

## **The Backside of Habit:**

### **Notes on Embodied Agency and the Functional Opacity of the Medium**

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**Abstract:** In this chapter what I call the “backside” of habit is explored. I am interested in the philosophical implications of the physical and physiological processes that mediate, and which allow for what comes to appear as almost magic; namely the various sensorimotor associations and integrations that allows us to replay our past experiences, and to in a certain sense perceive potential futures, and to act and bring about anticipated outcomes – without quite knowing how. Thus, the term “backside” is meant to refer both the actual mediation and the epistemic opacity of these backstage intermediaries that allow for the front stage magic. The question is if the epistemic complexities around sensorimotor mediation gives us valuable insights into the nature of human agency and further how it might begin to show us new ways to think of the mind as truly embodied yet not reducible to any finite body-as-object.

**Keywords:** Sensorimotor integration, embodiment, cognitive distance, mediation, mind-body problem

### **Background of Mind-Body Problems**

The concept of habit is interestingly positioned in regard to the some of the grand questions of philosophy of mind, life and action. Historically many philosophers have thought of habit as a rather mechanical, automatic and involuntary phenomenon, falling squarely on the body side of their explicit or implicit mind-body divide. The idea is that habit makes the body passively, inflexibly respond, and thus leaves organisms more akin to machines than intelligent mindful agents. The inference is therefore that freedom and true

intentional agency (not to speak of consciousness), if at all possible, would have to be found entirely outside the realm of habit.

However, Barandiaran and di Paolo (2014) point to a rather deep additional historical tradition, reignited in the nineteenth century, which takes habit to be much more central to the understanding of human cognition, agency and morality.<sup>1</sup> I shall in this chapter draw inspiration from this latter tradition via core figures like Ravaisson, Peirce, Dewey and Merleau-Ponty, who each positions the capability and embodiment of habit as central to a better grasp on the integral nature of the embodied mind.

The question is how this centrality of habit is supposed to be understood. The contention, I take it, is that for a truly embodied theory of the mind – and not just the body – we need to move beyond simple reductionisms and the lingering aspects of classic metaphysical dualism, but also the mind-body divisions of computationalism and epiphenomenalism. I want to stress that the mind-body problem to be overcome is not quite equivalent on all these positions. Classic meta-physical dualism is the idea that minds and bodies are in principle independent stand-alone entities, each somehow self-sustaining. The mind-body problem is then a problem of interaction: How can the mind affect the physical and bodily processes and vice-versa, after each is already in existence. Now most deny metaphysical dualism simply on the basis of the implausibility of the existence of un-mediated and disembodied minds. Thus, the implausibility of metaphysical dualism is not simply about interface processes between the body and the mind. The immateriality of the mind is implausible to most, as physical and physiological processes appear to provide not only “inputs” and “outputs” but appear to be sustaining, causing or realizing the mind in some way. The notions of mind-body supervenience, epiphenomenalism and aspect dualism are all attempts to assure such a physical underpinning and mediation – and yet avoid reductionism. But one issue with these accounts is that they appear to establish – either explicitly or by absence of explanation—a sort of parallelism of the mental and the physical as two sides of a coin that shall never meet. In other words, it seems that we might end up with a new—additional—kind of dualist interaction problem. Why is there a mind at all if it does not have causal consequences as a mind so to speak?

Computational functionalism provides an interesting and yet ambiguous case in this respect. On the classic functionalist computer analogy, the mind is thought of as being like the software and the brain like the hardware of a computer. The hardware sustains the encoding and functionality of the “mind,” but the functions and informational contents get their meaning through “input” and “output” interactions with the (informational) world beyond the brain. The question is how one is supposed to understand 1) the brain as an organ of implementation of mental functions if these functions go beyond the brain, and 2) the causal paths between the functions/informational content and the implementational/physical level. It seems to me that these are live issues in contemporary philosophy of mind and are reflected in tensions within classic computational theories, predictive processing models, as well as more cybernetic, autopoietic and enactive theories of cognition.<sup>2</sup> Many of the tensions that reoccur within these active research areas has to do with embodiment, feedback and self-organization, and involve logically, epistemologically and metaphysically thorny issues of how to understand non-collapsing yet recursive processes, and dialectics of functional differentiation and integration.

The point I want to make is that to truly understand our embodied subjectivity we need a story that not only overcomes the dualism of postulating a disembodied mind, but also the dualism that claims a functionally separate realm of mind or information – even if this is thought to be physically implemented and “realized.” The question is if there is a way to think of the dichotomy between “information” and “energy” to use Bateson’s terminology, that allows for their generative distinction yet does not leave them forever detached. My hope that the ensuing analysis of the mediation of habit and sensorimotor integration will provide a new angle on some of these ongoing debates.

### **A Broad Notion of Habit**

I shall, like many pre-twentieth century thinkers, use the notion of habit in a broad sense, as referring to any functionally acquired dispositions and repeatable patterns of behavior. Peirce notably thought of habits in perhaps the most encompassing sense, in that he included not only evolutionary entrainments but also

inorganic repeatable dynamics and patterns of change. I shall limit my use to behavioral habits linked to sensorimotor processes.

