Pragmatic Circulations

John Dewey's Philosophy, Movement Practices and Embodied Cognition

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ABSTRACT

The past decade has seen a burgeoning of projects and publications to articulate interdisciplinary perspectives into *dance* and *embodied cognition*. Many of these works include experiential perspectives, for which they have generally turned to phenomenology. *Pragmatism* on the other hand, another philosophy of experience, has been mostly absent from these discussions. We provide a close reading of some of *John Dewey*'s ideas, retrospectively informed by notions such as conceptual metaphors and image schemata, to consider a pragmatic framework for movement and embodied cognition, and some implications for embodied interaction.

CCS CONCEPTS

• **Computing methodologies** → **Cognitive science**; • **Applied computing** → **Performing arts**.

KEYWORDS

Pragmatism, John Dewey, William James, Embodied cognition, 4E cognition, Postmodern dance, Somatic practices

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1 INTRODUCTION

We first introduce John Dewey's pragmatic philosophy, starting with a contextual presentation, followed by advice for reading his work, and finally a discussion of his critique of the reflex arc.

1.1 Situating Dewey

Along with Charles Sanders Peirce and William James, Dewey is one of the founders of *American pragmatism*. It is an approach to philosophy that emphasizes action and agency, eschewing static categories in favour of situated, experiential and dynamic perspectives. Thus *mind* for Dewey is a *verb* denoting the ways in which we navigate the situations in which we find ourselves, rather than a thing or substance [8, p. 268]. And knowledge, or better, *knowing*, is an activity of intelligent inquiry to transform a problematic situation, rather than a set of propositional statements.

Dewey's work has had a wide influence in multiple fields, including psychology, education, political philosophy, and scientific inquiry. But as a philosophy of *experience* it is often overlooked or underappreciated. In *dance studies* it is eclipsed by phenomenological approaches mainly rooted in Merleau-Ponty's foundational work. And in *embodied cognition* only one line of inquiry builds upon his highly relevant ideas [22]. There is thus an oversight in recognizing that his pragmatic philosophy foreshadows contemporary ideas on cognition, and a missed opportunity to further these ideas along the wide range of fields that he has explored.

Much of Dewey's work is imbued with a desire to integrate the full range of human experiences, a goal which he pursued through a prolific body of work, and a wide range of interests. While he initially aligned his research with Hegelian idealism, he soon turned to pragmatism, a shift which he credited in part to the influence of James' philosophy and the publication of the latter's magnus opus in 1890: *The principles of psychology* [19].

In 1894, Dewey joined the University of Chicago as head of the Philosophy department, which also included programs in Psychology and Pedagogy. This new position was a landmark in the evolution of his ideas, particularly for his lifelong interest (and active role) in the field of education. Confronting knowledge, not as a concept, but as a developmental process of children actually learning, played a further role in his letting go of idealist abstractions. Other influences include close friendships with the social reformer Jane Addams, the art collector Albert C. Barnes, and F. Matthias Alexander, the founder of a somatic practice called the *Alexander Technique*. These relations are worth mentioning as they indicate three extended perspectives from which we can consider Dewey's philosophy: *(a)* social and political, *(b)* aesthetic, and *(c)* somatic.

While the first two connections are well known, the latter is rarely considered. The Alexander Technique is a mindfulness based practice that aims to overcome harmful habits of use through the cultivation of inhibition, and a gradual retuning of sensorimotor processes. Dewey met Alexander in 1916, and soon started taking lessons over a span of 35 years, during which he also wrote the introductions to three of the latter's books [2]. This is more than a peripheral relation. Dewey was concerned with developing a philosophy that could circulate between *theory* and *practice*. And he recognized that the technique had not only benefited his health, but

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also informed his views, allowing him to "transform [his theories of mind-body] into realities" [11, p. 44–45].

1.2 Reading Dewey

Reading Dewey can be disconcerting. As a writer he endeavoured to use plain language. This is a marked contrast from the tactics leveraged by other philosophers, such as Husserl's elaboration of a precise terminology from the ground up, or Heidegger's bewildering style, which disorients in order to reorient. Instead, Dewey uses common words and a more neutral prose, possibly with the aim of keeping his ideas accessible for a wide readership. This easily leads to misunderstandings though, if one fails to realize that he intends to invest familiar terms with new meaning, or reclaim them from what he sees as historical dead ends.

Further complicating a survey of his conceptual landscape, some key terms don't necessarily stand out as such on a first reading, and others have to be reinterpreted from established philosophical uses. He refers thus to experience, *an* experience, situations, form, transaction, continuity, nature, culture... These benign yet laden words should be approached carefully and almost tentatively, testing the ground to ensure one's footing is sound, and retracing past steps to confirm that one is on the right path.

