

Enactive – Performative perspectives on Cognition and the Arts.

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Abstract

The practices of the arts –plastic and performing - deal in direct sensorial engagement with the body, with materiality, with artifacts and tools, with spaces, and with other people. The arts are centrally concerned with intelligent doing. Conventional explanations of the cognitive dimensions of arts practices have been unsatisfying because internalist paradigms provides few useful tools to discuss embodied dimensions of cognition.

Conventional internalist conceptions of cognition can say little which is useful about the kinds of sensorimotor integration which are fundamental to action in the world, and practices of the arts epitomize and refine these sensorimotor intelligences to a high degree. In doing so, arts practices implicitly refute the paradigmatic separation of matter and information, of mind and body. Thus, internalist paradigms only confuse attempts to discuss creative intelligent practice. This explanatory crisis has hobbled useful discussion of cognition and the arts for much of the last century.

Happily, concepts arising from the post-cognitivist paradigms which have emerged over the past 30 years provide leverage on the qualities of intelligent action in the world - which is what artists do. Here I will explore how we might deploy concepts arising in Situated, Enactive, Embodied and Distributed paradigms (SEED) and explain how these fields can provide the

basis for a new discourse on arts practices which in the words of Maxine Sheets Johnstone, *gives the body its due*. Or rather, begins by refuting mind-body dualism, acknowledges the performative, the processual and the relational dimensions of practice.

Preface

Making art with materials and dynamics not traditionally used for artmaking is hardly a new thing. From the invention of photography through the development of cinema, radio and recorded music, adaptations of emerging technologies to art is a central trait of modernism. And indeed, the role of the artist/inventor has been central to such developments.¹

My own path into this has been through interdisciplinary practice at the intersection of art and computer science, designing and building custom interactive machinery for embodied interaction. Like many of my colleagues in the art and technology movement, I built new technological systems and tried to make the technology do things it hadn't been designed for. In the 1980s, as an artist exploring electronic and digital technologies, and their associated rhetorics, I struggled with challenges, and often assumed my problems were largely technical, a result of - rather presumptuously - thinking I could with in this realm without an engineering degree.

Throughout the 1990s I had the enormous good fortune, as professor of Art and Robotics at Carnegie Mellon, to work with world leaders in artificial intelligence, robotics and related aspects of computer science. It was in this

¹ Penny, Simon. 2008. "Bridging Two Cultures: Towards a History of the Artist- Inventor." In *Artists as Inventors—Inventors as Artists*, edited by Dieter Daniels and Barbara U. Schmidt, 142–157. Berlin: Hatje Cantz.

context that I realized that my attempts to utilize these emerging technologies to create *immediate interactive sensorial aesthetic experience* were at odds the intentions of my colleagues who understood such effects merely as pointers to abstract ideas.

Yet, as my familiarity developed and I skilled up, it became clear to me that something else, something deeper was going on, that thwarted my project: to build an intelligently interactive embodied art form in which sensor-based systems behaved in an ongoing but open ended way.² An artist's primary goal and responsibility is to create persuasive sensorial immediacy - affect – and immediate embodied experience. I became increasingly aware that this seemed entirely elided in CS and AI discourse, and only slightly less so in HCI! (This was a decade before 'games' were a thing and 25 years before there would be game design programs in Computer Science schools.) In the CS community, physical manifestations seemed only significant in that they pointed to some abstract verity. This privileging of the abstract over the concretely experiential seemed to me symptomatic of a deeper dualism, one epitomized by that article of faith in computer science: the complementarity of hardware and software. Further, this duality was nothing but a reification of the mind body dualism in the technology itself. The unremarked Cartesianism of digital computing marginalized embodied experience in a way that insidiously undermined my project.

It was in the contexts of the crisis in AI often called the *common sense problem* (and related issues raised by John Searle, John Haugeland, Stevan Harnad, Rodney Brooks and others) that I discovered *What Computers Can't*

² see for instance Petit Mal, Fugitive, and Sympathetic Sentience, at simonpenny.net

*Do.*³ I read it hungrily, furiously annotating (and published a short review⁴). Dreyfus seemed to have put his finger so adroitly on many of the misgivings I was experiencing. I was a philosophical neophyte, but his writing confirmed that my disquiet was not simply that of a technical newbie overawed by a triumphant and sophisticated technology. Dreyfus' phenomenological account provided a theoretical framework for my concerns, gave them the structure of an argument. I pursued my inquiry more deeply, towards an historical and critical study of AI and cognitive science. This was the early 90s, and the repercussions of the collapse of the GOFAI paradigm⁵ around the common sense/framing/symbol grounding problem had left a younger generation of AI researchers scrambling.

