

Academiejaar
2022–2023

Enactive Ecologies

Exploring the role of enactivism in developing
a relational environmental philosophy

Teun van Son

Wijsbegeerte

Masterproef
Milieufilosofie

Promotor
Prof. dr. Kristien Hens



Universiteit Antwerpen
| Faculteit Letteren
en Wijsbegeerte

Enactive Ecologies

Exploring the role of enactivism in developing a relational environmental philosophy

Teun van Son

28th September 2023

Masters thesis
without a practical component (21 SP)

Presented to
The University of Antwerp, Faculty of Arts

Submitted for the degree
Master of Philosophy

Abstract

This research aims to examine how and to what extent the enactive approach to cognition can contribute to a relational environmental philosophy that is fit for the ecological challenges facing humanity in the 21st century. The enactive approach, kickstarted by Varela, Thompson and Rosch's *The Embodied Mind*, is a relatively new approach to philosophy of mind that has tremendous yet underexplored potential in the field of environmental philosophy. In describing how human cognition is embodied, embedded and enacted, enactivism upends entrenched views on human nature and the place of humanity in its environment. This research aims to show how enactivist insights can help strengthen and underpin insights from ecofeminism, leading to a world view in which 'humanity' and 'nature' are inextricably entangled. Subsequently, these insights are applied to sketch the outlines of an enactive environmental philosophy. Enactive concepts such as 'participatory sense-making' are used to show that real-world encounters are indispensable for ecological awareness, and to discuss ways in which such encounters can be fostered. Along the way, connections will be made to care ethics and various other philosophical movements.

Keywords — *enactivism, environmental philosophy, care ethics, ecofeminism*

Word count: 35,552 / 40,000

To all those whose voices we cannot yet hear.

Acknowledgements

I would like to thank my thesis advisor, Kristien Hens. Both her lectures and our meetings – the latter of which were too infrequent completely through my own fault – have helped me along tremendously in developing my thinking beyond established boundaries and entrenched dualisms. Her positive outlook and passion for finding wisdom wherever it can be found have greatly inspired me in writing this thesis.

I would also like to thank my partner, who has empowered me at every turn and who has influenced my thinking on every subject imaginable. If any bravery is to be found in my writing, it comes from her.

I want to thank all the people – friends, fellow students, and lecturers – with whom I've had stimulating discussions over the past few years and who have influenced and challenged my thinking. They are too numerous to name (and I would be bound to forget important names), but anyone who feels they might belong to this group, most probably does.

I am also indebted to the work of Alexandra Elbakyan in creating and maintaining Sci-Hub. Without her passion project, many people would not have had the same access to the treasure trove of wisdom and knowledge that the academic world has created, and this thesis, too, would not have been the way it is.

Finally, I want to acknowledge the authors and thinkers that have inspired me. This thesis is merely a node in a mycorrhizal network of ideas, some old, some new. It is my hope that my thinking can one day give back to the ecosystems that nourished it.

Contents

1 Introduction	5
1.1 A glimpse into the West's troubled relationship with nature	5
1.2 The challenge, the plan, and the research question	8
2 Environmental philosophy and ecofeminism	10
2.1 Ecofeminism	10
2.2 The critique of anthropocentrism	12
2.3 The critique of individualism	15
3 Enactivism and non-dichotomous thinking	20
3.1 The reign of cognitivism	20
3.2 The enactivist alternative	22
3.3 Understanding the self	23
3.4 Understanding intelligence	31
3.5 Understanding consciousness	38
3.6 Synthesis: the deep continuity between the human and more-than-human world	44
4 The Encounter: Care ethics, participatory sense-making and the importance of 'letting be'	46
4.1 The striking affinity between care ethics and enactivism	46
4.2 Participatory sense-making in humans and non-humans	49
4.3 The encounter between the non-human and the human	52
4.4 Implications: fostering the encounter	56
5 Enactive Ecologies	66
5.1 Conclusion: Enactivism in Ecologies of Connectedness	66
5.2 Criticisms and replies	67
Bibliography	72

1 Introduction

It is usually at the edges where the great tectonic plates of theory meet and shift that we find the most dramatic developments and upheavals.

Val Plumwood, *Feminism and the Mastery of Nature*, (1993) 2003, 1

With the current proliferation of ecological crises on planet Earth, it seems high time to rethink the way we see and approach the natural world. The aim of this thesis is to incorporate the enactive approach to cognition into emerging ideas in environmental philosophy. The hope is that this can make for an approach that is more thoroughly relational and that is stronger in its rejection of modernist dualisms.

This introductory chapter will shortly sketch the ecological situation that has been the trigger for this research (section 1.1), and will subsequently outline the structure of the main text (section 1.2).

1.1 A glimpse into the West's troubled relationship with nature

The ecological situation on planet Earth is currently deeply disturbed. This section will briefly review three prominent ecological crises, highlight how these and others are interconnected, and summarize the sociopolitical response to them.

1.1.1 Three crises

Global average temperatures have been sharply on the rise for decades, and so have the concentrations of greenhouse gases (GHGs) that cause this heating (IPCC 2021, 4). Even though reliable knowledge of human-caused global warming has been around since at least the early 1970's (see for instance Sawyer 1972), we have not succeeded at slowing this trend, let alone at reversing it. The preferred target of maximum 1.5 °C heating compared to 1850–1900, set in 2015 by the 196 attending countries of the COP 21 (UNFCCC 2016), was already declared virtually unreachable just a few years later (IPCC 2021, 14–15). Although the process of anthropogenic climate change was seen for decades as mostly a future problem with hypothetical implications, the concrete effects are currently abundantly clear. It is now 'virtually certain' that many of the recent weather extremes "such as heatwaves, heavy precipitation, droughts, and tropical cyclones" are only explicable by the process of global heating (8).

In tandem with global heating, human activity is currently causing a 'sixth mass extinction' of species on planet Earth (Begon and Townsend 2021, 709). Species are dying out at a rate of approximately 1000 times the ordinary background rate, "and future rates of extinction are likely to be 10,000 times higher" (De Vos et al. 2015, 9). For example, the first-ever systematic review of the state of the planet's trees (BGCI

2021) found that 30% of tree species are threatened with extinction, another 7% are possibly threatened, and a total of 142 known species (0.2%) are already extinct in the wild. As long as the main drivers of tree extinction – habitat loss, timber production, pests and diseases, and climate change – are not diminished, these numbers will continue to rise year after year. A lot is unknown about the exact nature and extent of the current mass extinction, including the number of species that exist on the planet in the first place (see section 1.1.2). Nevertheless, it is likely that the biggest driver of this mass extinction is climate change (Begon and Townsend 2021, 711).

Another symptom of humanity's treatment of Earth is the proliferation of zoonotic diseases such as COVID-19, Ebola, Q fever, HIV and bird flu. To take the latter as an example: bird flu outbreaks have become a yearly phenomenon in places with large amounts of intensive animal farming. Between 2005 and 2020, the various strains of this disease have caused the death and mass slaughter of over 246 million animals in the poultry industry (NCIRD 2022). In 2018, virologist at Erasmus MC Marion Koopmans warned the general public that the recent increase in global viral infections was a sign that our ecosystems are changing too rapidly (in Universiteit van Nederland 2018). Too much ecological disturbance will easily cause a pandemic, was her prediction. As she spoke those words, the COVID-19 virus was already growing fit to infect humans.

1.1.2 Interconnectedness and uncertainty

The issues described above – global warming, mass extinction, zoonotic disease proliferation – are not the only ecological crises we face. They are joined by others, such as the disturbance of chemical flows, land-system change such as deforestation, and the introduction of novel entities such as microplastics (Steffen et al. 2015). These will not be described in detail here. More important for the present research than the details of each specific crisis, is the fact that all of these processes are interconnected.

For example, climate change, land-system change and biodiversity are known to be strongly and multidirectionally interrelated (Grimm et al. 2013). On the one hand, changing climates alter ecosystems in ways that are not easily revertible, which in turn affects the biodiversity in these ecosystems. On the other hand, changes in ecosystems affect the climate through feedback loops, one simple example being the thawing of permafrost releasing CO₂ and CH₄ (methane) into the atmosphere (480). Moreover, both climate and land-use change affect the risk of cross-species infection of zoonotic diseases (Carlson et al. 2022). Specifically, a warming climate facilitates viral sharing between wild mammals and humans, and this process of increased infection may already be underway. On top of that, anthropogenic ecosystem changes further increase the risk of transmission, as animals who thrive in human environments tend to carry more zoonotic diseases (Gibb et al. 2020; Johnson et al. 2020).

One final cause for concern is the large amount of uncertainty regarding different environmental factors as well as the way in which they are interconnected. For instance, regarding species extinction, there is uncertainty not just about how many species have recently gone extinct, but also about how many species exist in the first place. Although the total number of species on Earth is generally accepted to be more than the current number of described species (around 1.5 million), estimates of total species numbers range from 2 million to 1 trillion (Larsen et al. 2017). Additionally, there is a strong uncertainty about the 'normal

background rate' of extinction and how it should be calculated (De Vos et al. 2015). Microplastics are cause for even more perplexity, with recent studies concluding that they *may* affect a host of environmental processes but that more research is needed (Hu et al. 2019; Agathokleous et al. 2021).

1.1.3 Responses to the crises

The sociopolitical response to the interconnected ecological crises has been, to put it mildly, lacking. A recent report on climate action (Boehm et al. 2022) assessed 40 indicators on their progress toward a maximum of 1.5 °C of global warming (as agreed to in the 2015 Paris Agreement, see UNFCCC 2016), and found that none of them were on track to reach their targets. In five indicators, including the carbon intensity of electricity generation, steel production, and agriculture, the rate of change is not just insufficient but actively heading in the wrong direction. Current climate pledges for 2030 – if they are to be taken at face value – would still result in a warming of 2.4 °C to 2.8 °C by the end of the century (Boehm et al. 2022, 3).

Moreover, even the IPCC reports, which appear to provide the most reliable and complete information on climate change, are in fact strongly politicised. This is particularly true for the summaries for policymakers, which are reviewed and altered line-by-line by country delegates before publication (Templeton et al. 2023). However, apart from this review process – which is documented in detail and thus publicly accessible – there is also evidence for behind-the-scenes lobbying. Regarding the recent WGIII report on mitigation of climate change, investigative journalism has found that delegates from Brazil and Argentina successfully lobbied against mentions of the role of plant-based diets in the climate transition and the description of beef as a 'high-carbon' food (Dowler and Carter 2021). These mentions were still present in the first draft of the report (leaked by Scientist Rebellion 2021), but are absent from the final version (IPCC 2022). A similar process happened with Saudi Arabia and The Organization of the Petroleum Exporting Countries (OPEC) objecting to a host of remarks mentioning the necessity of phasing out fossil fuels and even to the use of the word 'transformation' (Dowler and Carter 2021).

Simultaneously, governments worldwide are actively subsidizing the fossil fuel industry. For instance, Metten (2023) has found that the Dutch government spends approximately €30 billion per year on subsidies and tax deductions for the fossil fuel industry, which is four to five times as much as it spends on climate-related policies (€6.8 billion for 2023, see [Ministerie van Financiën 2023](#)). Globally, fossil fuel subsidies have surpassed 1 trillion USD in 2022 (IEA 2023).

There is thus a strong political resistance to the kind of transformation that is required to safeguard a healthy future relationship between humans and their environments. Rather than embrace the conclusions of scientists, which are by now abundantly clear in its big picture, governments seem intent on stalling every step of the way.

The response from corporations is perhaps even more lacklustre. Despite having known about climate change since 1986 ([Rechtbank Den Haag 2021](#), §2.5.9), the oil giant Royal Dutch Shell has shown little willingness to make meaningful changes to address it (Milman 2022). In fact, even after having been forced by the district court of The Hague to reduce their emissions by 45% by 2030 ([Rechtbank Den Haag 2021](#), §5.3), and after pledging to reach net zero by 2050, leaked internal communications reveal that net zero is

simply not one of the company's goals (Milman 2022). Other fossil fuel companies have similar strategies: publicly claiming support for climate goals, while internally changing as little as possible (Li, Trencher and Asuka 2022).

1.2 The challenge, the plan, and the research question

What is the role of philosophy in dealing with the situation sketched above? What is the philosophical challenge to be tackled? It is, or so this work argues, to reimagine ourselves and our relationship with our environment from the ground up. In Cumhaill and Wiseman's *Metaphysical Animals* (2023), which tells the story of philosophers Elisabeth Anscombe, Iris Murdoch, Philippa Foot and Mary Midgley, the authors describe the philosophical relevance of their stories as follows:

As the world tries to recover from a pandemic, and wakes up to the reality of the climate crisis, it is perhaps time to ask again, as these women did after the Second World War: What sort of animal is a human being? What do we need to live well? Is philosophy of any use? (Cumhaill and Wiseman 2023, xii)

The present work will operate in this spirit: in order to properly deal with this era of ecological malaise, it is necessary to re-think our answers to the big questions: What does it mean to be human? What is 'nature'? How different are humans from other life on Earth?

This work will first set out its critical starting point in chapter 2, which will be drawn largely from ecofeminism, and more specifically from the work of Val Plumwood. In chapter 3, this ecofeminist critique will be coupled with the enactive approach to cognition. This chapter will introduce different aspects of enactivism and explore how they connect with Plumwood's ecofeminist ideas. Chapter 4 will venture further into the normative implications of the enactive approach. It will especially engage with Hanne De Jaegher's work on 'participatory sense-making' to develop a more concrete and hands-on picture of what can be called *enactive ecologies*. Along the way, this work will tap into other philosophers and philosophical movements, most prominently care ethics.

The question at the centre of this work is the following: to what extent, and in which ways, can the enactive approach to cognition contribute to a relational environmental philosophy that unravels and rethinks foundational dichotomies in Western thinking? As will be discussed in chapter 2, Plumwood identifies modernist dichotomies such as mind/matter, self/environment, intelligent/automatic and nature/culture as lying at the root of the oppression of both human and non-human minorities. This work aims to research how enactivism can help substantiate these ecofeminist claims, but also – and this is the project of chapter 4 – what normative conclusions flow from this. In this way, this work will attempt to sketch an environmental philosophy with enactive ideas at its roots. The goal is not to re-invent the wheel – as mentioned, there are plenty of rich philosophical currents that this work will draw from – but rather to strengthen and engage with existing literature, and to argue that ideas about mind and cognition should not be overlooked when dealing with environmental questions in philosophy.

Before commencing, one more preliminary is in order. This work will attempt to find answers to our ecological predicament in the intellectual realm; specifically the realms of environmental philosophy and

philosophy of mind. However, this is not meant to imply that the entirety of the problem exists in the intellectual realm. As Charles Taylor points out, it is naive to assume that one type of motivational force – be it intellectual, material, political or otherwise – always prevails in human history (C. Taylor 2007, 213–4). Indeed, it would be naive to assume that simply ‘changing the way we think’ about ecology will solve our ecological issues. There are material, economic and political circumstances that have their own unique role to play. The flipside of this consideration, however, is that ideas do matter. Only considering material or economic factors and disregarding the role that ideas can and do play in history, is equally naive. Therefore, this work will continue under the assumption that ideas play a role in the trajectory of humanity, while simultaneously keeping in mind that these ideas are not the sole guiding force behind this trajectory.



2 Environmental philosophy and ecofeminism

Ecological thought, once unleashed, permeates everything.

James Bridle, *Ways of Being*, 2022

The philosophical reaction to our ecological predicament has been manifold. This chapter will focus on the movement of ecofeminism as a promising tenet for a radically new way of thinking (about) nature. In discussing ecofeminism, a number of other movements in Western environmental philosophy will be critically discussed. As it turns out, the ecofeminist stance on rationalism and dualism provides ample opportunity for a fruitful, yet hitherto unexplored, synthesis with the enactive approach to cognition.

2.1 Ecofeminism

Although the term ‘eco-feminism’ was coined in 1975 by Françoise d’Eaubonne, it really came to life in the mid-to-late 1980’s (Kawall 2017, 20). This chapter will focus on the ecofeminist stance developed by Val Plumwood (1991, [1993] 2003). Plumwood was highly critical of conventional Western environmental philosophy, which she dubbed ‘rationalist’, but also of the main alternative movement at the time, ‘deep ecology’.

The main point that Plumwood’s ecofeminism stresses is the interconnectedness between the domination of nature on the one hand and domination based on gender, race and class on the other (Plumwood [1993] 2003, 1). According to her, these types of dominations are exponents of the same system of dualisms that has developed in Western thinking over time, such as human/nature, mind/body, reason/matter, male/female etc. (43). The essence of these dualisms is not just to sharply divide two spheres of existence, but also to devalue and subsume one in favour of the other. The topside of the dualism is marked essential, valuable, and pristine, whereas the underside is devalued, rejected, and unseen. What makes this dualistic structure of Western thought especially difficult to untangle is the fact that the underside is not straightforwardly rejected but rather “appropriated, incorporated, into the selfhood and culture of the master, which forms their identity” (41). Thus, Plumwood’s analysis, echoing the master-slave dialectic of Hegel, sees the relation between oppressor and oppressed as a complex interdependence – an interdependence which the oppressor denies.

Again, the many dualisms in Western thinking do not stand separately but are strongly entangled. This means that the many forms of domination in Western culture are also strongly entangled. Thus Plumwood resists any kind of analysis that reduces its scope to just one kind of dominant identity, be it the bourgeoisie

in the case of Marxism (Plumwood [1993] 2003, 5) or the masculine identity in the case of certain forms of feminism (42). For instance, women have, and still regularly are, included in the sphere of nature. Plumwood herself cites a slew of philosophers identifying women with subsistence, animality, emotion, family life, and sex (19), but one can also take the historical and present-day witch hunts as an example of the West's identification of women with nature (Federici 2004).

By being identified with nature, women are necessarily also excluded from the sphere of reason. This makes it unsurprising that women have been, and continue to be, severely underappreciated in philosophy (O'Neill 2005). "Nature", says Plumwood, "includes everything that reason excludes" (Plumwood [1993] 2003, 19–20). Thus it is the concept of 'reason' as it has been developed in Western culture – particularly since the enlightenment – that holds the key to understanding humanity's crooked relationship with nature.

It is precisely this critical analysis – tying together different forms of domination and tracing them back to the concept of reason – that previous environmental philosophers have failed to make, says Plumwood. Without a critique of reason, environmental philosophy is bound to sustain the reason/nature dualism.

In *Nature, Self, and Gender* (1991), Plumwood specifically discusses two works of environmental philosophy, Paul Taylor's *Respect for Nature* and Tom Regan's *The Case for Animal Rights*. Taylor, she argues, over-intellectualizes morality by making it "an essentially *cognitive* matter (that of a person believing something to have 'inherent worth' and then acting from an understanding of ethical principles as universal)" (5, emphasis in original). Following in Kant's footsteps, Taylor identifies morality with reason and disregards kindness, care and love as inessential matters. Plumwood's analysis here strongly resonates with care ethics, which equally emphasises that characteristics deemed 'feminine' are systematically excluded from the (masculine) realm of morality.¹ In identifying morality with reason, Taylor is perpetuating a dualism that has caused the disconnect between the human realm and the natural realm in the first place (5–6). Regan, who also argues from a Kantian framework, does much the same thing: starting from a reason-based account of moral rights and assuming it to be sufficient to account for both human and animal rights (7–10).

However, a deeper problem that Plumwood finds with both theories is that they reduce environmental philosophy to environmental *ethics* (10–11). That is, their approach to environmental philosophy consists in taking the standard concepts of anthropocentric ethics and extending them to include some non-human entities. In doing so, they neglect to ask the bigger questions that are absolutely necessary in dealing with nature: what does it mean to be human? What is nature? And what is the relation between humanity and nature? This means that Regan and Taylor implicitly accept the standard picture: nature as cut off from the human sphere, and humanity as the absolute masters over nature, standing outside of it and controlling it from there. Plumwood calls this entrenched view of humans and nature being strictly opposed to one another 'the discontinuity problem'.

By taking discontinuity as their starting point, Regan's and Taylor's philosophies cannot but be anthropocentric, ratiocentric and egocentric. Anthropocentric, because the human/nature duality is implicitly accepted, thereby placing humans in a position of exemption from the rest of nature. Ratiocentric, because the primacy of reason is the core element of what makes humans 'not nature'. Egocentric, because morality based on abstract reasoning is based on the concept of the self as naturally egotistical and thus in need of a

1. Plumwood herself affirms the affinity between ecofeminism and care ethics both in *Nature, Self, and Gender* (1991, 9) and in *Feminism and the Mastery of Nature* ([1993] 2003, 182–89).

universal law to keep it in check (Plumwood 1991, 6).

2.2 The critique of anthropocentrism

Plumwood's analysis can be fruitfully applied to other works of environmental philosophy (or environmental ethics), as well as societal tendencies more broadly. This analysis can be cashed out as a series of blind spots in Western thought, caused by the inability to question the dualisms underlying it. Broadly speaking, I will identify two blind spots: anthropocentrism and individualism.

2.2.1 Anthropocentrism and intelligence

Anthropocentrism, as Plumwood has shown, can occur even when conferring moral value to non-human creatures. It can consist in the application of human standards or capacities as the baseline for all other beings.

A relatively harmless example of this, recounted by primatologist Frans de Waal (2016, 17–8), is the story of a group of scientists who conducted a mirror test on an elephant, to see if they are 'smart enough' to recognize their own reflection. When the elephants failed to touch the mark on their body that they were given, the scientists concluded that elephants have no self-awareness. However, it turned out that the mirror they used was too small for the elephants to properly see themselves, and that when given a proper elephant mirror, some elephants did indeed touch the mark. This is an instructive case of humans assuming, unthinkingly, a human standard when a different standard would have been more appropriate. It also showcases an intellectualist bias: the scientists assumed that the problem was a cognitive one, whereas in fact it was related to the elephants' embodiment. Finally, this example illustrates how anthropocentrism is a self-affirming bias: the experiment's (unsound) results were reason for the scientists to conclude that elephants must not be all that smart. In De Waal's words:

In trying to find out at what mental level other species operate, the real challenge comes not just from the animals themselves but also from within us. Human attitudes, creativity, and imagination are very much part of the story. Before we ask if animals possess a certain kind of intelligence, especially one that we cherish in ourselves, we need to overcome internal resistance to even consider the possibility. (de Waal 2016, 3)

Of course, De Waal is no academic philosopher, and he does not make the connection between our inability to see animal intelligence and the human/nature duality in Western culture. Nevertheless, he does observe that in order to recognize intelligence in animals, we first need to turn our view inwards, and ask ourselves: *what are we even looking for?*

Unfortunately, the problem of anthropocentrism persists within philosophy as well. A glaring example of this is the recent book *Bots and Beasts* by philosopher of mind and cognitive scientist Paul Thagard. The book aims to be "the first systematic comparison of intelligence across machines, humans, and other animals" (Thagard 2021, preface).

In the chapter on animal intelligence, Thagard makes up 'report cards' of six animals – bees, octopuses, ravens, dogs, dolphins, and chimpanzees – where each animal is given an intelligence rating of A, B, C

or F on different mental features and mechanisms. However, the details hardly matter, since Thagard's methodology has already sealed these animals' fate. At the chapter's close, he explains what the ratings stand for: "an A means that the animal is close to humans, B means that the animal has much of human capability, C means that the animal has a bit of human capability, and F means a total lack of human capability" (Thagard 2021, ch. 4). Thagard has modelled intelligence in animals after human intelligence. This means that animals' intelligence scores depend solely on how closely they can approximate human capacities. Thus, not only are animals *a priori* prohibited from surpassing human intelligence (the best they can do is come close), they also cannot exhibit their own unique forms of intelligence. What counts as intelligent has already been pre-established by Thagard; it consists in twelve features and eight mechanisms that are all derived from human intelligence. The chapter concludes with the sentence: "Nevertheless, human minds possesses enormous advantages over animal and machine intelligence" (ch. 4). Unfortunately, this conclusion was already contained in the chapter's premise.

This book chapter by Thagard perfectly illustrates Plumwood's analysis. Thagard doesn't see the animal realm as a realm with its own *raison d'être*, but rather as a realm that can and should be exhaustively analysed according to human standards. That is, he extends the structure of human logic to the non-human realm and 'graciously' admits that there are indeed some forms of life that exhibit some, lesser, forms of intelligence – in perfect symmetry with Regan and Taylor who extend human ethical standards to allow certain animals to have some, lesser, moral standing. Although the chapter is supposedly a text about animals, humanity's shadow looms large over it.

2.2.2 Anthropocentrism and pain

A final example of anthropocentrism in philosophy is the way that the concept of 'pain' is used in environmental philosophy. Peter Singer, arguably the most influential philosopher on animal ethics and one of the most influential contemporary philosophers generally, puts pain at the centre of his moral philosophy. His approach has been dubbed *sentientism*, and it entails a commitment to minimizing harm and maximizing pleasure in *all* sentient creatures (Singer 2015, 195–6).

How exactly is this line between morally considerable and morally inconsiderable creatures drawn? For Singer, the demand for sentience mainly cashes out in a demand for the ability to feel pain. Thus "the evidence is overwhelming" that birds and mammals feel pain (195), less obvious but still convincing enough in fish, reptiles and crustacea (195–8), and downright questionable in molluscs (198). Singer bases these judgements both on commonsense inferences from observed behaviour – if an animal behaves the way we would when in pain, we can assume it is in pain – and on scientific insights regarding "the similarity of the nervous system of the being to our own" (195). This means that Singer requires of animals to be within a certain range of similarity to humans – in terms of their behaviour and/or nervous system – in order to qualify as being able to feel pain and thus to be eligible for moral consideration.

The underlying idea that humans are ultimately the benchmark of moral consideration is, however, not motivated by Singer. Just like in Thagard, it rather operates as an assumption on which his argument is built.² When reading texts like those of Thagard and Singer, it may seem as if there is no other way

2. Interestingly, Bridle (2022) observes the same tendency in the assessment of artificial intelligence; AI is considered good or

than to use human concepts for evaluating the non-human world. However, alternatives are available. For instance, Singer could have applied the concept of ‘suffering’ instead of ‘pain’. If we take ‘suffering’ to mean something like ‘setting back the organism in its goals or goal-oriented processes’, then the line between sentience and non-sentience shifts radically. Far from being just an abstract word game, such an emphasis on morally relevant suffering would be resonant with the experiences that people report of empathising in various ways with vegetative life. To give just one example: scientist Suzanne Simard’s autobiographical book *Finding the Mother Tree* (2021) describes how growing up in the wild surroundings of British Columbia has made her highly attuned to the needs of forests. In a particularly moving passage, she describes how spraying seedlings with the herbicide glyphosate for a scientific experiment filled her with remorse and dread. This passage is worth quoting at length, for it conveys an important moral intuition.

When we returned, the rhododendrons, false azaleas, and huckleberries in the highest-dose treatment had shriveled and died. Not just the shrubs, but all of the plants, even the wild ginger and orchids. The lichens and mosses were brown, and the mushrooms were rotting. Some shrubs were trying to leaf out again, but the new leaves were yellow and stunted. Berries that had been plump on branches had fallen. Even the birds weren’t eating them. Only the prickly spruce seedlings were alive, their needles still pale and stunted, some dripping with pink, and all no doubt in shock from the sudden flood of light. Most targeted plants were also dead in the intermediate treatment, but some were still green because they’d been hidden under the leaves of taller plants when the spray hit. At the lowest dose, most of the plants were still alive, but injured and suffering. [...]

I stared at my feet, because both of us crying would hurt too much. These plants were my allies, not my enemies. I raced over the reasons for doing this to justify them in my mind. I wanted to learn to do an experiment. I wanted to be a forest detective. This was for the greater good, for ultimately saving the seedlings. I would have proof that this was a stupid practice and be able to tell the government to investigate other avenues for helping seedlings grow. I looked at a thimbleberry plant trying to survive, its stems bare as they hunched over some pale seedlings newly revealed, but all it had managed to do was sprout a tiny basal pincushion of yellow leaves. (89–90)

Simard clearly saw a moral wrong in the destruction of life she had brought about. It didn’t occur to her to stop and ask whether these plants ‘*really*’ feel pain. She simply observed this to be the case, from a lifetime of living among the creatures.

