matter of separating Cleopatra’s Needle from “mankind’s worldly entanglements,” nor as the result of disregarding tangible and material qualities, but rather as *resulting from* worldly entanglements; it is a matter of how connections between tangible and material and phenomenological qualities are lived. This chunk that is Cleopatra’s Needle emerges from lived relations between subjective forms of occasion. That is, it emerges from the entanglement of humans with their world and from how they are capable of grasping, or in Whitehead’s terms *prehending*, relationships between occasions of experience. The Needle is an abstraction, yet not in the sense of something

disconnected from material and embodied reality but as immanent to our experience of material reality, as a lived set of relationships between occasions of experience.

Massumi's understanding of abstraction shares with new materialism an approach to difference in terms of differentiability rather than dualisms and dichotomy. It is from lived relations that abstraction is achieved and "the coming together of the differences *as such*—with no equalization or erasure of their differential—constitutes a formative force" (Massumi 2011: 5; italics in original). Massumi refers to such coming together as a technique of existence. "A technique of existence is a technique that takes as its 'object' process itself" (ibid.: 14). Techniques of existence are dedicated to ontogenesis. Humans and other entities are capable of achieving abstractions as a result of their capacity to grasp, orprehend, relationships between occasions of experience. And it is as a result of such prehensions that abstractions emerge from the continuity of process that is reality. These abstractions cannot be separated from material and embodied reality because they consist in lived relations between aspects of reality. They are immanent to how concrete reality becomes accessible in experience. Or as Deleuze, quoted at the outset of this text, observes: "the abstract is lived experience. I would almost say that once you have reached lived experience, you reach the most fully living core of the abstract. . . . You can live nothing but the abstract and nobody has lived anything else but the abstract" (Deleuze 1978: n.p.).

At this point, Massumi's Whitehead-inspired approach to abstraction actually relates very well to Alva Noë's (2004) enactive approach to cognition. Noë too conceives of the world as it becomes available to us as an achievement that results from the perceptual encounter and from how perceivers live relations between sensory impressions. Central to Noë's approach is the insight that perception is *enacted*: the world becomes available to perceivers as a result of how they enact patterns of sensory contingency. Sensory inputs are multiple, manifold, ambiguous, staggered over time; they do not cover the same range of velocities, and they are often fuzzy and incomplete. This is what Alain Berthoz (2000) describes as the fundamental problem of perception, which is unity (90). Crucial to how bodies solve this problem is the repertoire of sensorimotor schema (Berthoz) or sensorimotor skills (Noë) that act like blueprints for possible action and that organize perception even before sensory stimuli are processed and prior to subjective intervention. These schema are not sets of data. Rather, they organize relationships between action, perception, and memory (Berthoz 2000: 17–19). They are part of how bodies engage with what they encounter and presuppose certain capacities given in the structure of their embodiment. The basis of how bodies do so is implicit practical knowledge of the ways movement gives rise to changes in sensory stimulation (Noë 2004: 8). This is the kind of implicit knowledge, for example, that movement of the eyes to the left produces movement across the visual field. It is also the kind

of implicit knowledge that, when in the dark, or with our eyes closed, we touch different sides of a box; we feel not only a succession of surfaces, but grasp their spatial relationships as different sides of the same box. Such perceptual sense of presence results from the practical grasp of sensorimotor patterns mediating our relation to what we are perceiving. The impression of the different sides of the box on our fingers alone cannot explain how we are capable of perceiving a box as a three-dimensional object in space that we can pick up, turn around, and open. Actually, it is the other way around: because of experience with boxes, or more generally, with the effects of moving around as well as moving objects around, we are capable of grasping the connection between simultaneous and successive impressions. Doing so we are capable of abstracting a sense of the box out of the contingency or sensory impressions. Referring to these capacities as sensorimotor skills (rather than a sensorimotor schema), Noë foregrounds the fact that these capacities are not merely given but have to be acquired in and through experience. This leaves space for the possibility of something that is not part of Noë's own elaborations on the role of these skills in how we enact perception, but is implied within his explanations, and this cultural and historical specificity.

Massumi is critical of cognitive approaches because of how they seem to presuppose a subject existing separately from the event. "Rather than asking what's doing, cognivist approaches ask what the subject can know of the world, as if the subject does not come to itself already in the midst but rather looked upon the world at a reflective remove that is philosophy's job to overcome" (Massumi 2011: 6). Instead, following Whitehead, he argues that "the subjective is the passing present, understood not as a point in metric time but rather as a qualitative duration—a dynamic mutual inclusion of phases of process in each other, composing a 'span' of becoming (this is James's 'specious present')" (Massumi 2011: 9). This means that "the only subject there is in the completed sense is a 'superject': the 'final characterization of the unity of feeling' at an experience's peaking" (Massumi 2011: 9; referring to Whitehead 1978: 166). Nevertheless it seems that Noë's enactive approach to cognition has a lot to offer to ground the achievement of abstraction, and the coming together of the unity of feeling in relation to it, within embodied practices of prehending. These practices, as Noë observes, precede subjective intervention and are constitutive of how a sense of the world and in relation to this a sense of self come together. That is, they are not the doing of a subject "at a reflective remove" but pre-reflexive practices of engaging with the world encountered that are part of how the subject comes to itself "in the midst" (Massumi 2011: 6). Movement plays a key role in how such a sense of self in relation to a sense of the world encountered, is achieved, and thus in what Massumi (after Whitehead) describes as objectification: the achievement of objects as derivative of process. Noë's enactive approach to perception illuminates the central role of movement and sensorimotor skills in the emergence of