In practice, Dewey has often been misunderstood. Many of his positions have been debated along competing interpretations, during his lifetime and after. Attempting to clarify these issues led him to some revisions, from *interaction* to *transaction* for instance [10, p. 272], to emphasize the codependency of processes rather than give the impression of a reified in-between. In 1951 he even considered changing the title of his major contribution on metaphysics — *Experience and nature* [7] — to *Culture and nature*.

All of that being said, Dewey's work is strikingly prescient, and well worth the effort. It is challenging, also, because it forwards a radical reevaluation of long established dualist standoffs. From such an assumed stance, there seems to be no choice but to pick one side and argue for it over its antipode. Instead, Dewey consistently disentangles these standoffs by a conceptual shift from static to dynamic views, like a still image from a film suddenly resuming its play. In that return to movement and process lies the potential to reconcile what was previously incompatible.

In addition to Dewey's source materials, our views have been much informed by the readings of his philosophy elaborated by Mark Johnson [22] and Thomas M. Alexander [3]. While Dewey's writing is often relatively unsystematic, his last book — *Knowing and the known* — includes a penultimate chapter with a list of terms and definitions that constitutes a useful reference [10, ch. 11].

1.3 Critique of the reflex arc

Dewey's critique of the *reflex arc* is an early article published in 1896 [6], six years after James' *Principles*. It provides an advantageous point of entry to his philosophy as the focus is narrow, and many key ideas that he went on to develop in the following decades are introduced along this relatively approachable line of inquiry. The main argument is that perception and action cannot be viewed as separate and sequential processes, which leads him to a *sensorimotor* view of cognition, and foreshadows contemporary ideas in embodied cognition by almost a century.

The concept of the reflex arc was developed in part to remediate introspectionist methodologies, and aimed to model behavior as a series of stimulus and response pairings. As a basis for discussion, Dewey uses James' example of a child seeing the light of a candle (first stimulus), reaching for it (first response), getting burned (second stimulus), and finally withdrawing their hand (second response). Each arc assumes the existence of two distinct things happening one after another: a stimulus, and then a response.

For Dewey, this is an echo from dualist views that separate mind and body, now transposed to disjoin perception and action. A close examination of the first stimulus — the light — reveals that what actually takes place cannot be reduced to receiving an isolated perceptual given. Rather, the child is engaged in an *activity* — seeing — which combines moving, attending and perceiving. Instead of a stimulus, what we have is a *sensorimotor activity* or process of *coordination* that is fundamentally embodied and embedded. Using Dewey's later terminology, this is an example of a *transactional* relation between *organism* and *environment*.

The response, similarly, cannot be reduced to a mechanistic motor reaction. It is just as much a sensorimotor process of coordination, between eye and hand at least (and likely even more whole bodied), as the child reaches towards the candle and coordinates their reaching in part from visual feedback. Furthermore, this new activity resonates with the previous one, from which it has gained value that is carried over:

> *We now have an enlarged and transformed co-ordination; the act is seeing no less than before, but it is now seeing-for-reaching purposes. There is still a sensori-motor circuit, one with more content or value, not a substitution of a motor response for a sensory stimulus.* [6, p. 98]

And so Dewey's argument progresses. First, seeing is never just seeing, and acting never just acting. Rather, there are sensorimotor processes that interweave what we might think of as perception or action, to the point that it makes little sense to consider one or the other independently of the whole coordination. And second, these processes do not unfold in isolation, overriding whatever preceded. Rather, value accretes and meaning propagates:

> *It is no longer mere seeing; it is seeing-of-a-light-that-means-pain-when-contact-occurs. The ordinary reflex arc theory proceeds upon the more or less tacit assumption that the outcome of the response is a totally new experience; that it is, say, the substitution of a burn sensation for a light sensation through the intervention of motion.* [6, p. 98–99]

The problematic assumption that there is such a thing as a distinct stimulus or response is an instance of what James calls the *psychologist's fallacy*. It consists in superimposing abstracted features, arrived at by a process of analysis, upon the primary source that the analysis considers, as if they were already there. Dewey observes a similar misunderstanding at work here:

> *A set of considerations which hold good only because of a completed process, is read into the content of the process which conditions this completed result. A state of things characterizing an outcome is regarded as a true description of the events which led up to this outcome; when, as a matter of fact, if this outcome had already been in existence, there would have been no necessity for the process.* [6, p. 105–106]

The concept of the reflex arc treats stimulus and response as if these were 'distinctions of existence', when they are in fact 'distinctions of function' or 'teleological distinctions' [6, p. 104]. It reifies these functions into things, and by doing so generates a series of false problems. What unfolds are *circles* rather than arcs. And within these cycles of coordinated activity, function and meaning fluctuate through various phases. The stimulus is not a given passively received, but a discovery actively constituted. The response is not a mechanistic motor reaction, but an activity driven by a process of inquiry in engagement with the world. This dynamic view accounts for uncertainty, anticipation, exploration, resolution, and the possibility of growth and development.