Where colloquially we use habits to refer to quite extensive sequences of actions embedded in specific contexts, like driving a familiar route home, I shall think of behavioral sequences as involving habits simply in so far, they involve and rely on the repetition of previously learned sensorimotor contingencies. In this sense all purposive action involves elements of habit, even if the entire action sequence is not habitual. This use might seem to water down the notion beyond recognition, but the point is that larger behaviors have habitual aspects that could not be described if the word habit was limited to prolonged patterns of behavior. Dewey writes about his own broad use of the term:

The word habit may seem twisted somewhat from its customary use when employed as we have been using it. But we need a word to express that kind of human activity which is influenced by prior activity and in that sense acquired; which contains within itself a certain ordering or systematization of minor elements of action; which is projective, dynamic in quality, ready for overt manifestation; and which is operative in some subdued subordinate form even when not obviously dominating activity. (Dewey 1922: 40-41)

All willful and functional behavior thus appears to involve some level of habit according to Dewey:

All habits are demands for certain kinds of activity; and they constitute the self. In any intelligible sense of the word will, they are *will*. They form our effective desires and they furnish us with our working capacities. They rule our thoughts, determining which shall appear and be strong and which shall pass light into obscurity. We may think of habits as means, waiting, like tools in a box, to be used by conscious resolve. But they are something

more than that. They are active means, means that project themselves, energetic and dominating ways of acting. (Dewey 1922: 25)

Dewey in this way thinks of habits as means of action in general. But he stresses that they are adaptive, flexible and active. For pragmatists like Dewey we cannot just think of habits as one kind of behavior alongside others, or as added to some separately existing mental life. Rather the very activity of mind is intimately linked with habits.

### **Määttänen on Habit, Anticipation and Objective Conditions of Action**

Pentti Määttänen explicitly formulates a series of claims central to my argument. His approach is inspired mainly by Peirce's and Dewey's work and their notion of habit and its role in our semiotic and agentic relation to our environment and embodiment. Määttänen opens a 2010 chapter with the question: "How can habits of action be vehicles of cognition?" His proposal goes as follows:

The answer lies in the principle that thinking is the anticipation of action. A habit makes anticipation possible because it has been formed in the past. Past experiences of acting in certain kinds of circumstances, where action is accommodated to objective conditions of action, have given to these sequences of acts a certain form and structure. A new occurrence of a similar situation brings it about that the present situation is associated with the memory of the kind of a situation that has previously been the outcome of acting according to the habit in question. (Määttänen 2010: 204)

There are several ideas that invite further consideration in this passage: 1) That habits, via their associations of past situations and action outcomes, allow for anticipation. This anticipatory association is thought to

ground action selection through what Gibson called affordance perception, i.e. the perception of current possibilities for actions and their outcomes. 2) As we shall see Määttänen thinks of this anticipation as a sort of proto-intentionality, as it involves a directedness toward something, a potential outcome, that is not currently present or actual. I shall talk about this anticipation as a sensorimotor “jump” allowing for affordance perception and action initiation. 3) He further points out that our associative habits depend on a recognition of current circumstances as appropriately “similar” to past circumstances. He adds that habits have some level of abstraction from the exact conditions, which grounds the similarity categorization of the situation.<sup>3</sup> 4) Lastly, Määttänen links the successfulness of the anticipation to the relative permanence of the more objective “conditions of action.” This later point is central to what I call the backside of habit and much more needs to be said about how these conditions of action both informs the building of the habit and the continued success of the anticipation. Määttänen adds:

The anticipation is successful only if there is a certain similarity in the situations which an agent encounters during its course of life. In other words, there have to be some permanent, or relatively permanent, conditions of action to which the agent has had to accommodate its behavior. (Määttänen 2010: 204-5)

The main point seems clear: For an anticipation based on past experience to work, the conditions that gave rise to the past experience has to be appropriately similar in the current instance, otherwise the habitual association will provide us with misguided predictions and not actually succeed in anticipating the outcome of the potential action. However, there are at least two different kinds of similarities going on: One pertaining to the recognition of the type of situation that one is in and the kind of actions it affords – i.e. the specific anticipations that the perceived situation is associated with. Another issue seems to be how these associations comes about, and whether their resulting anticipations are correct. What is referred to as the

conditions of action appear to have to do with the latter. (Note though that these would rarely figure in our perception nor are they likely to be recognized as similar, or even to be judged to be part of the “situation.”)

Now Määttänen’s point, that the associations that we embody through our habits depend on past action success, is well taken. The structure of this past action, and how its outcome was obtained, depended on a host of objective conditions both in the body and in the environment. What is expressed is thus both that 1) our actions are necessarily shaped by and adapted to their concrete conditions of execution and 2) that these conditions need some level of stability or predictability for the anticipations to be accurate and to usefully guide our actions going forward.<sup>4</sup>

This leads me to a related tricky issue: in what sense of “objective” is it actually the objective conditions of action that Määttänen is concerned about here? Note that Määttänen’s notion of the conditions of action is quite broad as it encompasses both the body, the physiological medium of action as well as causal influences in the environment that affects the teleological outcome. But in each case what matters to what he calls the “operational success” of the anticipation are the relative reliability of the effects of the associative links. Thus, in the parlance of functionalism these conditions are at least in principle “multiply realizable” as long as the aspect, which we have adapted the particular action to, stays predictable enough to support the accomplishment of the outcome. I labor on this point to stress that words like “objective conditions” can distract us from the both the perspectival and general or approximate nature of the success of the sensorimotor anticipation.