abstractions from the continuity of process that is reality, and could contribute to further understanding of the relationship between movement and abstraction as what Massumi describes as the incorporeal dimension of the real.

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Massumi (2002) associates abstraction as immanent to concrete material and embodied reality with what Foucault has described as *incorporeal materialism*. In his lecture “Discourse on Language” (published as an appendix to *The Archaeology of Knowledge* [1972]), Foucault argues that we should conceive of discourse not in terms of consciousness and continuity, nor of sign and structure, but as ensembles of discursive events. Understanding how discourse operates as event requires acknowledging that events are *material yet incorporeal*, Foucault observes, because:

An event is neither substance, nor accident, nor quality nor process; events are not corporeal. And yet, an event is certainly not immaterial; it takes effect, becomes effect, always on the level of materiality. Events have their place; they consist in relation to, in coexistence with, dispersion of, the cross-checking accumulation and the selection of material elements; it occurs as an effect of, and in, material dispersion. (Foucault 1972: 230–31)

Grasping the nature of an event, therefore, requires that we “advance in the direction, at first sight paradoxical, of an incorporeal materialism” (Foucault 1972: 231).

In the introduction to *Parables for the Virtual* (2002) Massumi refers to Foucault’s incorporeal materialism as part of reflections on how to think movement. Movements take effect on the level of the very materiality of the body moving, yet as events movements cannot be located in or reduced to the body. “When a body is in motion, it does not coincide with itself. It coincides with its own variation. The range of variations it can be implicated in is not present in any given moment, much less in any position it passes through” (Massumi 2002: 4). To think the body in movement therefore “means accepting the paradox that there is an incorporeal dimension of *the body*. Of it, but not it. Real, material, but incorporeal” (ibid.: 5). This incorporeal dimension is abstract, yet not in a detached and cold way. The abstract nature of movements and other events is given in the relational dimension of their occurring as dynamic unity. Perceiving movement requires grasping movement as a dynamic unity that, like an event, is only present in passing.

In *Semblance and Event* Massumi (2011) further elaborates this abstractness and terms it lived abstraction. He gives the example of catching sight of a mouse out of the corner of your eye:

You don’t so much see the mouse as you feel the arc of its movement with your eyes. You feel the movement continuing out of the immediate past when

it was just outside your visual field, coming in. . . . You don't actually 'see' the vector of the mouse's movement, or your own. You immediately experience the dynamic unity of the event . . . phasing forward in the form of a felt line of approach. This perception of the arc of an event gathering up its immediate past and scurrying it forward toward an immediate postrodent future is an example of a semblance. If the arc is seen it is seen *nonsensuously*, as an abstract line. (Massumi 2011: 17; italics in original)

Seeing movement requires the capacity to abstract a sense of it out of a succession of sensory impressions. The movement is never there at any moment. Therefore you can never actually "see" the vector of the mouse's movement. It can only be perceived "nonsensuously" as an abstraction that is the result of your capacity to grasp contingency in the succession of sensory impressions. Such grasping also involves anticipation and the coming together of immediate past and immediate future in this feeling-seeing of the movement continuing out of the immediate past and going into the immediate future. Furthermore, such nonsensuously perceived abstraction is not something detached or separated from the concreteness of the event. It is not a generalization distant from it. Rather, as Stengers after Whitehead (quoted above) puts it, this abstraction acts as a lure, "vectorizing concrete experience" (2008: 95–96).

Massumi (2011) calls the "feeling seeing" of the abstract line of the event a vision effect: "It is a lived abstraction: an effective virtual vision of the shape of the event, including in its arc the unseen dimensions of its immediate past and immediate future" (17). Such a lived abstraction he calls an amodal perception: "amodal, nonsensuous, these are ways of saying that that the effective perception of the shape of the event was not actually in any particular sensory perception" (Massumi 2011: 18). Massumi refers to this as virtual vision. The virtual thus understood does not stand in opposition to the actual but emerges as a realized potential present in the actual. The virtual thus understood is also not a matter of digital technology, with which the emergence of the virtual is often associated. Rather it describes a real material yet incorporeal dimension of lived experience.