1.4 Discussion

Dewey elaborates a far reaching critique, which unfolds from the inadequacy of considering perception and action as separate, and leads to a sensorimotor view of cognition. He foreshadows similar ideas developed by researchers such as the neurophysiologist Nikolai Bernstein [4], the founder of ecological psychology James J. Gibson [15], and more recently in contemporary approaches to embodied cognition such as *enactivism* [35].

The essay is fascinating because it holds seeds of key ideas that Dewey went on to develop in the following four decades. Notions such as the *principle of continuity* and the *transactional* nature of *organism-environment* relations are hinted at. Most obviously, Dewey dissolves static and dualist ontologies by emphasizing instead process, activity, growth and development. Adopting James' radical empiricism — working from experience — he rejects the "false simplicity which is reached by leaving out of account a large part of the problem", not out of dogma, but because of what is lost when partial processes are reified into isolated things [6, p. 102]. This aspiration to account for the full depth and breadth of experience is axiological for Dewey, but also matters for the consistency and validity of the philosophy it leads to.

2 IMAGINATIVE MODES OF REASONING

We now jump onward in time, to the 1980s and the *embodied turn*, and specifically to the work developed by Mark Johnson and George Lakoff. While this line of inquiry unfolded first independently of Dewey's ideas, Johnson was introduced to them later on and realized their relevance for an embodied philosophy that incorporates the aesthetic dimensions of experience [22, p. xv]. We consider here the notions of *conceptual metaphors* and *image schemata*.

2.1 Conceptual metaphors

Lakoff and Johnson's *Metaphors we live by* [24] is an early and influential landmark for the embodied turn in linguistics, originally published in 1980. Starting from a detailed analysis of metaphors, they argue that our use of language, and even the ways in which we think, are deeply conditioned by our embodied nature.

> *The dimensions in terms of which we structure our experience (e.g., parts, stages, purposes) emerge naturally from our activity in the world. The kind of conceptual system we have is a product of the kind of beings we are and the way we interact with our physical and cultural environments.* [24, p. 119]

When we consider metaphors, poetry comes to mind and generally creative uses of language. But Lakoff and Johnson demonstrate that metaphors are pervasive rather than unusual or anecdotal. Furthermore, metaphors are not just linguistic phenomena. They underlie our thoughts and actions, and denote a fundamental process through which *meaning* is elaborated in relation to bodily and cultural experiences, as well as extended into abstracted situations.

This is obvious with *orientational metaphors* based on spatial distinctions such as UP-DOWN, IN-OUT or FORWARD-BACKWARD. From our physical experiences of UP and DOWN for instance, correspondences can be generated by mapping UP-DOWN to other opposites such as MORE-LESS, HAPPY-SAD, CONSCIOUS-UNCONSCIOUS or RATIONAL-EMOTIONAL. These combinations constitute *conceptual systems* that are reflected in expressions such as 'he *fell* asleep' or 'she *rose above* her emotions' [24, ch. 4].

Note that these metaphors generally work from a felt experience of space, rather than space as seen from a third-person perspective. Also, a metaphor here does not denote a single expression, but rather a conceptual system from which a multitude of expressions can be derived. Metaphors exhibit a form of coherence and systematicity, both within one system and across multiple related ones. These characteristics support the idea that we are dealing with patterns of thinking rather than strictly linguistic constructs.

While the previous examples emphasize the influence of bodily experiences, the cultural dimensions of experience are just as relevant. Tracing a single concept through multiple metaphors shows how versatile and widespread this process of meaning making is. Ideas can be: people (this idea *gave birth*), plants (the idea came to *fruition*), buildings (to *buttress* an idea), products (to *refine* an idea), resources (to *run out* of ideas), food (a *half-baked* idea), cutting instruments (an *incisive* idea), fashions (an *outdated* idea), light sources (a *brilliant* idea), or money (my *two cents*)... [24, ch. 10].

The full breadth of our experiences holds potential sources for metaphoric elaboration, which in turn impacts how we think and behave. The ARGUMENT IS WAR metaphor, for instance, obviously sets up a number of assumptions and entailments about arguments. Conversely, if our metaphor for having an argument was of a dance rather than war, then the ways in which we conceive of and conduct arguments would likely be different [24, p. 5].

Ontological metaphors are particularly important for this paper [24, ch. 6]. They consist in treating abstractions as if they were material things, thereby leveraging an experiential repertoire of possible physical interactions. Many of the examples listed for *ideas* are of that nature, reifying in effect the intangibility of our thoughts into something that can be seen and manipulated.

Lakoff and Johnson elaborate a *theory of meaning* which eschews both subjective and objective views by emphasizing the necessity of establishing a *theory of understanding* grounded in experience [24, p. 184]. On one hand, objectivism ignores the fact that meaning is culturally determined and metaphorical in nature. Our conceptual systems "involve an imaginative understanding of one kind of thing in terms of another". On the other hand, subjectivism misses the point that this imaginative understanding "is grounded in our successful functioning in our physical and cultural environments". Their final argument, that this process is "an imaginative form of rationality" [24, p. 194], provides a convincing middle way to bridge the traditional tension between objectivism and subjectivism.