In this context two developments arose, which are, to me, inextricably linked – Artificial Life and *post-cognitivist*⁶ theories of cognition – embodied, distributed, enactive, situated and the rest. In the latter work, I discovered cognitive scientists and philosophers of mind grappling with similar issues to those I struggled with.

Lucy Suchman, Jean Lave, David Kirsh and Edwin Hutchins emphasized social and material dimensions of human cognition. Enactivism arose out of autopoietic biology (itself strongly influenced by cybernetic thought) entering the world of cognitive science via the work of Francisco Varela, Evan Thompson and Eleanor Rosch. It should be noted that theorists of cognition in biology are seldom bothered with dualism - As Maturana put it – “to live is

³ WCCD

⁴ *What Computers Still Can't Do: A Critique of Artificial Reason* by Hubert Dreyfus. Review by: Simon Penny, *Leonardo*, Vol. 27, No. 1 (1994), pp. 83-84

⁵ "Good Old Fashioned Artificial Intelligence" John Haugeland's term.

⁶ My term

to cognize”⁷. Mark Johnson and George Lakoff, Andy Clark, Michael Wheeler, Ezequiel diPaolo (and others) helped fill out the philosophical context, and Kevin o’Regan, and Rizzolati, Gallese, et al provided connections with neuroscience. Rodney Brooks and Philip Agre led charges in the AI community.

Over a period of years, as my relationship with these paradigms deepened, it became clear to me that they provided an explanatory framework for the problem I had been dealing with in my work – the disjunction of mentation and experience in computing discourse, where materiality is automatically rendered ‘peripheral’. Further, it became clear that these paradigms provided something larger: a discursive context in which cognition in the arts, in all its sensorimotor complexity, might be discussed, described and validated. This is possible because SEED embraces material, spatial, prosthetic and social dimensions of action in the world.

This paper is a praisee of the potential of these new perspectives on cognition to provide a new discursive context for the understanding of the cognitive dimensions of embodied cultural practices. Arts practices have confounded cognitive scientists, due to their embodied and materially engaged nature. The fundamental Cartesianism of (conventional) cognitive science leaves it with no tools to grapple with the inherently embodied nature of arts practices. The Situated, Embodied, Enactive and Distributed paradigms provide ways of thinking cognition outside the cranium. By doing so, we also enrich and complicate cognitive research by pushing the

⁷ Maturana ref

complexity of cultural practices upon the cognitive sciences in ways that can no longer be elided or ignored.

I believe we are at an historical moment when the traditional valorisation of abstraction is being brought into question by leaders in cognitive science and other fields. This has great relevance for the explication of cultural practices. Hubert Dreyfus led this charge, reminding computer scientists that the special qualities of human intelligence are a result of having a history of human embodiment, and that such a history of embodiment builds the brains, minds and intelligence we have. His arguments, as Agre pointed out, were not so much rejected as found simply incomprehensible by an AI community locked into a paradigm in which dualism was axiomatic.⁸

The hegemony of the symbolic

The idea that things people do are more significant to the extent that they are dematerialised, is I think, a sickness of our academic culture, the corollary being that activities which engage with materiality are inherently intellectually inferior. The general acceptance of this idea has led to the assumption that practices in the arts are necessarily intellectually second class to the extent that they engage materiality. My experience tells me this is simply wrong. By that calculus, a mathematician *must* be more clever than a composer, and a composer more clever than a potter. Again, I think this is simply wrong. The valorisation of symbolic abstraction has led to the construction of *false opposition between intelligence and skill*. The upshot is that *the intelligences of the arts are simply inexplicable within the terms of the*

⁸ Agre, Philip E. 1997b. "Toward a Critical Technical Practice: Lessons Learned Trying to Reform AI." In *Social Science, Technical Systems, and Cooperative Work: Beyond the Great Divide*, edited by Geoffrey Bowker, Susan Leigh Star, Les Gasser, and William Turner, 131–157. Mahwah, NJ: Erlbaum.

cognitivist paradigm. In the bigger picture this makes cognitive science look a little silly, because historically, some of the most valorized of human activities are materially engaged cultural activities: musicianship, architecture and the like.