This again mirrors insights from Plumwood. Simard knows the situation to be wrong not by applying universal moral principles, but because she is engaged in a relationship of care with the trees, plants and fungi of the forest. Moreover, exactly as Plumwood would have predicted, Simard was persistently ridiculed by her male colleagues because she felt care and concern for her non-human companions. In one instance, she was shouted at by a colleague during a work trip for suggesting that aggressively weeding to maximize production of a single type of tree is counterproductive.

impressive to the extent that it can mimic human intelligence (Bridle 2022, 30–31).

“Well, Miss Birch,” he said, “you think you’re an expert?”

I’d heard this name whispered behind my back. Birch was the clever substitute in public for what some of them called me in private.

Then he became furious. “You have no idea how these forests work!”

My baby stirred for the first time, and I felt faint.

“You’re naïve to think we’re going to leave these weeds out here to kill the trees!” he roared.

I opened my mouth, but no words came out. A black-capped chickadee fluffed her wings inside a crown of birches. Three tiny yellow beaks opened like clamshells around her, but their songs for food were muted. The awful things I’d heard about women speaking their minds—comments made even in my own family—echoed in me. The criticisms doused on women behind their backs, even if said in jest, always burned my ears. My Grannie Winnie was quiet, but in large part her resorting to silences to avoid barbs was likely because it was—easier. I’d vowed not to provoke the criticisms of the men, and yet here I was. (Simard 2021, 206)

The men around Simard characterize her as weak and sentimental. They see her emotional attachment to the forest as antithetical to scientific research. Again, rationality is opposed to emotionality; the former is seen as masculine, the latter as feminine. The fact that she actively opposes the production-oriented approach of conventional forestry, makes this even worse. “It’s not the cost that’s the problem. It’s the results you’re reporting”, she was told when policymakers threatened to pull her funding (208). According to the male/female dichotomy, women, who embody femininity, are supposed to be passive – just as nature is supposed to be a mere background for the actions of enterprising (white, Western, male) humans (Plumwood [1993] 2003, 4, 22–23).³ By not only being active and enterprising but also openly critical of the male status quo, and – to add insult to injury – by doing so from a point of affective connection with nature, Simard’s actions went against Western dichotomies in a myriad of ways and thus invited a reaction of offence, shock and even anger.

Feminist writer and scholar Sara Ahmed points out that “any will is a willful will if you are not supposed to have a will of your own” (Ahmed 2017, 78). That is, those who are designated a role of passivity are deemed insolent if they exercise their own will. Nature, too, is supposed to stay in its rightful place – below humanity, obedient – and the obvious signs that this is not nature’s place (see section 1.1) become all the more difficult to accept. As such, Plumwood’s analysis of Western dualisms provides a theoretical underpinning both for the experiences of women and the exploitation of nature.

2.3 The critique of individualism

Plumwood’s critique of anthropocentrism is thus well-founded. However, it is my contention that a second line of critique is necessary, namely a critique of individualism. The concept of ‘individualism’ can be cashed out in multiple ways that are nevertheless related. Although Plumwood does critique certain forms

3. The fact that women are supposed to be passive objects to men’s proactivity is also exemplified in art by the passivity of the subjects of female nudes (see Berger 1972; Eaton 2012; Lavallee 2016).

of individualism, she leaves others relatively intact. As I will argue, this weakens the critical potential of her theory. A stronger anti-individualist claim can be developed with the help of both philosophical and recent scientific resources. In order to evaluate Plumwood's stance on individualism, I will now turn to the second big critique of *Nature, Self, and Gender*: the critique of deep ecology.

2.3.1 Deep ecology's identification with nature

Plumwood was well aware that the so-called 'rationalist environmental philosophies', exemplified by Tom Regan and Paul Taylor, weren't the only options in environmental philosophy. The most prominent alternative was deep ecology, spearheaded by Arne Næss (1973), which presented itself as a radical departure from conventional thinking on the environment. Plumwood recognizes deep ecology as a step forward from the status quo, but nevertheless critiques it on its inability to fully break away from the legacy of rationalism (Plumwood 1991, 11–18). Plumwood summarises that deep ecology locates humanity's problem with nature in the split between humans and nature, and that its solution is to find an 'identification' of self with nature (12). However, this identification is left vague, and Plumwood differentiates three distinct meanings of it in the works of deep ecologists Arne Næss, John Seed and Warwick Fox: identification as indistinguishability, as the expanded self, and as the transcended or transpersonal self.

Identification as indistinguishability On this account, identification with nature means rejecting all boundaries between self and nature. It means embracing a radically holistic metaphysics of "unbroken wholeness" (12) that doesn't allow for any boundaries or discontinuities. Consequently, any sense of individuality is eradicated: "to the extent that we perceive boundaries, we fall short of deep ecological consciousness" (Fox 1984, 7, as cited in Plumwood 1991, 12). Plumwood argues that although this move is an understandable reaction to the separation of humans and nature, it is an overly hasty and radical reaction that fails to target the real issue. Deep ecologists seem to assume that the problem is atomism in general, and they aim to fix it by proposing a metaphysics that does away with all distinction. The actual problem, according to Plumwood, is not atomism but dualism, more specifically the human/nature dualism. Only by addressing this specific dualism will we make progress on our relationship with nature. Deep ecology has no analysis of this dualism, and instead "proposes the obliteration of all distinction" (13).

The practical consequence of the deep ecological view is that entering a caring relationship with the natural world becomes impossible. After all, in order to care for someone or something, one first needs to recognize the other's distinctness and independence. Otherwise, any sense of 'your well-being' as distinct from my own will be lost. Thus, in its haste to close the gap between humans and nature, deep ecology has erected a new set of false dilemmas: the only alternative to the human/nature divide is the complete eradication of difference, and the only alternative to the egoistic self is "holistic self-merger" (14).

Identification as the expanded self This second interpretation moves away from 'identity' and towards 'empathy' (14–15). The idea is that the self is equal to all that we identify with. Thus, our self grows as we identify with more and more of our surroundings. Whereas deep ecology was too radical in proposing indistinguishability, here it is not radical enough, according to Plumwood. By proposing an expanded self,

it sticks to a view of rational egoism and merely expands the egotistical self. Deep ecology operates on the assumption that humans are egoistic by nature and that the only way to make them care about nature is by expanding the sphere of self-interest to include nature. Again, they seem to posit a false choice: others are either irreducibly other and therefore impossible to care for, or they are ‘self’ and any difference between self and other is denied.

Identification as the transcended or transpersonal self The third interpretation of identification with nature follows from the second, and says that we need to detach from the narrow and particular concerns of the ‘biographic self’. In other words, we need to transcend our own ego and “strive for *impartial* identification with *all* particulars, the cosmos, discarding our identifications with our own particular concerns, personal emotions, and attachments” (Plumwood 1991, 15, emphasis in original). In urging for this radical impartiality, deep ecology repeats the denouncement of particularity and situatedness in morality. All identity and all particular attachments become suspect, as if the only morally valuable attitude is that of a universal and impersonal love of the cosmos. Plumwood points out that this precludes the kind of love that many indigenous peoples feel for their land, which is rooted in a sense of identity built on ties to a specific place. Indigenous responsibilities of care, Plumwood points out, are not universal and abstract but specific and local.

2.3.2 Self-in-relationship

The concept of ‘self’ that Plumwood poses in opposition to the deep ecology view, is that of a “self-in-relationship” (20). This is a view that finds a middle way between the ‘disembodied and disembedded’ autonomous agent of rational egoism and the non-differentiated, dissipated self of deep ecology. This view holds that selves exist as individuals, with their own interests and attachments, but that relationality is an essential part of these individuals. That is, people’s interests are never purely their own interests, but make reference to others’ interests. With this concept of self, ethics becomes less about managing the relations between egoist individuals and more about expressing an identity (Plumwood [1993] 2003, 183–4; 1991, 20). The self is always necessarily embedded in a network of relationships of care and it is in navigating this network that the moral character of the self is formed and expressed.

However, she emphasises that this view does not entail a transcendence or dissolution of the self: “Although some of the mother’s interests entail satisfaction of the child’s interests, they are not identical or even necessarily similar. There is overlap, but the relation is one of intentional inclusion (her interest is *that* the child should thrive, that certain of the child’s key interests are satisfied) rather than accidental overlap” (Plumwood 1991, 20). Although this view is plausible and certainly attractive with a view of bettering our relationship with nature, Plumwood seems to restrict the relationality of the self to a relationality of interests. However, the ways in which individuals are related to their environments go further than that. In fact, both philosophical and scientific considerations can cast new doubt on the idea of the self.

One challenge comes in the form of recent human microbiome research, which focuses on the presence and role of microbial cells in the human body. Microbes, whose cells likely outnumber ‘native’ human cells in the human body (Gilbert et al. 2018, 17), play a wide variety of roles in our bodies. The gut microbiota

alone have many different ‘functions’ in healthy humans, including the biosynthesis of ingested compounds, elimination of toxins, protection against pathogen overgrowth, development of the immune response, and regulation of hormonal functions, neurological signalling and bone density (Lynch and Pedersen 2016, 2370).

Thus, the relationship between ‘host’ and microbiome is one of a far-reaching interdependence, to the point of being called a “foundational co-existence” by Formosinho, Bencard and Whiteley (2022, 151). Instead, we should be talking of ‘environmentality’, signifying the ‘causal context’ of any given entity or phenomenon. On this view, an environment(ality) is only ever such from a specific perspective. However, this perspective can change, and consequently what we consider ‘foreground’ and what ‘environment’ as well. Thus, the human microbiome may be seen as environmental to the human itself, but with a change in perspective, the human is environmental to the microbes living in and on it.

Rees, Bosch and Douglas (2018) argue that human microbiome research challenges the three usual biological underpinnings of the individual self: the immune system, the brain, and the genome. In all three of these systems, the microbiome plays a constitutive role, which causes the authors to conclude that “[t]he human is not a unitary entity but a dynamic and interactive *community* of human cells and microbial cells” (2, emphasis added).

A second angle from which the individuality of humans (and other animals) can be questioned, is the nature of the gastrointestinal tract itself. Although we usually think of our gut as ‘inside’ ourselves, biologists Furness and Clerc claim that “the lining of the gastrointestinal tract is our largest *external* surface” (Furness and Clerc, cited in Sullivan 2013, 240, emphasis in original). The idea, elaborated by Shannon Sullivan, is that since the gut is a continuous passageway *through* the human body, anything that is in that passageway is not inside but *outside* of us. Only when something passes through the gut wall does it become a part of us. More fundamentally, since the gut interacts with a myriad of external substances on a daily basis, it becomes a place where ‘body’ and ‘external matter’ intermingle and blur together. The gut is necessarily very open to the external world, and it has highly sophisticated control systems in place to determine how to interact with those ‘externals’. These systems in turn stand in relation to other bodily systems, which means that whatever enters the body has an effect on the entire embodiment of a person.

For instance, serotonin, the hormone that regulates mood and is widely believed to be implicated in depression (though see Moncrieff et al. 2022, for a recent criticism of this idea), is found for over 95% in the gut. This means that what one eats has implications for how one feels and vice versa. More specifically, eating, as taking in the ‘outside world’ to become inside, is related to the way in which we relate to the ‘outside world’ more generally. In the words of Sullivan:

[...] the gut can be a key site for the working-through, both physiologically and psychologically, of a person’s relations with others. We might say that relationships with other people become internalized in the habitual ways that the gut responds to the world it ingests. This phenomenon of transactional internalization also can be seen in the depressed person’s refusal or failure to eat. A person’s willingness or inability to put part of the world (food) in her mouth to digest and absorb is a form of her relationship with the world (other people). (Sullivan 2013, 244)

For Sullivan (2013), this fact reinforces the point originally made by the pragmatist philosopher John

Dewey; that human beings are in constant interaction with their environments, to the point that they can even be said to be co-constituted by their environments. “The wall of the gut [...] is a site of dynamic co-constitution in which what is ‘properly’ body and what is ‘properly’ world is necessarily and productively indeterminate” (Sullivan 2013, 241).

These considerations call into question the concept of individuality on a more fundamental level than Plumwood does. Humans seem to be relational not just in terms of sharing or adopting interests, but also in ontological terms. They ‘take in’ the world in a variety of ways, and it is through this continuous process that they can stay alive and thrive. Failure to take in the world even seems to present itself as a psychiatric disorder. So what a human being *is* – where to draw the line between self and not-self – is fundamentally fuzzy and indeterminate.

This point is less of a criticism and more of a complement to Plumwood’s concept of the self-in-relationship. After all, the above considerations do not force us to concede the self altogether – they merely show that the ‘self’ is relational in more ways than one. However, in a sense the question remains how to think of the self. Knowing how *not* to think of it – not as a selfish autonomous agent, not as an all-encompassing universal self – does not make it clear how we should imagine the self in a positive sense. Plumwood’s suggestion of the self-in-relationship goes some way towards formulating this positive account, but it leaves questions unanswered. For example, how individual are we really? To what extent are humans ‘individual selves’ and how is that self retained in spite of their continuous interaction with the environment?

This question, and many others, I will attempt to answer by moving from environmental philosophy to philosophy of mind. I do this for two reasons. First of all, as previously discussed, I see the enactive approach in philosophy of mind as a promising theory that can make important changes to the way we see humanity and the self, the way we see nature, and the way we conceive of the relationship between humans and nature. Secondly, the philosophical movements that enactivism is responding to – the main adversary being cognitivism – bear strong ties to the dualistic structure of Western thinking that Plumwood identifies. It is my contention that by looking at the way the mind has been conceptualized, we can identify an important part of what it means to live in a world composed of dualisms. That is, the society-wide structure of dualisms that Plumwood identifies consists partly in dualistic thinking about the mind. By attending to the entrenched ways of thinking in this specific discipline, we can make progress on establishing less dualistic, and less destructive, ways of interacting with our environments. To the extent that the enactive approach serves as a viable alternative to these entrenched ideas, it can also serve to strengthen and underpin ecofeminist thought.



3 Enactivism and non-dichotomous thinking

Let the things be illusions or not, after all I
would then also be an illusion, and thus they
are always like me. This is what makes them so
dear and worthy of veneration for me: they are
like me.

Herman Hesse, *Siddhartha*, (1922) 2001

‘The enactive approach’ was a term coined in 1991 by Varela, Thompson and Rosch in their book *The Embodied Mind* ([1991] 2016). Their book starts with a desire to unite cognitive science with lived human experience. They observed that cognitive science at the time did not take first-hand experience into account at all, and conversely, intellectual traditions dealing with human experience did not engage much with contemporary science of the mind. Their aim was to provide this connection, and in doing so, they developed a new approach to philosophy of mind that drew from both cognitive science and experience-based traditions.

Although Plumwood wrote some of her most impactful ecofeminist works at the time when enactivist ideas were also starting to get published, the two movements did not interact. This chapter will therefore highlight important features of the enactive approach and explore whether and how they relate to, and synergize with, the critiques of ecofeminism. Section 3.1 will sketch the intellectual climate in which enactivism was born, after which section 3.2 will describe the alternative view that enactivism put forth. Sections 3.3 to 3.5 will go more in-depth into enactivist views on the self, intelligence, and consciousness respectively, and discuss for each of them how they can be related to ecofeminism. Finally, section 3.6 will conclude by sketching an ecofeminist–enactivist picture of humanity in nature.

3.1 The reign of cognitivism

In order to appreciate the importance of this once-new enactive approach, it is essential to understand what exactly it was reacting to. The status quo in philosophy of mind at the time was a movement called cognitivism, along with the slightly narrower sub-category of computationalism (Varela, Thompson and Rosch [1991] 2016, 37–43). The main idea behind cognitivism is that cognition consists in representation made possible by information processing. That is, any cognitive being takes in information (through the senses) and processes that information in some way in order to represent the world around them. Through cognition, beings produce information about the world that is falsifiable: it can be more or less accurate. Good cognition, then, means “appropriately represent[ing] some aspect of the real world” (43).

This representation, on the cognitivist account, is achieved through symbolic computation (40–1). When we think, what we actually do is perform operations on symbols, just like a computer (human or

mechanical). These symbols have a syntactic and a semantic element. The syntax consists in the physical properties of the symbol that constrain what can be done with it, whereas the semantics of the symbol is its meaning. A mechanical computer only has access to the syntax of the symbols it operates with; it has no idea what the bits and bytes *mean*. However, because the semantics of these symbols are linked to the syntax (or rather: because we humans have put semantic propositions into a syntactical form), the computer can ‘mindlessly’ perform operations on its symbols and still appear ‘smart’. This computational model explains, according to the cognitivists, how intelligence is possible in purely mechanical and material systems. So human brains, too, perform computations on symbols in order to produce intelligent outcomes. That is what cognition is on the cognitivist account.

The symbols that the brain operates on should not be understood as literal physical symbols that could be found by opening up the brain or by analysing it with sophisticated equipment. Rather, cognitivism proposes a separate level of analysis, the symbolic level⁴, that is related to, but not reducible to, the purely physical or neurobiological level. This move makes sense when viewed in the context of the intellectual climate of the time, as cognitivism was itself a reaction to the immensely popular behaviorist psychology of the 1920’s to the 1950’s (Varela, Thompson and Rosch [1991] 2016, 45–6; Thompson 2007, 4). Behaviorism claimed that in analysing cognition, one can only make claims about the inputs (stimuli) and outputs (behaviour) of a creature. Whatever happens ‘between’ these two poles, in the organism itself, is to be seen as a black box that is both unapproachable and uninteresting to psychology. The cognitivist reaction to behaviorism was thus to posit a fully fledged cognitive level of analysis, irreducible to both the physical make-up of the organism and the behavioural ‘outputs’ it exhibited.

For a time, cognitivism as a research project was almost unquestioned. Fodor, in his book *The Language of Thought* (1980), claimed that “the only psychological models of cognitive processes that seem even remotely plausible represent such processes as computational” (27). However, in 1991, Varela, Thompson and Rosch identified a new movement starting to gain steam that was questioning certain cognitivist dogmas (Varela, Thompson and Rosch [1991] 2016, 85–103). This was connectionism and its emergence approach. Emergence in cognition is the idea that a cognitive system is not made up of a central processing unit that processes symbols in a linear fashion, but instead consists of relatively simple components that work together in dynamic ways to create an ‘emergent’ intelligence. Connectionism proposes that brains work in exactly this way: they are made up of a dense network of neurons that all have reciprocal connections of various strengths with their neighbours (Thompson 2007, 8–10). These connections create emergent patterns of activity that vary according to the system’s history of activity and various other factors. So whereas cognitivism saw deductive reasoning as the paradigm for all cognition, connectionism gave perceptual pattern recognition pride of place.

Still, the connectionist movement didn’t go far enough according to Varela, Thompson and Rosch. What, then, was their enactive alternative?

4. The symbolic level of analysis is sometimes also called ‘the cognitive level’ or simply ‘the mental level’, for example by Graham (2010).

3.2 The enactivist alternative

Varela, Thompson and Rosch ([1991] 2016) took inspiration from phenomenology, dynamic systems theory and the Buddhist mindfulness/awareness tradition to kickstart an entirely new approach to cognition. They argued that both cognitivism and connectionism failed to address the main problems in cognitive science.

Most notably, these research programmes did not provide a satisfactory answer to the ‘explanatory gap’ between the computational, material side of cognition, and the phenomenological, subjective side (Thompson 2007, 9–10). In other words: why is it that these computational processes should produce subjective experience at all?⁵ Cognitivism tended not to solve but rather to sidestep this issue, by claiming that phenomenal consciousness is not essentially related to cognition at all, but rather some by-product that is of little interest to cognitive science (Varela, Thompson and Rosch [1991] 2016, 49–52). Until the 1980’s, cognitive science had thus tended to stay silent on the subject of consciousness altogether. However, if one takes personal experience seriously at all, as Varela, Thompson and Rosch did, then this creates an unacceptable tension that begs to be resolved. Consciousness, after all, is usually taken to be the most central feature of the self. Any theory of cognition that fails to acknowledge our own sense of self is, at best, hopelessly incomplete.

In a nutshell, the enactive approach proposes the following. Human beings are not merely brains that happen to have bodies attached to them. Rather, humans are integrated organisms that are embedded in their environment (173). It is in the interaction between organism and environment – rather than in the brain – that cognition arises. Thus, cognition involves not just brain activity sandwiched between some input and some output, but is rather *embodied* and *embedded*. *Embodied* means that cognition depends essentially (rather than trivially) on having a body and the experiences that having a body entails. It is only because we can move that, for example, our vision works the way it does. This was described by Edmund Husserl as the body’s “original pact with empirical reality” (Reynaert 2009, 9): it is only because a bond exists between movement and perception that I can explore the world, be it by manipulating an object with my hands and experiencing its ‘rectangularity’, or by moving my head to find out that the object I’m looking at has depth. The organism’s abilities of perceptually guided action are also called ‘sensorimotor capacities’. *Embedded* means that the sensorimotor capacities of the organism operate in a larger context that includes biological, psychological and cultural factors. Finally, perception is never a passive receiving of input but always involves action in the world. Thus, in its shortest formulation, the enactivist approach sees cognition as consisting in *embodied action*.

The enactive approach garnered growing support after the publication of *The Embodied Mind*, and it has evolved and branched out into a wide and diverse range of theories and movements. Later, the broader term ‘4E cognition’ gained steam, referring to all theories that classify cognition as embodied, embedded, extended, and enactive (Newen, Bruin and Gallagher 2020, 4). This broad movement has received increased attention in the preceding years, having two recent volumes dedicated to exploring its ideas (Newen, Bruin and Gallagher 2020; Durt, Fuchs and Tewes 2017) and having been applied to a multitude of domains, including psychiatry (de Haan 2020), psychotherapy (Röhrich et al. 2014), pretend play (Rucińska and

5. A few years after publication of *The Embodied Mind*, Chalmers (1995) would famously reframe this problem as ‘the hard problem of consciousness’. This problem will be discussed in depth in section 3.5.

Weichold 2022), epistemology (De Jaegher 2021), aesthetics (Medina 2013), and even mathematics (Lakoff and Nuñez 2001). Although the enactive and 4E cognition approach “is rapidly gaining prominence in the world of cognitive science” (Adams 2010, 619), it is still an alternative view, as evidenced by the fact that in recent philosophy of mind textbooks, it appears either at the very end (Jaworski 2011; Slors, Bruin and Strijbos 2015) or not at all (Kim 2013; Asoulin et al. 2019).⁶

This work, however, will largely stick to the original transdisciplinary project of enactivism as it was conceived in *The Embodied Mind* and expanded upon afterwards by its authors and several others, most notably Hanne De Jaegher.

The main reason for this narrow focus is that the enactivist project of *The Embodied Mind* has a richness of ideas that most later treatments lack. The authors connect their theory to a broad field of pre-existing ideas, pulling mainly from phenomenology, dynamic systems theory and Buddhist mindfulness/awareness, but also tying certain aspects of their work to hermeneutics (Varela, Thompson and Rosch [1991] 2016, 149)⁷, pragmatism (30–31, 228–30), and the work on conceptual metaphors by Lakoff & Johnson (177–78). Moreover, they do not limit the scope of application of their ideas to ‘just’ cognitive science, but expand them to include evolution (185–204), artificial intelligence and robotics (207–13), existential discussions on the self and groundlessness (215–34), and ethics (243–52). Although the current proliferation of 4E-literature is certainly diverse in its own right, its diversity is spread out across many different approaches and theoretical commitments that are not always compatible (Newen, Bruin and Gallagher 2020, 4). Thus, the unique contribution of *The Embodied Mind* and its direct successors is that they offer an integrated yet rich account of cognition in the world.

In their discussion of cognitivism, the authors of *The Embodied Mind* lament that its precursor, cybernetics, has been all but forgotten. According to them, this “reflects the fact that to become established as a science in its clear-cut cognitivism orientation, the future cognitive science had to sever itself from its roots, which were complex and entangled but also rich with possibilities for growth and development. Such a severance is often the case in the history of science: it is the price of passing from an exploratory stage to a full-fledged research program—from a cloud to a crystal” (Varela, Thompson and Rosch [1991] 2016, 37–8). The same process of crystallization can already be seen at work in the enactive and 4E approach to cognition. Some of the roots of this movement, and in particular the Buddhist mindfulness/awareness tradition, have practically been forgotten about in contemporary theory.⁸ The present research aims to keep ‘classic enactivism’ alive by further exploring some of its richness and diversity, based on the conviction that its potential is nowhere near exhausted.

3.3 Understanding the self

Thompson (2007) summarizes one of the main ideas of *The Embodied Mind* as follows: “living beings are autonomous agents that actively generate and maintain themselves, and thereby also enact or bring

6. The exception is *The Phenomenological Mind*, written by enactivist philosophers Gallagher and Zahavi (2008).

7. Before coming up with the term ‘enactive’, Varela called the approach developed in the book ‘the hermeneutic approach’ (Thompson 2007, footnote 9 to ch. 1, p. 444).

8. The entirety of the 910-page *The Oxford Handbook of 4E Cognition* (2020) contains two passing references to Buddhist philosophy and none to mindfulness in the traditional sense.

forth their own cognitive domains” (Thompson 2007, 13). The notion of ‘autonomy’ employed here is intimately related to the dynamic systems approach to cognition, and will help to shed light on the way the enactive approach conceives of ‘the self’.

3.3.1 Dynamic systems and autonomy

A dynamic system in its widest definition is simply a system that changes over time (38–43). The solar system is a classic example. A dynamic system can have many different configurations or ‘states’, and the state of the system changes over time. Most dynamic systems cannot be accurately studied and predicted by modelling them with mathematical formulas, because they have non-linear components. Rather, they have to be studied with a more global approach: all possible states of the system are taken together and thought of as a geometric space, and concrete behaviour of the system is modelled as movement within that so-called ‘phase space’. This is the approach of dynamic systems theory. Rather than trying to predict each outcome of the system at a given time, dynamic systems theory studies “the general or global character of the system’s long-term behavior (its behavior in phase space)” (40). According to the dynamical approach to mind science, cognitive agents are not physical symbol systems (the cognitivist view), but rather dynamic systems that showcase global-level continuities in the way they behave.

Autonomy, then, is a property of a specific kind of dynamical system that “is defined by its endogenous, self-organizing and self-controlling dynamics, does not have inputs and outputs in the usual sense, and determines the cognitive domain in which it operates” (43). Autonomous systems are constituted of processes that recursively depend on each other, in such a way that they constitute the system as a unity in the environment. They are thus self-producing and, in the case of materially bounded autonomous systems such as cells and humans, they produce their own boundary.⁹ This process of self-production and preservation is called *autopoiesis*. This is in contrast with heteronomous systems, whose operation is defined exhaustively by external influences in an input/output fashion.¹⁰ Autonomous systems cannot be described in input/output-terms because its endogenous processes recursively depend on each other to constitute the unity of the system (43–4). Put differently, autonomous systems exhibit a two-way emergence that Thompson calls ‘dynamic co-emergence’ (60–5). Not only does the unity of the organism emerge from its constituent processes, as a whole that cannot be reduced to the sum of its parts, but the constituent processes also emerge from the whole, as global-level processes constrain the behaviour of the parts.

Finally, an autonomous agent brings forth its own cognitive domain because it generates its own law-like properties for interaction with its environment. For example, the bacterial cell *Escherichia coli* (*E. coli*) will react to the presence of a sucrose gradient by turning and subsequently ‘swimming’ so as to maximize their exposure to sucrose (74). The cognitive domain of the *E. coli* bacterium is determined by its own

9. Thompson remarks that not all autonomous systems are bounded in the strict material sense. An insect colony is an example of an autonomous system whose boundary is not material, but rather “social and territorial” (Thompson 2007, 44).