On the other hand, the use of objective is appropriate in the sense that the reliable association always relies on factors beyond itself. This point relates to the two core issues of this chapter, namely 1) that all action is mediated and world involving and 2) that there appears to be an opacity from the perspective of habit and sensorimotor agency in general in regard to its own medium, its own “backside”. As I shall return to, nervous tissue is notoriously without sensory receptors and unknow to its user. The question is whether this opacity precisely is essential for allowing for the anticipation and for what Määttänen calls the “cognitive distance,” i.e. the very thing that for him makes habits “vehicles of cognition.”

### **Cognitive Distance and the Jump Allowed by Sensorimotor Integration**

Before delving deeper into the question of the medium, let us unpack the suggestion that habit should be seen as a cornerstone of cognition precisely because it allows for anticipation. Note that this claim should be contrasted with the many philosophers who have thought of habits as automatic, mechanical and more or less mindless, and largely opposed to real intelligent or cognitive processes.

Määttänen's idea is that habit-based anticipation can ground a basic version of semiotic meaning and intentionality. He writes: "The minimum requirement of meaning is that with meanings one can think about something that is not here and now but somewhere else at another time. Meanings give cognitive distance in regard to the immediately given situation" (2015: 41). Habit, he suggests, supports pre-linguistic meaning because the anticipatory cognitive distance fulfills this minimum requirement for meaning: "By virtue of a habit, an observed situation functions as a kind of sign-vehicle referring to the anticipated future situation" (Määttänen 2010: 205). Määttänen argues that habits allow for a version of what Peirce called a semiotic "three-place relation."<sup>5</sup> The elements of the three-place relation are: 1) A present object/situation, which Peirce calls the "sign-vehicle," 2) the absent "object" that the sign refers to, is "about" or directed towards and 3) what Peirce calls the "interpretant" i.e. the subject that integrates and interprets and for whom the sign is somehow connected to its object.<sup>6</sup> A classic example is that smoke is a sign of fire for someone with the appropriate experience.<sup>7</sup>

Now my present interest is not so much in the question of whether habitual anticipations are truly "meanings" or not, but rather in this phenomenon of "cognitive distance" and how it becomes possible through something like the dynamics of a three-place relation. I want to understand not only what this habitually-supported cognitive distance can do for our agency and cognitive functioning, but also the relationship between the mediating circumstances and this distance. Differently put, how is it that the mediation makes sensorimotor habit and thus cognitive distance possible, which then allows for more advanced modes of mind and action?<sup>8</sup> Määttänen, as we have seen, describes how the habit allows for the current perception to represent something which is not there, namely, the anticipated outcome. But a potentially interesting tension lurks here: Namely that the distance is attained through integration, that a



break is created through a union if you will. It seems that there is a generative tension in this distance allowing association, where that which is not present is made cognitively present (or “re-present” as Bergson would say), by way of backgrounding part of that which is present. The question is how this extraordinary feat is accomplished.

Perhaps we can think of the sensorimotor integration underlying the habit as making possible a kind of “jump”. Määttänen talks about anticipation, but the reason I like to think of this anticipation as a jump—and label it such—is to underscore the future-directedness as not a gradual or continuous anticipation but rather a gluing of the anticipated outcome to the perception of the present situation. Almost like a digital composition creating something like an “if-then” but in an embodied rather than logical sense, with situated values and affordance measures of what “I can (want) from here.” The dual point I want to highlight using the notion of a jump is thus that there appears to be an absence of transparency of the mediating processes of the sensorimotor based anticipation, and that this absence is generative of the cognitive distance – the transcending of the actual into the potential or virtual.

This might seem like a minor issue, but there is, as Määttänen suggests, precisely a break, a distance, between the current situation and the anticipated future. This distance allegedly allows for the “three-place-like” semiotic grounding. But there is also a lack of distance, in that the habit precisely serves as the glue between the before and after, between the perceived present and the possible outcome.<sup>9</sup> There is notably a sensorimotor *integration* and it is this integration that arguably allows both for the situated affordance perception and the initiation of the habitual action.

### **Ravaisson: Discrete Ends Fusing with Continuous Means**

Several philosophers in the pragmatist tradition have touched on the necessary mediation of sensorimotor habits and their complex dynamics of embodiment. I have already referenced Pierce and Dewey, but another relevant work is Ravaisson’s 1838 classic *On Habit*. He writes extensively about how habits mediate between idea and matter. Interestingly he also makes the claim that our “understanding” and “will” attach

themselves to the outside of things, to their limits, to that which can be understood as discrete. “Nature suggests and furnishes the means,” the continuities between cause and effect.<sup>10</sup> Ravaissou’s point is that the two become intertwined through habit:

But in reflection and the will, the end proposed by intelligence is an object opposed to itself, as the more or less distant goal of movement. In the progress of habit, inclination, as it takes over from the will, comes closer and closer to the actuality that it aims to realize; it increasingly adopts its form. The duration of movement gradually transforms the potentiality, the virtuality, into a tendency, and gradually the tendency is transformed into action. The interval that the understanding represents between the movement and its goal gradually diminishes; the distinction is effaced; the end whose idea gave rise to the inclination comes closer to it, touches it and becomes fused with it. (Ravaissou 2008/1838: 55)

We see here Ravaissou’s interpretation both of what I have called the “jump” of accomplished habit and its backside! He also attempts to describe the process of learning; how the process of habituation creates the possibility of the jump through efforts of both thought and movement, as the concrete behaviors adapt to “the actuality it aims to realize.”<sup>11</sup>

His analysis also takes on the epistemological complexity of the fact that the true continuities of the fabric of nature cannot be directly known and yet we, and our agency and intellect precisely depend on these. His thought thus appears to integrate the Kantian phenomenal and noumenal worlds without collapsing their distinction. I take this epistemological-metaphysical dialectic to be at the core of the idea that habit can help us overcome dualism and understand the mind as embodied. He writes:

In reflection and in will, the end of movement is an idea, an ideal to be accomplished: something that should be, that can be and which is not yet. It is a possibility to be realized. But as the end becomes fused with the movement, and the movement with the tendency, possibility, the ideal, is realized in it. The *idea* becomes *being*, the very being of the movement and of the tendency that it determines. Habit becomes more and more a *substantial idea*. The obscure intelligence that through habit comes to replace reflection, this immediate intelligence where subject and object are confounded, is real intuition, in which the real and the ideal, being and thought are fused together. (Ravaisson, 2008/1838, 55)

Ravaisson thus argues that habit fuses thought with being, that it is a substantiation, an embodiment of the end to be accomplished. Habits are teleologically and intelligently organized, even as our conscious understanding recedes, but they are also necessarily embodied.

### **Stabilization of Outcomes, not Actions, through Flexible and Teleological Control**

Before I again turn to the question of the embodiment and mediation of habit, I want to point to a few insights by Bill Powers who writes in the tradition of control theory and cybernetics, but yet comes to very similar conclusions regarding the teleology of actions, the coordination around outcomes and also our relative oblivion regarding the embodied means. Powers points out that the teleological organization of actions around perceptual outcomes is what allows for control and stabilization of habits in a variable world and in the face of constant perturbations: “Regular behavior is *not* brought about by regular motor actions, and regular motor actions would not normally produce regular results.” (Powers 1989: 25) His point is that if behavior consisted of automatic “if-then” productions of motor output given specific sensory inputs we would never succeed in stabilizing our habits. He explains how control thus depends on flexible adaptation:

When we see consistent behavior in the presence of independent disturbances, we can deduce that the actions of the organism must be varying so that the resultant is right for producing what we see. This is the basic logic of the phenomenon we know as control. A disturbance that tends to alter the final pattern results immediately in a change of motor action that tends to alter it by the same amount in the opposite direction. The net result is no change, or almost none. It is this lack of change, under circumstances where change is to be expected, that tells us control is occurring. (Powers, 1989: 26-27)

I agree that the associative learning and adaptation processes are both flexible and teleological. It is quite fascinating to think about the amount of subtle and unique adjustments that characterize even our most habitual and skillful actions. The habit rather than mechanically reproducing past movements precisely allows for coordinated adaptivity to his individual situation. One might say the automaticity of habit lies not in the replication but in the lack of local deliberation. Interestingly Merleau-Ponty raises a similar objection to superficial association of stimuli and responses:

It is true of course, that what links elementary movements, reactions, and “stimuli” together in habit is not an external association. Every mechanistic theory runs into the fact that the learning process is systematic; the subject does not weld individual movements to individual stimuli, but rather acquires the power of responding with a certain type of solution to a certain form of situation. The situations may differ widely from case to case, the responding movements may be entrusted sometimes to one effector organ and sometimes to another, and situations and responses resemble each other in different cases much less through the partial identity of elements than by the community of their sense. Must we thus place an act of the understanding at the origin of the habit that would first organize the habit’s elements only later to withdraw from it? (Merleau-Ponty 1945: 143)

Merleau-Ponty is right that mechanistic association would fail to accommodate the variability of actions and stability of meaning across situations. He writes that habit is not “external association.” But yet there is some truth in the experience of “association” in a more teleological sense. I.e. the internal continuities and the actual conditions, which actions are adapted to, are largely hidden and the functionality of the associative “jump” relies on this obscurity of its own dependencies, even when these varies systematically and are dynamically adapted to the unique situation. I shall now try to make this tension more explicit in the discussion of association.

### **The Pragmatist Law of Association through Habit**

As seen in the previous section, several thinkers explicitly criticize the empiricist notion of association of simple ideas or perceptions based on some basic categories of similarity. Ravaisson puts it well: “It is not the *association of ideas* that explains habit; it is rather by the law, by the principle of habit that the association of ideas can be explained” (1838: 73). In other words, association must be explained through the meaningful integration of actions and outcomes through habit. The question is how the anticipatory association can come about and how to think of the “similarity” that allows habit-based affordance perception of action opportunities in the present.