Long ago, C.P. Snow characterised the binary quality of the *Two Cultures* of sciences and humanities, emphasising how different and incommensurable these pursuits are. Yet, in the academy at least, these two are bound together, traditionally, by their reliance on systems of abstracted representation, on the bifurcation of subject and object, and on implicit if not explicit temporal arrest - all hallmarks of humanism. The university is the temple of humanism, and the humanities and the sciences are bedfellows. The arts are the *ugly ducklings* of the liberal arts academy, and (or because) they trade in a different currency. The arts deal in direct sensorial engagement with the body, with materiality, with artifacts and tools, with spaces, and with other people. The Arts, moreover, are centrally concerned with *doing*. For me this is fundamental ontological difference between the arts and the academic disciplines is well captured in Andy Pickering's distinction between *the representational idiom and the performative idiom*.⁹

It seems necessary to highlight just what a different beast *the arts* is, precisely because textual validation has been marginal to it, for the ontological reasons Pickering describes. Conventional dualistic, internalist conceptions of cognition fail to explain *intelligent doing in the world*, and the arts specialise in intelligent doing in the world, negating *the paradigmatic separation of matter and information*, of mind and body, embracing the

⁹ Pickering, Andrew. 1995. *The Mangle of Practice: Time, Agency, and Science*. Chicago: University of Chicago Press.

performative, the processual, the relational, and rejecting the atemporal ossification of facts. I hesitate even to use the word *cognition* as most definitions use the word *mental* emphatically, and some deploy *consciousness*, neither of which should be taken for granted in the current context.

Cartesian schizophrenia

In conversations about cognition, the related styles of thought named *functionalism*, *internalism*, *mentalism*, *cognitivism*, *computationalism* have reinforced a Cartesian hierarchy which has marginalised the arts and other embodied practices, because of their lack of capacity to recognize or assess intelligent embodied action. More generally, it has profoundly skewed accepted notions of cognition by emphasizing the idea of thinking as logical reasoning in an abstract space, thereby separating perception from action and thinking from doing. As Gilbert Ryle noted long ago, and as artists of all stripes have always known: *When I do something intelligently, ... I am doing one thing and not two. My performance has a special procedure or manner, not special antecedents.*¹⁰ Ryle's point hinges on a deeper dualism, fundamental to humanism, the *mind body dualism*. This dualism is entrenched in the western world view, and we as westerners are fully naturalized to it.¹¹

The very acceptance of the notion that there exist separate and complementary entities we can refer to as *mind* and *body* (in Descartes' terms, the *res cogitans* and *res extensa*) prevents us from understanding holistically, the intelligences inherent in the behaviors of whole persons

¹⁰ Ryle, Gilbert. 1949. *The Concept of Mind*. Chicago: University of Chicago Press.

¹¹ I do not presume to speak of nonwestern ideas, except to recognize that in nonwestern cultures the lines are drawn differently, individuality and selfhood are constructed differently.

integrated into environments, structured and unstructured, articulated by tools, procedures and interpersonal interactions. Articulated is here meant in both senses: enunciated and entrained. The conventional internalist conceptions of cognition can say little which is useful about the kinds of *sensorimotor integration* which are fundamental to action in the world. Practices of the arts epitomize and refine these sensorimotor intelligences to a high degree. Therefore, *conventional cognitive science can say little about the arts*. This I believe is a crisis which has hampered useful discussion of cognition and the arts for much of the last century.

Mind, Brain and Body

The idea that “mind” exists in some mode or realm separate from “body” is one of the most powerful structuring dualisms in Western thought. It has held on tenaciously in our so-called scientific culture, in the face of the fact that there is not a shred of scientific evidence to support it. It has become enmeshed in everyday language and the assumptions of science, law and religion and has influenced the formulation of social and technological systems, not least among them computing. Along with the big Cartesian bogeyman come related ideas concerning the nature of thought as “reasoning” on “representations.” We are naturalized to such ideas, even if on particular occasions we adopt postures which are contrary to them, and even if this dualism sits uncomfortably with the neurologically materialist idea that cognition occurs in the brain.