10. Thompson acknowledges that the distinction between heteronomous and autonomous systems is not set in stone – or, put differently, it is not a dichotomy. Autonomy and heteronomy are heuristic notions that help us understand phenomena, and as such they refer back to the observer and their own needs (50). Thus, rather than saying that a system *is* autonomous or heteronomous, it would be more accurate to say that a system *is best described as* autonomous or heteronomous. His point with regard to cognition in organic life, however, is that cognitivism takes a purely heteronomous stance, and that this stance is ill-suited for a full understanding of what it means for an organism to be cognitive.

organisational structure: the status of sucrose as a nutrient is a result of the organism's need for sucrose, which is in turn a result of its metabolism, in which sucrose plays a major role. This notion of 'cognitive domain' is strongly related to that of the *Umwelt*, coined by the biologist Jakob von Uexküll, by which he means "an animal's environment in the sense of its lived, phenomenal world" (Thompson 2007, 59). So on the enactive view, an organism brings forth its own *Umwelt* through the rules (or habits, regularities) for engagement with its environment. This bringing-forth of a cognitive domain has recently come to be referred to as sense-making: it is "the creation and appreciation of meaning" (De Jaegher and Di Paolo 2007, 488) that any organism necessarily engages in in order to sustain itself.

3.3.2 Constituted selfhood

On the enactive view, rather than assuming the 'self' as an unproblematic bounded unit, selfhood is continuously negotiated between organism and environment. Put differently, the boundary between 'self' and 'environment' is not fixed, but fluid and dynamic.¹¹ The two terms of the interaction – organism and environment – only gain their identity through that interaction itself. That is, even though this work so far has been talking of 'self' and 'environment' as if these terms denote fixed entities, the enactive view problematizes this static view and sees both terms as entangled in, and emergent from, an overarching process of continuous interaction.¹²

The enactive conception of the self is much more fluid and dynamic than what cognitivism allows. Selfhood is a kind of individuality that emerges from interactions with an environment, and that is continuously negotiated with that environment. In the words of Thompson:

Individuality in this case corresponds to a *formal self-identity*—to an invariant dynamic pattern that is produced, maintained, and realized by the system itself, while the system undergoes incessant material transformation and regulates its external boundary conditions accordingly. An autopoietic system is thus an individual in a sense that begins to be worthy of the term *self*. (Thompson 2007, 75, emphasis in original)

This individuality is not pre-given and static, but an ongoing process: it is enacted. 'Self' and 'selfhood', on the enactive view, should be verbs rather than nouns.

3.3.3 Self in mindfulness/awareness

This interactive (or intra-active) conception of the self is underpinned in *The Embodied Mind* with insights from the Buddhist mindfulness/awareness tradition. The strength of this tradition, according to the authors, is that it is rooted in practice. It therefore provides a fitting counterweight to cognitive science, which is almost exclusively occupied with theory. In particular, it provides a compelling analysis of why humans

11. This view is congruent with recent findings in microbiome research, discussed in section 2.3.2.

12. This constitutive interaction is an example of what physicist and philosopher Karen Barad calls *intra-action*. Intra-action, as opposed to interaction, "signifies the mutual constitution of entangled agencies" (Barad 2007, 33). What emerges from intra-action are not, strictly speaking, entities in the traditional sense, as they are not ontologically distinct individuals. Rather, intra-action produces 'agencies' that exist and find their distinction only "in relation to their mutual entanglement" (33).

tend to think of themselves as having a Self in the sense of “a real, unchanging essence that is the source of our identity and that we must protect” (Varela, Thompson and Rosch [1991] 2016, 124).¹³

According to the Buddhist mindfulness/awareness tradition, insight into the nature of the (lack of a) self is to be found in practical introspection. Through meditation, practitioners gradually learn to observe their own mind at work in real-time. At first, they will primarily be struck by the incredible whirlwind of activity that their minds are continuously involved in – thinking, overthinking, self-talking, imagining, remembering, feeling, etc. – even when seemingly at rest. After having achieved some measure of stability in their mental activity, however, they will start to notice the impermanence of all experiences. Varela, Thompson and Rosch call this an awareness of “a personal penetrating impermanence of the activity of the mind itself” (60). Crucially, this impermanence relates not just to the perceptions as such, but also to the perceiver themselves. In experience, neither a fixed or permanent perception, nor a fixed or permanent perceiver – a “landing platform for experience” (61) – can be found.

An illuminating metaphor for this impermanence is lighting a candle with another candle, and lighting a third candle from the second one, and so on (69). The flame is passed on, but there is no material basis being transferred from one flame to the next. It is the burning process itself, rather than anything fixed or tangible, that is sustaining the series. In experience, we tend to misconstrue this series of occurrences as a continuity, or even as a ‘realm’ where all of experience takes place. This realm, when reified, is denoted with words like ‘mind’ and ‘mental space’, or, more recently, ‘head’ and ‘brain’.

The main contribution of the Buddhist mindfulness/awareness tradition, however, is not in its formulation of selflessness, but rather in its subsequent analysis of our habitual self-conception. After all, the realization of selflessness poses us with a contradiction: on the one hand most people experience a Self in everyday life, while on the other hand we reflectively conclude that there is no such thing as a Self. According to the authors, almost all other contemplative traditions that have supported some kind of no-self doctrine have failed to properly engage with this contradiction. They tend to turn away from it either by giving in to the idea that experience and reflection are incommensurable (e.g. Hume, Sartre), or by positing an unknowable transcendental self that ‘dissolves’ the contradiction without properly engaging with it (e.g. Kant’s transcendental ego, the Upanishads’ *atman*). The interesting and tough philosophical problem, therefore, is not with claiming that there is no Self, but rather with answering to the contradiction that follows from it: why do we still experience a Self?

At the heart of the Buddhist answer, as formulated in *The Embodied Mind*, is the notion of ‘grasping’. The basic idea is that even though human beings do not possess a fixed self, they nevertheless continuously grasp for one.

Moment by moment the meditator also sees the mind pulling away from its sense of impermanence and lack of self, sees it grasping experiences as though they were permanent, commenting on experiences as though there were a constant perceiver to comment, seeking any mental entertainment that will disrupt mindfulness, and restlessly fleeing to the next preoccupation, all with a sense of constant struggle. This undercurrent of restlessness, grasping, anxiety, and

13. For clarity, and following the authors, the word ‘Self’ will be capitalized when it refers to this unchanging and ontologically robust essence.

unsatisfactoriness that pervades experience is called *Dukkha*, usually translated as suffering. (Varela, Thompson and Rosch [1991] 2016, 61)

The pervasiveness of suffering, which is the First Noble Truth in Buddhism, is strongly tied to the pervasiveness of self-grasping, the Second Noble Truth. We continuously uphold our own sense of Self through our subconscious grasping for ground; a ground for our perceptions on the one hand and for ourselves as perceivers on the other. Thus, we continuously reify both the objects of our perceptions – into ‘external objects’ – and the subject of perception – into a Self.

Of course, the diagnosis of ‘grasping’ as the source of all suffering begs the question of what causes this grasping. It would take us too far to discuss the full Buddhist analysis of self and experience present in *The Embodied Mind*. However, one important aspect in understanding the origins of grasping is that the causality involved is circular rather than linear.

This is expressed particularly well in the Wheel of Life, which is an analytic description of the circular movements that human lives move through, construed as twelve links forming a chain (110–6). It can be applied on different timescales, ranging from single moments to an entire lifetime (or several lifetimes, if one follows the doctrine of reincarnation), which means, roughly speaking, is that the structure of experience is fractal: it has the same structure on different orders of magnitude. For the present purposes, the important takeaway is that in the Wheel of Life, ignorance of the true nature of the self and experience leads to craving and grasping for a Self, which in turn leads back to ignorance, continuing forever until the cycle is broken. On this picture, it is hard to pinpoint where exactly the cycle of grasping and suffering begins. In fact, this question of an ‘ultimate beginning’ becomes unintelligible within the Buddhist analysis of experience. The Wheel of Life is a description of a ‘codependent arising’ (*pratīyasamutpāda*), meaning that each link is dependent on the preceding link in the chain in a circular fashion (Boisvert 1995, 6–8). There is no ‘more fundamental’ cause to suffering and grasping than the *pratīyasamutpāda* itself.

It has thus become clear that the enactive approach, inspired by phenomenology, cognitive science and mindfulness/awareness, takes a fairly radical no-Self position. Enactivism acknowledges that people do generally experience a strong sense of selfhood: a sense of a firmly rooted identity that remains fixed over time and is ontologically real. This sense of self, however, appears to be an illusion upon closer inspection. That is, there is nothing to be found in experience that answers to the longing for a stable, unchanging ‘I’ in the midst of the whirlpool of experience.

The first chapter on Self and selflessness in *The Embodied Mind* is revealingly called “The I of the Storm” (Varela, Thompson and Rosch [1991] 2016, 59). The ‘I’ that we tend to experience as the centre from which all experience and all volitional action emanates, actually consists of nothing at all, and is only apparent because of the flurry of activity occurring ‘around’ it. Or, to speak in more dynamic-biological terms: the ‘self’ as a phenomenological reality emerges from the various activities of the organism that set it apart from its environment. This enacted self is not a fixed entity or centre but rather a continuously negotiated process. However, we have seen that when the organism is a human being, they tend to reify that process into an object: the capital-S Self, housed somewhere within us, that is supposed to be the locus of all our experiences and actions.

Does this refutation of the Self imply that there is no ground left to talk of such things as agency,

responsibility, and value? In other words, does the enactivist no-self doctrine result in a nihilism of self? And how does this doctrine connect to the ecofeminist critique of the self/other dichotomy (Plumwood [1993] 2003, 43, 141–5) and the idea of the self-in-relationship (Plumwood 1991, 20–2)?

3.3.4 Finding the self-in-relationship

Plumwood's position on the self, as discussed in section 2.3, is a refutation of both the individualism of traditional modern philosophy and the radical holism of deep ecology. Her concept of self-in-relationship can be seen as a middle ground between these two positions, challenging the implicit dualism that Næss and other deep ecologists hold on to. She argues, in other words, that an all-encompassing holism is not the only alternative to classical individualism. I have already argued that Plumwood's middle-ground position can be pushed further towards the no-self position in light of recent scientific findings on the microbiome and the gastrointestinal tract (see section 2.3.2). However, we can now make the comparison with the enactive view on the self. This comparison, as we shall see, can both corroborate and deepen Plumwood's account of the self.

In order to make this comparison, one final feature of *The Embodied Mind* needs to be brought out: their discussion of objectivism and nihilism, and the 'middle way' between them. The authors emphasize that, even though their no-self doctrine seems like a radical proposal, it is actually a middle way¹⁴ between two supposedly opposite positions. These positions are objectivism and nihilism. The common Western response to the idea of selflessness, according to the authors, is that it leads inevitably to nihilism (Varela, Thompson and Rosch [1991] 2016, 234). The idea is that denying the existence of an ultimate ground to our experience – in the form of a pre-given world and/or a pre-given mind – surely means that any talk of value, truth, goodness etc. becomes meaningless. This response seems commonsensical to Western thought, but according to Varela, Thompson and Rosch, it is unwarranted.

Objectivism and nihilism share a common root. More specifically, nihilism is a hurried and inadequate response to the collapse of objectivism. It is a response that reifies the absence of an objective ground into an *objective absence*, into "the objectivist abyss" (238). The nihilist is no less freed from grasping than the objectivist is. Having realized that the ultimate ground of the objectivist is mere illusion, the nihilist nevertheless keeps grasping and so immediately erects a new final reference point: the ultimate truth of Nothingness.

One project of *The Embodied Mind* is to rise above this dualism of objectivism/nihilism. They describe this move as a slipping out of the 'field of consciousness', a term coined by 20th-century Japanese philosopher Nishitani Keiji (239–43). The field of consciousness denotes the stance of there being a pre-given objective world and a pre-given knowing subject. The difference with the nihilist response is that the 'slipping out' is done without a preformulated idea of where this move would lead. It is not an 'overcoming', as if an alternative is already present, but rather a simple and humble attention to the disclosure of the groundlessness of experience itself. The trick, it seems, is to gracefully escape the

14. The phrase 'middle way' has two meanings in Buddhism: the way of the Buddha that avoids the extremes of indulgence and asceticism, and the ontological position that rejects the extremes of nihilism and eternalism, instead asserting interdependence as ultimate truth (Olson 2009; Rinpoche 1986, 163). Varela, Thompson and Rosch refer to and reappropriate the phrase in its second meaning.

grip of objectivism without jumping into the enticing hands of nihilism. The fact that this is hard to imagine for most people who grew up in a Western context, belies the thorough permeation of the ‘field of consciousness’ in Western culture.

A very similar dynamic of ‘slipping out’ of a dualist framework can be found in Plumwood’s discussion of the self, which flows from her critique of deep ecology. She too sees a false dichotomy – between individualism and holism – and challenges it by questioning the underlying shared assumption. In this case, the shared assumption is that 1) the categories of ‘human’ and ‘mind’ are treated as synonymous (Plumwood [1993] 2003, 106), and 2) this new human-mind category is seen as opposed to ‘nature’ (107). The fact that ‘nature’ is rarely well-defined in Western culture and thought is not an accident, since it is precisely its opposition to human and/or mind that characterizes it.

As the common thread running through a number of these dualisms, nature is in various guises the shared contrast term to the master (males of the ruling class, race and species, who define the ideals of masculinity as dominance), the male itself, the human, the mental and cultural spheres, and the sphere of reason. (Plumwood [1993] 2003, 107)

It is always the positive term which is well-defined – the human, the minded, the rational, the masculine – whereas the negative term is simply defined by its negativity: nature is not human, not minded, not rational, not masculine.

Despite the efforts of deep ecologists to provide a radical re-thinking of the human–nature relationship, Plumwood criticizes them for sticking to this dualist framework. Deep ecology proposes that it is only by extending the realm of the mind to include all of nature that we can come to terms with nature. This idea relies on the very distinction between human and nature, or mind and nature: what nature needs, according to deep ecology, is to be subsumed into the realm of the mental.

Deep ecology, as a reaction to rationalist environmental philosophy, is strikingly similar to nihilism’s reaction to objectivism. Rather than striking at the root of the issue of anthropocentrism and individualism, deep ecology offers a response to rationalist environmental philosophy which is radical on the surface but which is, upon closer inspection, woven from the same cloth as the theories it criticizes.

In short, enactivism criticizes both objectivism and the nihilist response to it, for being built upon the same grasping for an ultimate ground for experience – objectivism reifies the ground, and nihilism reifies the lack of a ground. Plumwood, then, criticizes both rationalist environmental philosophy and the deep ecological alternative, for relying on the same framework of the identification of humanity with mindedness and the human/nature dualism.

What all four of these criticized positions have in common, is their grasping for a separate realm of the mental. The positions that Plumwood criticizes are characterized by a wish to carve out a privileged space for human mental life. Rather than accepting that ‘mindedness’ might be a distributed and diverse phenomenon, they tie it tightly to humanity and subsequently conclude either that 1) non-human creatures are non-minded and therefore less valuable, but they still deserve some consideration on rational-ethical grounds (rationalism), or 2) humans have a responsibility to expand their own mental spheres to include as much of non-human nature as possible (deep ecology).¹⁵

15. The fact that the latter position is just as imperialistic as the first becomes apparent if one examines a different wording of the

The same dynamic is present in the views that enactivism criticizes: objectivism and nihilism. Objectivism posits the existence of a pre-existing realm of the material (objective) and a pre-existing realm of the mental (subjective), and makes it the mind's task to accurately represent the material. Mentality, on this account, presents the only opportunity for the material to gain meaning; without mental representation, the material world is devoid of meaning. It is only through interpretation by minded beings (usually humans) that the objective world becomes meaningful. Nihilism, then, accepts the non-existence of the Self and the World as opposing ontological spheres, but nevertheless stays within the same framework by giving up the search for an alternative. That is, nihilism is so fixated on finding a Self and a World that the non-existence of this duality automatically entails the impossibility of meaningful activity. Both objectivism and nihilism are captured by the search for a Self and a World; the only difference is that objectivism claims to have found it, whereas nihilism claims the impossibility of such a find.

To summarize, both Plumwood's ecofeminism and the enactive approach of Varela, Thompson and Rosch criticize the tenacious tendency in Western thought to look for a clearly delineated sphere of 'the mental'. The search for this mental realm is criticized by Plumwood from the perspective of ecology, and by Varela, Thompson and Rosch from the perspective of cognitive science, phenomenology and mindfulness/awareness.

Their alternatives are also highly compatible. Plumwood's proposal of the self-in-relationship lacks the imperialist tendencies that the extended self showcases, and gives an alternative to the rigid Western conceptions of Self without nihilistically giving up the idea of selfhood altogether. This idea of the self-in-relationship can be given more body through the analyses of *The Embodied Mind*. The self, on their account, is not something that 'exists' within a (human) being at all. Rather, selfhood is a pragmatic and open-ended concept that exists, to the extent that it does, in the interactions between a being and their environment – making the immediate qualification that 'being' and 'environment' are not to be understood as pre-existing opposites but rather as heuristic notions to signify realities that are constantly shifting and (ex)changing. A recurring slogan of *The Embodied Mind* is that "a path exists only in walking" (Varela, Thompson and Rosch [1991] 2016, 239), and this applies perfectly to selfhood as well: the Self exists only to the extent that we enact it.

same idea, provided by William James:

In its widest possible sense, however, a man's Self is the sum total of all that he CAN call his, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works, his lands and horses, and yacht and bank-account. All these things give him the same emotions. If they wax and prosper, he feels triumphant; if they dwindle and die away, he feels cast down,—not necessarily in the same degree for each thing, but in much the same way for all. (James 1983, 279–80, emphasis in original)

James considers one's possessions to be a part of one's Self. These possessions include one's wife and children, as well as one's lands and horses. This description obviously only applies to well-off men, but it also paints an image of Selfhood as a matter of accumulation: you are what you have. James' description of an extended self is different in scope and intent from Næss', but it helps to bring out the imperialistic nature of any conception of an extended self. Expanding the self to include other things and persons always entails a sense of possession, a sense of subsuming that which is included. Rather than seeing family, lands and domestic animals as independent actors with their own trajectory, agency, narrativity, etc., the idea of the extended self encourages us to see them as belonging to, and being a part of, our-Selves. Thus the sphere of the mental is not seen as something that should be problematized and minimized, but that should instead be expanded and extended.

3.4 Understanding intelligence

Now that the enactivist picture of selfhood is established, the next question that pops up is that of intelligence. After all, discussions on the moral standing of non-human organisms often revolve around their possession or lack of intelligence. I have already argued in section 2.2.1 that such discussions are often informed by anthropocentric assumptions. What, then, is the enactivist approach to intelligence?

3.4.1 Testing intelligence

First of all, it is crucial to point out that the concept of ‘intelligence’, as it is used in everyday speech, is normative. The practice of calling beings more or less intelligent amounts to calling them more or less good at something. Depending on one’s idea of what intelligence is, this ‘something’ can be problem-solving, pattern recognition, know-how, etc. This everyday view of intelligence fits with the predominant view in cognitive science, which is that intelligence is something that can be tested by subjecting people (and the occasional animal) to different tests measuring their different mental capabilities. To cite the Oxford *Very Short Introduction* to intelligence, the word ‘intelligence’ should be seen as “a shorthand for scores on cognitive (mental ability) tests” (Deary 2020, Ch. 1).

Intelligence, according to the cognitive science status quo, should not be seen as some kind of entity. Nevertheless, it is something *real* in the sense that is testable, highly correlated and more or less universal across cultures and backgrounds (Ch. 1). This concept is usually referred to as ‘general intelligence’: the overarching concept that unites different domains of cognitive performance which are strongly correlated with each other. General intelligence is said to be something that “emerges, unforced, from every dataset in which several mental tests are taken by large numbers of people” (Ch. 1), and is being investigated in non-human animals as well.

What exactly is being evaluated in intelligence tests? Taking the tests of the widely used Wechsler Adult Intelligence Scale IV (WAIS-IV) as an example, we see that it consists of fifteen sub-tests grouped into four ‘cognitive domains’: verbal comprehension, perceptual reasoning, working memory and processing speed (Ch. 1).¹⁶

The idea, again, is that the tests in one domain measure a specific cognitive area with a high degree of correlation, and that these areas in turn also strongly correlate to form ‘general intelligence’. In fact, all fifteen described tests have a positive correlation with every other test. That is: people who are good at one single test are expected to be good at all of them. These individual correlations waver between 0.21 and 0.74, and the overall correlation between all tests is 0.45.

16. The domain of verbal comprehension consists of four tests (Deary 2020, Ch. 1): subjects have to say what two words have in common (*similarities*), give the meaning of certain words (*vocabulary*), give general knowledge of the world (*information*) and answer comprehension questions about everyday things (*comprehension*). The domain of perceptual reasoning contains five tests: subjects have to reproduce a two-dimensional colour pattern with cubes (*block design*), find the missing element in a logical pattern (*matrix reasoning*), construct a given shape out of part-shapes (*visual puzzles*), solve a logic puzzle involving objects on scales (*figure weights*), and find missing elements in drawings (*picture completion*). In the domain of working memory, the subjects have three tests to complete: they have to repeat sequences of numbers (*digit span*), solve arithmetic problems (*arithmetic*), and put a list of letters and numbers in numerical and alphabetical order (*letter-number sequencing*). Finally, the domain of processing speed has three tests: subjects have to find abstract symbols in a list of symbols (*symbol search*), write down the right symbols given the correspondence of certain symbols with certain numbers (*coding*), and strike out all objects with a certain shape and colour, e.g. all blue squares and brown triangles (*cancellation*).

The enactive cognitive scientist wouldn't necessarily doubt the validity of these findings. However, one striking aspect about this approach, from an enactive point of view, is that these tests are overwhelmingly focused on information processing. That is, the relevant 'action' in these tests seems to be happening in the head. Insofar as bodily action in the world is required, it seems to serve merely as a way to pass the knowledge from the subject's head to the researchers: speaking, making pencil lines, and writing symbols. The only tests where sensorimotor activity is part of the activity itself are the *block design* and *visual puzzles* tests. There, subjects can experiment with shapes in order to arrive at the correct answer, rather than merely doing it 'in the head'. Still, even in these tests it is not strictly necessary to do the thinking 'in the world', as it would be equally possible (and perhaps even seen as more intelligent) to solve the puzzles in the head first, before making the correct shapes.

This focus on internal information processing is perfectly in line with the cognitivist status quo, which says that cognition is "[i]nformation processing as symbolic computation—rule-based manipulation of symbols" (Varela, Thompson and Rosch [1991] 2016, 42). The enactivist critique could start with the question: what about all these abilities that we call 'intelligent' that are not covered by the WAIS-IV? What about the abilities that do not primarily rely on information processing but rather on smart and adaptive interaction with the environment? For example, cycling through a busy city involves keeping oneself upright by pedaling, steering and balancing, dealing with different (often uneven) surfaces, estimating both one's own speeds and those of others, interpreting many different signs (traffic lights, traffic signs, crossing guards, police officers), understanding the behaviours and intentions of fellow road users (including through eye contact and various gestures), and integrating one's different needs (e.g. speed, safety, comfort, pleasure). It is by all means an activity that can be done more or less well, and it seems to be something that requires a certain level of intelligence.

The cognitivist might say that cycling is an intelligent activity, precisely *because* it involves processes such as estimation and symbol interpretation. But that would be missing the point: cycling doesn't merely involve intelligent sub-processes that are strung together; cycling is itself an intelligent activity that is more than the sum of its sub-processes. In fact, part of what makes navigating a busy city by bike a challenging activity is the fact that it requires the cyclist to integrate many different skills in new and unexpected ways. It demands of cyclists to react quickly and adequately to novel situations, without pre-determining which processes or cognitive domains will be needed for the job. On this view, intelligence, and especially 'general intelligence', does not consist in the ability to complete various demarcated puzzles with clear rules, but rather in the ability to deal with situations that are not demarcated. For the enactive approach, intelligence is not something that can easily be tested, precisely because it involves dealing with situations that are ever-changing and not predefined.

3.4.2 Intelligence in non-human organisms

Evidence of non-human intelligence is abundant. Frans de Waal's *Are We Smart Enough to Know How Smart Animals Are?* (2016) is filled with stories of apes, monkeys and birds who talk (98–99), who remember friendly and unfriendly faces and react accordingly (71–72), who solve puzzles using tools (84–87), and who are aware of what knowledge their peers have and lack and try to deceive them by

pretending not to know things (de Waal 2016, 129–131). However, intelligent behaviour is not limited to these ‘traditionally smart’ animals. For instance, the slime mould *Physarum polycephalum* – an amoeboid life form that doesn’t neatly fit in the kingdoms of animals, plants or fungi (Briggs 2022, 695) – has been shown to have memory and anticipation (Saigusa et al. 2008). When placed in an environment with food sources that represented a scale model of cities in the Tokyo area, it formed a network that closely resembles the actual Tokyo rail network (Tero et al. 2010) – a human engineering feat decades in the making, reproduced by one of the ‘simplest’ life forms imaginable. What’s more, the same slime mould is able to solve the so-called travelling salesman problem – “given a map of n cities [...], find the shortest tour for visiting each city exactly once and returning to the starting city” (Zhu et al. 2018, 3) – in linear time (meaning that it takes twice as long to solve a map with twice as many cities), something that digital computers are fundamentally incapable of (Zhu et al. 2018).¹⁷

However, a consequence of the prevailing internalist picture of intelligence is that such examples of impressive non-human intelligence can easily be dismissed as not *truly* intelligent, “because there is [supposedly] no mind behind these performances” (Lanz 2000, 22). On this picture, behaviour is only deemed intelligent to the extent that it is believed to be accompanied by the appropriate mental processes (see the discussion in Khattar et al. 2022, p. 2 for some examples of this view). As Lanz (2000) shows, prominent cognitive scientists such as Zeno Pylyshyn and Marvin Minsky follow exactly this approach (22–23).

3.4.3 Computation and information

A basic insight from enactivism is that the cerebral skills that tend to be called intelligent – reasoning, calculating, mastering a language – are actually dependent on a much broader set of sensorimotor skills. This latter set is the cognitive domain as it is conceived by the enactive approach. Hutto and Myin (2013) clearly articulate this view as they lay out the foundations for their Radical Enactive Cognition (REC). On the cognitivist picture, they write, the primary job of the mind, and the activity that makes intelligent behaviour possible, is “the manipulation and use of representations” (Dretske 1995, cited in Hutto and Myin 2013, 9). Their own contention is that “basic cognition is literally constituted by, and to be understood in terms of, concrete patterns of environmental [*sic*] situated organismic activity, nothing more or less” (11). In other words, the most basic forms of cognition are not characterized by information processing, but rather by (inter)active behaviour in the environment.

This view puts the traditional picture of intelligence on its head. Rather than seeing computation (information processing) as the basis of all intelligent behaviour, it sees *behaving intelligently* as the basis of all cognitive feats, including typically intellectual ones. The cyclist who navigates a busy city is able to do so not because of continuous mental computations that are subconsciously being made, but rather because she relies on a set of sensorimotor skills that she has acquired through practice. Some of these skills can eventually be cashed out in terms of information processing, such as the interpretation of traffic signs, but the entire activity taken together is an embodied skill rather than a product of computation.

Thompson (2007) points out that the word ‘computer’ used to mean ‘one who computes’, and that

17. These examples are inspired by the discussion of *Physarum polycephalum* intelligence by Bridle (2022, 191–94).

computation is a sophisticated human activity that has arisen from specific cultural needs and practices (Thompson 2007, 7). Thus, Hutto et al. (2018) argue, computation as a practice can only gain meaning through the larger sociocultural practices of which it is a part (278–80). Computers, whether humans or machines, can only be said to ‘compute’ if they perform their activities in a context in which their activities are understood *as* computation. Information processing is itself dependent on pre-existing cognitive and social practices, rather than cognition being dependent on information processing.

