

# INFORMATIONISM VS. SKILLFUL COPING

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Evolutionary psychologists take as one of their fundamental assumptions that the brain functions as a computer, indeed not only functions *as* a computer, but also that it *is* a computer, a computer which (or whose) main task is to extract information from the environment in order to produce proper responses that ensure survival.<sup>2</sup> What natural selection does according to the evolutionary psychologists' view is to select for that which *underlies* behaviour that which underlies the behaviour are the psychological mechanisms, mechanisms that are in turn likened to *programs*. The job of the programmer or if you will, the software, is to guide the hardware<sup>3</sup> (the body) and ensure its survival by responding appropriately to the environment in which it (the computer-body complex) finds itself. By processing the information received from the environment in a way sufficient for surviving (and subsequently for thriving) the human can then propagate its genes, and ensure the survival of the psychological mechanism that made the propagation possible. But it is not just evolutionary psychologists that take the mind/brain, in a fundamental sense, to function as a computer; it has been a general tendency both in neurology, psychology and the cognitive sciences in general to assume the fundamental metaphysics of *computationalism* since the so called "cognitive revolution."

What interests me the most is the ease with which the computer-language is accepted, and the underlying assumptions that subtend it. Instead of only being in the negative, at the end of the paper I also aim to show how there are viable alternatives to the computational view of the mind already circulating in academic circles, such as the *enactive approach* to cognition, which might be said to be a sub-field within the larger differentiated field of *embodied dynamicism* (Thompson 2007:4, 10).

Given that the computational theory of the mind is

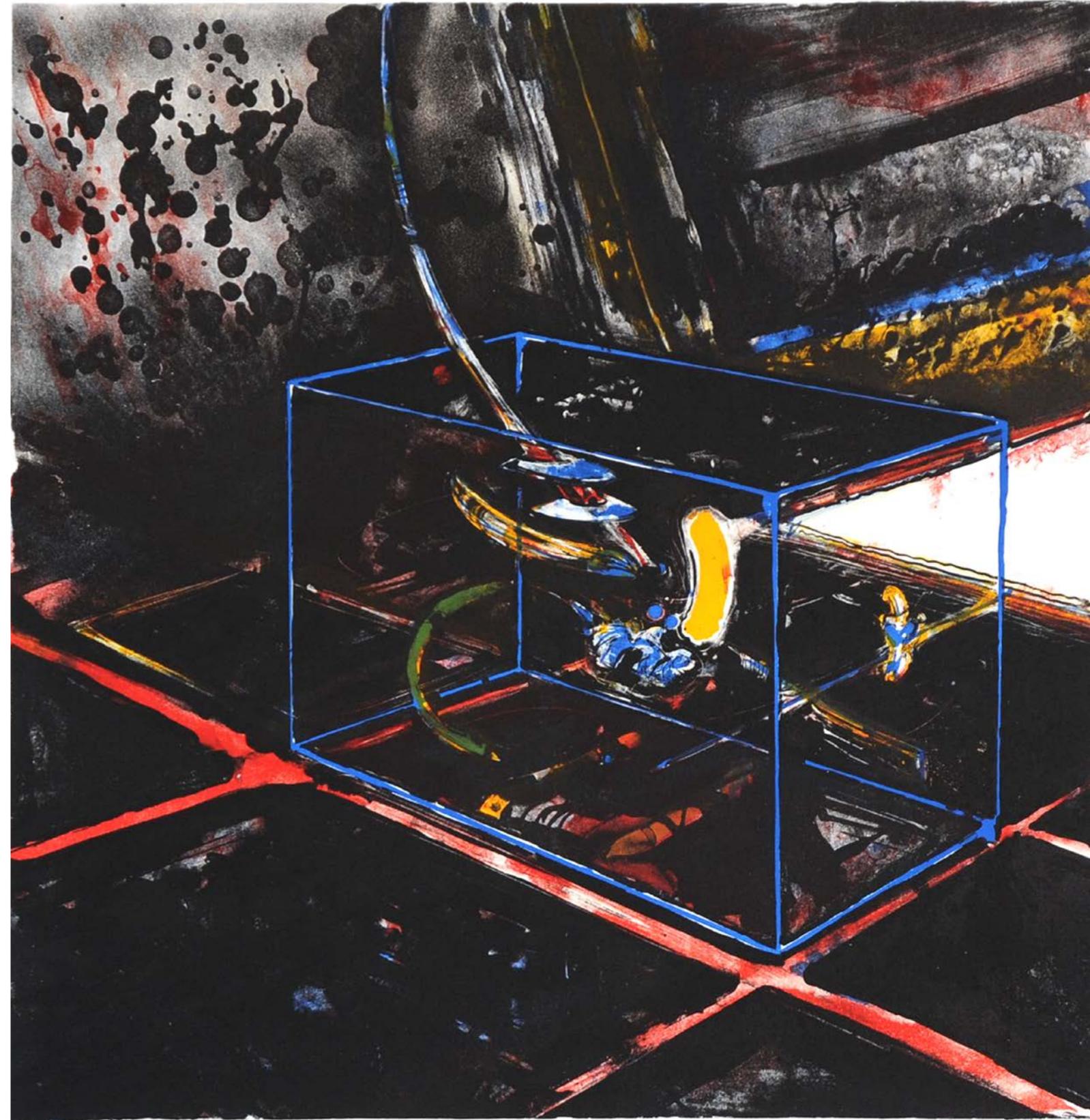
no longer necessary, indeed that it can on the whole be disposed of, save in certain domains<sup>4</sup>, does it follow that evolutionary psychology as a research project is untenable, i.e. that rejecting the computational theory of the mind will be a general threat to the evolutionary psychologist? I intend to show how the enactive approach can be used by the evolutionary psychologist without being a threat to further research in the field.