2.2 A pragmatic metaphor: James' stream of consciousness

James' description of the *stream of consciousness* is probably one of his best known contribution.

> *Consciousness, then, does not appear to itself chopped up in bits. Such words as 'chain' or 'train' do not describe it fitly as it presents itself in the first instance. It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. In talking of it hereafter, let us call it the stream of thought, of consciousness, or of subjective life.* [19, p. 233]

James leverages a metaphor to convey nuanced distinctions. The corresponding understanding, once grasped, comes to the fore as a powerful gestalt. Let's examine its entailments, and how the stream of consciousness differs from a chain or train. Most obviously, it entails the fluidity of a liquid, within which fixed boundaries are nowhere to be found. There are no carriages as in a train, or links as in a chain, nothing that defines a predetermined segmentation of a whole into parts. The stream flows, more process than thing, and it affords nothing solid that we could even figuratively hold on to or grasp. This distinction between continuous and discrete is the main idea that James aims to communicate, and he reiterates it soon after with a second metaphor.

> *The transition between the thought of one object and the thought of another is no more a break in the thought than a joint in a bamboo is a break in the wood. It is a part of the consciousness as much as the joint is a part of the bamboo.* [19, p. 233–234]

Remember that for James, the psychologist's fallacy results from a confusion of standpoints. From a reflective perspective, we are looking back at a mental state as if standing outside of it. But this differs fundamentally from the way in which the mental state was originally experienced [19, p. 195].

> *We have the inveterate habit, whenever we try introspectively to describe one of our thoughts, of dropping the thought as it is in itself and talking of something else. We describe the things that appear to the thought, and we describe other thoughts about those things — as if these and the original thought were the same.* [19, p. 268]

And thus we describe parts rather than the continuity of experience, assuming a segmentation that was not originally there. The main entailment of the stream metaphor is that it dissolves this illusion of solid parts.

2.3 Image schemata

Lakoff and Johnson's seminal work on conceptual metaphors raises important questions about the nature of meaning, understanding and rationality. This led them to develop the notion of *image schemata*, introduced in two books published in 1987 [21, 23]. We focus here on Johnson's line of inquiry, as it leads back to Dewey later on, and extends into embodied aesthetics and arts-based research.

> *Image schemata exist at a level of generality and abstraction that allows them to serve repeatedly as identifying patterns in an indefinitely large number of experiences, perceptions, and image formations for objects or events that are similarly structured in the relevant ways. Their most important feature is that they have a few basic elements or components that are related by definite structures, and yet they have a certain flexibility. As a result of this simple structure, they are a chief means for achieving order in our experience so that we can comprehend and reason about it.* [21, p. 28]

Johnson elaborates now a more general theory of *meaning* and *rationality*. He argues that linguistic meaning is just a "special case within the broader notion of meaningfulness in general" [21, p. 18]. And this extended view leads him to consider intermediate structures of understanding such as image schemata. While linguistic meaning is conventionally viewed as propositional in nature, these structures are grounded in recurring and dynamic patterns from perceptual and motor interactions with our environment.

A schema holds a small number of *components* and *relations*. For instance, the PATH or FROM-TO schema has three components: *(a)* a source point A, *(b)* an end point B, *(c)* an oriented path from A to B; and one relation: *(d)* a force moving from A to B. This basic structure can be mapped upon a diverse range of situations: walking from one place to another, throwing a stone, punching a dummy, gifting a present, a bird hopping from perch to perch, or the melting of ice to water. As evidenced from these examples, the schema has the potential to operate through endless variations. The situations range from embodied to abstract. Components can be inanimate objects, a body part, the self, a living other, or a concept. Physical movement can become an analog for a phase transition, or any type of state change. Perspectives and roles can shift.

A schema also affords *entailments*, which are implications derived from its internal structure. Let's consider the CONTAINMENT schema, which emerges from our experiences of physical containment, and underlies notions such as INSIDE and OUTSIDE. In this case we can distinguish at least five entailments [21, p. 22]:

- Protection from or resistance to outside forces.
- Containment of what is inside: *He is in prison.*
- The determination of spatial location: *The keys are in the box.*
- Accessibility or inaccessibility: *Put it out of your mind.*
- Transitivity: *If A is in B, and B is in C, then A is in C.*

A schema's internal structure is generative in the sense that it can generate entailments and constrain inferences. To some extent, this structure could be described propositionally. But such a description would remain partial and incomplete. Most importantly, by abstracting the schema to a set of propositions we would lose its capacity to generate new meaning based on natural operations. These transformations can be thought of as *abstracted analogs* of physical processes and operations.