The above point can also be put in terms of information and meaning. Thompson (2007, 51–60), drawing on insights from biologist Howard Pattee, distinguishes two modes of describing cognitive activity: the dynamical mode and the linguistic mode. In the dynamical mode, a system is described in terms of dynamic interactions or continuous processes. (We have already seen the dynamical mode in action in the description of autopoiesis in section 3.3.1.) The linguistic mode, on the other hand, describes a system in terms of discrete symbolic elements. For example, we can describe DNA as ‘coding for’ amino acids, in the sense that different triplets of DNA molecules ‘stand for’ different amino acids. This would be an employment of the linguistic mode, since the DNA triplets are treated as symbols with a fixed meaning.

However, in making this linguistic description, it should not be forgotten that it is a layer of abstraction above the more complex and messy dynamical mode. Describing something in linguistic or symbolic terms means abstracting away unnecessary physical details (such as the precise chemical reactions at play when DNA triplets encode amino acids) and focusing on a relatively stable and predictable sub-process within a dynamic system. This abstraction work is often forgotten when linguistic descriptions are made. For instance, it is common to say that DNA ‘contains information’ for phenotypes, as though information itself is an intrinsic property. Therefore, it is important to question which mode of description is apt for a particular system or process.

When cognitivists describe all cognition in terms of information processing, they make two mistakes. First of all, they generally fail to ask whether the linguistic mode is really the proper mode of description in all the varied instances of cognition in life. And secondly, they tend to reify ‘representations’ as ontologically discrete units of information, whereas they are really carried by “temporally extended patterns of activity that can crisscross the brain-body-world boundaries” (59), and are thus always *enacted* in a particular time and space. In other words, the idea that intelligent behaviour ultimately relies on information processing, usually through representations, is untenable in the light of the enactive analysis of the dynamical constitution of information.

3.4.4 Ryle’s anti-intellectualist argument

Another philosopher who argued against the idea of theoretical operations forming the basis of all cognition, is Gilbert Ryle (1900–1976). In chapter II of his book *The Concept of Mind* ([1949] 2009), he argues against the commonplace idea that the intellect’s primary task is theoretical reasoning with the aim of knowing facts. Rather, Ryle claims, the basis of intelligent behaviour is *know-how*, and theoretical reasoning is itself but a subcategory of this practical knowledge.

His main argument goes as follows (19). The intellectualist idea is that every intelligent action is preceded by a theoretical consideration, in which the actor considers some proposition about the action –

such as: ‘I should aim this bow at the target and let go of my finger’. However, this consideration is itself an action which itself can be performed more or less intelligently. After all, one can definitely consider the wrong proposition in a given situation – such as: ‘In order to hit the target, I should put the bow’s string in my mouth and bite down’. Therefore, the consideration of a proposition is an action which itself requires the consideration of a proposition. This results in an infinite regress and a picture on which no intelligent action is possible at all, since the action would never get off the ground.

On Ryle’s picture, intelligent action is not dependent on “some anterior internal operation of planning what to do” (Ryle [1949] 2009, 20). Rather, *knowing how* is itself the fundamental form of intelligence, and propositional knowledge, or *knowing that*, is a particular form of know-how. As such, he points out that ‘thinking in silence’, usually taken as the default way of thinking, is actually an acquired ‘trick’, both in the development of humanity (it started being mastered only in the Middle Ages) and in that of individuals (people learn to read out loud before learning to read ‘under their breath’) (16). So even though thinking ‘in the head’ is usually taken as the source of all intelligent conduct, it is itself already an acquired practice that depends on practice in order to be established and maintained.

3.4.5 Enculturation

In enactivism, we find a very similar reversal of priorities to Ryle’s: abstract reasoning (‘offline’ cognition) is dependent on practical behaviour in the world (‘online’ cognition); not the other way around. Of course, this position begs the question of how exactly offline cognition (silent thought, imagining, remembering, etc.) emerges from, or supervenes on, online cognition (interactive cognition in the world).

A common enactivist answer, given by Thompson (2007, 402–11) as well as other enactivist authors (see Slors, Bruin and Strijbos 2015, 244–6), is that abstract thought and symbolic representation is built up from more hands-on cognition through *enculturation*. That is, humans have learned – over the ages and across generations – to develop and leverage intellectual tools in their cognitive activities, and these tools act as ‘socio-cultural scaffolding’ that allow us to think differently. Among these tools is language, and it is language that enables us to not just express our abstract thoughts to others, but also to form these thoughts in the first place. Abstract thought, on this account, is made possible by an internalisation of the symbols of language. Thompson summarizes it as follows:

As one acquires a language, one internalizes, through imitative and cultural learning, the communicative intentions of others to get one to share their attention, as well as the perspectives they take on things in joint attentional scenes. In other words, language acquisition involves the internalization of joint attention into symbolic representation [...]. (Thompson 2007, 407)

Abstract thought, on the enactivist picture – and following Ryle – is to be understood as a silent variant of spoken language. Spoken language, in turn, has developed through interactions in ‘joint attentional scenes’ – situations where two individuals perceive an object or event together (397). Such situations emerge when young individuals learn to see others as ‘intentional agents’ just like themselves (Tomasello 1999, 68). In cultural psychology, joint attention is seen as a “primary cultural guidance device” that introduces young individuals to “increasingly more abstract” cultural signals and practices (Donald 2001,

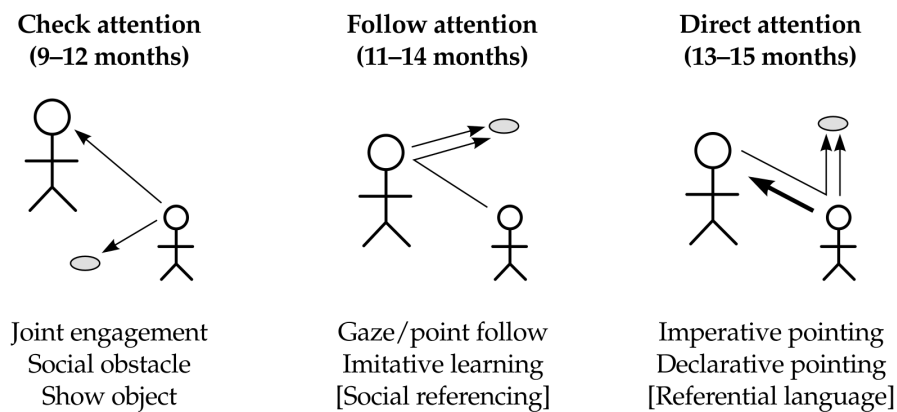


Figure 1: Cognitive development through joint attentional scenes, taken from Tomasello (1999, 65).

cited in Thompson 2007, 405). It also allows them to develop cognitive capacities such as the ability to consider others' perspectives and communicate accordingly – that is, it allows them to develop the cognitive basis for language use (see fig. 1).

The representational or symbolic abilities of human beings (e.g. language use, abstract thought) are not to be seen as innate capacities of the human mind – let alone as capacities that are at the basis of *all* human cognition – but rather as cultural tools. These tools have developed over time, both phylogenetically (i.e. in human evolution) and ontogenetically (i.e. in individual human development) (Tomasello 1999, 54–55). The development of these symbolic cognitive tools depends on more 'primary' cognitive skills, both sensorimotor and social. However, only a *cultural* revolution can explain the speed with which human cognitive abilities have changed over the relatively short timespan of six million years.

3.4.6 Bruno Latour and the nature/culture divide

According to the enculturation theory, it is the interaction of 'biological' and 'cultural' forces that can account for the genesis of language in humans. These words are in scare quotes, however, because it is precisely the development of language that shows that the dualistic categories of 'nature' and 'culture' are insufficient. Language is a prime example of what Bruno Latour calls 'hybrids': objects and processes that cross the supposedly uncrossable divide between the nonhuman and the human; between nature and culture (Latour 1993, 10–2). For Latour, the widespread existence of hybrids shows that the modern dualist project is untenable. This modern project, on his description, consists of two distinct practices: *translation*, the creation of hybrids, and *purification*, the creation of the divide between nature and culture.

He gives the example of the hole in the ozone layer. In translation, we chain together upper-atmosphere chemistry, industrial interests, political concerns, and ecological worries. In purification, we present this process as if it has always existed along the nature/culture divide: there is a natural phenomenon on the one hand, and a society with interests and stakes on the other. The purification hides the translation process, but can simultaneously not exist without it.

The most prominent symptom of this dead-end modern project, according to Latour, is the emergence of postmodernism (Latour 1993, 9, 46, 74, 134–5). Postmodernists attempt to turn away from modernism’s strict dualisms but fail to provide a sufficient analysis and critique of them. “Instead of moving on to empirical studies of the networks that give meaning to the work of purification it denounces, postmodernism rejects all empirical work as illusory and deceptively scientific” (46). The nihilism of the postmoderns flows from their rejection of the modernist dogmas, paired with their inability to escape the framework that it stems from.

Put like this, the dynamic between modernism and postmodernism as described by Latour has a strikingly similar structure to the tension between objectivism and nihilism in *The Embodied Mind* ([1991] 2016) (see also section 3.3.4). For Varela, Thompson and Rosch, nihilism is a misguided reaction to objectivism. In its rejection of the idea of an unshakable ground for experience (in the form of a pre-existing material world and/or a pre-existing Self), it nevertheless fails to halt the *grasping* for such a ground. Thus, nihilists are left in a void where the grasping itself becomes the ultimate truth: nothingness as the only certainty. Nihilism, seemingly the radical alternative to objectivism, is actually rooted in an objectivist logic, since it subscribes to the need for an ultimate ground. Hence, the authors propose a ‘middle way’ which involves ‘slipping out’ of the objectivist framework, not in the direction of nihilism but rather in a new, uncertain direction – as if adding a new dimension to a previously one-dimensional picture.

In a similar spirit, Latour presents the realization that “we have never been modern” as a first step to a new way of being. That is, the modernist dogmas shouldn’t simply be criticized and mocked (as postmodernism does), but the entire framework of nature/culture needs to be unveiled as never having gained a foothold in the first place. Latour wants to slip out of the ‘modern Constitution’ by showing the networks that have always existed between what we call ‘nature’ and ‘culture’. His project is not about starting a new era that goes beyond the modern (again, this is the postmodernists’ turf), but rather about revealing that the ‘previous era’ has never even started.

3.4.7 Synthesis: a middle way

Circling back to the topic of intelligence, the move to be made becomes apparent. Intelligence is not a prototypically or inherently human phenomenon (see section 3.4.2). However, it is not enough to simply grant that non-human animals (and perhaps plants) have some, lesser, degree of the intelligence that we humans possess. This would be holding on to the idea that there is some kind of typical ‘human intelligence’ that other animals are catching glimpses of but cannot quite reach. This ‘human intelligence’ is usually characterized as involving representation, symbolic understanding, computation processing, et cetera. Rather, we should acknowledge that human intelligence is built up from basic cognitive skills which, in interaction with other individuals and environmental objects (i.e. in joint attentional scenes), have evolved into cultural systems which allowed for the formation and expression of increasingly abstract thoughts.

The idea of human intelligence being built upon symbol processing acts as a border wall between humans and non-human nature, and reinforces many of the dichotomies that Plumwood rightly criticizes – most notably human/nature and reason/matter. Since only humans seem to have developed this particular symbolic way of communicating and thinking, making precisely this ability the *basis* for all cognition results

in non-human life being mostly excluded from the intelligence club. Breaking down this idea therefore means breaking down the border wall between ‘intelligent’ humans and ‘unintelligent’ non-humans. In keeping with the spirit of both Latour and Varela, Thompson and Rosch, this move should not result in the tempting but ultimately misguided idea that no differences whatsoever can be drawn between the intelligences of the various forms of life on Earth; that we are ‘just animals’ and have no special place on this planet. The fact is that through enculturation, we humans have given ourselves a special place on Earth. We do in fact possess a type of intelligence that seems to be different from what else we know to exist beside us, and we currently have a frightening amount of transformative power over Earth’s ecological systems.

When it comes to intelligence, the enactive approach provides a new middle way – a view that avoids conferring unique and quasi-magical innate powers on humans, while acknowledging the unique position that humanity has taken in the thicket of life. And crucially, it appears to succeed at acknowledging difference without establishing hierarchy.

3.5 Understanding consciousness

As pointed out in section 3.2, one of the main motivations for the authors of *The Embodied Mind* was the challenge of connecting scientific descriptions of the mind with first-person experience. However, with everything said above, this challenge still seems unaddressed. At this point, the cognivist would likely argue (as e.g. Mohan Matthen (2014, 126–27) does in a review of Hutto and Myin’s *Radicalizing Enactivism*) that the enactive approach, with its descriptions of selfhood and intelligent behaviour as emerging from dynamical processes, still has no answer for the so-called ‘hard problem of consciousness’: “how is consciousness, as experienced from the inside by an individual conscious being, related to the natural life of that being, as observed and understood from the outside?” (Thompson 2007, 222). This is the question at the centre of this section.

3.5.1 Consciousness and ecology

Before the question of consciousness itself is addressed, it is important to clarify the connection with ecology. Why does the nature of conscious experience matter for the ecological questions at the centre of this thesis? The main answer is that consciousness is yet another way for humans to instate a schism between the human and the non-human. The fact that humans have phenomenal consciousness is unquestionable merely from the fact that any human making this assertion will have a first-person account of their own consciousness. For other creatures, however, the matter is less straightforward. If the hard problem of consciousness is truly a hard problem, then the question of non-human consciousness appears to be an undecidable one. In this case, we do not have access to the first-person experiences of non-human animals, nor can we infer anything about it from third-person observation. Thomas Nagel came to much the same conclusion: since there is no way to extrapolate from the subjective experience of, say, a bat to a more generally understandable insight without sacrificing the very subjectivity that we are after, what it is like to be a bat necessarily “remains a mystery” (Nagel 1974, 446).

Expressed in Plumwood's terms, the hard problem of consciousness is a way to uphold the subject/object dualism (see Plumwood [1993] 2003, 43). Consciousness is often used as a criterion for moral respectability: only that which has an inner life, that which can suffer, should be taken into account in our moral considerations. This attitude has already come to pass in the discussion of Peter Singer's utilitarian animal ethics in section 2.2.2. For Singer, the creatures for which there is little to no known evidence of an inner life (molluscs, plants, fungi) are fair game when it comes to their commodification and consumption. The hard problem of consciousness is used to treat absence of evidence as evidence of absence: since we cannot conclusively know what it is like to be a mollusc, plant or fungus, we take them to be devoid of experience. This perspective divides the world into subjects and objects. It is, in the words of Plumwood, "a mode of attention to the world which denies dependency and kinship between observer and observed" (123). This shows that the hard problem of consciousness has a cultural legacy that goes far beyond the confines of cognitive science and philosophy of mind. This section aims to explore the enactivist approach to this problem, as well as the implications for environmental philosophy.

3.5.2 The enactive approach to consciousness

The difficulty of the hard problem of consciousness comes from the (supposed) fact that the outside view and the inside view are fundamentally different in what they describe. The idea is that no matter how well we can describe a physical system, we will still be in the dark about the subjective experiences that this system gives rise to (see e.g. Nagel 1974; Chalmers 1995). How does the enactive approach attempt to deal with this issue?

The basic insight that the enactive approach brings to the table is that the 'fundamental' gap between objective and subjective, or life and consciousness, never existed in the first place (Thompson 2007, 221–25). Thompson contextualizes this point with a historical example, which he uses to counter an argument made by David Chalmers. Chalmers, who coined the term 'hard problem of consciousness', compares two 'problems' in cognitive science: the problem of life (how does life emerge from non-life?) and the problem of consciousness (how does consciousness emerge from non-conscious processes?). For Chalmers, only the latter is a truly hard problem. Life, after all, is not a fundamentally different domain from non-life. Hence, the question of life is "How could a mere physical system perform these complex functions?", not "Why are these functions accompanied by life?" (Chalmers 1997, cited in Thompson 2007, 223). The question of consciousness, on the other hand, is about seemingly incompatible domains: why are certain (material) life processes accompanied by (mental) consciousness?

In response, Thompson points out that the problem of life has in fact been a hard problem in the past, namely for vitalists in the 18th and 19th century. They took the concept of 'life' to be a fundamental category, not supervenient on anything in the material realm. Hence, the question "why are these organized movements accompanied by life?" (224) was not only intelligible, but pressing. Today, most people accept that life processes can be explained by material processes. That is, life processes may have their own characteristic dynamics that set them apart from non-life, but there is no deep mystery as to how this 'vitality' can possibly be related to the material world. Because we no longer share the vitalists' concepts of matter and life, their 'hard problem of life' has become meaningless.

The point Thompson wants to stress is that the seemingly intractable problem of life was contained within the very concepts that the problem was composed of. Similarly, he argues, the hard problem of consciousness is a hard problem because of the concepts of ‘life’, ‘consciousness’ and ‘materiality’ that comprise it. Hence, Thompson proposes a new conceptualization in line with the enactive approach to cognition.

3.5.3 Consciousness, life, and body

A first major step in the enactive treatment of consciousness is the recognition that life already entails an expansion of the domain of ‘the physical’. This point has already come to pass, albeit with a different argumentative goal, in the discussion on dynamically constituted selfhood in section 3.3. The fact that living organisms create their own ‘interiority’, where the world starts to have meaning to the organism (sense-making) and a distinction between world and self is beginning to emerge (selfhood), means that the classical Cartesian distinction between the realms of the internal (mental) and external (material) no longer applies (Thompson 2007, 224–25, 238–39). ‘Life’ is not merely an external, material process but rather a process that creates its own interiority, in the form of a perspective on the world. The language of pure materiality is unfit for describing this interiority of living beings. In Thompson’s words, “life or living being is already beyond the gap between ‘internal’ and ‘external’ ” (224–25).

It is this interiority that is at the basis for the fully-fledged consciousness that we are looking to explain. In phenomenological terms, it is the lived body (*Leib*) that is already beyond the gap, and the existence of a lived body is implied by life itself.

However, does this approach not simply move the hard problem of consciousness without solving it? After all, Thompson claims that life implies interiority, but *why* is this the case? Isn’t it still conceivable that a living organism could exist which is functionally and materially identical to a human being, but without any form of consciousness or interiority?

This argument – known as the zombie thought experiment – is often taken to prove the fundamental separateness of consciousness from the material realm (e.g. Chalmers 1996, 93–99). However, as Thompson shows, it actually takes a Cartesian dualism as its starting point. After all, the argument assumes that sentience is a strictly ‘internal’ occurrence, and that exactly the same ‘outward’ behaviour can occur with and without sentience. Thompson counters this assumption with Husserl’s phenomenological analysis of the role of bodily awareness in perception (Thompson 2007, 231–34). As Husserl shows, the sensing of one’s bodily movements is a necessary element of perception of any kind. For instance, visually perceiving an object always means perceiving it from a certain perspective. In order to see a full object existing in the world and not just an aspect, the perceiver needs to become aware of the other aspects of the object that they are currently *not* perceiving, but that can become actual if they move in a certain way. In this way, visual perception is inextricably linked with the possibility of bodily movement and thus with one’s awareness of one’s own body. Without this awareness, the perception of objects simply wouldn’t be possible, as one would only perceive single aspects of objects at any given time.

This analysis does not refute the point made by Chalmers and others that zombies are *conceivable*. However, it does show that the conceivability of zombies is philosophically uninteresting, as it rests on

problematic assumptions that are not worth keeping. That is, the zombie scenario is conceivable, but only to those who are already convinced of a Cartesian dualism between materiality and consciousness. As the above argument shows (and as proponents of the enactive approach have tried to show on numerous occasions), this dualism is “a deeply problematic way of thinking about consciousness and bodily life” (Thompson 2007, 234).

The main takeaway of Thompson’s argument is this. There are many different ways of thinking about consciousness, life and materiality. The hard problem of consciousness as it is known today is not intrinsically unsolvable, but is in fact a consequence of one specific worldview: a dualism inspired by Cartesianism. Only on this worldview is consciousness *a priori* taken to be ontologically distinct from the material world, are zombies conceivable, and does embodiment have no impact on conscious experience.

This does not mean that there is no problem of consciousness on the enactive account. Following the phenomenological account of embodiment, there is still a gap, namely between the living body and the lived body (the so-called *body-body problem*, Thompson 2007, 236–37). However, the crucial difference with the hard problem of consciousness is that this gap is no longer absolute, because both phenomena are part of a common process of life. Life, or living being, provides the shared background to these different aspects of the body that ‘consciousness’ and ‘materiality’ lack in conventional formulations of the hard problem of consciousness. As discussed, organic life is already beyond the gap between ‘inner’ and ‘outer’, and is therefore a good starting point for seeing how the lived body and the living body are structurally related.

The work that needs to be done to make this relation clear is referred to by Varela (1996) as *neu-phenomenology*, and it requires a strong commitment to the methodologies of phenomenology (the phenomenological reduction in particular) as well as a cultural change in the cognitive sciences. In this sense, the problem of consciousness is still ‘hard’, but not in the sense of ‘intractable’. Rather, “[t]he ‘hardness’ and riddle become a research programme open for its exploration in an open-ended manner with the structure of human experience playing a central role in our scientific explanation” (345).

The question left to answer, then, is how the enactive conception of consciousness relates to ecology and the subject/object dualism.

3.5.4 Consciousness in ecology

As mentioned in section 3.5.1, the conventional approach to the hard problem of consciousness is a way to reinforce a subject/object dualism: a qualitative split between those that are conscious and those that are not. What does the ecological picture look like on the enactive view described above? Can it be argued that, since consciousness finds its beginnings in the ‘inwardness’ of organic life, consciousness is to be seen as a continuum across the whole spectrum of life (the biopsychism view)?

This view is called ‘biopsychism’, and Evan Thompson takes up this question in the final chapter of his book *Waking, Dreaming, Being* (2014). Principally, he emphasizes the uncertainty surrounding the question of the extent of consciousness in life (335–36). As has become clear in section 3.5.3, there is still a lot of work that needs to be done in order to understand the relations between biological processes and the emergence of subjectivity. On the one hand, it seems plausible that sentience goes ‘all the way

down' to single-celled organisms. For instance, microbiologist Lynn Margulis and ecological philosopher Dorion Sagan argue that “[n]ot just animals are conscious, but every organic being, every autopoietic cell is conscious” (Margulis and Sagan, cited in Thompson 2014, 335). Thompson considers this same view when he applies the Buddhist concept of the ‘five aggregates’ – the five basic components of experience according to the Buddhist tradition – to bacterial life (339–44).¹⁸ In short, Thompson notes that bacteria exhibit the first four of the aggregates: they register different chemicals (*form*), they distinguish and remember them (*cognition*), they attach a value to them (*feeling*) and they react accordingly (*inclination*).¹⁹

At this point, one might ask whether the bacteria’s positive and negative valuations of different chemicals also involves a ‘feeling’, a *something it is like* for the bacteria. That is: are bacteria sentient? However, as Varela points out, this question does not really refer to anything outside what is already discussed. In his own words:

The amoeba intrinsically manifests a differentiation between what it likes and what it doesn’t like. In that sense, there is sentience. Why do I say that a cat feels pleasure and pain and seeks satisfaction and is a sentient being? There is no way that I can know what the experience of a cat is. [...] Exactly the same argument applies to the amoeba or bacterium. I cannot know what the experience of a bacterium is, but if I observe its behavior, it is of the same kind. (Varela, cited in Thompson 2014, 340)

According to Varela, if we observe evidence for cognition – that is, if we see that an organism makes distinctions in the environment and reacts accordingly – there is no reason not to postulate some form of sentience. We might not know the precise mechanisms that realize this sentience, but we do not need them in order to make plausible the idea that cognition implies sentience.

Thompson himself remains undecided on the issue: “[w]hether bacteria can feel [...] remains a difficult question” (341). In a later publication (Thompson 2022), he similarly comes to the conclusion that “the empirical argument is inconclusive” with regard to biopsychism (20) as well as the more restrictive zoopsychism (the view that only animals are sentient; 23–32), and a transcendental argument is required to comprehend sentience in life. Ultimately, he writes, it comes down not to purely scientific argument, but to ‘seeing-as’: some will look at bacteria and see them as sentient, and others will not.

Nevertheless, I want to argue that the burden of proof is on those who wish to argue against biopsychism. After all, on the enactive approach, life is accompanied by a form of interiority – the self-specification of an ‘inside’ that is contrasted with and normatively related to the ‘outside’. We know for a fact that this inwardness is accompanied by sentience in humans, and we generally do not doubt this for most other mammals either (e.g. Nagel 1974, 436). Thus, the position that ‘simple’ organisms such as bacteria lack any form of sentience should be argued for with these facts in mind. This means that a convincing argument for this case should point at some mechanism or form of complexity that would be responsible for sentience in certain ‘higher’ organisms, but not in simple ones.

18. This chapter will stick to the bare minimum explanation of the five aggregates necessary for the present purposes. For more context on the five aggregates, see Thompson (2014, 320–21, 336–339) and Varela, Thompson and Rosch ([1991] 2016, 63–72).

19. The fifth aggregate, *consciousness*, will be discussed later in this chapter.

Thompson himself considers one such mechanism: the neural network (Thompson 2014, 341–44). The idea under consideration is that consciousness is dependent on the specific neuro-electrical systems that only animals possess. On this view, there *is* a distinction between life and mind: “Life in general can be considered as an outcome of the self-organization of molecules to cells and of cells to organs and organisms, and in the same way mind and consciousness can be considered as a manifestation of the self-organization of elementary bio-electrical fields to neuro-electrical macrofields in brains” (Roman Bauer, cited in Thompson 2014, 342). This view also introduces a difference between sentience and consciousness: whereas all living organisms are sentient by virtue of their interiority, only organisms with nervous systems are conscious.

Although Thompson does not specifically say so, ‘Consciousness’ in this context might then be understood as the fifth aggregate (aptly called *consciousness*). This aggregate refers to “an awareness of the presence of something” (338), which affects and is affected by the processes of the other four aggregates. It is also characterized as ‘attending’, since it involves a selectiveness in orientation: consciousness picks out certain objects of attention while demoting other things to the background. It is this aggregate that seems to be involved in self-consciousness, as well as ‘access consciousness’, or the grasping of a certain mental state *as one’s own* (341).

However, the neurally-motivated zoopsychism described above runs into the problem that plant systems also possess neuron-like structures that operate through high-speed electrochemical signals (Thompson 2022, 26; see also Simard 2018). This makes it even more difficult to articulate the qualitative difference between animal and non-animal life in neuronal terms.

Thus, although the biopsychist view seems more promising than the zoopsychist view, it cannot be conclusively embraced on empirical considerations alone.²⁰ What can be concluded, however, is that the enactive approach reveals a deep continuity between the inward mental states of humans and those of other living creatures. Rather than erecting a barbed-wire fence around ‘our’ consciousness, Thompson and others reveal that the origins of conscious experience emerge with life itself, and that we share a deep connection with all forms of life. The hard problem that remains, as Varela shows, is the cultivation of an awareness of our own states of consciousness that is open-ended and attentive, and that does not conform to tenacious dualistic ideas about mind and matter.