Määttänen talks about the “pragmatist law of association” as based on and mediated by the embodiment of habits, and how it differs from Humean association which is based on categories of “resemblance, contiguity in time or place and cause (or effect).” He explains:

The pragmatist law of association differs from this in that the associative connections between items are formed not only because they occur in a sequence, but because they are associated with a certain form of action, a habit. Sensory inputs are associated not only with each other but also, and more importantly, with neural mechanisms controlling overt

motor action. It is the course of habitual action that determines what kind of sensory inputs are integrated associatively with one another in a sequence and what sequence of the neural processes controlling motor movements is associated with it. The important point is that when habitual action determines the sequence of sensory inputs that are associated with each other, the sequence corresponds to the objective conditions of action to which the action is accommodated. (Määttänen 2010: 205)

Määttänen thus suggests that “sensory inputs” are associated with each other, but also with the actual “neural mechanisms controlling overt motor action.” I see what he is getting at, but he uses “association” in two very different ways here: I.e. on the one hand the experienced anticipation of a yet absent sensory outcome, an association presumably made possible by the already accomplished sensorimotor learning and neuronal connections. On the other hand, he now also refers to this underlying neuronal process and the adaptation to the “the objective conditions of action” as one of “association.” Are these both associations? Or would it be more useful to distinguish these, to show that there is a clear procedural difference?

If we look back to Ravaissón’s insights about the process of habit formation, his suggestion was that the “fusion” of the goals and the means come about through a gradual process of integration and adaptation where the goals are in a sense gradually dispersed in the body.<sup>12</sup>

Presumably it is in this process that sensorimotor paths get both integrated and adapted to what Määttänen calls the “objective conditions of action.” Now the “association” that is experienced as an anticipation, i.e. “cognitive distance,” is presumably the achievement of the established habit. It is thus made possible by a broader sequence of prior adaptations and events, which now perhaps can be said to be physiologically “associated” with the sensory inputs – but in a more concrete and yet more experientially opaque sense. These associations lie in the background of the habit, in what Ravaissón calls

continuous “nature.” Additionally, the term “association” might be problematic in this latter regard given the implicit suggestion that the anticipatory association could exist without its material and generative conditions.

### **Re-afference and the Myth of the “Sensory Input”**

Another difficulty is Määttänen’s use of the word “sensory inputs” as it appears to take on board one of the most problematic assumptions of the traditional empiricist notion of association. Namely, it appears to rely on the notion that the mind operates on already reified “inputs” or “simple ideas”. This assumption is by the way still prevalent in functionalist and computational models of sensorimotor processes. However, as discussed by Dewey in his 1890 critique of theories of “stimulus-response” reactions, the stimulus is precisely reified only through the circular causality and holistic teleological organization of the entire sensorimotor loop. There is no neat predefined “input” that can be used as a starting point for a pure “external” association to glom onto.

Within motor control and neuroscience this issue has perhaps most prominently been theorized by von Holst and Middelstaedt (1950), through their concept of “reafference.” The core idea is that the nervous system always receives a stochastic and layered flow of afferent activity. To actually isolate and differentiate the sensory influences of the environment on the agent, what they called the “ex-afference,” you need some kind of anticipation of the aspects of the afferent activity that is the product of your own action (efference). They called the anticipated sensory outcome of one’s own action the “re-afference.” A favorite example is that of saccadic eye movements and the judgement of whether the shift of the pattern on the retina is due to the world jumping or the eye moving.

However, an additional complication, which is not addressed by von Holst and Middelstaedt’s original model, is that the category of sensory effects of one’s “own action” obviously travels through not only the worldly body but generally also includes other aspects of the environment. It is world involving. In

other words, all re-afference in some sense reflects “objective conditions” minimally of the embodiment of the sensorimotor organs themselves, but typically also of aspects of the environment (not to mention body-environment interactions).

Now this means that the isolation of the “ex-afference,” i.e. the aspect of the sensory flow that is due to the world beyond the expected outcome of the agents own action, is not only an active process but one which depends on the activity in question. In brief, the ex-afference vs. re-afference distinction appears itself to depend on the teleological context of the sensorimotor engagement.<sup>13</sup>

Our repertoire of habitual jumps becomes the guide of both purposive action and explorative perception. Habit itself becomes the necessary background for both knowing and doing. Each jump – each learned sensorimotor integration teaches us about our own embodiment, be it biological or technically enhanced. It teaches us about the body we can move in respect to stable aspects of the world. Now as we learn to anticipate and control some of these basic sensorimotor contingencies of our bodies, we can also stabilize these and create habitual expectations about changes in environment and adapt our actions to these. The point is that all sensorimotor integration travels through some “objective conditions of action” be these only in our bodies or both in body and broader world.

Now, I want to suggest that this raises some questions for an internalist functionalist account of the mind, where the “external world” is thought to always only be indirectly known as evidenced through the “sensory input” and interpreted by “internal states.” But what if all internal and input states are, as I have just argued, already derivatives of embodied and external involvement? I am not saying that this gives us some neat direct perception of “things in themselves” – rather I simply want to challenge the starting point that most internalists, like Hohwy (2016), claim for their argument that the material world is experienced indirectly. If all structured experience is dependent on interpretation and prior habits and sensorimotor involvement, then it seems that the whole notion of “directness” in the sensorimotor loop needs to be reconsidered.