## The Mind as a Computer and the Computer as Evolved

Cognitive science came into being in the 1950s with the "cognitive revolution", which served as a reaction to behaviorist psychology. At the center of this revolution was the computer model of the mind [...] according to this classical model, cognition is information processing after the fashion of the digital computer. (Thompson 2007:4)

The use of animals as research tools had been jettisoned in favor of the computer as an analogue of human cognition. (Laland & Brown 2011:106)

As indicated in these two excerpts, the story of how the computer-model of the mind became hegemonic, is well accounted for, but it is surprising that not more attention is provided on the validity of what seemingly began as an *analogue* and not necessarily a *tentative* investigation into the workings of the mind. Back-tracking to the original motivations for the analogy and how it came to be can, I think, give us reason to view it as *one of many* experiments into the nature of the mind performed over the last hundred years, and not necessarily as the final or penultimate one.<sup>5</sup>



The idea of the mind-as-computer, began as a research program inspired by advances in computer technology, coupled with staunch critique of fundamental tenants of the dominant psychological research programme leading up to behaviorism in the 50s. Behaviorism, though methodologically established and empirically confident, faced problems in the language department. It proved difficult to account for the poverty of the behavioral stimulus, compared with the impressive language acquisition of most children, a language acquisition that was spontaneous, creative, fast and also seemingly rule-bound and systematic. Behavior (language behavior in particular) seemed to not be enough; necessary perhaps, but far from sufficient for understanding how children acquired the complexities and sophistications of language with such ease. This is what lead linguist Noam Chomsky to formulate ideas such as the *language acquisition device*<sup>6</sup>, which was a mechanism internal to the (human) organism, and that ensured that the poverty of the behavioral-perceptual input could be processed in such a way as to ascertain language acquisition proper, and not just an incidental, arbitrary appropriation. This internal turn proved highly potent for the explanatory power of the associated ideas, hypotheses and theories of the mind that ensued. Finally one could talk of the cognitive processes *internal* to the organism, processes now seen to be necessary for its dealings with the environment. For the evolutionary psychologist, the internal processing was executed by *psychological mechanisms* necessary for producing the output (behavior) required for survival in the Environment of Evolutionary Adaptedness (EEA)(Laland & Brown 20011:124)<sup>7</sup>. As mentioned in my introduction, what is selected for by evolution is not mere behavior, but that which precedes it and is responsible for it: The evolved psychological mechanisms (Cosmides and Tooby as referred to by Laland & Brown 2011:108). The guiding metaphor for the psychological mechanism was, as mentioned, the *computer*.

### What Computers Do

Minds could be described in terms of information processing in which representations of the world were constructed based on the information from sensory inputs, and cognitive decision rules determined motor outputs. (Laland & Brown 2011:106)

As seen by this quote, the computer-model was consistently taken over and applied to the mind by the evolutionary psychologist. The consistency of the application resided in

an accurate understanding of what it is that computers do: They are machines designed to solve specific problems based on taking in explicit, discreet pieces of information in order to produce a sufficient, often highly determinate, output. The output can vary in kind from numbers displayed on a screen, to the movement of a robotic arm in a way conducive to car-maintenance, to coffee brewing and the increasingly frequent robotic lawnmowers that self-propel through the landscape, eagerly cutting the grass outside university buildings. The problem is not that the analogy between the mind and machine was not consistently taken in and formulated into a research program by the evolutionary psychologist (Laland & Brown 2011:112)<sup>8</sup> but that it was taken for granted that the human mind *was* indeed a computer, through the implied assumption that it always had to *work* like a computer. Inspired by Charles Taylor we can claim that what the evolutionary psychologists did was to *ontologize* a good method (Taylor 1995). The ontologizing lies in taking a functional method (in-put à processing à out-put, with explicit information as the raw material), essentially a process with clear conditions for success, and ontologizing it, that is, taking the entity that purportedly does the processing (the human mind) and viewing it as solely a *thing that processes* in order to produce satisfactory behavior. Much like Descartes reified the thinking process (doubting, ascertaining, contemplating, calculating, ruminating etc.) and made the *operations* of the system into the (in) famous “thing that thinks” so did the cognitive scientist get stuck in the information processing metaphor.<sup>9</sup> Taylor has for a long time investigated the long history which this calculative way of viewing the human (or animal/organismic) mind has in the West.