The concept of ‘beginner’s mind’ may be helpful in guiding this process. In a paper on spiritual wisdom, Eleanor Rosch describes the beginner’s mind as the state of being unburdened by mental ‘baggage’ (Rosch 2008). This requires unlearning a host of unhelpful concepts and theories that have accumulated over time, so that one can be more receptive to the many possibilities of experience. This idea resonates with both the methodology of neurophenomenology described by Varela (1996) and the Buddhist meditation practices referred to by Thompson (2014). What is needed to gain further insight into the nature of consciousness and its connections with material and biological life, is perhaps not further theory-building²¹ or the accumulation of empirical data, but an unlearning, a radical openness to the actuality of experience, and the (momentary) giving up of concepts and structure. This is perhaps the attitude with which the fictional phytolinguists of

20. A third option, panpsychism, will be discussed in section 5.2.1.

21. *Pace* Chalmers (1995), who suggests that “we need an *extra ingredient* in the explanation” to account for consciousness (10, emphasis in original).

Ursula Le Guin's short story *The Author of the Acacia Seeds* approach the challenge of deciphering plant language:

“Do you realise,” the phytolinguist will say to the aesthetic critic, “that they couldn't even read Eggplant?” And they will smile at our ignorance, as they pick up their rucksacks and hike on up to read the newly deciphered lyrics of the lichen on the north face of Pike's Peak. (Le Guin 1983, 14)

3.6 Synthesis: the deep continuity between the human and more-than-human world

This chapter has shown different ways in which the enactive approach to cognition can break down persistent modernist dichotomies that have separated humans and non-humans for centuries. Firstly, enactivism revises our idea of the self, revealing that it is not a fixed 'thing' but rather a *process* of continuous negotiation between organism and environment. Secondly, enactivism challenges entrenched notions of intelligence, arguing that it primarily about intelligent *action* rather than an exclusively human process of computation or representation. Thirdly, enactivism breaks down the barriers of consciousness by showing that life and consciousness are intimately related.

In these different ways, the approach of *The Embodied Mind* and subsequent works opens up the possibility for a radically relational and inclusive new perspective on ecology and humanity's place in it. The standard modernist-rationalist view of ecology puts humans squarely at the top, ruling over nature with their superior intellect. The relational view inspired by enactivism is one in which humans are as entangled in 'nature'²² as tree roots in mycorrhizal fungal networks. Humans are not self-sufficient, autonomous individuals, but precarious beings whose selfhood is continuously sustained through interactions with their environment. They are not distanced from the rest of nature by their unique intelligence, but possess their symbolic and linguistic capacities only by virtue of cognitive skills that are ubiquitous in the more-than-human world. And they are not the only conscious beings on planet Earth, stuck in a kind of species-wide solipsism, but they share their experiential world with countless other forms of life – animal, vegetative, fungal, and many that do not fit human categories.

This is by no means the first expression of the view that humans are deeply connected with nature.²³ However, the value of the enactive account specifically is that it provides such a view on the basis of an engagement with present-day cognitive science. Although it is highly critical of established ideas and attitudes of the so-called 'Global North', it still has its roots in current Western thought. This means that it has a higher potential for transformative change in the West than approaches that are centuries old or ones that are 'imported' from non-Western cultures, such as Colombia's *Buen Vivir* (Cochrane 2014) or India's Hindu perspectives (Dwivedi 1993).²⁴

22. The word 'nature' gradually loses its meaning as this relational view is developed, since the human/nature dichotomy to which the term belongs is dismantled by the relational view.

23. See for instance Ravaissou's doctoral thesis *Of Habit* ([1838] 2008), a lesser-known yet deeply evocative account of the continuity of all of nature, by way of an analysis of habit.

24. This is not meant to imply that these non-Western approaches cannot provide insight for the Western context. On the contrary,

This chapter thus provides a substrate for an enactive ecological philosophy, but it has not yet developed any truly normative claims. The next step to this research is to mobilize insights from enactivism to develop a more normative and hands-on account of how to live and act on planet Earth.



this work is deeply inspired by both Buddhist views and, especially in chapter 4, by indigenous perspectives. Rather, the point here is that these perspectives cannot be 'imported' wholesale because they have emerged out of their own specific cultures. Hence, an effort is necessary to interpret these perspectives. The enactive account of ecology sketched in this chapter represents some of that effort.

4 The Encounter

Care ethics, participatory sense-making and the importance of ‘letting be’

His role was not to control or change the world as a human, but to learn from the world how to be human.

Robin Wall Kimmerer, *Braiding Sweetgrass*,
(2013) 2020

The previous chapter has shown that on the enactive account of cognition, the human and more-than-human worlds are deeply connected. Rather than supporting existing dichotomies that serve to separate the non-human from the human – such as intelligent/mechanical, mental/material, self/other, and subject/object – the enactive view helps to undermine human exceptionalism and show that, as James Bridle puts it, “we share a world” (2022, 68).

In this chapter, I want to move forward and ask *what to do* with this entanglement. That is, I want to make a start with developing a normative ecological picture on the basis of enactivism: how are we to live on Earth, knowing what we do about ecology and cognition?

The first stop on this journey will be to recognize the compatibility between enactivism and care ethics (section 4.1). Afterwards, the concept of ‘participatory sense-making’ is introduced and subsequently extended to include interactions between human and non-human participants (sections 4.2 and 4.3). Finally, the insights from this chapter are applied to reach a number of conclusions about how to live on Earth in the 21st century (section 4.4).

4.1 The striking affinity between care ethics and enactivism

In the final chapter of *The Embodied Mind* ([1991] 2016), Varela, Thompson and Rosch discussed the ethical implications of their enactive approach to cognition. A few years later, Varela expanded upon this topic with *Ethical Know-How* (1999). In this first expression of ‘enactivist ethics’, the affinity with care ethics is already apparent. Before explicating this link, however, a brief introduction to care ethics is in order.

4.1.1 Care ethics

Care ethics is a family of feminist ethical theories, the beginnings of which are usually traced back to Carol Gilligan’s 1982 book *In a Different Voice* (Norlock 2019). It has since become a rich and multi-faceted field, but a common thread is that care ethics is a relational ethics (Noddings [1984] 2013, xii). The starting point is not the isolated individual asking, in the abstract, how to relate to the world, but rather the already

engaged person who is not just involved in, but also partially constituted by, her various relationships. All of ethics is reliant on interactions with ‘the proximate other’, and, more specifically, on the caring relations that develop between individuals. All other ethical issues that do not involve a proximate other are derivative of the face-to-face situation.²⁵ For care ethicists, relations are more fundamental than individuals, and these relations serve as the starting point of moral analysis.

Another way to characterize the feminists’ departure from rationalistic moral theories (i.e. deontology, utilitarianism and, to an extent, virtue ethics) is to say that they do not start from immutable moral principles (such as the categorical imperative or the utility principle) but rather from the lived experience of caring. From these actual caring relations, certain moral obligations or principles may arise, but they remain rooted in actual situations and relations (Noddings [1984] 2013, 79–86).

As a final point, for care ethics, the question of ‘why to be a moral agent in the first place’ does not arise with the seriousness with which it does for more rationalistic moral theories. On rationalistic theories, which assume that moral judgments are arrived at primarily through abstract reasoning, there should be no particular overlap between what we want and what we ought to do. This begs the question of why we are so often motivated by our moral judgments.²⁶ For care ethics, on the other hand, the question of moral motivation is much less thorny. After all, care ethicists situate ethics first and foremost in actual caring done in actual relations. In doing so, they recognize that human beings are characterized by what Noddings calls ‘natural caring’: “caring motivated by love or inclination” (xv).²⁷ Thus, the question ‘why should I care?’ – while intelligible in the context of, say, the moral precepts of utilitarianism – is meaningless when it comes to care ethics. The answer is: you already do.²⁸ Since the ethical dimension is already entangled with and emergent from one’s actual engagements, the motivation question does not arise.

On Noddings’ view, care ethics is primarily an ethics for human–human interactions (151–52). The topic of caring for animals and plants is not unimportant for Noddings, however, and it will be discussed in section 4.3.3. First, however, the current thread will be continued and the resonance between enactivism and care ethics will be explored.

4.1.2 Caring in enactivist ethics

In both *The Embodied Mind* ([1991] 2016) and *Ethical Know-How* (1999), the ethical dimension of enactivism hinges on *sunyata*, or the emptiness of the self (discussed in section 3.3). That is, they believe that the realization of *sunyata* provides a counterargument to the commonplace view of the ‘economic man’, who is characterized by rational self-interest and who needs to be constrained in order to keep the social order (Varela, Thompson and Rosch [1991] 2016, 243–45). According to this ‘economic view of

25. Note the contrast with utilitarianism, which argues that proximity has no moral import (e.g. Singer 2011, 202–4).

26. Rosati writes on moral motivation: “Perhaps because of the apparent opposition between self-interest and morality, the fact of moral motivation has seemed especially puzzling. How is it that we are so reliably moved by our moral judgments?” (Rosati 2016, introduction)

27. Note the contrast with the deontological picture of morality. According to Kant, a morally correct action performed out of inclination is not fully moral (Kant [1785] 1998, 4:397–98). Care ethics reverses the picture: there is no such thing as a moral action without an “initial, enabling sentiment” (Noddings [1984] 2013, 79).

28. This is a simplification of the nuance involved in care ethics and the question of motivation. Noddings, for instance, distinguishes natural caring from ethical caring, and argues that the latter arises from, and is dependent on, the former (79–95). However, this does not detract from the main point of the paragraph.

the mind', the self is a bounded territory which takes as its goal to bring as many good things as possible within its boundaries, while 'paying out' as little as possible. On this view, all people are autonomous selves in competition for the same scarce goods. Altruism, on this view, is only possible to the extent that it is properly repaid. Unreciprocated generosity will result in disillusionment and is therefore unlikely to happen again.

If one takes seriously the experience of *sunyata*, however, the economic view falls apart. The realization that the self is not a bounded *thing* but rather an open-ended process means that whatever one calls 'self' is necessarily codependent on 'other'.²⁹ Whether we are aware of it or not, we are already other-directed even when we think we are acting selfishly:

If I want praise, love, fame, or power, there has to be another (even if only a mental one) to praise, love, know about, or submit to me. If I want to obtain things, they have to be things that I don't already have. Even with respect to the desire for pleasure, the pleasure is something to which I am in a relation. (Varela, Thompson and Rosch [1991] 2016, 244–45)

The practice of mindfulness/awareness can make one aware of this innate other-directedness of the self, and cultivate it (245–52). The cultivation of other-directedness means that the sense of warmth that is usually reserved for our closest friends and family expands to include more and more beings. In the Mahayana tradition, groundlessness and compassion are two sides of the same coin: only by letting go of one's ego (*sunyata*) can one achieve compassion (*karuna*).

Although this cultivation of compassion has the appearance of a trajectory of learning, it is more akin to an un-learning. "Our natural impulse, in this view, is one of compassion, but it has been obscured by habits of ego-clinging like the sun obscured by a passing cloud" (246). If we are truly mindful, and we reach a state of *bodhicitta* or 'wisdom mind', then we will naturally embody an unconditional compassion – one that is no longer concerned with the business mindset of reciprocity and instead simply *is generous*.

To some, this may sound esoteric and perhaps overly spiritual, but *bodhicitta* is inexplicable only in its simplicity. It is nothing more or less than the world as it is, accepted and experienced fully, without any searching, conceptualizing, or negating to obscure it. It cannot be described in any absolute terms, or, in fact, in any terms at all, because it is precisely the putting-into-words that leads one away from *bodhicitta* back into the conceptual realm.³⁰

Moreover, many other authors have come to similar conclusions with regard to ecology specifically, usually without citing any Buddhist influence. For example, James Bridle writes the following about solidarity with the more-than-human:

Just as the questing root of the tree undermines the foundations of a stone house, so *attentiveness* to the omniscient forces of the more-than-human world, entangled as they already are with

29. Recall that on the enactive approach, all organic life is characterized by an inherent other-directedness (see section 3.3.1).

30. This turning-away from words and towards pure experience is evoked beautifully in Herman Hesse's novel *Siddhartha*:

Perhaps it is these which keep you from finding peace, perhaps it is the many words. Because salvation and virtue as well, Samsara and Nirvana as well, are mere words, Govinda. There is no thing which would be Nirvana; there is just the word Nirvana. (Hesse [1922] 2001)

our human world in every possible way, explodes the existing political order of domination and control from without and within. (Bridle 2022, 279, emphasis added)

Here, Bridle puts their faith not in political or ethical theories, but in a simple heeding of the living environment. The work of emancipating the more-than-human world, they say, necessarily leads us outside of the existing political and legal systems, because existing structures simply do not provide the language for the radical attentiveness that is required. In a similar spirit, Scientist Suzanne Simard notes throughout her autobiographical book *Finding the Mother Tree* (2021) that she developed an understanding for, and a benevolent relation with, her natural surroundings by simply attending to the life around her: “I had learned so much more by listening instead of imposing my will and demanding answers” (285).³¹

This view, much like that of care ethics, upends the conventional emphasis on rules and principles in morality. More than anything else, moral action is about responsiveness to a particular situation. Morality is not about gaining knowledge (‘What is the good?’ ‘What is the right thing to do?’) but about developing a skill: ethical know-how. Varela, in his book on ethical know-how, writes that this skill consists in “the progressive, firsthand acquaintance with the virtuality of self” (Varela 1999, 63). It is a continuous learning to embrace, in practice, the innate other-directedness that always already characterizes one’s experience. This other-directedness is expressed in “the spontaneous gestures that arise when one is not caught in the habitual patterns—when one is not performing volitional actions out of acquired habitual patterns. In other words, actions that embody and express the realization of the emptiness of self in a nondual manifestation of subject and object” (69). Thus, the realization of *sunyata* can help us uncover the innate attitude of “authentic care” (73) in order to live by it ever more fully.

At this point, the parallels with care ethics should already be quite clear. Both the enactivist approach to ethics and care ethics identify an innate tendency in the human being to take a caring and compassionate stance towards its surroundings. Ethics should be built up not from rules and principles, but rather from a pragmatic training that builds on this inherent caring attitude. Any rules that do come into play have to be continuously informed by the practice of caring in order for them not to become fossilized and hollow.

The next question, then, is how to implement this vision in practice. What does it actually mean to build up caring relationships? And, especially, how does this scale in the context of non-human life? To answer these questions, one more puzzle piece is necessary. So far, the enactive approach presented here has only been applied to individual organisms in their world. But what about interactions between individuals? Here, the concept of *participatory sense-making* will help to describe the caring interactions that are central to the enactive approach to environmental philosophy.

4.2 Participatory sense-making in humans and non-humans

In a 2007 paper, De Jaegher and Di Paolo introduce the term ‘participatory sense-making’. They do this because they feel that up until that point, no properly enactive account of social cognition had been given. They observe that the existing attempts remained stuck in a methodological individualism, trying to explain

31. The relation between knowledge and attentive engagement will be further explored in the discussion of participatory sense-making in section 4.3.

social cognition processes by way of individual cognitive skills, which runs counter to the spirit of the enactive approach (De Jaegher and Di Paolo 2007, 486). Instead, De Jaegher and Di Paolo propose that social interaction forms its own irreducible layer of sense-making. That is, while each participant in an interaction has their own autonomy (in the sense that they enact their own individuality, see section 3.3.2), the interaction itself can take turns that neither participant may have intended or foreseen³², which means that the social interaction has an autonomy of its own.

The authors explain this process of interaction with the same language that Thompson (2007) used to describe the self-organizing properties of life: that of dynamical systems, and specifically, *coordination* in dynamical systems (De Jaegher and Di Paolo 2007, 490–91). Just as individual organisms can be described as dynamical systems (see section 3.3.1), social situations can be as well. Just like fireflies can collectively synchronize their flashing behaviour without any sort of sophisticated ‘synchronizer’ in their individual cognitive systems, just so are social interactions between people coordinated without a cognitive faculty responsible for ‘mind-reading’ or ‘simulating’ the other’s cognitive states. Coordination, the authors point out, is such a common phenomenon in both biological and non-biological systems, that it is often harder to avoid than to make happen.

If social interactions have their own dynamic that is irreducible to the individual participants because of the coordination at play, then this means that the sense-making of these participants cannot stay unaffected (496–502). Indeed, in social interaction, sense-making is affected to various degrees, from simply being modulated to being shared and fully participatory. It is important to point out that even simple modulation can end up significantly impacting the dynamic of the interaction. For example, a pause caused by a delay in a video conference can cause someone to weaken a statement they made moments earlier, which in turn can prompt the other participant to go along with this weaker statement, permanently changing the trajectory of the conversation (498). On the more involved end of the spectrum, however, individuals can no longer be said to be sharing or modulating their individual sense-makings, but are instead jointly engaged in *one sense-making process* – examples of this include negotiating, cooking a meal together or playing charades.

The crucial point for this chapter is that participatory sense-making is not restricted to human participants. De Jaegher and Di Paolo point this out themselves (486), but it also becomes readily apparent when we consider that sense-making is a process that starts with the very simplest forms of life. Participatory sense-making is not a more complex or sophisticated form of cognition compared to ‘regular’ sense-making; it is simply the name for what happens when multiple sense-making organisms meet.³³

A straightforward example is that of baboons’ social life. Cheney and Seyfarth (2007) describe in detail how chacma baboons in Botswana, despite their limited vocalization options, engage in highly complex social interactions (90–97). In baboon interactions, the meaning of a vocalization depends not only on the sound itself (e.g. a threatening grunt or a fearful bark) but also on the sex, age and social standing of both the issuer and the receiver(s). For instance, female baboons sitting near each other only react to the

32. The authors give the example of two people trying to pass each other in a narrow corridor, who get stuck in a kind of ‘dance’ in which they inadvertently keep mirroring each other’s movements (De Jaegher and Di Paolo 2007, 493).

33. In fact, it might be apt to question this division between ‘regular’ and ‘participatory’ sense-making altogether, since a lot of human – and arguably also non-human – sense-making is already social by nature.

sound of a dispute between two individuals if the sounds are made by their respective relatives. Cheney and Seyfarth describe what happens when this is the case: “both females looked at each other, as if they were asking, ‘Hmm. Your relative is fighting with mine. What are we going to do about this?’” (Cheney and Seyfarth 2007, 97). Thus meaning is generated not by individual baboons but through the interaction between baboons.

Another example worth considering is the slime mould *Physarum polycephalum* discussed in section 3.4.2, which can engineer the Tokyo metro system and solve the travelling salesman problem. The coordination of this life form is so tight, that they are said to trouble the divide between individuals and groups altogether (Bridle 2022, 191). That is, they can and sometimes do exist as separate unicellular organisms, but when conditions worsen, these cells tend to clump together to form sacks, clumps and networks which seem to act as a single mind. The question is whether we can still speak of ‘participatory’ sense-making in this case, since it is unclear to what extent the individual cells of the *Physarum polycephalum* can still be said to have a degree of autonomy. Perhaps these organisms have gone full circle and have started coordinating so tightly that they comprise a single organism, exhibiting ‘regular’ sense-making.

It is also clear that participatory sense-making can take place between different species, and even between different kingdoms of species. For instance, Simard (2018), drawing on her own research as well as that of many others, shows that trees exchange information and nutrients amongst each other through mycorrhizal fungal networks. In this case, not only do trees (conspecific or not) engage in participatory sense-making by communicating kinship information and defence signals to each other, they also do so with the fungi that connect the trees. These fungal networks are not mere transmitters of information, but play their own active role in the constitution of meaning that goes on in forest soils: they transfer more or less depending on the age, species and even kinship of the different trees that it connects to (203–4). Thus the different tree and fungi species are engaged in a continuous process of interaction whereby meaning is constituted not by any single organism but by the system as a whole.

In discussing these examples, it is worth pointing out that describing an interaction as ‘participatory sense-making’ goes beyond purely scientific descriptions. It is rather a certain way of recognizing the creation and modulation of meaning in social interactions between organisms. This meaning – and this is precisely the point that De Jaegher and Di Paolo stress – is not reducible to the physical or biological level, but exists only *for* the organisms participating in the interaction. Hence, it always requires a certain way of looking, one that goes beyond the methods of reductionist science and relies on a certain level of imaginativeness or empathy.

This is not to say that making such claims is in principle impossible in scientific discourse. Simard (2018) is not afraid to describe plants as having agency, as perceiving, remembering, communicating, and even as using language. However, her tendency to ‘animate’ vegetative nature has resulted in persistent ridicule and even anger from her (mostly male) colleagues (see Simard 2021 and section 2.2.2). Thus, the point here is that this level of description requires a transformation of scientific practice, in which first-person experience and meaning are no longer taboo subjects – which is exactly what Varela, Thompson and Rosch argue for in *The Embodied Mind* ([1991] 2016, 3–14).

4.3 The encounter between the non-human and the human

We have seen so far that sense-making – the world-building and meaning-making activity of organic life – can be, and often is, shared and social. We have also seen that this participatory sense-making occurs not just between humans, but between non-human species as well. What, then, are the prospects for shared sense-making between non-humans and humans? Can they happen in the same way that they happen between human participants?

In order to answer these questions, we could turn to the various examples of humans bonding with non-human beings, such as animal psychologist Francine Patterson with the gorilla Koko (J. Taylor 2016), documentary filmmaker Craig Foster with a nameless wild octopus (Ehrlich and Reed 2020), or the aforementioned Suzanne Simard with forest ecosystems (Simard 2021). However, simply citing these examples would immediately beg the question to what extent they embody true participatory sense-making. How can we be sure that Patterson was really communicating with Koko, and not just projecting (as discussed in Candland 1993, 293–301)? Was Foster really friends with the octopus, as he claims (Stark 2020), or was his love hopelessly one-sided (as suggested by Hunt 2020; Walsh 2021)? And were Simard’s detractors right in calling her overly idealistic and imaginative (Simard 2021)?

In all encounters between human and non-human actors, there is the risk of anthropomorphization. The worry is that this can result in a lopsided interaction in which the non-human actor is not really a full participant but rather an object to the human subject. This is not an unfounded worry: the history of humanity is full of examples of humans’ arrogance, impatience and ignorance impoverishing their interactions with nature.³⁴

In order to get a better grip on the types of encounters that could qualify as true participatory sense-making, it would be useful to formulate norms for such encounters. A recent article by Hanne De Jaegher, titled *Loving and Knowing* (2021), provides crucial insights for dealing with this difficult question.

4.3.1 Knowing the other and ‘letting be’

De Jaegher’s *Loving and Knowing* (2021) is primarily about epistemology. However, it is highly relevant for this discussion, because it argues that the highest forms of knowing occur not in detached observation but in engaged relationships. It is therefore primarily an examination of knowing *the other*. This reflects the questions that closed the previous section: how can we really get to *know* Koko, or a forest ecosystem?

De Jaegher proposes answers to these questions by means of the concept of ‘letting be’. She draws here on Maclaren (2002), who in turn is inspired by Merleau-Ponty’s discussions on intercorporeality and intersubjectivity. Maclaren’s point, as summarized by De Jaegher, is that human knowing is characterized by a tension between letting the known be as it is, and appropriating it for oneself (De Jaegher 2021, 858–60). She acknowledges that it is impossible to know a thing fully for what it is, but at the same time there are many ways to blatantly fail to do a thing justice. Her example is that of a horse trainer who is only interested in his horse for the money she can make him. This way of knowing fails to see the horse “in

34. See the recent report by the European Environment Agency (2022) for examples of this in Europe. For North-American examples see Turner et al. (2013), Pearkes (2016), Lindsay (2018) and Nelson (2019).

its horseness, in its this-horseness” (De Jaegher 2021, 858), and as a consequence, the horse suffers and breaks down.

The general insight from Maclaren is that our interactions with others (taken broadly as any actions that involve others) never let the others be, but instead always situate and determine the other to a certain degree and in a certain way. Even a loving horse trainer will determine their horse in certain ways, and in each interaction the horse has a choice to go along with this determination or not. ‘Letting be’, then, means trying to find the balance between over- and underdetermination: determining the other enough to be able to know them, without limiting them in your image of them. The knowledge that flows from this process always consists of a blend between the other as they are and the knower as they know the other – it is thus a process that happens *between* the two parties, or rather *in* the relationship between them. ‘Letting be’ is not an end-point to be reached but rather a continuous commitment to the other and to the relationship, even as they change (as they inevitably do). It is a constant process of engagement: an engaged epistemology.

De Jaegher then develops Maclaren’s insights into a comparison between knowing and loving (860–3), arguing that the two, in their basic form, “are manifestations of the same basic, existential way of relating” (861). More specifically, the same dynamic of over- and underdetermination that applies to knowing is also at play in loving. Loving, just like knowing on the above picture, cannot be done purely abstractly or ‘in theory’. Love and knowledge both require nearness, interaction, and an ongoing dynamic between the two parties and the relationship itself.³⁵ De Jaegher suggests that although most people are familiar with this dynamic in the context of love, it has to be re-discovered in the context of knowing. The knowing that we tend to treat as exemplary – i.e. abstract, detached knowing – is of the over-determining sort, and is necessarily dependent on the hands-on, engaged mode of knowing.³⁶

4.3.2 Letting non-human beings be

Applied to the question of participatory sense-making between non-humans and humans, De Jaegher’s insights can lead to the development of norms for what counts as a proper interaction.

First of all, any interaction between non-humans and humans needs to be characterized by a balance between over- and underdetermination. The human participant ought to be careful in applying their own ideas too readily onto the other. To give just one example: the long-held belief that plants compete with each other for nutrients in a zero-sum game turned out to be an overdetermination based on the uncritical application of human individualism to plant life (see e.g. Simard 2021; or the discussion of ‘symbiogenesis’ by Haraway 2016, 58–67).

Secondly, it is important to embrace not-knowing. Every relationship is characterized by unknowns. In order not to fall back into an anthropocentric over-determination of the other, these unknowns need to be acknowledged and accepted. For instance, scientist and Potawatomi member Robin Wall Kimmerer says that in interpreting the behaviour of the wild strawberry (*Fragaria virginiana*), we have a choice between

35. For simplicity’s sake, I stick with relationships between two parties here. This is emphatically not meant to imply that knowing or loving relationships can only happen in dyadic structures.

36. c.f. the enactivist claim that abstract cognition is dependent on basic sensorimotor skills (section 3.4.3), Ryle’s claim that knowing-that is dependent on knowing-how (section 3.4.4), and the phenomenological claim that scientific knowledge is necessarily embedded in and dependent on the life-world (e.g. Varela, Thompson and Rosch [1991] 2016, 17–18; Thompson 2007, 33–36).

characterizing it either metaphorically as a gift, or scientifically as evolutionarily adaptive behaviour (Kimmerer [2013] 2020, 29–30). By recognizing how little we know, Kimmerer opens up the space for the more metaphorical approach, which in turn can also inform our scientific practices. Embracing the unknown also means accepting paradoxes and ambiguities, and this is an area in which metaphor and poetry can flourish.

Crucially, this type of not-knowing should not be confused with certain kinds of ignorance that flow from systemic injustices – such as the white ignorance described by Mills (2007). Although De Jaegher makes reference to this type of ignorance when she speaks of the importance of the unknown (2021, 865, footnote 22), I want to argue that there is a difference between the socially enforced and racially motivated ignorance about Black realities, and the ignorance of humans with regard to, say, the inner workings of a forest ecosystem. In the latter case there is a sense in which the cherishing the unknown can be said to carry value, in the sense of preserving “the hidden, the secret, and the mysterious” (865). In the former case, however, there is no sense in which it is desirable to preserve white ignorance, because it is quite simply an unjust phenomenon which both strengthens and is informed by an unjust racialized society. In both cases, it is of paramount importance to *become aware* of one’s not-knowing, but in the case of white ignorance it is not something to be preserved or cherished.

Thirdly, we need to be aware of the distinction between detached knowing and engaged knowing, and which one we employ at any particular time. In engaged ways of knowing, the knower and the known affect each other reciprocally, whereas in detached ways of knowing, this reciprocity does not seem to take place. However, De Jaegher herself immediately qualifies this distinction, suggesting that, firstly, detached knowing is merely an abstraction from engaged knowing, and secondly, even in these so-called ‘objective’ knowings, “the known does reflect back to us and on us” (864) and knower and known cannot be fully untangled. This does not necessarily mean that all knowing ought to be fully engaged and the scientific method as we know it can be cast aside. Rather, De Jaegher’s insights serve as a warning as to the risks involved with trying to objectively approach a being who cannot be fully captured by this stance. As such, it is of utmost importance that we be aware of the stance we take when interacting with a non-human being – whether we approach them with a sense of objective detachment, or rather with a curiosity and an openness for the here-and-now of the specific moment.

