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The Ecosocial World of Education

Perception and Interaction in Multispecies Society

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ABSTRACT

The recognition of human-caused environmental crises has increased the need to think and act in a way that bridges the ecosocial realities of humans and the rest of nature. Therefore, this theoretical article challenges the anthropocentric assumption of human social life and communication. We formulate an educational philosophy on the nature of sociality, that recognizes the intertwining of human and other realities, and we ask how this kind of multispecies approach can guide education towards an eco-socially sustainable transformation. Based on biological and phenomenological perspectives, we describe the multispecies social community through three concepts: holobiont, flesh, and umwelt. First, human sociality must be understood in a multispecies context. Second, the ontological intertwining of humans and other living beings forms an interdependent and non-hierarchical web of life. Third, the social interaction in this multispecies society must begin by recognizing different perceptual realities. The inability to interact and participate amid different perceptual realities within the same flesh of the world with other species has proved destructive to both fellow living beings and humans. Thus, we conclude that bringing different perceptual realities to education could make learners more sensitive to different manifestations of life and create aptitudes for living together in a more-than-human world.

Keywords: ecocrisis; ecosocial education; flesh; holobiont; interspecies interaction; more-than-human; multispecies; perception; phenomenology; umwelt.

1. Introduction

As we write this article, the human animals are looking out from a window, watching trees and birds. Under the snow cover, there are enormous quantities and qualities of microorganisms and fungus, which extend to the very ground where the house of the human animals is built. Human life is surrounded by diverse forms of more-than-human life. Only a moment of watching birds gives a definite impression they are social creatures like humans too. They communicate with each other and have social structures and dynamics, which they constantly maintain and transform (Tobias *et al.* 2016). The sociality of trees is less obvious, but according to Suzanne Simard (2021), trees also communicate with each other in a prosocial and mutually beneficial manner. They, for example, warn about dangers and share nutrients and relevant information with each other. Hidden underground, another social organism of a completely different kind, a fungus, also participates in the sociality of trees by acting as a mediator that connects the roots of different trees to a common network (Bonfante and Genre 2010). The relationship between a tree and a fungus is a typical illustration of a mutualistic symbiosis in which the relationship is beneficial, and often essential for both parties.

Humans reside and interact in a more-than-human world (Abram 1997), that is thoroughly social (Tsing 2013). Scholars have begun to understand that human sociality and the sociality of the more-than-human world are not "worlds apart" but aspects of the same reality (Hastrup 2013; Sridhar and Guttar 2018). So far, the common characteristics of interacting and perceiving the multispecies communities have not been adequately described in educational terms. Life in general has a social basis that needs to be accounted for in thinking about ways of escaping the complex ecosocial crisis of today.

Ecocrisis is, in fact, a crisis of human culture (Plumwood 2002), because ecological problems are fundamentally caused by modern humans' destructive interaction with the rest of nature. The same beliefs and behavior that cause environmental damage are also causing multiple social problems in postindustrial societies (Martusewicz *et al.* 2015; Foster *et al.* 2022). The intertwined ecological and social problems can be addressed in a framework we call the ecosocial approach (e.g. Keto *et al.* 2022). The interaction of humans and other life forms can be improved by specifically understanding how the multispecies world is simultaneously ecological and social. Therefore, to solve the environmental

problems of our time, we need to consider education that enables understanding, perceiving, and interacting with the more-than-human world.

In this article we ask what characterizes the ecosocial world of education, that recognizes the intertwining of human and other realities, and how this kind of multispecies approach can guide education towards an ecosocially sustainable transformation. We combine biological sciences (Margulis 1998; Uexküll 2010) and phenomenological perspectives (Abram 1996; Merleu-Ponty 2003) to describe the features of a multispecies social community and its importance, particularly for education. We approach this through three concepts: Lynn Margulis' formulation of *holobiont*, Maurice Merleau-Ponty's *flesh* and Jacob von Uexküll's *umwelt*. While all concepts have been discussed in educational context (e.g. Hung 2008; Campbell 2019; Pulkki and Keto 2022), a concerted effort to discuss the social ontology of (ecosocial) education through all three concepts have not been done previously. By social ontology, we mean the philosophical analysis of the nature and properties of sociality (e.g. Ikäheimo and Laitinen 2011). We consider how multispecies sociality expands our educational thinking and pedagogical practices. Our article therefore formulates the basic ideas of ecosocial educational philosophy to better perceive, understand, and interact within the more-than-human world.