Today most people, without much critical reflection, adhere to the orthodox idea that cognition occurs largely or exclusively in the brain and that the brain is a kind of computer. This assumption is nothing but the result of

proliferation of AI functionalism which are perpetuated in popular culture long after their demise in AI theory itself. This renewed currency of dualist, functionalist ideas is in large part due to the infiltration of digital computing into diverse aspects of human culture. Computing, as our paradigmatic technology, became the main source of metaphors for human cognition. Yet in day-to-day life we are presented with very different experiences of cognition as it is lived. Strangely, we seem to be content with a philosophical explanation that is at odds with our lived experience.

While the blood/brain barrier is taken to be paradigmatically indicative of a difference in kind between brain and body, the brain is a biological part like the appendix or the foot. In order to avoid the philosophical quicksand of fallacious solipsisms of the “brain-in-a-vat” kind, it is necessary to accept that mind arises within biology. (To say “human biology” would be to assert a human exceptionalism which would similarly demand justification.) Cognitive events are embodied events. To propose that the part of the cognition which occurs on the membranes of the body or even in non-neural tissue is not really part of cognition constitutes question begging. This calls to mind Herbert Simon’s rhetorical sleight-of-hand deployed in his famous hedge: *“Now I should like to hedge my bets a little. Instead of trying to consider the ‘whole person,’ fully equipped with glands and viscera, I should like to limit the discussion to Homo sapiens, ‘thinking person.’ I myself believe that the hypothesis holds even for the whole person, but it may be more prudent to divide the difficulties at the outset, and analyze only cognition rather than behavior in general”*.¹² Contra Simon, there is no principled way in which the “thinking person” can be separated from “the

¹² Simon, Herbert A. 1996. *The Sciences of the Artificial*. 3rd ed. Cambridge, MA: MIT Press. p53.

‘whole person,’ fully equipped with glands and viscera.” Simon avoids reference to aspects of the body involved in obvious ways with sensorimotor engagement with the world, as this would beg deeper inquiry.

The notion of higher-level function is itself dubious. Why do we say the processes of imagination, for instance, are qualitatively different, more refined or otherwise better than the sorts of ongoing cognitive work we do when, for instance, riding a horse at a gallop? The notion of “higher-level functions” presumes a value-laden hierarchy of neural processes. This analogy is reminiscent of the modern hierarchy of labor, where remuneration is usually inversely proportional to the thickness of calluses on the hands.

Contemporary neuroscience continues to show us that a model of the brain with “faculties” located in specific places — a bureaucratic analogy with departments for different cognitive functions — is anachronistic. Various areas are in constant contact with others, mental operations are neurologically dispersed. The brain is wildly cross-connected, and “faculties” seem to be distributed. To think that vision is *here* and language is *there* reflects outmoded notions of mental capacities reminiscent of phrenology. For example, Lakoff and Gallese (2005)¹³ argue that so-called higher-level mental properties like *concepts* arise in the territories of paradigmatic “lower-level” areas like motor circuits. This conjoining of “primitive” motor functions with “higher” reasoning contradicts the faculty model.

In terms of intelligent action, is there a principled division between brain and non-brain, John Haugeland argued that there is no justification for

¹³ Gallese, Vittorio, and George Lakoff. 2005. “The Brain’s Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge.” *Cognitive Neuropsychology* 22 (3/4): 455–479.

a separation of brain and body from a systems-theoretic point of view.¹⁴ The connections between brain and body are all wide-bandwidth, neurologically as well as physiologically. It makes more sense (to me) to imagine any specific mode of cognition as involving — *this bit of brain plus this bit of body plus this bit of world*. For instance, we cannot meaningfully speak of the act of handwriting without referring to hands, eyes, pencils, paper, chairs, tables and light, natural or artificial. Together they constitute the realm of the cognitive act of handwriting. This way of thinking, which sees cognition as embedded within procedures which involve actions with artifacts in contexts, harkens back to von Uexküll and has been technologically validated in Brooksian subsumption architecture.