4.3.3 Care ethics, revisited

With the above considerations in mind, it will be instructive to attend once again to care ethics, and specifically to Noddings ([1984] 2013) and her views on caring for animals and plants.

Noddings dedicates one chapter of her book to caring for non-human beings and things (148–70). In it, she argues that as one moves further away from human beings (meaning: from animal life to plant life to inanimate objects) “the ethical shades off into the sensitive” (160). She acknowledges that we can feel affection for non-human beings, and that this affection may develop into caretaking behaviour and feelings of responsibility. However, it can only develop into a morally relevant caring relation to the extent that the non-human other is capable of responding to the care. Only then is the other a proper ‘cared-for’ and do they confirm the human as a proper ‘one-caring’: “The cared-for contributes to the caring relation [...] by

receiving the efforts of one-caring, and this receiving may be accomplished by a disclosure of his own subjective experience in direct response to the one-caring or by a happy and vigorous pursuit of his own projects (Noddings [1984] 2013, 150–51). Thus, she argues, a pet cat can be a proper cared-for (156–57), but a plant cannot (159–60).

Moreover, just like with humans, Noddings says that we do not have an obligation to care for those with whom we do not have a relationship. She has a moral responsibility for her cat because they have established a caring relationship, but she has no moral responsibility for the rat that appears at her door, beyond a baseline duty of not inflicting pain (155–59). This results in an ethics of non-judgement with regard to non-human life: those who enter into relationships with animals may develop moral duties toward them (something which cannot be said for people who relate with plants), but those who do not cannot in any way be blamed for this, and cannot be ‘given’ moral responsibilities to animals (again, beyond the baseline of refraining from inflicting pain). Hence, fully in line with her own ethics, Noddings says about the rat encounter that she “would shoot it cleanly if the opportunity arose” (157). For the same reasons, there is also no judging those who fell redwoods (161).

However, in all of this, Noddings does not consider the role of the human actor in the (im)possibility of establishing a properly moral caring relation. She seems to assume that some (if not most) animals and all plants are simply not capable of responding as a cared-for. However, the above discussion of participatory sense-making provided the insight that in interactions, meaning emerges from the interaction itself, rather than travelling straightforwardly from one actor to another. On this picture of human–non-human interactions, the human actor always has an active role in soliciting and interpreting the responses from the other. One cannot simply say that a certain life form is inherently incapable of being a cared-for – it all depends on the interaction they find themselves in.

In this omission, Noddings makes several claims that can now be examined more critically. Firstly, Noddings says the following about her taking care of plants:

I, being scientifically educated, suspect that they would do quite as well whether I care or not.
I am quite sure that my talking to them is not crucial. (160)

For Noddings, there is no difference between caretaking (i.e. simply going through the motions) and caring when it comes to plant life. In the spirit of letting be, however, the assumption that the plants would do just as well regardless of the level of care given is unwarranted. After all, we do not really know how plants work.³⁷ To say that you know what does and doesn’t affect plants is to say that you know positively how plants operate. Rather than filling in the gaps in our knowledge with a false sense of security, however, the attitude of letting be urges us to suspend our judgment and simply observe, experience and interact.

Secondly, Noddings concludes the chapter on non-human others by claiming that “there is no true ethical relation between humans and plants because the relation is logically one-sided and *there is no other consciousness to receive the caring*” (170, emphasis added). As for the claim about plant consciousness, the chapter on consciousness in enactivism (section 3.5) has shown that the divide between conscious animals

37. Of course, humanity has learned a lot about plants since the publication of Noddings’ original text in 1984, which puts some of the present criticism of the text into perspective.

and non-conscious plants is questionable to say the least. Additionally, the discussion in section 4.3.1 has shown that a judgment about an other is never fully determined by the one under scrutiny, but is also affected by the one doing the scrutinizing. In this case, the judgment that plants lack consciousness may be a reflection of the knower just as much, or even more so, than a reflection of the known. Knowing this, it is apt to question one's judgments about the inner life of plants, wonder to what extent one's own attitudes contributes to these judgments, and explore which attitudes may produce different results.

Thirdly, we can go one step further and question Noddings' claim that plants cannot be ones-caring (Noddings [1984] 2013, 159). Again, the nature and behaviour of plants in human eyes is at least partly a product of human ways of knowing and caring. Luckily, the detached attitude generally seen in Western culture is not the only one in existence, even today. Let us return to Robin Wall Kimmerer and her passage about wild strawberries. From her perspective – which is a lived one first and a scientific one second – it was the strawberries who cared for humans before the latter could even return the favour.

You could smell ripe strawberries before you saw them, the fragrance mingling with the smell of sun on damp ground. It was the smell of June, the last day of school, when we were set free, and the Strawberry Moon, *ode' mini-gizis*. I'd lie on my stomach in my favorite patches, watching the berries grow sweeter and bigger under the leaves. Each tiny wild berry was scarcely bigger than a raindrop, dimpled with seeds under the cap of leaves. From that vantage point I could pick only the reddest of the red, leaving the pink ones for tomorrow.

Even now, after more than fifty Strawberry Moons, finding a patch of wild strawberries still touches me with a sensation of surprise, a feeling of unworthiness and gratitude for the generosity and kindness that comes with an unexpected gift all wrapped in red and green. "Really? For me? Oh, you shouldn't have." After fifty years they still raise the question of how to respond to their generosity. (Kimmerer [2013] 2020, 23)

On Kimmerer's view – which is just one instance of the countless indigenous perspectives on nature and ecology – non-human life can teach and care for humans just as much as other humans can. This view also entails a radically different ontology than the one usually taught in Western contexts. Rather than putting humanity on top of a hierarchy ranked by instrumental rationality, Native cosmologies call humans "the younger brothers of Creation" (9): they have arrived on Earth very recently, and so they have relatively little experience with how to live. Hence, we require the teachings of other species in order to survive and thrive.³⁸

4.4 Implications: fostering the encounter

4.4.1 The importance of the encounter

The most important conclusion to be drawn from the discussion above is that the real-world encounter is indispensable in ecology. Without interaction – actual, bodily, here-and-now interaction – any and all

38. Chapter 3 of this work has, in a way, similarly attempted to motivate a move from humans at the top to humans in the middle of nature, albeit with a very different starting point.

attempts to engage in ecology will get stuck in abstract speculation in which the non-human processes and entities themselves have no say.

Moreover, it is not simply the encounter that matters, but also one's attentiveness and mindfulness during the encounter. In order for a true exchange to take place – in the sense of participatory sense-making – it is not enough to get in close proximity to non-human life; one has to *meet* it. This means: being willing to reach out and get out of one's comfort zone in order to get closer to the other. It also means simply being present and open to whatever the exchange has to offer.

It is very easy for humans to close off pathways for interaction because of preconceived notions of what humans, animals and plants are like. We might think that plants are just motionless matter, utterly passive and uninteresting to us. Such a preconception is a self-fulfilling prophecy: as long as we believe plants to be so, no interaction is possible and they will remain so in our eyes. However, setting aside these prejudices³⁹ opens up the potential for being affected by the other, and thus for a true interaction. In such an interaction, both parties are mutually constituted by the interaction itself, and neither is left untouched. As James Bridle poetically puts it:

We seek to meet, and not to conquer. We are as comfortable with companionable silence as with talking. We have different words for the same things. (Bridle 2022, 70)

The realization that we are already constituted by our interactions – and we are not the bounded selves that we often think we are – is at the basis for this openness.

However, it would be wrong to think that a personal emphasis on interaction requires the intellectual route that this text has taken. One can perfectly well be open to genuine interactions with the more-than-human without ever having heard of 'participatory sense-making' or 'autopoiesis'. The intellectual route of academic philosophy is but one way to arrive at this point (and it should be noted that simply arriving at a conclusion like this work has done is not yet equivalent to acquiring practical wisdom, let alone skill). As has been noted at various points throughout this text, Native cultures have been living in genuine interaction with the more-than-human world for millennia. For all this time, they have known things that Western science is only now beginning to discover, such as the fact that trees talk to one another (Kimmerer [2013] 2020, 19–20; Simard 2021, 66) or that forest fires can be beneficial to forest health (Huggins and Skulski 2018). They have garnered this knowledge not through scientific investigation, but by simply (that is to say, not simply at all) living with and through these ecological processes; by depending on them and trusting them and incorporating them into their culture – in an enactive vocabulary: by *letting them be* and getting to know them on their own terms.

4.4.2 The importance of time and patience

When it comes to letting the more-than-human world be, time is a particularly important factor. Humans have a specific way of experiencing the passage of time due to their embodiment and neurological constitution

39. Setting aside one's prejudices is easier said than done. The discussion on *sunyata* in the Buddhist mindfulness/awareness tradition of section 4.1 provides one possible avenue for going about this. The discussion on art and imagination of section 4.4.4 below provides another.

(Thompson 2007, 312–338).⁴⁰ What this means in concrete terms is that what we experience as ‘the current moment’ is not an infinitesimally small slice but rather a block with forward-looking and backward-looking parts, and that the width and character of this block is affected by the underlying neurodynamics.

This means that non-human life may not experience time in the same way we do. In particular, non-animal life forms such as plants and fungi lack both the nervous systems⁴¹ and the movement capabilities that animals have. This means that the passing of time has a different meaning for humans and plants. Plants’ movement in the world generally takes place in the order of days at least and years at most, compared to humans, who can complete meaningful tasks in a matter of seconds.

This is an important fact to keep in mind when on the topic of inter-species participatory sense-making. Any meaningful interaction with vegetative life is unlikely to happen in the span of five minutes. If the interaction is to be truly reciprocal, it will need to be sustained for timespans that are meaningful to the non-human party. For instance, Robin Wall Kimmerer’s interactions with wild strawberries (mentioned in section 4.3.3) took place across many years. Only when witnessing their full seasonal cycle can one start to make sense of their way of life.

4.4.3 The importance of locality and rootedness

The rationalistic philosophies of modernism and the moral theories that flow from them all strive toward a certain universality (Plumwood [1993] 2003, 166–171). According to this family of views, humans are rational animals, and rationality consists in transcending the local and temporal to establish knowledge that is universal in both space and time. The moral precepts of utilitarianism or deontology are not bound to one’s own time and place but apply universally, and the content of these precepts similarly takes no heed of where and when someone is.

However, both care ethics and enactivism point, each in their own way, to a more locally rooted perspective. Care ethics states – against the status quo of rationalistic morality – that one’s existing relations *do* matter for one’s moral outlook. These relations can only exist by virtue of proximity, i.e. actually being together. Thus, proximity does play a moral role according to care ethics: it provides the basis for the caring relations that are required for any kind of morality to exist at all. On the side of cognitive science, enactivism sees cognition and intelligence not as processes of universalization and abstraction, but on the contrary, as processes of navigating the here-and-now. Cognition always happens in interaction with the environment, and so one’s place necessarily plays a constitutive role in one’s mental processes. Knowledge is primarily local and engaged, and can only then be expanded to become increasingly abstract and place-less (De Jaegher 2021, 13–16).

The fundamental difference between these two approaches, broadly speaking, is an inversion of what is considered fundamental: on the rationalist picture (which includes cognitivism in the cognitive sciences), the universal takes pride of place and the particular is a philosophically fairly uninteresting derivative of it. On the ‘particularist’ picture, it is the temporally and spatially local differences that are primary, and any

40. Enculturation also plays a role in the experience of time (see e.g. Sorokin and Merton 1937), but to my knowledge no enactive or neurophenomenological analyses of social time have been carried out.

41. Granted, plant systems can form neuron-like structures that are excitable similarly to animal nervous systems (Simard 2018; Thompson 2022, 26), but it seems unlikely that they operate on timescales similar to those of humans.

moves towards universality are abstractions away from this concrete particularity.

This means that the perspective sketched in this work points toward a more localist attitude towards the more-than-human world. It means that we cannot – as deep ecology did – be content with stating that humans have to ‘identify with nature’, as if nature is one thing to become familiar with. Rather, the enactive and care-ethical perspectives urge us to become familiar with *particular* environments, ecosystems and non-human beings. If we want to get better at inter-species sense-making, we have to proactively seek out encounters with the other, and this is only possible on the basis of proximity. I cannot get to know kangaroos by sitting at my desk in Belgium – nor by visiting the local zoo, for that matter.⁴²

Moreover, the discussion of time-consciousness of section 4.4.2 shows that it is not enough to *be* in a place. To really get to know the more-than-human environment, one has to stay in a place, dwell there, take root. This rooting need not be solely individual: a rooted community that has lived in a particular place for generations can gain insights into the place that individuals cannot reach on their own. These insights can then be passed on and built upon by each successive generation. This collective rooting into and becoming one with a place is at the heart of indigenous cultures, which is exemplified by the lawsuits that several Native American tribes have filed against local governments on behalf of other, non-human, inhabitants, such as the manoomin (wild rice) of the White Earth Indian Reservation and the Tsaladaxw (salmon) of the Skagit River (Bunten 2022).

However, currently even most indigenous tribes have been forcefully removed from their homelands by settlers (Kimmerer [2013] 2020, 11–21). As for people living in the so-called ‘Global North’, they are used to a way of living that is decidedly non-local. Latour describes poignantly how the process of globalization has created countries whose sources of prosperity originate largely from outside their own borders: living in a globalized society “is a sure way of being misled and lost: your wealth, or your misery, comes from places that are invisible on the administrative map of your own land” (Latour 2019, 3). The Western individual, in other words, lacks a territory, precisely because the West sees the entire globe as its territory.

‘Becoming indigenous’ to a place is no easy task. It might even be impossible. In the words of Robin Wall Kimmerer:

Immigrants cannot by definition be indigenous. *Indigenous* is a birthright word. No amount of time or caring changes history or substitutes for soul-deep fusion with the land. (Kimmerer [2013] 2020, 213)

However, Kimmerer writes, perhaps the challenge is not to become indigenous but rather to become naturalized (213–15). She gives the example of White Man’s Footstep, *Plantago major*, the round-leafed plant that was introduced to the Americas with the arrival of the European settlers. Unlike other ‘intruders’

42. In the essay *Why Look at Animals?*, John Berger explains why zoos are incapable of facilitating the encounter between humans and animals:

“The zoo cannot but disappoint. The public purpose of zoos is to offer visitors the opportunity of looking at animals. Yet nowhere in a zoo can a stranger encounter the look of an animal. At the most, the animal’s gaze flickers and passes on. They look sideways. They look blindly beyond. They scan mechanically. They have been immunized to encounter, because nothing can any more occupy a *central* place in their attention.” (Berger 2009, 37, emphasis in original)

such as kudzu, who aggressively colonize whatever space they can, White Man's Footstep turned out to be a gentle and cooperative plant. The Native people discovered many uses for the different parts of the plant, and human and plant got entangled in a fruitful relationship.

This wise and generous plant, faithfully following the people, became an honored member of the plant community. It's a foreigner, an immigrant, but after five hundred years of living as a good neighbor, people forget that kind of thing. (Kimmerer [2013] 2020, 214)

Becoming naturalized is to get entangled with the local community; to be a good neighbour. It is to realize that "to carry a gift is also to carry a responsibility" (211), and subsequently to learn what one's gift and responsibility are. True to the enactive approach, each person's gifts and responsibilities will be dependent on the place where they live, as different places will provide different opportunities for action and different needs to be met. Hence, figuring out one's own gift and responsibility means getting to know one's place in the proximate environment; recognizing what is already there, what might still be lacking, and how oneself could fit in.

4.4.4 The importance of art and the imagination

As we have seen, a lot of the difficulty in encountering the non-human other properly lies in humans' incapability of stepping outside of their own human-ness. That is, they do not know how to coordinate with non-human life forms because their values and expectations are unyieldingly human. One potent pathway of challenging this deep-seated anthropocentrism is through art and the imagination. After all, changing our relationship with the more-than-human world is not merely about changing our beliefs about the world – it is also about altering the images, narratives, associations and conceptual structures that keep us from connecting.

Maren Tova Linett has argued convincingly for the relevance of art to bioethics. In the introduction to her book *Literary Bioethics* (2020), she draws on Martha Nussbaum and her claim that literature's "particularity and imaginativeness" (5) has the ability to make people care for characters and to see them as complex wholes. Linett expands these insights to marginalized, non-human and trans-human characters:

By inviting readers into vivid fictional worlds, these novels [that are discussed throughout the book] establish literary-ethical laboratories where we can examine human exceptionalism, ideologies of cure, compressed morbidity, the devaluation of disabled people, and humane farming. (29)

Literature can be an imaginative 'playground' for trying out ideas and for getting to know complex characters. The richness of literature – and by extension, other art forms as well – allows the reader to grapple with situations and experiences in all their detail. The fact that art can provide "a diverse concreteness" (a phrase taken from Nussbaum; Linett 2020, 6) that does not come with a manual for interpretation, enables it to provide experiences that philosophy, and especially academic philosophy, cannot.

Critics may be tempted to argue that enactivism has no foothold when it comes to the imagination, because enactivism has an aversion to representation-based explanations of mental activities (see e.g. Foglia and Grush 2011, for an argument along those lines). The debate surrounding enactivism and the imagination is too complex to do justice to here, but the point to be made here is that there do exist credible enactive accounts of the imagination – notably those by Medina (2013) and Gallagher (2017, 192–97). Medina in particular argues that not just imaginations but fictional experiences of any kind “are embodied experiences in their own right, which expand the repertoire of patterns of interaction that we are capable of” (Medina 2013, 320). This view only strengthens the relevance of art: it has the ability to affect our sense-making habits and hence to enrich our interactions.

With these considerations in the background, the remainder of this section will pick out and discuss two works of art to further illustrate the relevance that art has to the ecological encounter: the first one an animation film, and the second one a novel.

Wolfwalkers (2020) The first work of art to be discussed is the animation film *Wolfwalkers*, directed by Tomm Moore and Ross Stewart, and produced by the Irish studio Cartoon Saloon. Loosely based on Irish folklore, the film’s story takes place in 1650 in Kilkenny, Ireland, and features ‘wolfwalker’ Mebh – whose spirit turns into a wolf and roams around when she sleeps – and the headstrong hunter’s daughter Robyn.

The film oscillates between the city of Kilkenny and the neighbouring forest, and thematizes the tensions between the two realms. It shows, for instance, in true enactivist fashion, how the wolves of the forest are seen from different perspectives depending on one’s position and attitude. In the film’s introductory scene, the wolves threaten a group of loggers from the city; to the loggers, they appear as mysterious, terrifying and bloodthirsty. But to Robyn, who inadvertently turns into a Wolfwalker herself, the wolves become kin; to her, they are merely trying to protect whatever living space they have left. The film seems to suggest that, in order to understand the wolves, it is necessary to live, move and smell like them. In the film’s story, the conflict between humans and wolves is clearly to blame on the humans’ inability to understand the wolves on their own terms, to let them be in their wolfness.

Wolfwalkers also manages to convey the lived world of the wolves through expressive imagery (see also fig. 2). Certain scenes are shown from the perspective of the wolves, and they show how the wolves navigate the world primarily through smell and hearing: people and animals have their own distinctly coloured scents, and sounds reverberate through the ground as purple waves. The film thus not only treats the wolves as true subjects, but also recognizes that their embodiment and embeddedness influences the way they experience the world, which, in turn, affects their interactions with others. This latter point is exemplified by the scene in which Robyn’s wolf-spirit awakens for the first time, and she is utterly unable to communicate with her father, who sees her as a threat and an intruder in the home.

All in all, it might not be a coincidence that this film’s story takes place a mere thirteen years after Descartes wrote that the goal of the new philosophy is to “make ourselves [...] the lords and masters of nature” (*Discours de la Méthode*, published in 1637, cited from Descartes 1985, 142–43). The film shows the awkward transition period of modernity in which people were distancing themselves from the natural, and where non-human nature started to be seen increasingly as a resource to be exploited or a nuisance to

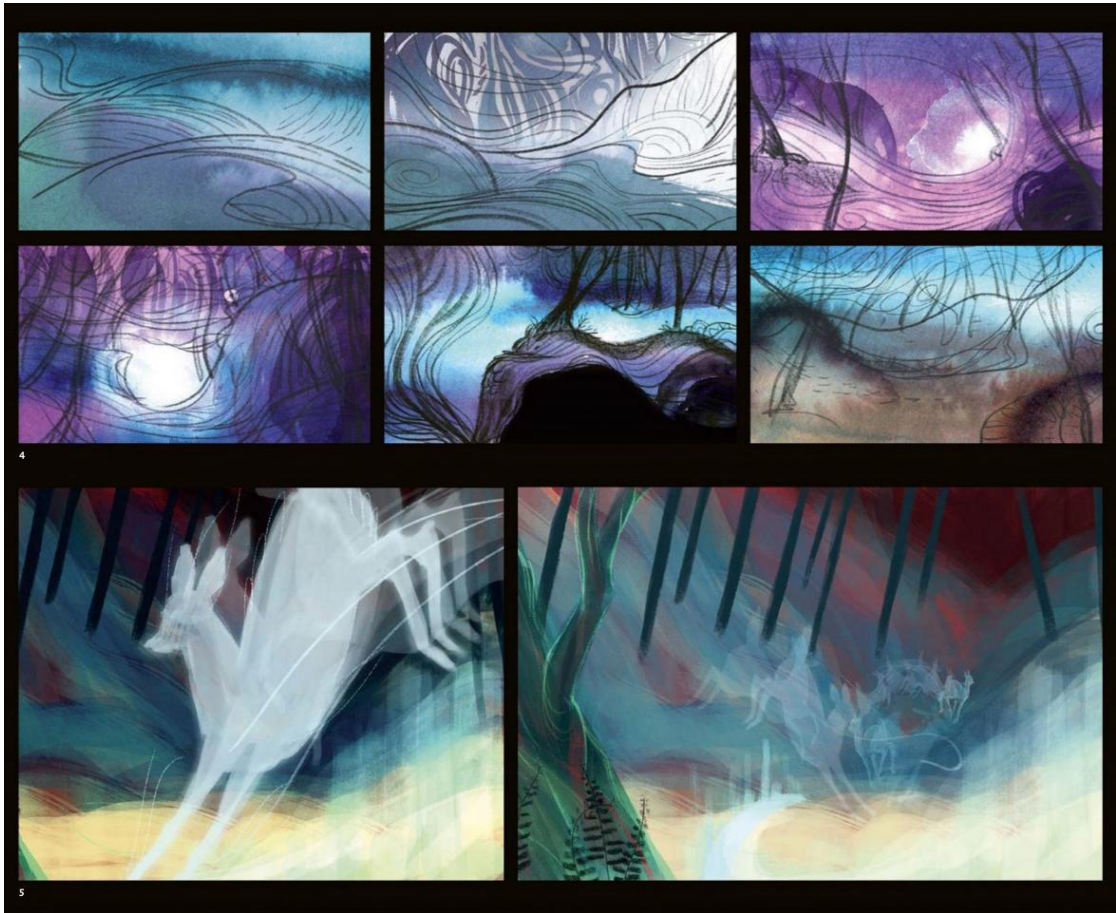


Figure 2: Concept art for the ‘Wolfvision’ of *Wolfwalkers*, showing how the artists created the experiential world of the wolves. Art by Friedrich Schäper (4) and Flora Taverner (5). Image taken from *The art of Wolfwalkers* (2020).

be eliminated. However, the film doesn't require this intellectual level of analysis in order to be understood and appreciated. After all, it is primarily a children's film, and its power lies not in its intellectual analysis but in its compelling storytelling and strong characters. It speaks directly to the imagination and has an ability to spark discussion that philosophical works often lack.

The Overstory (2019) Richard Powers' novel *The Overstory* chronicles nine different characters whose lives become entangled with trees in different ways. Although the novel resonates in many ways with the views described in this work, the focus here will be on its ability to thematize sense-making between humans and trees. In a particularly gripping series of scenes, two characters – Olivia and Nick, nicknamed 'Maidenhair' and 'Watchman' – inhabit a tree in order to defend them against an opportunistic logging company. The tree, a giant sequoia called Mimas, ends up hosting the human visitors for over a year, during which the two learn to live like a tree. They get accustomed to Mimas' rhythms, movements and moods, and they learn from them that in order to survive a storm, the trick is to stop resisting and ride the waves (576–77).⁴³ By letting Mimas be – by allowing them to influence their own way of life – Olivia and Nick grow into a new way of being and are irreversibly transformed.

Whole afternoons pass as Watchman sketches. He draws the mosses that sprout up in every crevice. He sketches the usnea and other hanging lichen that turn the tree into a fairy tale. His hand moves and the thought forms: *Who needs anything, except food?* And those like Mimas who make their own food—freest of all. (567)

Mimas – just like the wolves in *Wolfwalkers* – has become a subject for the human duo; someone deserving of love, care and respect. As *The Overstory* shows, this acknowledgment of subjecthood is only possible through the openness and vulnerability of the human actors. If humans are not willing to put their own pride, individuality and habitual ways of living on the line, they will never truly encounter the more-than-human world – and they will never see it as anything other than a collection of materials, ready for the taking.

There are certain insights that can only be gained through embodied experience. Works of art can provide this experience by speaking to the imagination. Hence, they can provide insight into what it means to live together with wolves or trees, or even what it might be like to be these creatures. Philosophical reflection, however illuminating, cannot bring these insights because it necessarily remains an abstraction. In order to gain access to the lived realities of others, and to develop our moral imagination past the human, what is needed is a 'diverse concreteness' that can only be provided by art. This is not to imply that art and philosophy cannot go together. John Berger's essays in *Why Look At Animals?* (2009) are poetic as much as they are philosophical, to such an extent that these two aspects – usually carefully kept from mingling – become one. However, in *academic* philosophy, the extent to which one can indulge in poetic language and descriptions of 'diverse concreteness' will generally be limited.

43. The numbers in the references to *The Overstory* refer to the section markings in the ebook edition.

4.4.5 Application: concrete encounters

To conclude this section, it will be insightful to discuss a few concrete examples that showcase what ‘fostering the encounter’ can mean in practice.

A live feed of Earth The first example is one that shows how technology can be employed for awareness rather than exploitation, even if in the smallest of ways. Technologist James Bridle describes a computer script they wrote that updates their computer’s desktop background every hour to an up-to-date satellite image of their local part of the Earth – in their case, the Mediterranean (Bridle 2022, 137). Moreover, they made their script publicly available⁴⁴, including clear documentation, so that anyone can implement it on their own system.

Bridle’s script, together with the publicly available images from the EUMETSAT project, allows anyone with access to the internet to see their corner of the Earth in almost-real-time with minimal effort. This project offers a different view of the places that people inhabit: users can look up, see a dark grey sky, and see on their screen where these clouds come from and where they are going. If one is willing to put in the work, it provides an opportunity of learning to link a limited and local perspective with a large-scale overview; to see how different scales connect and interact in ecological systems. Bridle argues throughout their book that although currently prevalent technologies mostly alienate people – from each other as well as from other species – other types of technology are possible. This script is a small-scale and relatively low-effort example of what such technology could look like.

Berry-picking The second example concerns berry-picking. Picking berries is an activity that can be done in different ways: patiently or hungrily, attentively or absent-mindedly, greedily or gratefully. However, heeding the other and letting them be means, first of all, being aware of who is handing over this gift of berries. This other is another living being who has put time and energy into making these sweet and sour treats. There are many ways of disrespecting the plant in its way of being – for instance, by taking as many as you can, or worse, by harvesting them as efficiently as possible and selling them. These ways of acting approach the plant as an ‘it’, as something to be appropriated and used to one’s own benefit. Approaching the plant as a fellow living being means realizing that their berries are not made for the sole purpose of feeding humans or their wallets. They exist to feed all kinds of animals, so that the plant’s seeds may spread and the plant may continue to flourish. Taking and enjoying some berries may actually contribute to that project. Taking them all, however, would not.