Image schemata are often represented as diagrams. These are helpful visualizations to highlight their structural components and relations. But the schema should not be identified with its diagram, which would suggest a visual and static modality, nor is it a mental image more or less abstracted from concrete visualizations. In summary, the schema is neither its diagram, nor a mental image, nor can it be reduced to a set of propositional descriptions. Rather, it constitutes an intermediate and preconceptual level of cognitive processing based on regularities and recurrent patterns of interaction, which structures our understanding and entails constraints on meaning and reasoning.

2.4 Discussion

Johnson proposes a middle way that does not deny the validity of propositional views of cognition, but argues that such a process of reflection is always elaborated upon "more basic modes of understanding" that afford a blending of "culture, language, history, and bodily mechanisms" [21, p. 104]. Conversely this pre-reflective *background* is not an inchoate dimension. Much of Johnson's work is an exploration of it and the structures that it holds. There is thus a *continuity* whereby "much of the structure we find in the social, epistemic, and conversational or speech-act domains is intimately related to parallel structure in our embodied (so-called physical) experience" [21, p. 63]. This view culminates in a discussion of *imaginative modes of reasoning*, which delineates a continuum of rational processes from embodied to conceptual situations. Imagination should not be misunderstood as an unstructured process solely concerned with creativity, and unrelated to meaning and reasoning. Rather, it is the basis of our cognitive abilities, including in fields such as research, art and philosophy.

Johnson recounts a medical discovery on stress reactions made possible by a shift in the underlying schema, from BODY-AS-MACHINE to BODY-AS-HOMEOSTATIC-ORGANISM. This is a powerful reminder that we are not neutral in our rationality. But stating that our conceptual perspectives are influenced by underlying assumptions fails to capture the full extent of the issue. The assumptions here are not facts and pieces of information that can simply be amended. Rather, we have preferential modes of reasoning, based on conceptual structures such as image schemata, that influence how we engage with ideas and process them. Incidentally, such a shift from facts to process is a typically pragmatic gesture with deep implications.

This also applies to research on cognition. In trying to understand the mind, humans have historically reached for the technological cutting edge of their time (clockworks, hydraulic systems, electricity...). The computational view of the mind is just the latest in a long line of metaphors. Any such bias is more than a surface connotation. We can expect it to operate as a strong constraint on our understanding and reasoning, which is likely to mask other possibilities. Alternatively, we can engage with image schemata and conceptual metaphors knowingly, and thus remain aware of the background upon which we ground our research.

3 EMBODIED AESTHETICS

We return now to Dewey's pragmatic philosophy, to highlight recurring gestures in his philosophy of experience and aesthetics.

3.1 Dewey's philosophy of experience

Dewey's philosophy consistently circles back to *experience* as the keystone through which apparent opposites are brought together in dynamic relation. This emphasis is obvious from the title of his main work on metaphysics: *Experience and nature* [7]. But as discussed in section 1.2, we should be careful to delineate what Dewey actually means by experience.

What he forcefully rejects is any account that reduces it to some form of private mental content. Three influences are worth considering. *(a)* From Darwin and the theory of evolution, he viewed the organism as an agent in ongoing interaction with its environment. Later on he preferred the term *transaction* to indicate the reciprocal nature of these co-determining influences. *(b)* From Hegel, he emphasized that our human environment is also culturally determined, and that our experiences unfold through and are shaped by ongoing social transactions. *(c)* From James, he adopted a radically empirical approach that acknowledges the philosophical relevance of personal experience, along the full range of its dimensions, including felt and immediate qualities.

Experience, then, is a circulation between seemingly opposed categories. In James' words, while 'thing' and 'thought' are *single-barreled*, experience is *double-barrelled*, referring to the unity of both *what* is experienced, and the *ways in which* that is experienced [7, p. 18–19]. Dewey consistently works to reconnect such disjoined abstractions in an extensive critique of philosophical thought through the ages, discussing pairs of concepts such as *(a)* perception and action; *(b)* subject and object; *(c)* body and mind; *(d)* organism and environment; *(e)* animal and human; *(f)* culture and nature; *(g)* theory and practice.

He dismantles these antipodal distinctions first by appealing to variations of the *psychologist's fallacy*, which he also calls the *fallacy of selective emphasis*; and second by elaborating what he characterizes as the *principle of continuity*. As we recall from his critique of the reflex arc (1.3), the fallacy consists in reifying teleological distinctions such as stimulus and response into distinctions of existence. More generally, it is caused by "the conversion of eventual functions into antecedent existence" [7, p. 34].