2. "Holobiont" – An example of social community in a multispecies context

Bringing the idea of social interaction to the natural sciences has proved problematic, as, for example, sociobiology and evolutionary psychology have illustrated (Wilson 2000). As Anna Tsing (2013) has stated, sociobiology and evolutionary psychology are not so much interested in sociality as in explaining it away from the picture. Our aspiration is the opposite: asking what taking sociality to the more-than-human world could mean, particularly in terms of education. We argue that bringing different perceptual realities to the pedagogy could make pupils more sensitive toward diversity, understand different manifestations of life, and create aptitudes for preserving it. We claim and clarify later that there are possibilities of parallel perceptual realities between humans and other living beings. Acknowledging this can reveal more possibilities to communicate peacefully and participate respectfully in the life world of different species.

Sociality can be approached in a more-than-human world by thinking about the similarities and differences between the concepts of *social* and *ecological*. They both have in common their emphasis on relations instead of individuals. They both stress the significance of context: the individual should not be scrutinized irrespective of its relations and unique situations, which are part of the individual (Pulkki *et al.* 2021). However, when considering the etymology of these two words, there are interesting differences too.

The eco-prefix in "ecology" comes from the Greek term *oikos* meaning house or habitat. Ecology examines an organism and its habitat and environment. The word "social" derives from the Latin words *socius* and *socialis* meaning friend or an ally. Differences in connotations are considerable. Ecology studies the relations between organisms – also human relations to other species – but it does so in a kind of disconnected manner. Living creatures are studied in ecology in a remote, detached, and objective manner (Bonnet 2021). Using the terminology of Merleau-Ponty (2012), the object of interest in ecology is in the measurable and physical *object body* of living creatures, not the *lived experience* of the *lived body*. What we often call "nature", other than human organisms, must be objectified to be operationalized for scientific study. Humans are subjects, and the other species are objects of study, which is often left unproblematized.

Defining a social community is not simple. For example, objectively, people in the same region can be defined as a social community. But if the people in the area define themselves as a community, they should experience some kind of social cohesion with the other people of the area. Social community is, therefore, defined by the lived experience of belonging to a community (e.g. Nivala and Ryynänen 2019). In order to establish a sense of belonging, the community members need to have something in common. The people in an area can become a social community if they have enough common activities. The experience of social cohesion is often accompanied by an assumption of uniformity or commonality. These can be seen on different levels: in values, beliefs, personalities, goals, actions, circumstances, and so on. The commonality is also consciously reinforced with cultural narratives of particular nations but also in attempts to describe a narrative of a common humanity, which is completely separate and radically different from other living beings (e.g. Ruuska *et al.* 2020).

How does the idea of commonality or similarity fit into a more-than-human world? In some sense, it seems more obvious that there is

a commonality in the more-than-human world, too. Some animals, especially mammals and birds, are rather close to humans, and the ethical questions about them resemble those relevant to human beings (Aaltola 2018). This "closeness" can be at least partly explained by commonality in evolutionary ancestry: e.g. humans and bonobos have 99% the same DNA while the sap fly shares 60% of human DNA (Prüfer *et al.* 2012).

From an embodied perspective, the "closest" organisms to humans are the microbes living in and on the human body that constitute the human microbiome. Pleading to genetic similarity between humans and those microbes might not be too convincing at all. Some fungi in the human body may be 23% similar with the human genome, but most organisms in the human microbiome are genetically less than 10% similar (Liu *et al.* 2017).