Määttänen explicitly suggests that a pragmatist notion of habit can help us overcome the internal-external dichotomy: “That which is external to the body is not necessarily external to the processes realizing cognition. In sum, the idea that habits as forms of interaction realize cognitive processes rejects reductionism as well as the dichotomy of internal and external.” (2010, 204) However, another interpretation is that the boundary of what is internal or external is flexible and itself functionally dependent, and that this very flexibility is part of what makes a non-dualist interpretation of embodied perspectival subjectivity possible. But I am getting a bit ahead of myself.

### **Dewey on Means and Magic**

If I ask you to raise your hand or say boo, you can presumably do this without much sweat. But what if I asked you exactly how you did that; which exact muscles you used and **with how** much force? I want to highlight this semi-magic feel of the “jump” and its role in affordance perception and action initiation.

First, observe how all our actions and coordinated behaviors, have this aspect of working in opaque ways. Ironically the more familiar and habitual the movements or action sequences are the broader the possible zone or reach of magic so to speak. If I try to produce a new action like phonemes from a new language, the habitual sequence is not there, thus the full jump escapes me, and I am struggling to get my tongue right in my mouth. But note that there are still small little magic jumps at work as I try to produce the wanted sound and explore the hitherto uncharted territories of my vocal organs.

Now I suggest that there is an opacity to successful intentional movement that is almost like a “feeling of magic.” Dewey takes up the related issue of *belief in magic* in his discussion of habitual actions and their means. He writes: “...belief in magic has played a large part in human history” and he adds “the essence of all hocus-pocus is the supposition that results can be accomplished without the joint adaptation to each other of human powers and physical conditions.” (1922: 26) This focus on magic as in essence a

refusal of the means of actions and accomplishments is obviously very interesting to the tension I am trying to bring out.

Dewey's point is slightly diverging from mine as he stresses belief in magic rather than the experience, i.e. in our case there need not be a belief that the movement is actually magic, that the "jump" did not have an embodiment and a whole history of adaptive processes making it possible. But he elaborates with the following comment: "The principle of magic is found whenever it is hoped to get results without intelligent control of the means; and also when it is supposed that means can exist and yet remain inert and inoperative." (1922: 26-27)

Now in this further statement Dewey chooses a quite broad, I would say too broad, definition of when something is belief in magic, as he here subsumes all cases where outcomes are expected by means that are outside of intelligent control. There is obviously a difference between the belief that something happened magically, without means, and on the other hand the belief that something can happen through means that are outside of intelligent control. It seems that Dewey leaves out all the cases where we trust the processes, that have been reliable so far, albeit we don't fully know them, and we would not know how to control or repair them did they not work. It seems to me that most complex biological and ecological, and cosmological means really are like that, quite outside our intelligent control. All we can do is adapt from the outside so to speak. Accept the regularity of the consequences and adapt.

I should mention that the context of Dewey's argument is that of moral action and thus complex societal means, and in that context, I do understand his disdain for this sort of wishful thinking. He writes:

We think that by feeling strongly enough about something, by wishing hard enough, we can get a desirable result, such as virtuous execution of a good resolve, or peace among nations, or good will in industry. We slur over the necessity of the cooperative action of the objective conditions, and the fact that this cooperation is assured only by persistent and

close study. Or on the other hand we fancy we can get these results be external machinery, by tools or potential means, without a corresponding functioning of human desires and capacities. (1922, 27)

I thus take Dewey's main point to be that the "the cooperative action of the objective conditions" is necessary to attain desired results. He adds that "this cooperation is assured only by persistent and close study" and this makes sense in the political context of contrasting interests. I similarly approve, particularly in these days of delusional technology and A.I. optimism, of his critique of the notion that mere right machinery will get the job done alone. However, my question is if his analysis here, though explicitly grounded in basic embodied habits, is too intellectualized, as he stresses "control" and "close study."

### **Multiplicities and the Epistemic Dynamics of Foregrounds and Backgrounds**

Interestingly Dewey himself is aware of the inherent difficulties of foregrounding the background conditions, and also that habits work precisely by largely being taken for granted and kept out of scrutiny. In the context of how our habits holistically shape our character he writes:

The mutual modification of habits by one another enables us to define the nature of the moral situation. It is not necessary nor advisable to be always considering the interaction of habits with one another, that is to say the effect of a particular habit upon character—which is a name for the total interaction. Such consideration distracts attention from the problem of building up an effective habit. A man who is learning French, or chess-playing or engineering has his hands full with his particular occupation. He would be confused and hampered by constant inquiry into its effect upon character. He would resemble the centipede who by trying to think of the movement of each leg in relation to all the others was rendered unable to travel. At any given time, certain habits must be taken for granted

as a matter of course. Their operation is not a matter of moral judgment. They are treated as technical, recreational, professional, hygienic or economic or esthetic rather than moral.

(Dewey 1922: 39)

In other words, the habit is here treated as a means and during the time of active use of a means it must be unquestioned. In Phenomenology this issue has been approached through various distinctions, one of them the Heideggerian distinction between a tool being ready-to-hand, i.e. in use as means, or present-at-hand, meaning that it is present as an object for the hand to explore.