These models fit neatly into already established categories. The “information processing” construal builds on a long-supported earlier conception, whereby atomic “ideas” were combined in the mind, and made the basis of a calculation underlying the action. Classical Cartesian and empiricist epistemologies provided earlier variants of this conception, which combine an atomism of input with a computational picture of mental function. (Taylor & Dreyfus 2015:92)

The proof that computers were seen as the next great model for understanding the nature of the mind and its intelligence, can be seen by the rise of the field of Artificial Intelligence (A.I.) in the 1950s and 60s. Not only could the human mind be seen as a computer, but computers and machines could, given the symmetry of the analogy,

soon be seen as intelligent. To make machines intelligent would take time and work of course, but it should, not just in theory, but in *principle* be possible (Dreyfus 2014: chapter 5, section 1.)

The latter is an excellent example of what I called the “over-determination” of the epistemological construal. The plausibility of the computer as a model of thinking comes partly from the fact that it is a machine, hence living “proof” that materialism can accommodate explanations in terms of intelligent performance; but partly too it comes from the widespread faith that our intelligent performances are ultimately to be understood in terms of formal operations. (Taylor 1995)

### What Humans Do

The difficulty in creating intelligent machines based on the computationalistic approach to the mind soon became apparent as by 1970 “[c]omputers couldn’t comprehend the simple stories understood by 4-year-olds”, this despite Marvin Minsky’s (head of MIT’s Artificial Intelligence Laboratory at the time) incredibly optimistic outlook just a few years earlier (Dreyfus 2014:chapter 5, section 1.) So what was the problem? Hubert Dreyfus harshly (and now famously) criticized the original A.I. research program from the beginning, stating that they got the fundamental background assumptions regarding the mind wrong. In his critique, Dreyfus draws on phenomenology, especially the phenomenology of Heidegger and Merleau-Ponty. When we move around in our daily environments, skillfully dealing and coping with things, we do so on, a large, unarticulated, and un-focused background, a background which sets up the meaningful relations of our world. A few examples are in order to clarify what this means. When we grab the door handle to enter the house, we do not focus performing the task at hand, we simply respond in an *appropriate way* to door handles, i.e. by grabbing it and opening the door. Focusing specifically on the door handle as an object out there in the world simply makes it into a different thing altogether, and this only happens when there is something wrong with the door handle. Furthermore the “wrong-ness” of the door handle becomes apparent only when we find ourselves unable to grab it in an appropriate way. One might say that we move into the contemplative, objective stance through a breakdown of the embodied luminousness of the situation: An immediate situation we always already find ourselves in. This means that the original situation of dealing appropriately with door handles (and thus doors, and houses in general)

is primary, and it is only post hoc that we reify our dealings with the world by making “mental maps” “internal representations” and the like. The famous Heideggerian example is that of the hammer. For the hammer to “do its job” in our world *qua* hammer, it needs to recede into the background of our pragmatic world of nail-driving, carpentry and house building. If we focus on the hammer, it is much more difficult to drive in the nails. And unexpectedly, when the hammer breaks down, we are encountering it in a different way, that is, we are encountering it as an entity that is no longer functional; that does not belong to our world of everyday practices and skills. This is the way to understand the background practices: There are more things that we *ignore* than focus on, and the world in which we find ourselves and are familiar with is not the world of explicit, discreet information-information that require processing in order to be meaningful – but a world of significations, meaningful relations (manifested and expressed in the bodies of other humans, animals and plants) and manipulable objects and artefacts of our making. Thus “skillful coping” is a fundamental way of being in the world in which reference to internal mental states are redundant, and “skillful coping” then turns into a technical term for Dreyfus. Our perceptions are not those of detached observers, making inferences based on explicit bits of information, rather they are that of engaged *skillful copers*, dealing with pragmata in an already meaningful world. “The meaningful objects ... among which we live are not a *model* of the world stored in the mind or brain; *they are the world itself*.” (Dreyfus 2014: chapter 5 part 2) A convenient summarization is presented by John Haugeland on Dreyfus’ *What Computers Still Can’t Do*: “[H]uman intelligence is essentially embodied; [...] intelligent bodies are essentially situated (embedded in the world); [...] and the relevant situation (world) is essentially human” (Haugeland 1996:1).