Kimmerer ([2013] 2020) points out that when everything becomes a gift, people will naturally feel self-constraint and only take what they need (29). It is the market economy that makes people selfish and greedy, and which makes the occasional gift seem like an opportunity to cash in. This, however, fundamentally misreads the nature of the gift: it is not to be maximized or used up but to be gratefully accepted and, if possible, shared. Gifts are expressions of, and co-constitute, an ongoing relationship.⁴⁵ According to Varela, Thompson and Rosch ([1991] 2016), too, the ‘self’ is fundamentally not a bounded

44. See <https://github.com/stml/weatherdesk>.

45. Michael Sandel (2012) has made similar observations about the incompatibility between gift-giving and the market economy.

territory marked by greed, but rather a dynamically constituted and ever-shifting process that is in constant interaction and cooperation with its environment, and capable of profound compassion or *karuna* (Varela, Thompson and Rosch [1991] 2016, 243–45, see also section 4.1.2). Hence, it is this capacity for compassion that needs to be tapped into when encountering a gift such as berries.

River restoration A third example concerns larger-scale action that can be taken by governments: restoring river ecosystems to a more original state. Such projects have recently been carried out in the US (Sundstrom 2013) and the UK (Morris 2022). In both cases, the rivers' flows had been severely limited in the past, having been reduced to one straight line so that the rest of the land could be used for agriculture. However, this reduction of landscape complexity also reduced biodiversity, gave invasive and non-native vegetation free range, and caused frequent floodings, among other issues. The restoration projects, which are both still ongoing at the time of writing, involve giving the river space to 'decide for itself' where it wants to go, as well as re-planting native vegetation and curbing invasive species.

Hence, these projects are balancing acts between letting the river be 'in its riverness', and taking active action to undo some of the damage caused by previous human activity. A simple hands-off policy would have been much less effective at restoration, since the ecosystems – being dynamic systems – had already settled into new, partly anthropogenic, stable states, which would have persisted for a long time without further action. These projects show that ecological restoration is much more involved than simply 'letting nature run its course'.⁴⁶

Concretely, and following De Jaegher (2021), this means that really knowing – and perhaps loving – a river ecosystem entails neither imposing one's own human will onto it, nor leaving it alone entirely. Rather, it is a precarious balancing act between human insights and river-insights. Humans know what they have done in the past and how that has affected the ecosystem. The river knows where and how it ought to flow, and how to cooperate with the land, vegetation and animals, in order to negotiate a dynamic equilibrium with the surrounding environment. It is only through a coordinated act of participatory sense-making between the river, the wider ecosystem, and humans that the latter has a chance at restoring the system to a healthier state.⁴⁷



46. In ecology, the idea that there is an inherent 'balance of nature' has been popular for some time, but is considered outdated since the late 1990s (Wu and Loucks 1995).

47. What exactly constitutes a 'healthy' ecosystem is, of course, a thorny issue. In the case of the mentioned restoration projects, the recognition that what humans have previously done for their own benefit is not necessarily healthy for the ecosystem seems to be an important step in the right direction. Moreover, the US project has contacted local tribes as partners, although it seems that the resulting partnerships are rather passive and mostly consist of informing the tribes of the plans for the area, rather than involving them from the start as experts. In any case, even with these tentatively positive signs, there remains the risk of having an overly anthropocentric idea of what constitutes ecosystem health. This work has pointed at some directions for addressing this issue, but it does not claim to have a ready-made answer. In any case, it seems clear that there is no one 'optimal' solution when it comes to ecosystem health.

5 Enactive Ecologies

It is time to open doors, not close them.

Stuart Kauffman, *Humanity in a Creative Universe*, 2016

5.1 Conclusion: Enactivism in Ecologies of Connectedness

What has emerged from this work, is a view on ecology and humanity that dissolves many of the traditional dualisms between the human and the non-human, and which takes embodiment and interaction to be central themes.

Chapter 3 has surveyed several features of enactive cognition and concluded that it undermines many of the dualisms that Val Plumwood also criticizes: subject/object, mind/body, reason/matter self/other and mind/nature, to name just a few. This chapter has shown that the enactive approach to cognition can help construct an ecological picture that is less anthropocentric and exclusionary, and more egalitarian, entangled, and complex – a picture of humanity *in* nature and *as* nature, rather than outside of it.

Chapter 4 has attempted to build on the synergies between care ethics and enactivism in the realm of environmental philosophy. In particular, it has emphasized the importance of the encounter by applying enactive conceptions of participatory sense-making and letting be. Its main takeaway is that any affinity for, or knowledge about, the more-than-human world has to be built up through direct experience, of which the encounter with the more-than-human other is a vital part. The ‘radical otherness’ of the other, so this chapter has argued, is not an inherent property of that being, but is always a product of the interaction between the human and more-than-human participants. Hence, this chapter has urged to examine the human side of the equation: what attitude and which presuppositions do we bring to our encounters with ‘nature’? How do these factors shape our interactions? And how could we change so as to make our encounters flourish? This chapter has suggested that a radical openness and an attentiveness to the present moment are indispensable for fostering human–non-human interactions, and thus a healthier, more caring relationship with the non-human world.

The direction that this work has taken has significant overlap with other philosophical texts. Apart from Plumwood’s ecofeminism discussed in chapter 2, there is a strong affinity with Donna Haraway’s *Staying with the Trouble* (2016), James Bridle’s *Ways of Being* (2022), Robin Wall Kimmerer’s *Braiding Sweetgrass* ([2013] 2020), and Bruno Latour’s *Facing Gaia* (2017) and his ‘fictional planetarium’ (2019) – most of which have also appeared throughout this text. The common factor between these works is that

they attempt to sketch an ecology of connectedness, one that distances itself from the individualism and rationalism of conventional environmental philosophy, and aims to move towards a new understanding of embodiment, entanglement, and our place within the incomprehensible web of life that is planet Earth. These works, in various ways, point to a middle way: between modernism and post-modernism, between scientism and relativism, between ecomodernism and technological determinism, between optimism and pessimism, and between spirituality and scientific understanding. These middle ways are not compromises, but radical new directions that break through dualistic modes of thought. Embracing them requires letting go of the well-worn paths and forging new ones, ignorant of where exactly they will lead: laying down a path in walking.

The point of making explicit these connections with other works, is to make it clear that the direction that this work has developed into is not a new one. It is supported and nurtured on all sides by works like the ones mentioned, as well as many others. The aim of this work has not been to develop an unprecedented approach to ecology, but rather to show how enactivism can contribute to this connectedness-first approach that is currently being developed. It has attempted to show how enactivist concepts such as autopoiesis, the enacted self, and participatory sense-making synergize with and strengthen this approach to ecology.

5.2 Criticisms and replies

This section will consider two possible criticisms of the work presented here. Because of the relative novelty of the present approach, these criticisms will necessarily be imagined rather than actual – although they will be based on existing arguments and critiques of other works. Nevertheless, the aim is to do these critiques justice and to explore their implications for the view described in this work.

5.2.1 What about glaciers?

The enactive approach to ecology as sketched in this work seems to be mostly concerned with living beings. That is, it seems to favour expanding our circle of concern to include all life – not just humans, but also animals, plants, fungi, unicellular life, and everything in between – but this equally seems to imply that this new border excludes anything that is not biologically alive. From the perspective of ecological awareness, this position can be questioned. ‘What about glaciers?’, a critic might rightfully ask, ‘Or the ozon layer? Canyons? Mountain ranges?’ This is a criticism that could come especially from animist and so-called ‘new-animist’ positions, which see all of nature – biotic *and* abiotic – as alive and possessing personhood (Brennan and Lo 2022, §3.3).

For instance, the ecologist Robin Wall Kimmerer, whose writings have been recruited at numerous points in this text, points out that the Potawatomi language – the indigenous language that helps her understand her ecological surroundings – draws a very different distinction between animate and inanimate than European languages do (Kimmerer [2013] 2020, 48–59). In Potawatomi, not only plants and animals, but also “rocks are animate, as are mountains and water and fire and places. Beings that are imbued with spirit, our sacred medicines, our songs, drums, and even stories, are all animate.” (55–56). All of these are addressed with ‘they’ rather than ‘it’, and they ‘*yawe*’ – the animate ‘to be’ – rather than ‘*yewe*’ – the

inanimate form. Only human-made objects such as tables can be inanimate.

Indeed, concern for inanimate nature carries a certain urgency in the Anthropocene. As glaciers are globally receding at ever-increasing rates (Zemp et al. 2019), the question arises whether the only tool at our disposal for protecting them is an instrumental rationality – that is, arguing that the disappearance of glaciers is undesirable only to the extent that it negatively impacts living beings. Considering that this instrumental rationality is precisely what the enactive approach to ecology aimed to avoid with regard to anthropocentrism and zoocentrism, it seems at least plausible that it is problematic with regard to biocentrism as well.

Is a purely biocentric concern unavoidable on the enactive approach? A recent article by Thompson (2022) makes an argument that may suggest otherwise. In it, he discusses different views on the extent of sentience: that it is limited to animals (zoopsychism), to living organisms (biopsychism), or that it is a feature of all matter or reality itself (panpsychism). As discussed in section 3.5.4, the enactive approach seems to support either a biopsychist or a zoopsychist position (although I have argued that the burden of proof is on those who make the zoopsychist claim that non-animal life lacks sentience). Thompson, however, argues that biopsychism and panpsychism are not incompatible (20–23). It might be true, he writes, that all matter is sentient, while it being equally true that only living organisms have ‘individual sentience’.

What this means is that panpsychism, if true, gives non-biological matter “elementary sentience” only (21). This is not yet the kind of sentience that organic life has, but merely forms the basic building blocks for it. Organic sentience, on the other hand, is wrapped up in a being’s individuality, in that it is the experience of the world from the point of view of an organism’s enacted self. According to Thompson, panpsychism and biopsychism can actually strengthen one another. After all, panpsychism on its own cannot explain why organic beings exhibit the individuality that they do – i.e. why they seem to be such strong loci of sentience compared to non-organic collections of matter (the so-called ‘boundary problem’). The enactive approach does have an explanation for this, already discussed in section 3.3: biological organisms are individuals because they self-individuate through autopoiesis; they continuously produce and renew their own constitutive processes and thus enact a self. On this view, both theories have their place: panpsychism describes the metaphysics of sentience in the universe, and (enactive) biopsychism describes the emergence of individual sentience in organisms.

However, it is questionable whether this reply truly resolves the critic’s issue. On this combined view, it seems that the relevant type of sentience is still restricted to organic life only. What it means for non-living matter to be sentient but not ‘individually sentient’ is unclear. This theory does not hold much value for truly addressing the glacier criticism until the exact nature of this basic sentience is specified. It seems that more work is required in developing a combined enactive–panpsychist view on sentience.

There is, however, another possible response to the glacier critique. It begins by pointing out that this critique assumes that the enactive approach to ecology locates inherent value in living, sentient beings *only*, and not in non-living matter. However, this assumption rests on a subtle misunderstanding. It redescribes the enactive approach to ecology in the terminology of rationalistic ethical theories: ‘find out what the Good is, locate inherent value accordingly, and draw inferences about what to do from there’. However, as

discussed in section 2.1, Plumwood criticized exactly this ethical approach to environmental philosophy, and the enactive approach suggested here has avoided going that route.

‘Inherent value’, on the enactive approach, is not in certain mental states of individuals, in certain character traits, or in reason, but exists rather *in the entire life-world of every organism*. It is worth spelling out the difference in some detail. In rationalistic moral theories, the objective world is taken for granted, and certain features of that world are said to carry inherent value: utility (pleasure minus pain) on the utilitarian account, actions carried out with respect for the categorical imperative on the deontological account, et cetera. Enactivism, however, starts from the position that organism and world mutually specify each other: the organism is formed by the material opportunities and constraints of the environment, and the world appears in a certain way to said organism. The life-world of the organism – which is the only world that matters on the enactive account – is thus already suffused with normativity.

Because of this, the conclusion that ‘only *x* are sentient’ does not lead to the ethical claim that ‘only *x* have inherent value’ on the enactive account. After all, value, on the enactivist account, is *in* the life-world itself, i.e. in the experience of the world. This means that anything can be valuable, including, for instance, a sucrose gradient to an *E. coli* bacterium, or a glacier to a human being. This is no instrumental or second-grade value; the glacier has proper, first-class value, due simply to the fact that it is being valued.

The distinction in enactivism between life and non-life, sentience and non-sentience, then, does not equal a distinction between inherent and instrumental value, but rather determines what kinds of things in the world can and cannot *experience* value. Since the experience of value, on the enactivist account, is also the creation of value, the distinction between life and non-life maps onto the distinction between which things can be loci of value, and which things cannot. That is to say, a hypothetical world without any biological life would be a world in which value does not come into play. This makes sense, since in a lifeless world there would be nothing to enact a life-world. In an important sense, a lifeless world would be a world without *worlds*.

5.2.2 ‘Post-truth’ philosophy

The accusation of ‘post-truth’ philosophy has been levelled at philosophers such as Bruno Latour and Donna Haraway (Haraway 2023; for a recent example see Stamenkovic 2020). The general critique is that these philosophers have developed philosophies that reject a belief in reality, truth and science, and that they contribute to a dangerous culture of relativism and nihilism. Although the same criticism has, to my knowledge, not (yet) been given to enactivism, it is not an unlikely response. After all, enactivism too denies the idea of an absolute ground in the form of a material world ‘out there’ that can be discovered. That is, the enactive project does not start from a fixed (material) world and a fixed (mental) observer of said world – as realist philosophies do – but rather from an *interaction* in which world and organism mutually specify one another. The ontological implications of this stance are rarely explicitly discussed in enactivist literature⁴⁸, but as argued in section 5.2.1, a world without minds would be, in an important

48. Varela, Thompson and Rosch ([1991] 2016) are quite radical in their evocations of groundlessness (217–234), which suggests a rejection of the idea of a mind-independent reality. However, subsequent literature has not engaged much with this subject. One exception is Weichold and Rucińska (2021), who dedicate a footnote to the question whether the enactive approach denies the existence of mind-independent reality (p. 9, footnote 5).

sense, a world without worlds.

The enactive response to the post-truth critique that I want to put forward is similar to the discussion of Varela, Thompson and Rosch about nihilism about the self (235–43 [1991] 2016, discussed in section 3.3.4), as well as to Latour’s and Haraway’s own responses to the critique.

Haraway (2023, 165–66) recalls an encounter that she and Latour had at a conference, where a behavioural psychologist asked them whether they ‘believed’ in science (although Latour recalls the question as being “Do you believe in reality?”; Latour 1999, 1). For them, however, belief does not come into the picture at all. Reality is not something to believe in, or which one can stop believing in; reality is rather what is experienced and inhabited. Reality is about the “domain of worlding” (Haraway in Weigel 2019); and as long as there is worlding, there is simply no question whether there is a world or not: it is right here, you and I inhabit it right now. Although Latour did not use a term like ‘worlding’, for him, too, reality is about real-world action rather than belief. This is why in the foreword of his 1999 book *Pandora’s Hope*, he described his project of science studies – in which he studied the workings of scientific practice in an anthropological fashion – as having “added reality to science, surely not withdrawn any from it” (Latour 1999, 2, emphasis in original). For him, describing the actual goings-on of scientists means taking science out of the abstract reference frame that it is usually put in, and into the real world. Instead of a “pale and bloodless objectivity” (2), there is life, action, intrigue, and countless interactions between humans and non-humans that are real and not merely posited.

The problem, it seems, is that in everyday talk, ‘reality’ has stopped meaning *life-world* and has drifted more and more towards ‘*outside world*’ (see e.g. Latour’s discussion on ‘the strange invention of an outside world’, 1999, 3–7). The problem with reality as an ‘outside world’ is that it presupposes a split between inside (mind) and outside (world), which in turn introduces the ‘problem of the bridge’: how do minds ‘represent’ the ‘outside world’?

Latour and Haraway sidestep this question by dismissing entirely the inside–outside split and speaking instead of ‘worlding’ (Haraway 2023) and ‘networking’ (Kofman 2018). The enactive approach, as discussed, sidesteps the question by putting forward an entirely different picture of cognition: not as representation but as sense-making, an interactive process occurring between organism and environment. In both cases, a middle way is found between the supposed opposites of objectivism and nihilism. This middle way entails the recognition that the two are not really opposites, but rest on a shared inside–outside logic, the negation of which opens up new pathways for exploration.

Hence, the charge that these philosophies would bring forth some kind of dangerous ‘post-truth’ culture rests on a misunderstanding of the philosophies themselves. Those who make the charge think that the philosophies in question deny that reality exists, while what they are actually denying is the identification of ‘reality’ with an objective ‘outside world’. Reality, rather, is a process that does not have to be believed in to exist. It is difficult to call by name because it is ubiquitous and all-encompassing – some terms for it are *worlding*, *networking*, *sense-making*, *sharing a world* (Bridle 2022) and *intra-acting* (Barad 2007). These terms all have importantly different connotations and contexts, but their shared baseline is a wish to address the *process* of living and inhabiting which is already infused with subjectivity, rather than the supposedly objective *things* that inhabit or are inhabited.

Hence, neither enactivists nor philosophers such as Haraway and Latour would deny the importance of scientific findings about the state of the Anthropocene. They would, however, emphasize that the scientific method is always an abstraction from our direct familiarity with the world – an important and sometimes necessary abstraction, but an abstraction nonetheless. Recall, for instance, Hanne de Jaegher’s claim that detached knowing (i.e. the objective, scientific approach) is detached precisely from engaged knowing (see section 4.3.2), and compare that to Latour’s comments about the scientific practice of representing:

I hope to show that what characterizes the so-called scientific ways of expressing oneself is not the fact that scientists’ objects of study are *inanimate* but only the fact that our *degree of familiarity* with these objects or “actors” is *very slight*; the inanimate “actors” or *actants*, thus need to be presented *at greater length* than the characters we call anthropomorphic, with whom we believe we’re better acquainted. (Latour 2017, Lecture 2, emphasis in original)

For Latour, there is no qualitative difference between human and non-human *actants*; there are only our differing levels of familiarity with them. Science is an attempt at filling that lacuna through scientific representation.⁴⁹ Hence, it could be said that the philosophy of Latour and Haraway, as well as the enactive approach to ecology sketched here, are new attempts to go ‘back to the things themselves’⁵⁰ – with the recognition that ‘the things’ are not the distant objects of science but the real, intimate and meaningful goings-on in the living, breathing world.



49. A difference between Latour and Haraway is that Latour emphasized the importance of these scientific ‘inscriptions’ and “trials of strength” in making knowable the faraway and the alien, whereas Haraway emphasizes the role of “caring and diverse collective composing and decomposing, something with a sensorium not restricted to vision or writing” (Haraway 2023, 166). In the vocabulary of De Jaegher, one could say that Latour’s focus was more on detached knowing, whereas Haraway’s focus is more on engaged knowing.

50. A reappropriation of Husserl’s phrase in his *Logical Investigations* (Husserl [1900] 2001, 88).

Bibliography

- Adams, Fred. 2010. 'Embodied cognition'. *Phenomenology and the Cognitive Sciences* 9, no. 4 (September): 619–628. <https://doi.org/10.1007/s11097-010-9175-x>.
- Agathokleous, Evgenios, Ivo Iavicoli, Damià Barceló and Edward J. Calabrese. 2021. 'Ecological Risks in a 'Plastic' World: A Threat to Biological Diversity?' *Journal of Hazardous Materials* 417 (September): 126035. ISSN: 0304-3894. <https://doi.org/10/gj2g5z>.
- Ahmed, Sara. 2017. *Living a Feminist Life*. Durham, NC: Duke University Press. ISBN: 978-0-8223-6319-4.
- Asoulin, Eran, Paul Richard Blum, Tony Cheng, Daniel Haas, Jason Newman, Henry Shevlin and Elly Vintiadis. 2019. *Introduction to Philosophy Philosophy of Mind: Philosophy of Mind*. Edited by Heather Salazar. Introduction to Philosophy. Rebus Community. ISBN: 9781989014073.
- Barad, Karen. 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Duke University Press, July. <https://doi.org/10.2307/j.ctv12101zq>.
- Begon, Michael and Colin R. Townsend. 2021. *Ecology: From Individuals to Ecosystems*. Fifth edition. Hoboken, NJ: Wiley-Blackwell. ISBN: 978-1-119-27935-8. <https://www.wiley.com/en-ca/Ecology:+From+Individuals+to+Ecosystems,+5th+Edition-p-9781119279310>.
- Berger, John. 1972. 'Ways of Seeing'. BBC.
- . 2009. *Why Look At Animals?* Penguin Books. ISBN: 9780141043975.
- BGCI. 2021. *State of the World's Trees*. Richmond, UK: BGCI. <https://www.bgci.org/wp/wp-content/uploads/2021/08/FINAL-GTAReportMedRes-1.pdf>.
- Boehm, Sophie, Louise Jeffery, Kelly Levin, Judit Hecke, Clea Schumer, Claire Fyson, Aman Majid et al. 2022. *State of Climate Action 2022*. Berlin and Cologne, Germany, San Francisco, CA, and Washington, DC: Bezos Earth Fund, Climate Action Tracker, Climate Analytics, ClimateWorks Foundation, NewClimate Institute, the United Nations Climate Change High-Level Champions, and World Resources Institute. <https://doi.org/10/grgqv4>.
- Boisvert, Mathieu. 1995. *The five aggregates: Understanding Theravāda psychology and soteriology*. 166. Editions SR 17. Wilfrid Laurier University Press. ISBN: 0-88920-257-5.
- Brennan, Andrew and Norva Y. S. Lo. 2022. 'Environmental Ethics'. In *The Stanford Encyclopedia of Philosophy*, Summer 2022, edited by Edward N. Zalta. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/sum2022/entries/ethics-environmental/>.
- Bridle, James. 2022. *Ways of Being: Animals, Plants, Machines: The Search for a Planetary Intelligence*. First American edition. New York: Farrar, Straus and Giroux. ISBN: 978-0-374-60111-9.
- Briggs, George M. 2022. *Inanimate Life*. Version 2.0. Milne Open Textbooks, July. <https://milnepublishing.geneseo.edu/botany/chapter/physarum/>.
- Bunten, Alexis Celeste. 2022. 'Defending the Indigenous Rights of Nature' [in en]. *NMAI Magazine* 23, no. 1 (Spring). <https://www.americanindianmagazine.org/story/indigenous-rights-of-nature>.
- Candland, Douglas K. 1993. *Feral children and clever animals: Reflections on Human Nature*. 411. Oxford University Press. ISBN: 0195074688.
- Carlson, Colin J., Gregory F. Albery, Cory Merow, Christopher H. Trisos, Casey M. Zipfel, Evan A. Eskew, Kevin J. Olival, Noam Ross and Shweta Bansal. 2022. 'Climate Change Increases Cross-Species Viral Transmission Risk'. *Nature* (April): 1–1. ISSN: 1476-4687. <https://doi.org/10/hrxm>.
- Chalmers, David J. 1995. 'Facing up to the Problem of Consciousness'. *Journal of Consciousness Studies* 2 (3): 200–19.

- Chalmers, David J. 1996. *The conscious mind: in search of a fundamental theory*. 414. Oxford University Press. ISBN: 0195105532.
- Cheney, Dorothy L. and Robert M. Seyfarth. 2007. *Baboon Metaphysics: The Evolution of a Social Mind*. Chicago: University of Chicago Press. ISBN: 978-0-226-10243-6.
- Cochrane, Regina. 2014. 'Climate Change, "Buen Vivir", and the Dialectic of Enlightenment: Toward a Feminist Critical Philosophy of Climate Justice'. *Hypatia* 29, no. 3 (3): 576–598. ISSN: 08875367, 15272001. JSTOR: 24542018. <http://www.jstor.org/stable/24542018>.
- Cumhaill, Clare Mac and Rachael Wiseman. 2023. *Metaphysical Animals: How Four Women Brought Philosophy Back to Life*. Vintage. ISBN: 978-1-5291-1218-4.
- de Haan, Sanneke. 2020. *Enactive Psychiatry*. Cambridge: Cambridge University Press. ISBN: 978-1-108-42606-0. <https://doi.org/10/gr5tfv>.
- De Jaegher, Hanne. 2021. 'Loving and Knowing: Reflections for an Engaged Epistemology'. *Phenomenology and the Cognitive Sciences* 20 (5): 847–870. <https://doi.org/10/gghxcp>.
- De Jaegher, Hanne and Ezequiel Di Paolo. 2007. 'Participatory Sense-Making'. *Phenomenology and the Cognitive Sciences* 6, no. 4 (December): 485–507. ISSN: 1572-8676. <https://doi.org/10/bh4wtx>.
- De Vos, Jurriaan M., Lucas N. Joppa, John L. Gittleman, Patrick R. Stephens and Stuart L. Pimm. 2015. 'Estimating the Normal Background Rate of Species Extinction.' *Conservation biology* (United States) 29, no. 2 (2): 452–462. ISSN: 1523-1739 0888-8892. <https://doi.org/10/f66dhk>.
- de Waal, Frans. 2016. *Are We Smart Enough to Know How Smart Animals Are?* ISBN: 978-0-393-35366-2.
- Deary, Ian J. 2020. *Intelligence: A Very Short Introduction*. Second edition. Very Short Introductions. Oxford: Oxford University Press, March. ISBN: 9780192515988. <https://doi.org/10.1093/actrade/9780198796206.001.0001>.
- Descartes, René. 1985. *The Philosophical Writings of Descartes*. Translated by John Cottingham, Robert Stoothoff and Dugald Murdoch. Vol. 1. Cambridge, New York: Cambridge University Press. ISBN: 0-521-24594-X.
- Dowler, Crispin and Lawrence Carter. 2021. 'Leaked Documents Reveal the Fossil Fuel and Meat Producing Countries Lobbying against Climate Action'. *Unearthed*, October. <https://unearthed.greenpeace.org/2021/10/21/leaked-climate-lobbying-ipcc-glasgow/>.
- Durt, Christoph, Thomas Fuchs and Christian Tewes, eds. 2017. *Embodiment, Enaction, and Culture: Investigating the Constitution of the Shared World*. Cambridge: The MIT Press. ISBN: 978-0-262-33712-0. https://muse.jhu.edu/pub/6/edited_volume/book/51829.
- Dwivedi, O. P. 1993. 'Human Responsibility and the Environment: A Hindu Perspective'. *Journal of Hindu-Christian Studies* 6, no. 1 (January). ISSN: 2164-6279. <https://doi.org/10/gr5tfn>.
- Eaton, A. W. 2012. 'What's Wrong with the (Female) Nude? A Feminist Perspective on Art and Pornography'. In *Art and Pornography: Philosophical Essays*, edited by Hans Maes and Jerrold Levinson, 277–308. Oxford University Press. ISBN: 978-0-19-960958-1. <https://doi.org/10/gr5tf2>.
- Ehrlich, Philippa and James Reed. 2020. *My Octopus Teacher*. documentary film. <https://seachangeproject.com/my-octopus-teacher/>.
- European Environment Agency. 2022. 'What is harming Europe's nature?', <https://www.eea.europa.eu/signals/signals-2021/signals-2021/articles/what-is-harming-europe2019s-nature>.
- Federici, Silvia. 2004. *Caliban And The Witch*. Penguin Classics. penguin Random House UK, September. ISBN: 978-0-241-53253-9. <http://archive.org/details/CalibanAndTheWitchWomenTheBodyAndPrimitiveAccumulation>.