Each pair of terms in the preceding list is based on an underlying assumption: that there is a fundamental ontological distinction between two things. And at first each such pair seems rather self-evident, as in: 'of course I see and then I act', or: 'evidently I have a body and a mind'. The distinctions, however, become problematic as they imply gaps to bridge and contradictions to resolve. For Dewey, the issue lies in the original assumption which imposes a false segmentation and presumes things that were not there to begin with. In terms of imaginative reasoning, this is thinking as if manipulating solid objects with clearly defined boundaries: a conceptual world of blocks. Dewey was at least metaphorically aware of such a schematic bias:

> *The literal isolation of processes of experiencing, as if they were actually something solid and integral, is absurd; because dispositions and attitudes are always towards or from things beyond themselves.* [7, p. 382]

To rejoin what was disjointed, Dewey returns to the underlying processes, tracing their inbound and outbound flows as they circulate within and beyond. This dynamic view is further articulated by what he defines as the *principle of continuity*, an effort to naturalize so-called higher forms by tracing how they emerge from lower ones, potentially down to physical or biological levels of description.

> *The primary postulate of a naturalistic theory of logic is continuity of the lower (less complex) and the higher (more complex) activities and forms. The idea of continuity is not self-explanatory. But its meaning excludes complete rupture on one side and mere repetition of identities on the other; it precludes reduction of the "higher" to the "lower" just as it precludes complete breaks and gaps. The growth and development of any living organism from seed to maturity illustrates the meaning of continuity.* [9, p. 30]

Dewey foreshadows contemporary ideas on *emergence*. Continuity is neither rupture, nor mere repetition or identity. It entails changes through emergent forms that cannot be reduced to what they emerged from, but are still connected to it. Continuity is carried through by reclaiming process, growth, and the fundamentally temporal nature of experience. Conversely, flattening time out of dynamic processes creates artificially static entities that appear to have fixed properties and set demarcations. But this leads to contradictions and fallacies.

> *The idea that matter, life and mind represent separate kinds of Being is a doctrine that springs, as so many philosophic errors have sprung, from a substantiation of eventual functions. The fallacy converts consequences of interaction of events into causes of the occurrence of these consequences — a reduplication which is significant as to the importance of the functions, but which hopelessly confuses understanding of them. "Matter," or the physical, is a character of events when they occur at a certain level of interaction. It is not itself an event or existence; the notion that while "mind" denotes essence, "matter" denotes existence is superstition.* [7, p. 201]

For Dewey, all the false dichotomies of philosophy "have a single origin in the dogma which denies temporal quality to reality as such" [7, p. 120]. This turn towards temporality and change is already evidenced in Dewey's *theory of inquiry*. Instead of approaching truth or knowledge as the satisfaction of a set of propositions, he adopts a processual perspective to delineate inquiry as an active and dynamic pattern. Typically, it unfolds: *(a)* first as a qualitative feeling of instability; *(b)* then by formulating a problem; *(c)* constructing a hypothesis; *(d)* reasoning through the corresponding meanings; *(e)* until this active evaluation comes to a closure, restoring a form of stability. This pattern is schematic and in practice usually more intricate, overlapping, and iteratively looping back on itself. But it demonstrates the continuity from felt quality to reasoning, and the dynamic interplay between balance and imbalance. It is in a sense thinking as if walking. It also implies that knowledge and truth are contextual, contingent, temporary, open to reevaluation and further inquiry.

3.2 Dewey's aesthetic philosophy

Dewey's aesthetic philosophy is an extension of his philosophy of experience, a reflection he initiated in the penultimate chapter of *Experience and nature* [7], and then fully developed nine years later in *Art as experience* [8]. This is particularly clear in his discussion of having *an experience*, by which he means a pattern of intensified experience that exhibits a particular structure. He elaborates another continuity, from the ordinary experiences of everyday life, to potentially heightened modes experienced in relation to art.

> *A primary task is thus imposed upon one who undertakes to write upon the philosophy of the fine arts. This task is to restore continuity between the refined and intensified forms of experience that are works of art and the everyday events, doings, and sufferings that are universally recognized to constitute experience. Mountain peaks do not float unsupported; they do not even just rest upon the earth. They are the earth in one of its manifest operations.* [8, p. 9]

Aesthetic experience for Dewey is a paradigmatic example of what he means by experience: "experience in its integrity" [8, p. 278]. He muses that you could almost call it pure, but that the term has been far too abused in philosophy. It is experience unimpeded, and freed of confusion or distraction. Dewey's aesthetic theory is thus far from peripheral. In fact, it presents the culmination of his metaphysics of experience, and contributes a retrospective elucidation to a term often misunderstood.

Dewey cautions against viewing art in a museum context, at least as the basis for an aesthetic reflection. His critique operates on two levels. First, the museum experience tends to foreground art as a collection of physical objects. And second, in the generally neutral space of the museum, these objects are cut off from any meaningful social context that would normally inform and sustain their cultural function. Dewey's philosophy always circles back to experience, continuity and process. Thus, he makes an important distinction between an *artistic product* — physical objects such as paintings or statues — and the *work of art*, which he conceives of as what engaging with the product actually "does with and in experience". The more classically established the product, put on a pedestal in a museum, the more removed it is from "the human conditions under which it was brought into being and from the human consequences it engenders in actual life-experience" [8, p. 9].