### Being in the World versus Being at the World

In the book *Skillful Coping: Essays on the Phenomenology of Everyday Perception and Action* – a collection of selected essays from his entire career in the subject field – Hubert Dreyfus is drawing heavily on Merleau-Ponty and other phenomenologists in his life-long project of establishing the phenomenology of skillful coping as a primary, embodied way of being in the world. The project actually began as a negative one, as he aimed to criticize what he viewed as fundamentally flawed ideas and assumptions in the research field of Artificial Intelligence. Based on the titles and topics of many of the essays in Skillful Coping, it be-

comes clear that one of the underlying threads for Dreyfus throughout his work is not only to critique A.I. research, but also a comprehensive phenomenological account of the way human beings are in the world.

By using Merleau-Ponty and Heidegger, Dreyfus especially wanted to criticize the idea that knowledge of the world needed mental or physical representations in the minds or brains of organisms, in order to be functional. Dreyfus explicitly states: “Merleau-Ponty holds that the most basic sort of intelligent behavior, skillful coping, can and must be understood without recourse to any type of representation.” The latter quote shows his indebtedness to Merleau-Ponty in establishing skillful, as primary, or what Merleau-Ponty called *sensorimotor* knowledge, and this is exactly the point where Dreyfus heads off with his own phenomenological project: The phenomenology of skills and skill acquisition learning, that is – and finding out how learning actually works. According to Dreyfus, the A.I. researchers inherited the philosophical traditions stemming from Descartes without being explicitly aware of this, since one of the things they did was to criticize traditional philosophy for being unable to solve the riddles of intelligent action and the relationship between mind and world. The questions for them were: How do organisms, such as ourselves, represent, picture, and process information about the world? If these questions were to be answered, we would reach an understanding of what intelligence is in a global sense, and be able to make robots with A.I. that could act in the world, presumably perceive it, and be sentient, much like us. An important part of the project was to make certain that the robots/machines/programs could *learn new things* about the world around them, such as being able to act in it as dynamic organisms. One of the paradigmatic definitions of intelligence is indeed its flexibility and inherent dynamicism, i.e. that intelligent organisms are intelligent in virtue of responding successfully to what the situation demands, even if it finds itself encountering a situation in which it has never been, nor could anticipate. And surely, intelligent beings such as ourselves know how to walk, talk, cook and drive because we understand the world, that is *represent* it, and thus use rules to act in it? Certainly, many times we do just that. We plan ahead, we read maps (our own mental ones as well as paper-based representations of landscapes) we think about and formalize a plans of attack, and have clear intentions in mind before acting them out in the world of which we have beliefs. Am I not initiating an action because I have a clear intention of doing so, that can either fail or succeed, according to conditions of satisfaction? Not so, according

to Dreyfus. There is a primary way of being in the world that does not require rules, concepts or representations to function; indeed it presupposes a direct contact with the world. But this is not an unintelligible, *automatized* way of being geared into the situation. The fundamental contact with the world is based on an embodied form of *understanding*, not identical with the higher order understanding of symbolic or mental representations we are so used to as being paradigmatic examples of “understanding”. One might say it is a form of “proto-understanding” that we share with other animals. Spelling out the implications of this direct contact is done particularly well by the aforementioned Charles Taylor:

[O]ur representations of things — the kinds of objects we pick out as whole, enduring entities—are grounded in the way we deal with those things. These dealings are largely inarticulate, and the project of articulating them fully is an essentially incoherent one, just because any articulative project would itself rely on a background or horizon of non-explicit engagement with the world. [...] We can draw a neat line between my picture of an object and that object, but not between my dealing with the object and that object. It may make sense to ask us to focus on what we believe about something, say a football, even in the absence of that thing; but when it comes to playing football, the corresponding suggestion would be absurd. (Taylor 1995)

Playing football does not require any beliefs about footballs, facts of the matter, nor does it require any explicit intentions of engaging in football-like activities. Our lives mainly consist of this form of non-conceptual and pre-reflexive coping. One of the most crucial consequences of the aforementioned direct contact with the world (that is the project, objects, tasks etc.), is the overcoming of the Cartesian idea of the mind, the “Inner-Outer” (I/O) picture of epistemology, as Taylor calls it. “The very idea of an inner zone with an external boundary can’t get started here, because our living things with a certain relevance can’t be situated “within” the agent; it is the interaction itself.”<sup>10</sup> As we can see, this is the movement from an epistemological picture of the world (Being-at-the-World) to an ontological one (Being-in-the-World). The fleshing out the phenomenology of skill acquisition (how we learn new things) in particular, and skillful coping in general is thus providing an alternative ontology; an ontology where the *myth of the mental* is not residing. The myth of the mental is, according to Dreyfus, the myth of the

mind as detached. The myth is often more of a taken for granted picture of mind-in-world, rather than an explicit theory or idea, and as such, it can go unchallenged and promote various dualisms and what ends up being the products of attempts to answer the dualistic picture. Idealism and materialism, for example, which both get their argumentative thrust from opposing the other side, are by-products of the myth of the mental.