Nevertheless, those microbes are such an important part of humans that it is appropriate to speak of humans and their microbiome as a *holobiont*, a unit or a body community consisting of human and microbial cells (Margulis 1998). The holobiont human already emerges in the fetus stage of individual development when one receives the first microbes from its mother's womb (Aagaard *et al.* 2014). Interaction with microbes has a central role in human development: the effects are seen in diverse physiological, psychological, and behavioral processes throughout the person's lifetime (Hsiao *et al.* 2013; Jones 2016; Allen *et al.* 2017; Sarkar *et al.* 2018). For example, an adult's microbiome shows how much time one has spent in diverse natural environments (Hanski *et al.* 2011).

Still, the commonality of human and microbe DNA can open a novel vista for understanding the relationship with the human and other life forms. Not all the similarities in organism DNA can be explained by common ancestry, but commonalities can be based on so-called horizontal gene transfer (Crisp *et al.* 2015). For example, the human genome can change in an interdependent relationship with other life forms – typically with bacteria and other microbes.

From perceptual and experiential points of view, there are many living beings that humans are not even aware of in their everyday lives, so, how a human could experience commonality or social cohesion based on similarity with them. One is, for example, not typically conscious of microbes even though they form a base for life and there are more microbial cells in the human body than human cells (Savage 1977; Sender 2016). Modern humans living in postindustrial societies are used to thinking of these other life forms in the human body as alien intruders that one needs to get rid of as quickly as possible. Of course, there are

pathogens within microbes, but in most cases, microbial life is still vital for humans, an important part of healthy human existence (Gilbert 2014; Lorimer 2016).

To sum up our argument so far: human sociality includes many life forms, and our relationship with the more-than-human world is constructed in interrelations with many of them. Humans are not only surrounded by and intertwined with other forms of life, but the human's relationship with other species is socially significant in similar ways the human individual's relationships with other people are significant. When a human seems to be involved only with other humans, there are always interactions between the more-than-human holobionts too. The failure to solve the myriad ecocrisis of today derives from the ignorance of this kind of multispecies interaction. It is crucial to understand that human connection to the more-than-human world is constructed both within ancestral and current multispecies interactions. Because the notion of social community includes, necessarily, other living creatures, we now turn to Maurice Merleau-Ponty's later phenomenology to understand how humans perceive, interact, and communicate with different living creatures.

3. "Flesh" – Bridging the ontological abyss between humans and other species

Like Merleau-Ponty, another and even more canonical phenomenologist Martin Heidegger before him was also interested in relationships between humans and other life forms. In some sense, Merleau-Ponty's work may be seen as a commenting and continuing Heidegger's work. Heidegger's ontology did not seem to bring human life and other living beings closer but instead arguably spread these further away from each other (Derrida 1991, 105; Agamben 2004, 39). There is not only qualitative otherness between humans and animals but also an ontological abyss (Heidegger 1995, 383-385). Animals represent life that always lacks something compared to humans (Elden 2006). To Heidegger, an animal "is poor in the world" (Heidegger 1995, 284).

Merleau-Ponty's late philosophy can be seen as a pursuit to overcome the abyss between humans and animals. Probably there was not such an abyss in the first place in Merlau-Ponty's mind (Westling 2012). Even so, questioning the anthropocentrism of Heidegger via Merleau-Ponty may seem contradictory, because in his last remaining studies there are traces

of human-centric ways of thinking. In *Nature Lecture Notes*, he suggests, for example, that the kinship between human and animal bodies is "quite illusory" (Merleau-Ponty 2003, 272).

The word "animal" taken literally is problematic. We can talk about animals as one category, but doing so makes it difficult to say anything universal. The group of animals seems too heterogeneous for generalizations. For example, a sap fly and a bonobo are very different creatures and also different in relation to human beings. Using the phylogenetic logic that is generally used to categorize living creatures, a bonobo or a chimpanzee could be categorized as a "sibling" species to humans – and we would all be in the same *homo* (or *pan*) family of organisms (Wildman *et al.* 2003). The common ancestry or similarity of humans and other animals, and life in general, is not illusory but a very concrete and existing reality. Humans are considered a part of the animal category, as e.g. a pine is a part of plants, a chair is one kind of furniture, and Europe is a continent.