Nevertheless, Massumi (2011) does also observe the potential of technology to induce the virtual and to become part of how abstraction is achieved, when he points to Deleuze's *time-image* as "the prime example in his work of the appearing of the virtual in what here would be termed the semblance of an event" (17). Deleuze introduces this notion in his book with the same title, which is the second of his books on cinema (Deleuze 1986 and 1989). In these books, he presents an approach to cinema that, like Noë's (2004) enactive approach to perception, centralizes the role of movement in perception, including our perceptual engagement with cinema. All perception, he observes, "is primarily sensory-motor" (Deleuze 1986: 64). Things and perceptions of things are prehensions in which "I grasp the 'virtual action' that they have on me, and simultaneously the 'possible action' that I have on

them” (ibid.: 65). Deleuze does not use the term sensorimotor skills, like Noë does, but sensory-motor schema. In watching film, he argues, our sensory-motor schema makes it possible to grasp the continuity of movement and actions shown on screen. We are capable of grasping the movement of, for example, a character on screen as a continuity unfolding over time. This relates to how we bring our sensory-motor schema to bear on what is depicted in the image. This not only the case with movements shown. Our sensory-motor schema also allows us to perceive movements that are not shown. For example, when a camera moves through a room we see an image of an immobile room while we perceive movement. We sense movement even though we do not see a body moving in the image. Our familiarity with the effects of movement and changing points of view makes it possible to follow the changing point of view of the moving camera or to grasp the logic of the cuts and jumps of montage and thus abstract unseen motion out of the succession of images. The technology of cinema thus mediates in the perceptions of movements that are not shown but achieved “nonsensuously” as an abstraction that is the result of our bodily capacity to grasp contingency in successions of sensory impressions and thus actualize a potential present in the material encounter.

These virtual movements made possible by the technology of cinema, Deleuze argues, engender new modes of thinking time and space. They are part of cinema’s potential not merely to reproduce time, space, and movement by means of cinematic images but to mediate in the emergence of new kinds of images, namely what he describes as the movement image and the time image. With movement-image and time-image he refers to lived abstractions of events not so much shown in the projected image as perceptually felt as the effect of our perceptual encounter with what is projected on the screen. These new types of images, he argues, and not the reproduction of movement on the screen, but the manifestation of the true potential of cinema and the reason that cinema played a key role in the formation of new ways of thinking and imagining time and space characteristic of modernity (Deleuze 1986: 7).

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With his analysis of cinema in his cinema books, Deleuze (1986, 1989) points to the potential of technology to mediate in the generation of new kinds of abstraction that are not static forms imposed from the outside but immanent to the dynamism of matter and that are achieved as a result of bodies’ capabilities to draw out a set of virtual tendencies across what they encounter. He thus points to the relationship between modes of abstraction and historically and culturally specific technologies, and how these technologies may contribute to opening up new ways of thinking as a result of the perceptual practices engendered by them. With his observations on the relationships between movement and abstraction,

McCormack (2013) is interested in how practices of doing movement may similarly mediate in the generation of new abstractions. He begins his explorations from Lefebvre and his understanding of bodies and spaces as actively produced together in a generative relation. Abstraction is part of Lefebvre's thinking in two seemingly opposed ways. On the one hand, Lefebvre opposes abstraction to lived experience as he writes about abstract space erasing the difference of everyday life and being a betrayal to and denial of the lived experience of bodies. On the other hand, he acknowledges the value and necessity of abstraction in grasping elements of experience and that such grasping is not a matter of thinking withdrawn from the world of lived experience but rather "a process of drawing out something of this world that would otherwise not be available to thought" (McCormack 2013: 169). Abstractions thus understood are derived from the "experience and knowledge of the body" (Lefebvre 2004; quoted in McCormack 2013: 170) in a process that McCormack describes as:

A mode of emergent organization implicated in the active and generative occupation of space, and expressed through symmetries and rotations. This is not the occupation by a body of an already existing space: rather it is an occupation which would need to be understood genetically—that is, according to the sequence of productive operations involved. (2013: 171)

Lefebvre thus points to the intimate connection between doing, perceiving, and thinking also addressed by enactive approaches to cognition, and explains how it is from the very material practice of moving that a sense of space emerges as what Massumi (much later) would term an incorporeal dimension of the material world, actualized in the doing of movement.

In his affirmative critique of abstraction as immanent process rather than an ideal form, McCormack looks at dance practice (Laban and Forsythe) as examples of how we may understand the doing of movement as practices of developing a differentiated sense of abstraction. He shows how dance practice, and in particular Forsythe's approach to choreography, acts as that "lure" described by Stenger explicating Whitehead, "drawing attention toward 'something that matters,' vectorizing concrete experience" (Stengers 2008: 95–96; quoted in McCormack 2013: 185). He shows how Lefebvre's ideas not only offer the possibility for thinking philosophically about the relationship between movement and abstraction in everyday life, but also illuminate how movement practices like Forsythe's can themselves be conceived as techniques of existence. His reflections point to the fundamental entanglement of the abstract, embodiment, and materiality also addressed by Massumi and reconfirm the need, expressed by Massumi, for modes of understanding abstract enough to grasp the real incorporeality of the concrete.

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