The alternative ontology that Dreyfus mentions in several of his essays is inspired by Merleau-Ponty’s middle way, between naturalism and intellectualism. We are as such, as the existential phenomenologists say, primarily and fundamentally beings that are already in the world, instead of detached minds directed at the world. In this, it is plain to see that Dreyfus is an existential phenomenologist, and not a transcendental one. Our practical dealing with the world is fundamental, and it is best understood on the background of the already meaningful world given by our bodies and practices. So far we can see how Dreyfus’ reading of Merleau-Ponty is in line with what we initially discussed. Skillful coping is for Dreyfus embodied, situational and highly dynamic, and it requires Merleau-Ponty’s thorough phenomenological investigations of the lived body to be intelligible.

The aforementioned phenomenology of skill acquisition is what gives credence and support to skillful coping. How we become good at something – swimming, basketball, riding bicycles etc. was investigated by Dreyfus and his brother Stuart Dreyfus, and they found that we, as adult humans indeed begin with detached, context free following of rules – which is the paradigmatic example of the intellectualist way of perceiving and acting – but that as we increase our perceptual abilities (responding to the way the basketball fits in the hand, the water enveloping our body or the pedals feels against our feet) our skills become refined as we respond to the relevant features of the landscape to such an extent that rules and concepts would not only be unnecessary, but get in the way, completely in line with this quote: “As a system of motor powers or perceptual powers, our body is not an object for an ‘I think’: is a totality of lived significations that moves towards its equilibrium.” (Merleau-Ponty 2012:155). Hubert and Stuart Dreyfus present several stages of skill acquisition ranging from novice to expert, and one of the fundamental attributes characterizing the expert copier is that she is emotionally involved with her project(s). Dreyfus mentions a study where nurses that failed to get emotionally involved with their tasks and patients also failed to develop beyond the level of competency, while

the nurses that got engaged, increased their perceptual abilities and became experts. This emotional, caring involvement is what Merleau-Ponty talks about when he talks about significations and solicitations. It seems that one can do (pun intended) without rule-following. Moreover, the body and its abilities absorb the basketball, the bike, and the cane into its body schema, and, as Merleau-Ponty aptly states, relieves us of the very task of interpreting them (Merleau-Ponty 2012:154). “When the cane [of the blind man] becomes a familiar instrument, the world of tactile objects expands, it no longer begins at the skin of the hand, but at the tip of the cane.” (Merleau-Ponty 2012:153). This is thanks to the *touche-touchant* phenomenon: The blind man no longer feels the cane, but the objects through the cane. Just as we feel objects with our hands, but never our hands feeling them.

The body then, is necessary for having a world, and Dreyfus draws on the insights of Merleau-Ponty to ground the phenomenon of skillful coping through the phenomenology of the lived body. “The example of instrumentalists demonstrates even more clearly how habit resides neither in thought nor in the objective body, but rather in the body as the mediator of a world.” (PP p.146) If we find the theory of skillful coping and embodied being in the world plausible, we are also entitled to accept the ontology that Merleau-Ponty presents and Dreyfus advocates. We are not primarily homo *sapiens*, nor are we *homo loquens* or animal *symbolicum* (although we are also characterized by these of course), we are *homo practicus*.

### Homo prospectus practicus

In this essay I have talked about knowledge in a wide sense, as I have used it in terms of practical knowledge. Now, on one account, knowledge is defined exactly in terms of the concepts, representations and ideas that we wanted to avoid in our explanations of how it is that human beings act in and perceive their world. On one other definition, knowledge is defined as the way we perceive the world in our skillfully absorbed dealings with it, and the way we pre-reflectively and pre-objectively understand it. This is a form of non-theoretical (non-*thetic*, as Merleau-Ponty often calls it) and non-conceptual understanding, and is not to be confused with detached contemplating. This is the way children, for example, understands laughter as a primordial gesture without explaining what it is that laughter does, or what caused laughter in situation x at time t. It is exactly this context and background-dependent understanding that resists conceptualization (like Merleau-Ponty’s *corp propre*), precisely because

articulating the way you respond to laughter or throw a ball will move away from the situation itself and become something other than what you indeed wanted to explain, like mistaking the map for the landscape.