Heidegger and Merleau-Ponty are related to a long line of Western philosophers that defined humans in relation to "the animal" – and things that separate humans from animals. "Animal" was not the opposite of human for Merleau-Ponty, however, but something generally other to a human. It is difficult to assess how much homage we should give to Merleau-Ponty's anthropocentric notions. His posthumously published texts are at least partially edited by others. It seems his work was interrupted by his passing, and there was not enough time to accomplish the enormous work of overcoming anthropocentrism (Westling 2012) – which might be too extensive a task for one person anyway. Perhaps his goal remained in deconstructing the Cartesian dualism especially in relation to human beings in terms of human mind versus human body (Smith 2007, 171).

Merleau-Ponty has been influential in the development of many lines of thought in social sciences and humanities (Spurling 2013). In this article we use his philosophy as a heuristic means for understanding the social ontology of ecosociality. Merleau-Ponty adopted the German concept of *ineinander* from Edmund Husserl to describe the fundamentally social nature of existence: we are always part of others, and they are part of us (Merleau-Ponty 1968). "Ineinander" means *within each other*, and for Merlau-Ponty "ineinander" means particularly the inherence of the self and the world in the self (Merleau-Ponty 2003, 306; Pulkki *et al.* 2015). The animality and human being are given together within the whole of Being. Human beings and animals are both "natural beings" that are

irreducibly intertwined (Merleau-Ponty 2003, 214-215, 220, 268, 273). Husserl used the concept of ineinander to describe the human-to-human social existence, but Merleau-Ponty extended the concept to envelop humans and other living beings (Moran 2015).

Merleau-Ponty's concept of *flesh* refers to the fundamental bodily intertwining of humans and the world (Merleau-Ponty 1968; Värri 2018). It must be noted that this intertwining element of the flesh was not groundbreaking in itself. For example, Eastern philosophies, worldviews, psychologies, and religions have had similar insights about interrelationality for several millennia. But there are two especially interesting features in Merleau-Ponty's ontology of the flesh: (1) the social nature of the flesh, that is based on a pre-objective, pre-linguistic, and pre-reflective interaction, and (2) the flesh as a lateral element that unites different living beings.

Pre-objective, pre-linguistic, and pre-reflective interaction is important in human relations (Spurling 2013; Moran 2015), but in the human relationship with other life forms it is absolutely essential. Humans can teach for example to bonobos human concepts and even sign language, and bonobo's may learn to use them themselves. At the same time, it is evident that these means can only reach the surface of the interaction potential between humans and bonobos. Perhaps we can make an analogy to a human who tries to communicate their thoughts and feelings using only emojis. Participating in the more-than-human world requires one to use interaction that works, which fundamentally means the ability to perceive and communicate with one's multisensory body (Keto and Foster 2021). By paraphrasing Merleau-Ponty (1968), it could be said that participating in the world requires a body that can touch and be touched. This kind of pre-reflective interaction is not more primitive or less valuable than reflective interaction in human interaction (Värri 2018).

This brings us to the lateral nature of flesh. Laterality here is best understood as the opposite of hierarchical, as horizontal. Many aspirations of seeking connection or union with the world have to do with humans rising to some higher level – may this level be spiritual, higher reason, nature as a higher entity, or even conquering space, for example (Pulkki 2020). Adopting the idea of flesh does not promote higher pursuits but in contrast, turns one to perceive, witness, and recognize what *is* here and now (Foster 2016). Interestingly, there is a kind of metaphysical quality of equality in the flesh, which can also be included in the idea of spiritual understanding of the world (Pulkki 2020). According to

Merleau-Ponty, the human and animal bodies are intertwined with the same flesh of the world. Because of the common flesh of the world, there is "strange kinship" and unity between human and animal worlds (Merleau-Ponty 2003, 211-214, 268-273; also Toadvine 2010, 254-256).