Thus, we might think of the extension of the embodied agent, the lived body, as fluidly changing as various means are taken up as part of the sensorimotor loop, the conditions for action that the habitual control of the sensory outcome relies on. Our broad and multitudinous motor repertoire, as well as our extensive capabilities of tool use, means that we have library of habitual co-ordinations that flexibly can be put to use. The point is that there is a quite real sense in which this repertoire of actions does not rely on one self-identical body but many different ones depending on the task at hand. It is precisely this multiplicity that gives us some depth of access to the so-called “objective conditions of action” as we through variation of our bodies vary our perspective on the world and the other ways around. This multiplicity is also interesting in relation to the mind-body problem and functionalist dualism of content and implementation. If we constantly vary the scope of the bodily implementation and thereby also boundary to the “world” being perceived or acted on, then is there a sense in which the distinction of mind and body can be retained without the inescapable dualism?

However, in each action we must know what to expect of our own medium. We must trust that the habitual expectations we rely on are either reliable, or if not something that we can bring into the foreground so to speak, and then explore such that we can again stabilize these, re-adapt, re-habituate – and then again let them fall into the background. What is foregrounded relies on that which is backgrounded, and thus this

story would go straight against the Cartesian self-transparent mind. Any sensorimotor integration must background aspects of the “objective conditions” of the action in question to create the “cognitive distance” that Määttänen reminds us is characteristic of mind and intentionality. Note that the opacity is not simply about the bodily “implementation” of the mind as the functionalist might have it, but it is also about hiding that which *could have been* content but must be backgrounded for the particular “jump” in question. In other words, on this proposal the hidden and world-involving aspect is generative of the mental content itself, not merely its implementation.

### **The Brain as a Backside that cannot be Foregrounded**

I have described how our sensorimotor interactions whether via tools or merely the sensorimotor organs of our peripheral bodies are always world involving, and their use thus involves some level of implicit self-knowledge. We must be familiar with our own “re-afference” to understand the world beyond. In terms of learning I should add we use stabilities in the worlds to gain knowledge about ourselves.

However, there are aspects of ourselves that seem permanently relegated to the background, the most prominent exemplar being our own nervous systems. This is of course quite interesting in the present context. The sensorimotor habits depend on the nervous system yet remain completely oblivious to this core part of their own medium. Habits are not only world involving but world-directed if you will. William James has a nice description of the world-directed plasticity of sensorimotor coordinations:

If habits are due to the plasticity of materials to outward agents, we can immediately see to what outward influences, if to any, the brain-matter is plastic. Not to mechanical pressures, not to thermal changes, not to any of the forces to which all the other organs of our body are exposed; for nature has carefully shut up our brain and spinal cord in bony boxes where no influences of this sort can get at them. She has floated them in fluid so that only the severest shocks can give them a concussion, and blanketed and wrapped them about in an

altogether exceptional way. The only impressions that can be made upon them are through the blood, on the one hand, and through the sensory nerve-roots, on the other; and it is to the infinitely attenuated currents that pour in through these latter channels that the hemispherical cortex shows itself to be so peculiarly susceptible. (James 1890: 112)

The protective anatomy and the army of support systems allow the brain to be an organ that is oblivious about itself, and its own mediating processes. The question is why? Why is this elaborate scheme of privacy and lack of self-transparency? I suggest that cognitive distance ultimately depends on this opacity of its own medium. All our knowing and doing depend on the distance that the sensorimotor habits from the past can provide.

Now we might want to make a rough differentiation between two kinds of mediation or “backsides” of habit: 1) the many world-involving “conditions” of the sensorimotor loops (the ex-afference that becomes anticipated reafference via habitual learning), and 2) the physiological embodiment that the sensorimotor integration itself relies on.

An example of the former could be expectations about the weight of my limbs, which I could rather easily adapt to changes of, such as if I wear a heavy jacket. The adaptation would here be driven by what control theorists call an error signal. Examples of the latter are not only gray matter, but include all sorts of physiological processes, such as the dynamics of membrane ion channels, synaptic maintenance by glia cell. Note that the distinction is between expectations and implementations. Thus our peripheral nervous systems is the medium relied on (2) yet the varied length and speed of conduction of our nerves gives rise to reafferent expectations (1). The ability to create relatively stable expectations support the proper timing of multimodal sensorimotor integration and the very existence of “jumps”. Thus, we really see the need for certain conditions of action to remain fairly predictable. In all cases of background conditions success goes unnoticed, and we only become aware of the mediation when the processes go awry. However, when there are internal irregularities due e.g. to demyelination, what is experienced is certainly

not these new slower conditions in the nerves (these can only be inferred), but rather a host of disturbances to our normal perception, action and other cognitive functions. The point is that in terms of the latter kind of “backside” any processes of adaptation or repair would have to take a much more indirect route, than when error signals that are themselves perceptible. But the imperceptibility allows our attention and intention if you will, to be directed beyond its own medium.