### Enactive Evolution

My main argument in this paper has this fundamental premise: The human mind does not function as a computer. The following question relevant for the evolutionary psychologist then, is this: If the human mind does not function as a computer, why continue to talk in computer terms with input, outputs, information processing, algorithms and modules? Is it necessary to investigate human decision-making, perception and intention through creating computational models?<sup>11</sup> I say no, and my contention is that computational models are only applicable to humans in certain situations, such as when we deal logically with certain puzzles or clear-cut problems.<sup>12</sup> Intelligent behavior is not just about processing symbols about the world, but to act *in* the world through directly perceiving the relevance of the situation. This is why many people fail at abstract problem solving when presented with a logical (completely solvable) puzzle, but immediately “perceive” that they should check the cards “drinking beer” and “16 years old” in a logically isomorphic exercise (Laland & Brown 2011:114). The puzzle had two variants: One in which the “familiar” examples were abstracted to their logical constituents, represented by cards, another in which the cards were to be used by the participants to pick out which ones should not be in the situation. For instance, the cards “drinking beer” and “16 years old” do not fit, as 16 year olds are not allowed to consume alcohol, whereas two cards that should not fit when presented symbolically (the candidate should be able to figure it out) were not so easily separated, presumably due to the abstractness of the task. Leda Cosmides, an evolutionary psychologist investigating the psychological mechanisms through various behavioural experiments, explains this through the evolved module “cheating detector mechanism”<sup>13</sup> as an adaptation formed through “reciprocal altruism” important in our evolutionary past, and that is fine up to a certain point, but why talk of the ability of cheater detection as a mechanism that purportedly resides inside the mind/brain? The ability to detect cheaters might be tied to many abilities and capacities of us humans, but why go from the input (the social situation) through the mind/brain (processing) and out again into the world? It might be that we *directly perceive* cheaters through our

immediate engagement with our social environment, and environment that is not “constructed” or “processed” by us, but that is disclosed as already meaningful.

[C]omputationalism ... perpetuate the dualism of hardware and software, matter versus information, body versus mind, and both mischaracterize the role that particular subsystems play in what are fundamentally dynamic phenomena of the whole organism embedded in its environment. (Thompson 2007:174)

Many of our capacities as social animals have a very long evolutionary history<sup>14</sup>, and some of the fundamentals (child rearing, bonding with mates, cooperation etc.) are built into our primate bodies. Take for instance forward looking face, hands for touching, and, unique to us humans, the large portion of eye-white that allows us to see where people are looking. Not to mention *language*, the acquisition of which is not just dependent (necessary perhaps, but not sufficient) on an internal acquisition mechanism<sup>15</sup> inside the mind/brain, but is dependent on our facial features such as the muscles around the mouth and jaw, and internal structures in the throat, tongue and lips, and of course our global ability to gesticulate and move our bodies when we speak, and to perceive others doing so.

What can we at present then say about the world and our knowledge of the world, if we itch closer and closer to a non-representational picture? Because some knowledge of the world is not received, it is achieved. Achieved through our skills; it is enacted. This is what has led to the formulation of a theory known as enactivism in the cognitive literature. A central tenant of *enactivism* is that the world is not processed, “taken in” or represented, but that through our bodily activity we *enact* the world in which we live and act. Writes Thompson, co-founder of the enactive approach:

In *The Embodied Mind*, we presented the idea of cognition as enaction as an alternative to the view of cognition as representation. By “representation” we meant a structure inside the cognitive system that has meaning by virtue of its corresponding to objects, properties, or states of affairs in the outside world, independent of the system. By “enaction” we meant the ongoing process of being structurally and dynamically coupled to the environment through sensorimotor activity. Enaction brings forth an agent-dependent world of relevance rather than representing an agent-indepen-

dent world. We called the investigation of cognition as enaction the “enactive approach.” (Thompson 2017)

By looking at not just the brain and information processing and/or representations, but the brain-body-situation matrix, many of our abilities as evolved organisms becomes more understandable. The listing of the relationship between mind, body and world can then begin to shed light on our evolutionary history. Take for instance Gallagher and Zahavi’s focus in *The Phenomenological Mind* as an example:

The fact that we stand upright, for example, is distinctive for the human species and this biological fact, which comes along with many other biological facts, has far-reaching consequences with respect to perceptual and action abilities, and by implication, with respect to our entire cognitive life. (Gallagher and Zahavi 2012:150)

The evolutionary psychologist can then say that evolution is not just selection for computational abilities, but that it is *psycho-somatic* (to take an already established term in psychology) involving both mind and body.