The understanding of evolution during Merleau-Ponty's time (and also still in today's public discussion) was hierarchical: human connection to other life forms is based on common ancestry, manifested mainly in genetic material. Branches of biology, such as ecology, developmental biology, and ethology, remained separate from evolutionary biology for a long time, and only recently, there have been notable integration in these (Gilbert *et al*. 2015). This has led scholars to scrutinize what kind of role the lived life has in the place of an organism and its relations in a world in an evolutionary framework. For example, the microbiome-human connection is not based so much on a common ancestry in terms of evolutionary history but on life and interaction in a common holobiont, the mutually lived "body community".

The concept of the flesh can also be understood as the ancient cosmologies and the "elements" of water, air, earth, and fire. The elements are not meant literally as objective material substances (Pulkki *et al*. 2015). Flesh, water, air, earth, and fire are general things, a midway between the spatio-temporal individuality and the idea, a sort of incarnate principle that brings a style of being wherever there is a fragment of being (*ibid.*). The flesh is, in this sense, the "element of Being" (Merleau-Ponty 1968, 139), and the flesh of the embodied perceptual experience and the flesh of the world are the one and same flesh (Pulkki *et al*. 2015).

The common flesh of the world helps to address the phenomena of life without resorting to the narratives of human exceptionality and entitlement. The flesh is something common, and from it, our different bodies emerge: it is, therefore, "unity in difference" (Värri 2018, 61). It is a concept that aims to capture the idea of commonality, similarity, and unity without letting different life forms fall to sameness. After all, there must be differences and diversity for life to exist. Therefore, we now turn to examine difference and diversity through the concept of *umwelt*.

4. "Umwelt" – Interacting in different perceptual realities

Umwelt is an idea and theory launched by biologist Jakob von Uexküll in the early 20th Century, who aimed to describe how different animals live in different realities according to which they can perceive and sense the

world (Uexküll 2010). We use the term "perceptual reality" to describe *umwelt*, while understanding this does not adequately capture all the aspects of this concept. It is relevant for ecosocial understanding of education to note that Uexküll recognized the subjectivity of other animals besides humans. He stated that biology can understand organisms only by treating them as subjects that inhabit and experience their worlds (*ibid.*, 41).

Those worlds of experience, perceptual realities, carry with them meanings that cannot be captured from other perceptual realities. Human perceptual reality holds particular meanings, which the other animal does not possess, and the other animal might have certain meanings that humans do not even come to think of or to understand them as meaningful. Perceptual realities, according to Uexküll (2010), are relatively unchanged and closed environments (also Tønnessen 2009). Therefore, for example Heidegger (1995) saw that perceptual realities are kind of prisons to (other) animals. A known example by Uexküll is the perceptual reality of a castor bean tick which he describes as poor (this might have been the source of Heidegger's term "poor in the world") (Uexküll 2010, 51).

Merleau-Ponty (1968; 2003) seemed to move away from the hierarchical implications of the umwelt theory (also Westling 2012). According to him, different perceptual realities are not in hierarchical relation to each other but enfold within each other (Merleau-Ponty 2003). There are no border areas between humans and the world (including other species) but a kind of contact point in between them (Merleau-Ponty 1968, 271). Perceptual realities are not confined, enclosed, or unchangeable environments. Therefore, by enfolding perceptual realities also enable better communication and interaction with different perceptual realities. Furthermore, enfolding perceptual realities also has significant potential in environmental education and moral education as it is a prerequisite to understanding different life forms and seeing what they need for flourishing (Pulkki *et al*. 2015).