Embodied and Embedded

Let us begin, then, from a rational holistic position which makes no “*invidious distinction between bone and brain*”¹⁵ and says, “cognition is always embodied.” But we must be cautious to avoid trivialising or restricting what we mean by ‘embodiment’. The simple fact of being a physically instantiated living creature is just the starting point of an understanding of the complexities of the idea. Tim Ingold consistently reminds us of this, as in the following passage: *It is in the very ‘tuning’ of movement in response to the ever-changing conditions of an unfolding task that the skill of walking, as that of any other bodily technique, ultimately resides (Ingold, 2000: 353). Indeed it could be said that walking is a highly intelligent activity. This intelligence, however, is not located exclusively in the head but is distributed throughout the entire field of relations comprised by the presence of the human being in the*

¹⁴ Haugeland, John. 1998. “Mind Embodied and Embedded.” In *Having Thought: Essays in the Metaphysics of the Mind*, 207–237. Cambridge, MA: Harvard University Press.

¹⁵ (MacIver 2009, 492)

*inhabited world.*¹⁶

Theorists from von Uexküll to von Foerster to Dreyfus to Varela have argued that the world I have is defined by the embodiment I have. As such, embodiment cannot be separated from situation and engagement with the material world. I am involved in a temporally and spatially immersed and autopoietic dance of negotiation with artifacts and structured spaces which is determined by the specificities of my embodiment. Embodiment is my experiential ontology. My identity, my selfhood, my existence, arises in that dance. But the 'embodiment I have' is not a simple given, it is an accretion of capabilities and limitations define by culture and lived experience, including enhancements and disabilities. As Ingold says elsewhere "*... throughout life, the body undergoes processes of growth and decay, and that as it does so, particular skills, habits, capacities and strengths, as well as debilities and weaknesses, are enfolded into its very constitution - in its neurology, musculature, even its anatomy.*"¹⁷

Cognition includes experience; it is being *in the world*. There is no cognition except for current experiences in the world or reference to past experiences in the world. You can't reason about Plato's cave without having had situated, embodied experiences of windows and shadows which make the metaphor meaningful. But cognition is also *doing* in the world. As David Kirsh established, many behaviors we call cognitive in the narrow and conventional sense are facilitated by, or cannot occur without, physical

¹⁶ Tim Ingold, Culture on the Ground, The World Perceived Through the Feet. Journal of Material Culture Vol. 9(3): 315–340, Copyright © 2004 SAGE Publications (London, Thousand Oaks)

¹⁷ Ingold 1998, p26

action in association with artifacts and tools. In this sense, cognition is not only embodied but also *embedded* and *enactive*.

Implementation Details

Implementation details is a phrase which stands in for an entire corpus of disciplinary rationalizations to justify the disembodiment of AI, as articulated by Herbert Simon in the “root document” of cognitivism (see above). His arbitrary and convenient “limit” permitted the excision of embodied, situated materiality from AI and cognitive science for a generation. The devil is not so much in the (implementation) details as in the belief that it is acceptable or possible to ignore them. Explanation of a group human activity in terms of computation will inevitably render invisible the significance of embodied practice, because the irrelevance of embodiment is axiomatic to the rationale of the discipline. Edwin Hutchins insightfully observes, “*From the perspective of a formal representation of the task, the means by which the tools are manipulated by the body appear as mere implementation details*” (2010a, 445) ¹⁸. The phrase “implementation details” tells the score before the game begins. It belies a commitment to dualism that will automatically render invisible or irrelevant aspects of embodiment. But “implementation details” cannot be swept under the rug. Like the anachronistic and double-edged phrase “human factors”, the term has allowed the technical community to avoid engagement with human contexts.

Embodied Cognition

¹⁸ Hutchins, Edwin. 2010a. “Enaction, Imagination, and Insight.” In *Enaction: Toward a New Paradigm for Cognitive Science*, edited by John Robert Stewart, Olivier Gapenne, and Ezequiel A. Di Paolo, 425–450. Cambridge, MA: MIT Press.