Thus, the physiology of the encased brain provide not only an “implementation” but crucial stabilizing conditions for sensorimotor integration and thereby the ability to correctly anticipate exact action possibilities and consequences. As a matter of fact, it is a core physiological and agentic preoccupation to actively ensure these medium stabilizations. Yet these processes are not experienced, at least given current technological standards. Nor are they explicitly “associated” within the affordance perception they allow for. The “jump” relies on these stabilizing and integrative processes but remains epistemologically oblivious to them. This hidden mediation is I suggest what makes our actions and their sensorimotor anticipations – and perhaps the realm of the mind itself - feel a bit like magic.

## **Conclusion**

A core challenge for most philosophers of mind is to find a way to put the mind-body problem behind us without eliminating our subject; i.e. without reducing the mind to the body as an object, and thus positively to understand our lived perspectival body without reinstating a new version of mind-body dualism. It is my contention that the question of sensorimotor mediation is central to this solution, and thus to a truly fleshed out theory of embodied cognition. I have in this chapter discussed both habit as mediation for other cognitive processes and the mediation of habit itself. The backside is what provides the cognitive distance of the subject perspective – but the perspective is not equal to the mediating backside.

Another take away from the sequence of analyses presented is that habit allows for and relies on historicities of dialectic interacting processes that cannot neatly be collapsed into one frame. What we might call habit itself is, as Määttänen suggests, more general than the individual behavior and the conditions it

produces and is produced by. Hoffmeyer makes an analogy to the chicken and the egg. For me the key is that what we call mind, subjectivity and agency always involves a sort of mismatch. Langer writes in her discussion of Merleau-Ponty:

...this “dehiscence of the present towards the future” is subjectivity. The self is both affecting and affected – it is self-affecting, rather than unchanging self-identity. As Sartre shows in *Being and Nothingness*, there is an inherent duality at the heart of consciousness which is not to be confused with dualism... We can never coincide with ourselves—and yet we are present to ourselves precisely because we have the distance of non-coincidence.

(Langer 1989: 129)

Curiously this notion of “non-coincidence” with ourselves, suggests that one of the reasons why mind-body dualisms have been so hard to get rid of might be that we refuse to see this dialectic and its mediating processes.

This chapter is also an attempt to open a conversation about mediation and epistemology. I have suggested that the lack of transparency into the medium of action and the “backside” of habit is generative. The “cognitive distance” of anticipation and its functions in thought and agency is made possible by a lack of self-awareness about the mediation of these processes. There is a past-to-future “jump” only because the mediating route is left out.

But as Dewey, Bateson, Haraway and others have reminded us, this lack of insight into our own bodily and ecological dependencies might also very well be humanity’s downfall.<sup>14</sup> It allows for a dangerously destructive ignorance about our own individual and collective dependencies. What we need to do is to remind each other of the multiplicity of our intertwined media, and use our abilities to frameshift and use tools to expand and change our perspectives and thus our affordances, our habitual and agentic possibilities.



Penult. draft, forthcoming in *Habits: Pragmatist Approaches from Cognitive Neuroscience to Social Science* by Caruana F. & Testa I. (Eds.). Cambridge University Press.

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<sup>1</sup> See also Malabou (2008: vii).

<sup>2</sup> To see the liveliness of this issue within current "predictive mind" approaches please refer to the work of e.g. Hohwy (2016) who explicitly states that his account of the mind is functionalist and therefore is internalist and excluding physical embodiment from the processes of mind. Friston and Gallagher and others represent more embodied approaches with roots in cybernetics and autopoiesis, but some of the main mediation conundrums do not seem fully solved.

<sup>3</sup> See also Merleau-Ponty (2012/1945: 143) on this point.

<sup>4</sup> He uses the word “permanence” in the quote above, but I think that is too strong a requirement and would instead prefer stability or predictability as permanence is not needed as long as the changes can be anticipated and adapted to.

<sup>5</sup> For similar arguments see also Peirce-inspired biosemioticians like the extensive work of Hoffmeyer.

<sup>6</sup> Peirce’s full story is a bit more involved and distinguishes between sign and “reprentamen” – but Määttänen’s core point does not appear to depend on these further distinctions.

<sup>7</sup> See e.g. Hoffmeyer (2010: 159). “An ‘interpretant’ is constructed by brain processes that mediate the connection between the sense impression of smoke and the presumed existence of something burning. Thus, we get the Peircean triadic sign concept.”

<sup>8</sup> See Brincker (2014) for sensorimotor grounding of social cognitive capacities.

<sup>9</sup> Note that both “sign-vehicle” and “interpretant” in the semiotic three-place relation also appears to integrate in a way that invites distance and the ignoring of the material means.

<sup>10</sup> See Ravaisson (2008/1838: 75).

<sup>11</sup> To this day the neuroscience of motor control suffers by its neglect of the process of adaption, and of how skilled and smooth goal-directed movements come about and are supported by lots of non-goal directed and more receptive movements. See here Torres (2011) and Brincker and Torres (2017).

<sup>12</sup> Ravaisson thus argues that the difference between habit and instinct – and even evolutionary anatomy – is one of degree. Spinal posture supporting reflexes are a good example, where the “purpose” of not falling can be seen as having been pushed out of deliberative control. Most of what we traditionally call habits can function without deliberation but still be brought back under volitional control.

<sup>13</sup> See also Brincker and Torres (2017).

<sup>14</sup> See eg. Bateson (1979).