Umwelt, especially Merleau-Ponty's understanding of it, also seems consistent with the idea of the ecological niche (Peterson *et al.* 2018). Niche Construction Theory (NCT) has become an important part of evolutionary biology in recent years (Laland *et al.* 1999). According to NCT, organisms are not just passively adapting to their environments, but actively seek to change it. They built ecological niches and the changed environment can be inherited by the offspring of the organism and, thus, affect the lives of many in significant ways. Organisms, also

non-humans, are not at the mercy of their environments passively, but active creators and builders of new environments.

Lately, in evolutionary sciences, the hierarchical tree of life has been replaced with a more lateral web of life: all the world's species are intertwined with each other in a complex web of interaction (Hilario and Gogarten 1993; Guimarães *et al*. 2017). Simplistic dualisms, based on the higher and lower positions, often seem outdated and even misleading. It might be tempting to state that a bee is "poor in the world", or that its life does not have a meaning, because its life is different from a human's. But how much can a human presume to know about the life of a bee, as they have different perceptual realities and meanings? An educated human may know that bees communicate through a kind of "dance". One has perhaps learned that through dance the bees can convey information to the other members of their bee society: how long and which way is the nearest meadow, drink source, or potential nesting area. But has the educated human really perceived *all* the meanings incorporated in the bee dance – or in the whole spectrum of bee communication?

An observer, who treats the more-than-human world in a respectful and curious manner, probably understands that all of its meanings are not reduced to the human perceptual realities. The life of a bee can be seen as poor if the richness is defined by the standards of human life. On the other hand, if bees would disappear, and the world would be "poor of the bees", this would make human life much poorer too. This is evident when we think of bee's role as pollinators of human consumed plants. Human beings are also poorer in more general terms if bees are lost, as the extinction of any species makes the web of life, or the flesh of the world, poorer. In a similar vein, we can see how the disappearance of bees or any other species or population makes the world poorer when considered through the umwelt theory: the diminishing web of life rids the world of beings with unique perceptual realities and meanings.

5. Discussion and conclusion

Looking out from the window makes us realize we are surrounded by other life forms, yet the window stays in between us. The inside of a window and a house wall contains life only sparsely. The most apparent life form is a dog lying on the couch, and a more focused perception reveals for example silverfishes and sap flies. Many other organisms also dwell in the house structures away from human perception.

The science of ecology provides a similar framing to life: like seeing it through a window (Bonnett 2021, 24). We claim with Bonnett (2007, 717) that instead of objectifying, instrumentalizing, and controlling attitude toward nature, "a more intimate, intuitive, non-logical style of encounter with the world" and its living creatures is needed. In education, this means emphasizing the phenomenology of nature, not only in terms of causal or probabilistic law-governed biophysical interdependencies, but being attuned, for example, to trees and birds in a living presence, and participating and creatively interplaying with the more-than-human world (Bonnett 2021, 21-25; also Foster *et al*. 2022). Furthermore, this means conveying an idea of life with experiences of friendship and comradery as a constructive element of intimacy and warmth in our multispecies relationships. Enabling warmth and intimacy in multispecies relationships may help humans to tolerate the coexistence with such organisms that are traditionally not seen as the most desirable, such as sap flies and silverfish.

In this article, through the notions of holobiont, flesh, and umwelt, we have outlined a social ontology of (ecosocial) education. First, we pledged the need to understand human sociality in a multispecies context. Second, we argued that the ontological intertwining of human life and other living beings in one common flesh must be the starting point of (ecosocial) education. Third, we discussed how social interaction in a multispecies society needs to be based on the understanding of different perceptual realities.

Education needs to affirm the sense of belonging to the more-than-human community and build an idea of society, which does not exclude living beings on an arbitrary basis. In other words, we need to think of education and the context of education in an ecosocial way, recognizing the ways in which we are related to the multispecies world. In this more-than-human ecosocial community, the sense of belonging can be strengthened by pleading to the possibility of perceptually enhanced interaction. Before interaction, we need to understand different perceptual realities of other living creatures to gain insights about the ecosocial world of education. This way, social ontology is not restricted to the human domain, but the idea of different perceptual realities may improve our understanding of what social community in a multispecies context means.

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