When it comes to human (psychological) evolution, a few examples are necessary to see what a viable form of research into enactive, psychosomatic evolution would look like. To get the examples going, we can take a look at a common point of departure; that of the contrast between humans and other animals. We tend to talk about the “world of the rat” or the “nature of the dog” or the “cunning of the cat” as both metaphorical and poetic contrast, often to understand human being-in-the-world better, but also in a more reductive way when we as biological and ethological researchers investigate the psychological capacity of, for instance, our closest living relative in the animal kingdom, the chimpanzee. To understand the chimpanzee is to understand the *world* of the chimpanzee as it is *lived*, that is, as the chimpanzee sees it. But we are not chimpanzees, only related, and the relation goes back about 13 million years (previously believed to be only 6–7 million years) when we and our common ancestors began to diverge. As if human phenomenology was not hard enough, we cannot begin to brazenly phenomenologize the experiences of different species. That is why establishing a few axiological biological facts is necessary to get started. First we can say that chimpanzees are highly hierarchical; the flock is ruled by one dominant male who gets to freely mate with the females, and there is a constant

ebb and flow of trial and error as the more submissive males and females of the flock position themselves in the hierarchy. A few weaker, more cunning male chimps might overthrow a single, more physically powerful one, which complicates the picture, but the point is that there is a primacy in terms of *social dominance* in chimp-life. So given the hierarchy, we can expect the chimps to be constantly drawn into situations subtended both perceptually and behaviorally by other chimps, particularly the alpha male and his interactions with others.

The phenomenological point here is that what matters to the chimps, what is closest to them perceptually (and thus meaningfully) is the dominance or non-dominance of the other chimps, and the way this dominance and non-dominance rule the availability of food, mating opportunities and the inherent safety of the group as a whole. To bring the point home, we can say that the world of the chimp, before any representations of it by the scientist or the chimp itself, is always and already structured in meaningful dominance relations that render the various actions by the individual chimp, or the chimp-group as a whole, intelligible as such. Furthermore, this intelligibility is also dependent on the body of the chimp. Much like us, the perceptual world of the chimp is ordered into a foreground-background structure, an up-down structure, and a left-right orientation of the visual field. How can we say this for certain? Because some fundamental bodily structures tied to engaged agency, is shared by humans and chimps alike. Two examples are forward-gazing eyes that provide depth-vision and precise eye to hand coordination, and opposable thumbs as tied to dexterity needed by the chimp for climbing in trees, using primitive tools (like rocks and sticks) and grasping food. Furthermore, depth-vision through forward-gazing eyes and the dexterity in the chimp hand is not just to separate capacities that are meshed together, but are two finely tuned structures that imply one another, and that help structure the chimp world. Much like the engaged human agent, the chimps have no problem with handing each other food and tools, attend to one another’s needs and/or threatening displays and coordinate a battle-party against a foreign chimp-group. A caveat that perhaps can be mentioned is that whereas the human skillful coper can learn to be skillful in an indefinite amount of domains upon the background that is the human cultural world, the chimpanzee world is in comparison rather limited, and the instincts of the chimps are more “closed” than they are in humans. What is paradigmatic

of humans, what Dreyfus and Heidegger calls *Dasein* (literally being-there), is that we find ourselves in worlds that are already *disclosed* as meaningful in terms of our projects, needs and drives. The only essential thing about *Dasein* is that it is a world-discloser, i.e. that we as skillful copers constantly through our developed and developing practices open up radically new ways of being, by pushing at the edges of what is intelligible in a given culture. And, notwithstanding the chimpanzee's (or crow, or cat, or jackdaw or hermit-crab) lack of flexibility in this regard, the chimp already finds itself, as we discussed, in a chimp-world, already disclosed as a dominance hierarchy. And as far as we know, the chimpanzees are unable to disclose radically new ways of being, perhaps because the background that constitutes the world in which they live is not complex enough? Or perhaps it is the case that our human worlds are never complete, that we constantly try to articulate our assumptions and that we constantly reach for the fringes of the reaches for the fringes of the intelligible? The chimp, much like other animals, is "world-poor" as Heidegger states,<sup>16</sup> but that seems to be only in virtue of the fact that it can only *qua* animal live in one world, whereas we as humans can live (although not at the same time of course) in several. Still we can use the word disclose, in the enactive way: The chimp discloses its social world by enacting it, not representing it. Also, when describing life-forms radically different from chimpanzees, *plants* for instance, we can see that the word "disclose" can prove fruitful for understanding the plant behaviour, and the plant world. Plants are certainly *alive* and active, but in what way? Do plants have *minds* in any way? We can mean something like what has been proposed in this quote:

**Also, when describing life-forms radically different from chimpanzees, *plants* for instance, we can see that the word "disclose" can prove fruitful for understanding the plant behaviour, and the plant world**

Plants have minds because their activities disclose a world of things that have significance for them. What is it to disclose a world of things that have significance? Focus on the most familiar case of a thing with a mind, a human being. [...] This is a world of things that have significance for me. These things are not merely aggregates of matter, made of the elements of the Periodic Table, obeying laws of physics. Rather, I'm surrounded by an array of things

that are for something, writing this post, and being a teacher. Desk, keyboard, coffee, book, tests, and food have a purpose within those projects; there are ways they should and should not be used. These things are "disclosed" because they have significance in virtue of their place in my projects of writing and teaching, an activity which in turn has its significance in virtue of its place in several wider contexts: my personal life, my job, and contemporary philosophy. (Thomson 2017)