- Fodor, Jerry A. 1980. *The Language of Thought*. Language and Thought. Cambridge, MA: Harvard University Press, January. ISBN: 978-0-674-51030-2.
- Foglia, Lucia and Rick Grush. 2011. 'The Limitations of a Purely Enactive (Non-Representational) Account of Imagery'. *Journal of Consciousness Studies* 18 (5-6): 35–43.
- Formosinho, Joana, Adam Bencard and Louise Whiteley. 2022. 'Environmentality in Biomedicine: Microbiome Research and the Perspectival Body'. *Studies in History and Philosophy of Science* 91 (February): 148–158. ISSN: 0039-3681. <https://doi.org/10/gr5tf3>.
- Gallagher, Shaun. 2017. *Enactivist Interventions: Rethinking the Mind*. Oxford University Press.
- Gallagher, Shaun and Dan Zahavi. 2008. *The Phenomenological Mind: An Introduction to Philosophy of Mind and Cognitive Science*. Taylor & Francis Group. ISBN: 9780203086599.
- Gibb, Rory, David W. Redding, Kai Qing Chin, Christl A. Donnelly, Tim M. Blackburn, Tim Newbold and Kate E. Jones. 2020. 'Zoonotic Host Diversity Increases in Human-Dominated Ecosystems'. *Nature* 584, no. 7821 (7821): 398–402. ISSN: 1476-4687. <https://doi.org/10/gg66c6>.
- Gilbert, Jack, Martin J. Blaser, J. Gregory Caporaso, Janet Jansson, Susan V. Lynch and Rob Knight. 2018. 'Current Understanding of the Human Microbiome'. *Nature medicine* 24, no. 4 (April): 392–400. ISSN: 1078-8956. <https://doi.org/10/gc923m>.
- Graham, George. 2010. *The Disordered Mind: An Introduction to Philosophy of Mind and Mental Illness*. Routledge. ISBN: ISBN 0-203-85786-0.
- Grimm, Nancy B, F Stuart Chapin III, Britta Bierwagen, Patrick Gonzalez, Peter M Groffman, Yiqi Luo, Forrest Melton et al. 2013. 'The Impacts of Climate Change on Ecosystem Structure and Function'. *Frontiers in Ecology and the Environment* 11, no. 9 (9): 474–482. ISSN: 1540-9309. <https://doi.org/10/f5f35z>.
- Haraway, Donna. 2016. *Staying with the Trouble: Making Kin in the Chthulucene*. 304. Experimental Futures: Technological Lives, Scientific Arts, Anthropological Voices. Duke University Press. ISBN: 9780822373780.
- . 2023. 'Present to Bruno, from Donna'. *Social Studies of Science* 53 (2): 165–168. <https://doi.org/10.1177/03063127231157395>.
- Hesse, Herman. (1922) 2001. *Siddhartha: An Indian Tale*. Translated by Gunther Olesch, Anke Dreher, Amy Coulter, Stefan Langer and Semyon Chaichenets. Project Gutenberg. <https://www.gutenberg.org/ebooks/2500>.
- Hu, Duofei, Maocai Shen, Yaxin Zhang, Hongjuan Li and Guangming Zeng. 2019. 'Microplastics and Nanoplastics: Would They Affect Global Biodiversity Change?' *Environmental Science and Pollution Research* 26, no. 19 (July): 19997–20002. ISSN: 1614-7499. <https://doi.org/10/gg9q48>.
- Huggins, Adam and Mendel Skulski. 2018. 'On Fire: Camas, Cores, and Spores (Part 1)'. *Future Ecologies*, no. 1.5. <https://www.futureecologies.net/listen/fe1-5-on-fire-pt-1>.
- Hunt, Elle. 2020. 'An octopus 'love story' on Netflix has caused thoughts to run wild. Why?' *The Guardian*, <https://www.theguardian.com/commentisfree/2020/sep/24/octopus-love-story-netflix>.
- Husserl, Edmund. (1900) 2001. *The Shorter Logical Investigations*. Edited by Dermot Moran. Translated by J. N. Findlay. London: Routledge. ISBN: 0-415-24192-8.
- Hutto, Daniel D. and Erik Myin. 2013. *Radicalizing Enactivism: Basic Minds without Content*. Cambridge, MA, USA: MIT Press. ISBN: 978-0-262-01854-8.
- Hutto, Daniel D., Erik Myin, Anco Peeters and Farid Zahnoun. 2018. 'The Cognitive Basis of Computation'. In *The Routledge Handbook of the Computational Mind*, 272–282. Routledge, August. ISBN: 978-1-315-64367-0. <https://doi.org/10/gr5tgc>.

- IEA. 2023. 'The global energy crisis pushed fossil fuel consumption subsidies to an all-time high in 2022', <https://www.iea.org/commentaries/the-global-energy-crisis-pushed-fossil-fuel-consumption-subsidies-to-an-all-time-high-in-2022>.
- IPCC. 2021. *Summary for Policymakers*. Cambridge University Press. <https://www.ipcc.ch/report/ar6/wg1/#SPM>.
- . 2022. *Summary for Policymakers*. Cambridge, New York: Cambridge University Press. <https://doi.org/10.1017/9781009157926.001>.
- James, William. 1983. *The principles of psychology*. 1302. Harvard University Press. ISBN: 0674706250.
- Jaworski, William. 2011. *Philosophy of Mind: A Comprehensive Introduction*. 520. Wiley-Blackwell. ISBN: 9781444397581.
- Johnson, Christine K., Peta L. Hitchens, Pranav S. Pandit, Julie Rushmore, Tierra Smiley Evans, Cristin C. W. Young and Megan M. Doyle. 2020. 'Global Shifts in Mammalian Population Trends Reveal Key Predictors of Virus Spillover Risk'. *Proceedings of the Royal Society B: Biological Sciences* 287, no. 1924 (1924): 20192736. ISSN: 1471-2954. <https://doi.org/10/ggrdwz>.
- Kant, Immanuel. (1785) 1998. *Groundwork of the Metaphysics of Morals*. Edited and translated by Mary Gregor. Cambridge Texts in the History of Philosophy. Cambridge University Press. ISBN: 0521622352.
- Kauffman, Stuart A. 2016. *Humanity in a Creative Universe*. Oup Usa.
- Kawall, Jason. 2017. 'A History of Environmental Ethics'. In *The Oxford Handbook of Environmental Ethics*, edited by Stephen M. Gardiner and Allen Thompson, 13–26. Oxford Handbooks. Oxford University Press, January. ISBN: 978-0-19-998361-2. <https://doi.org/10/gr5tf6>.
- Khattar, Jennifer, Paco Calvo, Ina Vandebroek, Camilla Pandolfi and Farid Dahdouh-Guebas. 2022. 'Understanding interdisciplinary perspectives of plant intelligence: Is it a matter of science, language, or subjectivity?' *Journal of Ethnobiology and Ethnomedicine* 18, no. 1 (May). <https://doi.org/10.1186/s13002-022-00539-3>.
- Kim, Jaegwon. 2013. *Philosophy of Mind*. 384. Avalon Publishing. ISBN: 9780813345208.
- Kimmerer, Robin Wall. (2013) 2020. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Penguin Books. ISBN: 9780141991955.
- Kofman, Ava. 2018. 'Bruno Latour, the Post-Truth Philosopher, Mounts a Defense of Science'. *The New York Times Magazine*, <https://www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html>.
- Lakoff, George and Rafael Nuñez. 2001. *Where Mathematics Comes From: How the Embodied Mind Brings Mathematics into Being*. 512. Basic Books. ISBN: 9780465037711.
- Lanz, Peter. 2000. 'The Concept of Intelligence in Psychology and Philosophy'. In *Prerational Intelligence: Adaptive Behavior and Intelligent Systems Without Symbols and Logic, Volume 1, Volume 2 Prerational Intelligence: Interdisciplinary Perspectives on the Behavior of Natural and Artificial Systems, Volume 3*, 19–30. Springer Netherlands. https://doi.org/10.1007/978-94-010-0870-9_3.
- Larsen, Brendan B., Elizabeth C. Miller, Matthew K. Rhodes and John J. Wiens. 2017. 'Inordinate Fondness Multiplied and Redistributed: The Number of Species on Earth and the New Pie of Life'. *The Quarterly Review of Biology* 92, no. 3 (September): 229–265. ISSN: 0033-5770. <https://doi.org/10/gbv bq7>.
- Latour, Bruno. 1993. *We Have Never Been Modern*. Translated by Catherine Porter. Cambridge, MA: Harvard University Press, October. ISBN: 978-0-674-94839-6.
- . 1999. "'Do you believe in reality?'" —news from the trenches of the Science Wars'. Chap. Foreword in *Pandora's Hope: Essays on the Reality of Science Studies*, 1–17. Cambridge: Harvard University Press. ISBN: 978-0-674-65336-8.

- Latour, Bruno. 2017. *Facing Gaia: Eight Lectures on the New Climatic Regime*. Epub. Cambridge, Malden: Polity. ISBN: 9780745684376.
- . 2019. “‘We don’t seem to live on the same planet’—A Fictional Planetarium”. In *Designs for Different Futures*, edited by Kathryn B. Hiesinger and Michelle Millar Fisher, 193–199. New Haven and London: Yale University Press. ISBN: 9789024433285.
- Lavallee, Zoey. 2016. ‘What’s Wrong with the (White) Female Nude?’ *Estetyka i Krytyka. The Polish Journal of Aesthetics* 41 (2): 77–97. https://pjaesthetics.uj.edu.pl/documents/138618288/138826957/eik_41_4.pdf/aab1ceb2-c6d3-4692-ad30-cb220fbb2da2.
- Le Guin, Ursula K. 1983. *The Compass Rose*. 288. Spectra. ISBN: 9780553235128.
- Li, Mei, Gregory Trencher and Jusen Asuka. 2022. ‘The clean energy claims of BP, Chevron, ExxonMobil and Shell: A mismatch between discourse, actions and investments’. *PLOS ONE* 17 (2): 1–27. <https://doi.org/10.1371/journal.pone.0263596>.
- Lindsay, Bethany. 2018. ‘It blows my mind’: How B.C. destroys a key natural wildfire defence every year’. *CBC News*, <https://www.cbc.ca/news/canada/british-columbia/it-blows-my-mind-how-b-c-destroys-a-key-natural-wildfire-defence-every-year-1.4907358>.
- Linett, Maren Tova. 2020. *Literary Bioethics: Animality, Disability, and the Human*. Crip: New Directions in Disability Studies. New York: New York University Press. ISBN: 978-1-4798-0126-8.
- Lynch, Susan V. and Oluf Pedersen. 2016. ‘The Human Intestinal Microbiome in Health and Disease’. *New England Journal of Medicine* 375, no. 24 (December): 2369–2379. ISSN: 0028-4793. <https://doi.org/10/gf8pc7>.
- Maclaren, Kym. 2002. ‘Intercorporeality, Intersubjectivity and the Problem of “Letting Others Be”’. *Chiasmi International* 4 (January): 187–208. <https://doi.org/10.5840/chiasmi2002431>.
- Matthen, Mohan. 2014. ‘Debunking Enactivism: A Critical Notice of Hutto and Myin’s Radicalizing Enactivism’. *Canadian Journal of Philosophy* 44 (1): 118–128. <https://doi.org/10.1080/00455091.2014.905251>.
- Medina, José. 2013. ‘An Enactivist Approach to the Imagination: Embodied Enactments and “Fictional Emotions”’. *American Philosophical Quarterly* 50 (3): 317–335. ISSN: 0003-0481. JSTOR: 24475354. <http://www.jstor.org/stable/24475354>.
- Metten, Alman. 2023. ‘Belastingvoordelen voor fossiele brandstoffen nóg veel groter’. *Me Justice*, <https://www.mejustice.nl/artikelen/detail/belastingvoordelen-voor-fossiele-brandstoffen-nog-veel-groter>.
- Mills, Charles W. 2007. ‘White Ignorance’. In *Race and Epistemologies of Ignorance*, edited by Shannon Sullivan and Nancy Tuana, 11–38. State Univ of New York Pr.
- Milman, Oliver. 2022. ‘Criticism intensifies after big oil admits ‘gaslighting’ public over green aims’. *The Guardian*, <https://www.theguardian.com/environment/2022/sep/17/oil-companies-exxonmobil-chevron-shell-bp-climate-crisis>.
- Ministerie van Financiën. 2023. *Integraal overzicht klimaat*. <https://www.rijksfinancien.nl/miljoenennota/2023/bijlage/1485781>.
- Moncrieff, Joanna, Ruth E. Cooper, Tom Stockmann, Simone Amendola, Michael P. Hengartner and Mark A. Horowitz. 2022. ‘The Serotonin Theory of Depression: A Systematic Umbrella Review of the Evidence’. *Molecular Psychiatry* (July): 1–14. ISSN: 1476-5578. <https://doi.org/10/gqh6nd>.
- Moore, Tomm, Ross Stewart and Will Collins. 2020. ‘Wolfwalkers’. Cartoon Saloon and Melusine Productions.
- Morris, Steven. 2022. ‘‘Like a computer reset’: Exmoor river to be liberated in pioneering project’. *The Guardian*, <https://www.theguardian.com/environment/2022/oct/14/exmoor-river-aller-pioneering-project>.

- Naess, Arne. 1973. 'The Shallow and the Deep, Long-range Ecology Movement. A Summary'. *Inquiry* 16, nos. 1-4 (1-4): 95–100. ISSN: 0020-174X. <https://doi.org/10/dzmj5j>.
- Nagel, Thomas. 1974. 'What Is It Like to Be a Bat?' *Philosophical Review* 83 (October): 435–50. <https://doi.org/10/cjr7k4>.
- NCIRD. 2022. 'Current Bird Flu Situation in Poultry'. Centers for Disease Control and Prevention, March. <https://www.cdc.gov/flu/avianflu/poultry.htm>.
- Nelson, Joyce. 2019. 'Monsanto's "Rain of Death" on Canada's Forests'. *Global Research*, <https://www.globalresearch.ca/monsantos-rain-death-forests/5677614>.
- Newen, Albert, Leon de Bruin and Shaun Gallagher, eds. 2020. *The Oxford Handbook of 4E Cognition*. First published in paperback. Oxford: Oxford University Press. ISBN: 978-0-19-886347-2.
- Noddings, Nel. (1984) 2013. *Caring: A Feminine Approach to Ethics and Moral Education*. 2nd edition. Berkeley: University of California Press, June. ISBN: 978-0-520-23864-0.
- Norlock, Kathryn. 2019. 'Feminist Ethics'. In *The Stanford Encyclopedia of Philosophy*, Summer 2019, edited by Edward N. Zalta. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/sum2019/entries/feminism-ethics/>.
- O'Neill, Eileen. 2005. 'Early Modern Women Philosophers and the History of Philosophy'. *Hypatia* 20 (3): 185–197. ISSN: 0887-5367, 1527-2001. <https://doi.org/10/fck795>.
- Olson, Carl. 2009. *Historical Dictionary of Buddhism*. Historical Dictionaries of Religions, Philosophies, and Movements 97. Toronto: Scarecrow Press. ISBN: 9780810863170.
- Pearkes, Eileen Delehanty. 2016. *A river captured: The Columbia River Treaty and Catastrophic Change*. Rocky Mountain Books. ISBN: 9781771601788.
- Plumwood, Val. 1991. 'Nature, Self, and Gender: Feminism, Environmental Philosophy, and the Critique of Rationalism'. *Hypatia* 6 (1): 3–27. ISSN: 0887-5367. JSTOR: 3810030. <https://www.jstor.org/stable/3810030>.
- . (1993) 2003. *Feminism and the Mastery of Nature*. Transferred to digital print. Redacted by Teresa Brennan. Opening Out: Feminism for Today. London, New York: Routledge. ISBN: 978-0-415-06810-9 978-0-415-06809-3.
- Powers, Richard. 2019. *The Overstory*. Epub. New York, London: W. W. Norton & Company. ISBN: 978-0-393-35668-7.
- Ravaisson, Félix. (1838) 2008. *Of Habit*. Translated by Clare Carlisle and Mark Sinclair. London/New York: Continuum. ISBN: 978-1-84706-197-3 978-1-84706-198-0.
- Rechtbank Den Haag. 2021. *ECLI:NL:RBDHA:2021:5339*. Judgment. http://climatecasechart.com/wp-content/uploads/sites/16/non-us-case-documents/2021/20210526_8918_judgment-1.pdf.
- Rees, Tobias, Thomas Bosch and Angela E. Douglas. 2018. 'How the Microbiome Challenges Our Concept of Self'. *PLOS Biology* 16, no. 2 (February): e2005358. ISSN: 1545-7885. <https://doi.org/10/gft42d>.
- Reynaert, Peter. 2009. 'Embodiment and Existence: Merleau-Ponty and the Limits of Naturalism'. In *Phenomenology and Existentialism in the Twentieth Century II: Fruition–Cross-Pollination–Dissemination*, edited by Anna-Teresa Tymieniecka, redacted by William S. Smith, Jadwiga S. Smith and Daniela Verducci, 104:93–104. Analecta Husserliana. Dordrecht: Springer. ISBN: 978-90-481-2978-2. <https://doi.org/10/cmgm4z>.
- Rinpoche, Kalu. 1986. *The Dharma: That Illuminates All Beings Impartially Like the Light of the Sun and the Moon*. Edited by Kagyu Thubten Choling. 222. State University of New York Press. ISBN: 9780887061561.
- Röhrich, Frank, Shaun Gallagher, Ulfried Geuter and Daniel D. Hutto. 2014. 'Embodied cognition and body psychotherapy: The construction of new therapeutic environments'. *Sensoria: A Journal of Mind, Brain and Culture* 10, no. 1 (July): 11. <https://doi.org/10.7790/sa.v10i1.389>.

- Rosati, Connie S. 2016. 'Moral Motivation'. In *The Stanford Encyclopedia of Philosophy*, Winter 2016, edited by Edward N. Zalta. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/win2016/entries/moral-motivation/>.
- Rosch, Eleanor. 2008. 'Beginner's Mind: Paths to the Wisdom that is Not Learned'. In *Teaching for Wisdom*, edited by M. Ferrari and G. Potworowski, 135–162. Dordrecht: Springer. ISBN: 978-1-4020-6532-3. https://doi.org/10.1007/978-1-4020-6532-3_8.
- Rucińska, Zuzanna and Martin Weichold. 2022. 'Pretense and Imagination From the Perspective of 4e Cognitive Science: Introduction to the Special Issue'. *Phenomenology and the Cognitive Sciences* 21 (5): 989–1001. <https://doi.org/10/gr5tgm>.
- Ryle, Gilbert. (1949) 2009. *The Concept of Mind*. 60th Anniversary Edition. London/New York: Routledge. ISBN: 978-0-415-48547-0.
- Saigusa, Tetsu, Atsushi Tero, Toshiyuki Nakagaki and Yoshiki Kuramoto. 2008. 'Amoebae Anticipate Periodic Events'. *Physical Review Letters* 100, no. 1 (January): 018101. <https://doi.org/10.1103/physrevlett.100.018101>.
- Sandel, Michael J. 2012. 'How Markets Crowd Out Morals'. *Boston Review*. <http://bostonreview.net/forum-sandel-markets-morals>.
- Sawyer, J. S. 1972. 'Man-Made Carbon Dioxide and the "Greenhouse" Effect'. *Nature* 239, no. 5366 (September): 23–26. ISSN: 0028-0836, 1476-4687. <https://doi.org/10/dsqtz3>.
- Scientist Rebellion. 2021. 'We Leaked the Upcoming IPCC Report!' scientist rebellion_. <https://web.archive.org/web/20210824201738/https://scientistrebellion.com/we-leaked-the-upcoming-ipcc-report/>.
- Simard, Suzanne W. 2018. 'Mycorrhizal Networks Facilitate Tree Communication, Learning, and Memory'. In *Memory and Learning in Plants*, 191–213. Springer International Publishing. https://doi.org/10.1007/978-3-319-75596-0_10.
- . 2021. *Finding the Mother Tree: Uncovering the Wisdom and Intelligence of the Forest*. New York: Alfred A. Knopf. ISBN: 978-0-525-65610-4.
- Singer, Peter. 2011. *Practical Ethics*. 3rd ed. Cambridge University Press. ISBN: 978-1-139-49689-6. Google Books: [INgnV0eDtM0C](https://www.cambridge.org/be/academic/subjects/philosophy/ethics/practical-ethics-3rd-edition). <https://www.cambridge.org/be/academic/subjects/philosophy/ethics/practical-ethics-3rd-edition>.
- . 2015. *Animal Liberation*. Open Road Media. ISBN: 978-1-336-02618-6 978-1-4976-4559-2. <http://api.overdrive.com/v1/collections/v1L1B2wEAAA2b/products/3f55ece4-de0b-438a-b6a6-9fab20a1ac39>.
- Slors, Marc, Leon de Bruin and Derek Strijbos. 2015. *Philosophy of Mind, Brain and Behaviour*. Amsterdam: Boom. ISBN: 978-90-8953-654-9.
- Solomon, Charles. 2020. *The Art of Wolfwalkers*. New York: Abrams. ISBN: 9781419748059.
- Sorokin, Pitirim A. and R. Merton. 1937. 'Social Time: A Methodological and Functional Analysis'. *American Journal of Sociology* 42:615–629. <https://api.semanticscholar.org/CorpusID:143016143>.
- Stamenkovic, P. 2020. 'The contradictions and dangers of BrunoLatour's conception of climate science'. *Disputatio* 9 (13): 227–260. ISSN: 2254-0601.
- Stark, Vicky. 2020. "'Octopus Teacher' Lets Filmmaker Into Secret World'. *Voice of America*, https://www.voanews.com/a/arts-culture_octopus-teacher-lets-filmmaker-secret-world/6195670.html.
- Steffen, Will, Katherine Richardson, Johan Rockström, Sarah E Cornell, Ingo Fetzer, Elena M Bennett, Reinette Biggs, Stephen R Carpenter, Wim De Vries and Cynthia A De Wit. 2015. 'Planetary Boundaries: Guiding Human Development on a Changing Planet'. *Science* 347 (6223). ISSN: 0036-8075.

- Sullivan, Shannon. 2013. 'Oppression in the Gut. The Biological Dimensions of Deweyan Habit'. In *A History of Habit from Aristotle to Bourdieu*, edited by Tom Sparrow and Adam Hutchinson, 236–255. Lanham, MD: Lexington Books. ISBN: 978-0-7391-8198-0.
- Sundstrom, Johnny. 2013. *Fivemile-Bell Landscape Restoration Project*. Report. Siuslaw Institute. <https://www.landcan.org/article/FivemileBell-Landscape-Restoration-Project/3005/>.
- Taylor, Charles. 2007. *A Secular Age*. Cambridge: Belknap Press of Harvard University Press. ISBN: 978-0-674-02676-6.
- Taylor, Jonathan. 2016. *Koko: The Gorilla Who Talks to People*. documentary film. <https://www.bbc.co.uk/programmes/b07gxp7>.
- Templeton, Jessica, Deborah Davenport, Laura Bullón-Cassis and Moritz Petersmann. 2023. 'Summary of the 58th Session of the Intergovernmental Panel on Climate Change: 13-19 March 2023'. *Earth Negotiations Bulletin* 12, no. 819 (March): 1–22. <https://enb.iisd.org/58th-session-intergovernmental-panel-climate-change-ipcc-58-summary>.
- Tero, Atsushi, Seiji Takagi, Tetsu Saigusa, Kentaro Ito, Dan P. Bebber, Mark D. Fricker, Kenji Yumiki, Ryo Kobayashi and Toshiyuki Nakagaki. 2010. 'Rules for Biologically Inspired Adaptive Network Design'. *Science* 327, no. 5964 (January): 439–442. <https://doi.org/10.1126/science.1177894>.
- Thagard, Paul. 2021. *Bots and Beasts: What Makes Machines, Animals, and People Smart?* Epub. Cambridge/London: MIT Press, October. <https://doi.org/10/gr5tgg>.
- Thompson, Evan. 2007. *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*. Harvard University Press. ISBN: 978-0-674-02511-0.
- . 2014. *Waking, Dreaming, Being: Self and Consciousness in Neuroscience, Meditation, and Philosophy*. Columbia University Press. ISBN: 9780231538312.
- . 2022. 'Could All Life Be Sentient?' Preprint, *Journal of Consciousness Studies* 29, no. 3 (March): 229–265. <https://doi.org/10.53765/20512201.29.3.229>.
- Tomasello, Michael. 1999. *The cultural origins of human cognition*. Harvard University Press. ISBN: 9780674005822. <https://doi.org/10.2307/j.ctvjfsf4jc>.
- Turner, Nancy J., Fikret Berkes, Janet Stephenson and Jonathan Dick. 2013. 'Blundering Intruders: Extraneous Impacts on Two Indigenous Food Systems'. *Human Ecology* 41, no. 4 (June): 563–574. <https://doi.org/10.1007/s10745-013-9591-y>.
- UNFCCC. 2016. *Report of the Conference of the Parties on Its Twenty-First Session, Held in Paris from 30 November to 13 December 2015. Addendum. Part Two: Action Taken by the Conference of the Parties at Its Twenty-First Session*. Conferentieverslag. Parijs: UN Framework Convention on Climate Change, January. <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>.
- Universiteit van Nederland. 2018. 'Waarom Zijn Wij Niet Goed Voorbereid Op de Volgende Pandemie?' Directed by Universiteit van Nederland. In collaboration with Marion Koopmans, November. https://www.youtube.com/watch?v=sEr_Xls9A3A.
- Varela, Francisco J. 1996. 'Neurophenomenology: a methodological remedy for the hard problem'. *Journal of Consciousness Studies* 3, no. 4 (April): 330–49. ISSN: 1355-8250. <https://www.ingentaconnect.com/content/imp/jcs/1996/00000003/00000004/718>.
- . 1999. *Ethical Know-How: Action, Wisdom, and Cognition (Writing Science)*. 96. Stanford University Press. ISBN: 9780804730334.
- Varela, Francisco J., Evan Thompson and Eleanor Rosch. (1991) 2016. *The Embodied Mind: Cognitive Science and Human Experience*. Revised edition. Cambridge, Massachusetts ; London England: MIT Press. ISBN: 978-0-262-52936-5.

- Walsh, Colleen. 2021. 'So why did you love 'My Octopus Teacher'?' *The Harvard Gazette*, <https://news.harvard.edu/gazette/story/2021/05/harvard-panel-discusses-what-made-my-octopus-teacher-a-hit/>.
- Weichold, Martin and Zuzanna Rucińska. 2021. 'Pretense as Alternative Sense-Making: A Praxeological Enactivist Account'. *Phenomenology and the Cognitive Sciences* (September). issn: 1572-8676. <https://doi.org/10/gmq2c3>.
- Weigel, Moira. 2019. 'Feminist cyborg scholar Donna Haraway: 'The disorder of our era isn't necessary''. *The Guardian*, <https://www.theguardian.com/world/2019/jun/20/donna-haraway-interview-cyborg-manifesto-post-truth>.
- Wu, Jianguo and Ori Loucks. 1995. 'From Balance of Nature to Hierarchical Patch Dynamics: A Paradigm Shift in Ecology'. *The Quarterly Review of Biology* 70:439–466. <https://doi.org/10/fn9qs8>.
- Zemp, M., M. Huss, E. Thibert, N. Eckert, R. McNabb, J. Huber, M. Barandun et al. 2019. 'Global glacier mass changes and their contributions to sea-level rise from 1961 to 2016' [in en]. *Nature* 568, no. 7752 (April): 382–386. issn: 1476-4687. <https://doi.org/10.1038/s41586-019-1071-0>.
- Zhu, Liping, Song-Ju Kim, Masahiko Hara and Masashi Aono. 2018. 'Remarkable problem-solving ability of unicellular amoeboid organism and its mechanism'. *Royal Society Open Science* 5, no. 12 (December): 180396. <https://doi.org/10.1098/rsos.180396>.