Like Heidegger [17], Dewey turns to the Greek temple to argue that it operates in relation to a community and its members. The temple's standing as a work of art came from its capacity to kindle and sustain specific experiences for its original Athenian dwellers. These experiences were founded on a cultural field that included religious values, a sense of civic engagement, and beyond that a rich layer of multisensory experiences. For Dewey the aesthetic is not separated from ordinary experiences. It emerges from a similar field of pervasive quality, that we inhabit and navigate as both biological organisms and cultural beings. For our understanding of experience, this continuity circulates both ways. We can make sense of the aesthetic as an intensified form of ordinary experiences, looking for it *in the raw* [8, p. 10], which in turn clarifies what experience is or has the potential to be. Conversely, if the ordinary feels artless, that is but a symptom of segregated aesthetic views.

Dewey then proceeds to discuss what an intensified form of experience might be, which he denotes as *an experience*. It stands out as a whole within the general stream of experience, a dynamic pattern of fullness unlike the distraction or dispersion through which we often drift astray. Temporally, it unfolds as a distinct arc that reaches a sense of fulfillment, an end and resolution that has accreted meaning from everything that led to it. And along this arc it also fulfills the paradigmatic structure of experience as a field within which diffuse structures can be delineated: an underlying background or surrounding horizon of tacit *feeling*, a pervasive quality that binds together everything that is experienced, and then potential articulations through shared and communicable symbols. Note that these distinctions denote gradations and variations rather than discrete ontologies. Here as elsewhere, the principle of continuity applies.

In the intensified case of *an* experience, the unity of its pervasive quality goes hand in hand with clearer delineations of all the element that contribute to it. Instead of an inchoate and unstructured whole, we find that "the enduring whole is diversified by successive phases that are emphases of its varied colors" [8, p. 43].

This heightened vividness which circulates from parts to whole and back is also dynamic and temporal. There are no gaps or breaks in the experience, but rather variations, moments of acceleration and suspension, and each resting pause resonates with what has happened before, defining a sort of fractal micro structure. The overall process advances through a dynamic balance between doings and undergoings. The skill of the artist in facilitating an aesthetic experience lies in part in navigating that balance.

4 IMPLICATIONS

4.1 Dewey and embodied / 4E cognition

Dewey's philosophy holds the seeds of most ideas advanced in contemporary approaches to embodied cognition. His discussion of the immediate and qualitative dimensions of experience resonates with Merleau-Ponty's notion of the pre-reflective [25].

From early on he insisted on viewing perception and action as codependent processes, rejecting what Susan Hurley has critiqued as cognitivism's *sandwich view of the mind*: perception, thought and action as sequential and clearly demarcated layers, with thought of course constituting the 'meat' and most substantial layer [18].

His focus on temporality, process and emergence foreshadows *dynamicism*, which positions temporal dynamics as central to cognition, and emphasizes its situatedness, with systems both internal and external continuously influencing each other and co-evolving as they unfold through time [30, 34].

It is surprising that Dewey's legacy has only been recognized and embraced by one line of inquiry in embodied cognition, through Johnson's work on embodied aesthetics [22].

Further connections can be traced in relation to what is now termed *4E cognition* [26], a diverse research program that came out of the embodied turn, and characterizes cognition as:

- *Embodied*: Influenced by bodily structures.
- *Embedded*: Influenced by our physical, biological and cultural environment.
- *Enactive*: Unfolding through sensorimotor loops interweaving perception and action.
- *Extended*: Distributing and off-loading cognitive processing into the environment.

As we have established, Dewey's notion of experience is rich, nuanced, and comes to full fruition in his aesthetic philosophy:

> *Life goes on in an environment; not merely in it but because of it, through interaction with it. No creature lives merely under its skin; its subcutaneous organs are means of connection with what lies beyond its bodily frame, and to which, in order to live, it must adjust itself, by accommodation and defense but also by conquest. At every moment, the living creature is exposed to dangers from its surroundings, and at every moment, it must draw upon something in its surroundings to satisfy its needs.* [8, p. 19]

Clearly, Dewey views experience as embodied, embedded (continuity between organism and environment), enactive (meaning emerges from interaction and activity), and extended (we don't live merely under our skin). It is also *autopoietic*. An organism in transaction with its environment, through ongoing *doings* and *undergoings* [8, p. 29], is continuously losing and recovering its integrity. For Dewey, *precarity* and *stability* are fundamental qualities of experience. They imply a process of falling out of step with our surroundings, and recovering our unison with it. In this recovery lies the potential for *growth*, as the balance regained has been transformed by the fall and recovery it just underwent. These are the organic roots of aesthetics: value and meaning emerging from organic struggle, in moments of alert presence, when we are fully there, living in the present, a dynamic everchanging present.