This quote from Chauncy Maher in his series on plant minds in the-philosophy-of-brains blog, leads him to introduce the example of the magnolia, which constant self-reproduction (what is in the literature known as *autopoiesis*) "actively creating and maintaining itself, it too induces an array of things that matter to it. It does not exist in mere space surrounded by mere matter. Some things it actively seeks, or is drawn toward; others it actively avoids." (ibid). Now, jubilating as it is to allow plants a fundamental level of mindedness, the plant world, is still, at least as compared to the world of the chimpanzee and human, exceptionally poor. Plants, most of them not being self-propelling (self-moving) animals, cannot be said to *act* in the world as creatures endowed with nervous systems. Although plants are now increasingly seen by both experts and layman alike to be highly complex living systems that can even communicate with members of the same and other species across vast distances, most of them are still rooted in the same place their entire lives, and the world they project around themselves is intensely immediate: Water = good, minerals = extract à seek, sun à absorb etc. That said, on the minimal definition of disclosure/disclosing, the world of the plant is still a *world*.

### Conclusion: Evolution and Information

In conclusion then, we can see that the alternatives to computationalism that arises out of the enactive approach, as well as phenomenology and various approaches in embodied cognition, are enough to challenge fundamental assumptions in computationalism, at least in its stricter forms. Furthermore, my initial critique, manifested in my neologistic *informationism* revolves around the unwarranted ontologizing of good method, a tendentious phenomenon that quickly reduces the perceived world to information, and the mind to an information processing

machine. This is not to say that machines do not process information, or that sometimes humans and animals (and/or subsystems of these) process information, just that this processing should not, given its successful implementations in certain theories, be shot out into the entire field. Theories of evolution are also something that evolves.

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### NOTES

- <sup>1</sup> Here I am hinting to a problem one can perhaps already discern, which is that of reducing the human (which in evolutionary psychology is the "object of study") to a computer, whose sole purpose is to, via its programs, survive and thrive: this instead of referring to humans as conscious subjects, or "perceptual centres" or even "advanced hominids" as sometimes is done.
- <sup>2</sup> *Stanford Encyclopedia of Philosophy* entry on *Evolutionary Psychology* section 2.
- <sup>3</sup> Although it might be strange to refer to the human body as "hardware" given the weird prospect of witnessing a PC or a hard disc walk down the street, it is to set up the distinction with embodied cognition later on, making the contrast more poignant.
- <sup>4</sup> Because it is of course the case that we also sometimes process information, calculate, reason based on inferences and explicit information etc. and that the information processing, calculative *modus operandi* at times is indispensable for our human way of being-in-the-world.
- <sup>5</sup> A question can be raised as to whether our models fit reality, or rather if our models (and the corresponding metaphors, pictures and similes and allegories) make us see reality in a different light, thus making us (the scientist) postulate entities or processes that had not been postulated had the models been different from the beginning.
- <sup>6</sup> There are many places that provide good surveys of Chomsky's general idea here, for instance Costly (2013), along with plenty of textbooks for students of developmental psychology and psycho-linguistic.
- <sup>7</sup> See *Sense and Non-Sense* for a critical evaluation of the concept of EEA.
- <sup>8</sup> The research program, also formulated by *Stanford Encyclopedia of Philosophy* in section 2. in the entry on *Evolutionary Psychology*.
- <sup>9</sup> As Thompson states in *Mind in Life* each major approach to the study of the mind has its "preferred theoretical metaphor." (Thompson 2007: 4)
- <sup>10</sup> *Overcoming Epistemology*
- <sup>11</sup> It is nr.4 I am criticizing then, listed on p.112 (Laland & Brown 2011). And nr. 1. as listed in *Stanford Encyclopedia*.
- <sup>12</sup> If we take Dreyfus and Taylor seriously, which I think we should, we should be open to the possibility that the rise of cognitivism was due to the aforementioned "ontologizing" of good method, and that this has a longer history than one tends to think.
- <sup>13</sup> As seen in, and explained by, Laland & Brown 2011 pp. 113-16.
- <sup>14</sup> Many authors make the point that we did not evolve in a solely hostile world, but also evolved *from* a world to which we are, after all, well adapted. (Many examples in Midgley 1995 chapter 13 p.309, and Bellah 2011, especially the first 3 chapters).
- <sup>15</sup> See an example of non-reductive, holistic thinking as regards language acquisition, by Bellah 2001:131.
- <sup>16</sup> *Mind in Life* pp.455-456.