The framing of group performance on a ship's navigation bridge as distributed computation in a computational-cognitivist worldview was a tour de force by Edwin Hutchins. Yet, as he himself recognized years later, his style of analysis rendered the bodily dimensions of thinking obscure:

The processes that underlie the "Aha!" insight remain invisible to a computational perspective in part because that perspective represents everything in a single monomodal (or even amodal) system. A careful examination of the way a navigator used his body to engage the tools in the setting, however, helps to demystify the discovery process, and to explain why and how it happened when it did. The insight was achieved in, and emerged out of, the navigator's bodily engagement with the setting through enacted representations. (2010a, 436–437)

In such statements, Hutchins comes close to the work of Mark Johnson (1987)¹⁹ and Lakoff and Johnson (1999)²⁰ regarding the origins of abstract concepts in embodied experience. Such (embodied) thinking is not "reason" in the cognitivist sense. It is not computational in the usual sense. Attempts to interpret embodied thinking in terms of computation necessarily force it through awkward transmogrifications to fit such immaterial, non-contextualized models of representation.

As Edwin Hutchins recognizes, *"Interactions between the body and cultural artifacts constitute an important form of thinking. These interactions are not taken as 'indications' of invisible mental processes, rather they are taken as the thinking processes themselves"* (2010b)²¹. Suggesting that

¹⁹ Johnson, Mark. 1987. *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. Chicago: University of Chicago Press.

²⁰ Lakoff, George, and Mark Johnson. 1999. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.

²¹ Hutchins, Edwin. 2010b. "Imagining the Cognitive Life of Things." In *The Cognitive Life of Things: Recasting the Boundaries of the Mind*, edited by Lambros Malafouris and Colin Renfrew, 91–101. Cambridge: McDonald Institute.

bodily motion may constitute a medium of thinking is a radical assertion for a (rehabilitated?) cognitivist, but it comes as no surprise to the dancer or practitioner of martial arts or to any thoughtful person while rock climbing or hanging out the laundry. But we must not underestimate the profundity of this sea change in cognitive science. It indicates a hard-won emancipation from naturalization to the dualist and internalist tenets of AI.

Aldous Huxley observed long ago, *"In a world where education is predominantly verbal, highly educated people find it all but impossible to pay serious attention to anything but words and notions"* (1954, 62) ²². Huxley proposes that there are valuable qualities of human cognition/intelligence that are non-linguistic. Numerous students of embodied cognition, from Michael Polanyi to Evan Thompson to John Sutton, have stated what practitioners and teachers of embodied cultures have always known: the skills of bodily know-how are notoriously hard to document, because such thinking is inherently non-textual and does not intersect with textual representation and text-based reasoning. Dreyfus, after Merleau-Ponty, refers to such knowledge as "muscular gestalts" (249) ²³. John Sutton notes it in regard to the skill of a potter: *Because this kind of expertise relies on an immense reservoir of practical skill memory, embodied somehow in the fibres [sic] and in the sedimented ability to sequence technical gestures appropriately, verbal descriptions of it (by either actors or observers) will be inadequate. ... what the expert remembers is in large part consciously*

²² Huxley, Aldous. 1954. *The Doors of Perception*. New York: Harper & Row. 1954, p62

²³ Dreyfus, Hubert L. 1996. "The Current Relevance of Merleau-Ponty's Phenomenology of Embodiment." *The Electronic Journal of Analytic Philosophy* 4.
<http://ejap.louisiana.edu/EJAP/1996.spring/dreyfus.1996.spring.html>.

inaccessible as well as linguistically inarticulable. (2008, 49) ²⁴. Philip Agre makes the complementary point when he observes that computational fields “*concentrate on the aspects of representation that writing normally captures. As a result, theories will naturally tend to lean on distinctions that writing captures and not on the many distinctions that it doesn’t*” ²⁵

Recasting Cognition

We are culturally accustomed to thinking about being in a dualistic and serial way: we believe generally that we perceive, cogitate and act, with those distinctions and in that order, with cogitation being different in kind. Increasingly, neuroscientific research is showing us what is obvious from an evolutionary perspective: the brain is — before culture, before consciousness, before language — the organ which enables us to move in and interact with the world.