4.2 Movement and somatic practices

While there is a growing literature elaborating scholarly research on dance and somatic practices, experiential approaches in these fields usually adopt phenomenological perspectives, mainly based on Merleau-Ponty's embodied phenomenology, and more rarely Husserl's transcendental phenomenology [1, 13, 27, 32].

Pragmatism, on the other hand, has been overlooked as a framework to consider movement practices, a surprising lapse given Dewey's emphasis on articulating yet another continuity, between *theory* and *practice*. One exception is Shusterman's work on *somaesthetics*. He proposes an approach to philosophy that includes attention to experiential dimensions, as well as the cultivation of embodied practices, to refine our own sense of embodiment, and ground scholarly reflections on the matter [33]. At the same time, Shusterman's views have been criticized as too normative by dance scholars such as Isabelle Ginot [16].

Turning to pragmatism here achieves more than correcting a historical oversight. What we gain is a framework that consistently dismantles dualist positions, and instead delineates the continuity between previously disjoined notions. This applies also to views on the structure of experience. Attending to its pre-reflective dimensions matters. But if the boundary between reflection and pre-reflection is figuratively drawn as a sharp black line separating two domains, then we are again establishing a fallacy. The schemata underlying such imaginative reasoning are biased towards the static, bounded and solid, which is the cause of much misunderstanding.

James' view of consciousness as a stream is revelatory because it eschews solidity for fluidity. The stream is emblematically processual and transactional. The riverbed channels the water's flow. And the water is in turn slowly carving the riverbed. The timescales differ: the flow almost too fast for our eyes to follow, while erosion progresses at an infinitesimal pace which escapes our human awareness. But the co-determination is clear and dynamic. And if we attempt to pin down what the stream is, we realize that it is neither the water nor its bed: not a thing but a process. The stream abidingly eludes our temptation to reify, draw boundaries, and segment a whole into fixed parts.

If we now turn to movement practices as discussed by expert movers, what we find is a similar fluidity. There are no static demarcations but rather liminal fringes like fertile flood plains. Steve Paxton, a master of postmodern dance, writes:

> *Dizziness and nausea are, I think, signals that we have reached the borderland between these two aspects of physical control — conscious and reflexive. When we linger in the borderland on purpose, we become our own experiment.* [28, p. 257]

The unconscious dimensions of experience are not like a dark closed box, thoroughly shut, and undifferentiated in its opacity.

There are processes, patterns and flows, some barely out of sight, others running as deep aquifers. There is thus potential for growth and development to deepen the transactional relations between voluntary and involuntary processes. For Paxton this is a process of inquiry to transform experience, in part by carefully attending to ordinary locomotor patterns such as standing and walking. In Dewey's words, Paxton cultivates *an experience* in simple pedestrian activities, thereby realizing the continuity between life and art that Dewey calls for.

5 CONCLUSION

We finish with some implications for our work with movement, computation and interaction. We are interested in multimodal interactive systems for live performance that generate sound based on subtle embodied cues and movement qualities from the performer [5, 14]. The research overlaps with artistic explorations of *biofeedback* [31], projects from the New Interfaces for Musical Expression community [20], and what Donnarumma characterizes as *biophysical music* [12], with the distinction that we came to this focus from the perspective of dance first rather than music.

Outlining the arc of this paper, we started from Dewey, jumped onward to Lakoff and Johnson's work on conceptual metaphors and image schemata, to then return to James and Dewey with the retrospective elucidation that their pragmatic reasoning can be viewed as unfolding from schemata that are fluid and dynamic rather than solid. We find this circulation of ideas across time and scholars arresting and inspiring. It engages us to consider the patterns of imaginative reasoning that underlie our own reflections.

It is tempting, when working with movement or biophysical sensors that detect subtle embodied cues, to think of the corresponding system as a tool to reveal otherwise hidden cues and qualities. The metaphor of a lens, microscope, or a highly sensitive microphone, comes to mind. Experientially, this type of work is potentially transformative, whether it is purely somatic as in Paxton's postmodern dance practice [29], or digitally mediated. But if we are transformed, it is not from receiving previously hidden information, now suddenly uncovered and revealed. It is the activity of attending to and engaging with that disclosure that changes us.

Interestingly, Varela et al. elaborate a similar clarification in relation to mindfulness, which is added in the preface to the *revised edition* of their seminal work on embodied cognition:

> *From the enactive perspective, mindfulness practices should be viewed as forms of skillful know-how for enacting certain situated mind–body states and behaviors, not as a form of inner observation of a private mental realm.* [35, xxv]

This amendment came to the fore during the 25 years elapsed since the original publication. Highlighting it in the preface demonstrates both its importance, and how easily it is overlooked. As repeatedly emphasized by Dewey, what matters is process and activity. This is a subtle but momentous distinction which has profoundly changed how we approach and navigate our research.

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