I believe it is justifiable to assert that knowledge is embodied — not in the trivial way that it is done by a body, but that the knowledge, the “skill,” is etched into joints and shapes muscles and into a holistic cooperation of (motor) neurons, muscles, bones, fascia sensory organs for proprioception. No matter how much “information” I acquire, I cannot play piano if I do not have fingers nor can I play well unless I have tuned my sensorimotor systems to the task, by extensive practice - playing scales at speed, hearing harmonies and so on. Nor could I play piano if it were not scaled to human scale — if the keys did not fit my fingers or the span of my hand. But this is not just a matter of motor skills. With Mark Johnson, I argue that abstract concepts

²⁴ Sutton, John. 2008. “Material Agency, Skills and History: Distributed Cognition and the Archaeology of Memory.” In *Material Agency: Towards a Non-anthropocentric Approach*, edited by Carl Knappett and Lambros Malafouris, 37–55. New York: Springer. (p, 49)

²⁵ Agre, Philip E. 2003. “Writing and Representation.” In *Narrative Intelligence*, edited by Michael Mateas and Phoebe Sengers, 281–303. Philadelphia: John Benjamins. (p 290).

arise in bodily experience; with Lakoff and Gallese, I find the hypothesis of neural exploitation persuasive as an explanation of the evolution of cognitive capabilities.

Whether we say the knowledge is in the mind/body but inarticulable out of context, or whether we say, with Clark and Chalmers, that the knowledge is in the artifact, or if we aver that the knowledge is *relational* - all that is irrelevant here. To the extent that such knowledge is *knowledge in practice*, it is effectively non-existent except in the context of its actual performance, as so-well articulated by John Sutton.²⁶

Conclusion: Rethinking Being and Consciousness

We are not minds that happen to have bodies to do their material work. Rather we are bodies that seem to have minds. We are bodies in motion that happen to produce a subjective sensation we call consciousness, which gives us the impression that we are something more than, or something other than, bodies. This is the remarkable illusion we call mind. When that illusion is given not only identity but an identity of a higher order, embodiment is devalorized and the inherent value of embodied practices is denigrated.

The dualisms of mind/body and self/world are untenable. The idea that exercises of intelligence are considered to be computational must be reconsidered. We must recast cognition as dynamical, relational and performative doing in the world. I am not saying that there is no room for symbols or mental representation. I *am* saying that a filter which extracts analysis and symbolic representation from bodily practices and privileges

²⁶ Sutton, John. 2007. "Batting, Habit and Memory: The Embodied Mind and the Nature of Skill." *Sport in Society: Cultures, Commerce, Media, Politics* 10 (5): 763–786.

the abstract over the embodied may have jettisoned the larger and richer part of the intelligent behavior in question.

Research questions arise within research paradigms. Many of the questions that are askable in post-cognitivist inquiry are unaskable in the internalist paradigm. In this new post-cognitive context, one could ask questions like, *“If intelligence does not occur (entirely) locked within the cranium, and if it does not occur (exclusively or at all) in algorithmic manipulation of immaterial symbols, then what and where is it?”* Aspects of this new paradigm are captured in the new approaches to cognition: embodied, embedded, enactive, extended, situated, distributed.

We need to build an integrated, materialist account of being and consciousness which exposes the fetters of dualism and is washed clean of transcendentalist mumbo-jumbo. Such an account would involve serious reconfiguration around ideas such as the following:

1. We cognize as integrated biological creatures, and any attempt to mechanistically separate faculties into organs and systems can only be understood in the context of an overarching multimodal integration.
2. Intelligence, thinking, cognition, is situated and embodied. We think in engagement with the world — in other words, active engagement with the world constitutes thinking.
3. Skill *is* intelligence. Skill is the traditional, non-scientific descriptor for the capabilities which permit epistemic action and distributed cognition.
4. Abstract cerebration, the mental manipulation of symbols, is a special case, and even then, such thinking leverages (and would be impossible without) a history or embodiment.

5. “Mind” and “consciousness” are epiphenomena of embodied being and have no existence outside embodied being.

From this base, one could lay out a new account of cultural action. This would entail a reconceptualization of conscious/non-conscious thought/action; a reconceptualization of “nature and nurture” through the idea of cultural bootstrapping of latent capacity/neural exploitation; and a reconceptualization of cognition as embodied, enactive and integrated with the material and cultural world.

This is what is so exciting: the current revolution in cognitive science provides basis for a paradigm shift which will allow new ways of speaking about embodied, materially engaged action. Such an approach holds the potential to level the (academic) playing field that has for so long been tilted in terms of the abstract and the symbolic. It has the potential to provide an entirely new register in which to speak about what we might call *cultural cognition* - embodied art and cultural practices - in a new way that gives full recognition to the materially, socially and spatially situated intelligences involved in human cultural activities, both ‘high’ and ‘low’.

Simon Penny, Los Angeles, 2017.