



Between social cognition and material engagement: the cooperative body hypothesis

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Abstract

In recent years, social cognition approaches to human evolution and Material Engagement Theory have offered new theoretical resources to advance our understanding of the prehistoric hominin mind. To date, however, these two approaches have developed largely in isolation from one another. I argue that there is a gap between social- and material-centred approaches, and that this is precisely the sociomateriality of the appearance of ancestral hominin bodies, which evolved under selective pressure to develop increasingly complex, cooperative sociality. To get this socio-material body in focus, I develop an *esthesiological* framework, appropriated from Merleau-Ponty (2003), for interpreting the expressive body in an evolutionary and comparative context. The guiding hypothesis of esthesiology is that before being rationality (social or material), “humanity is another corporeity” (Merleau-Ponty, 2003, p. 208). Esthesiology studies the appearance of the body and its sense organs as an intertwining locus of a *sensing* power (the ability to see, to touch, etc.) and a *sensible* character (the visible, touchable body). It is this dual-aspect character of the body that facilitates the most basic affective and sensorimotor modes of sociality. Examining these features from a comparative perspective, we find that the human body is distinctively suited to prosocial communication and cooperation: a more cooperative eye, an exposed and communicative skin. I thus propose a *cooperative body hypothesis*, by analogy with the cooperative eye hypothesis (Tomasello et al., 2007). Esthesiology provides a framework for integrating and interpreting a wide range of otherwise disconnected facts concerning human and nonhuman animal bodies, forms of life, cognition, and evolution, thereby bridging the gap between social cognition and material engagement perspectives. In doing so, however, it not only solves problems and proposes new directions of investigation, but also demands theoretical revisions from each.

Keywords Social Brain Hypothesis · Social cognition · Cognitive archaeology · Material Engagement Theory · Human evolution · Merleau-Ponty · Direct social perception · Empathy · Expression

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1 Introduction

Two novel approaches to understanding human prehistory and cognitive archaeology have radically challenged conventional conceptions and narratives of the evolution of the hominin¹ lineage: A cluster of approaches focusing on hominin social intelligence, which I will refer to as Social Cognition Theory (henceforth “SCT” - e.g., Dunbar, 2016; Dunbar et al., 2014; Gamble et al., 2014; Tomasello, 2008, 2014, 2019); and Material Engagement Theory (henceforth “MET” - Malafouris, 2013). SCT puts the emergence of increasingly complex sociality at the heart of the story of hominin evolution, while MET emphasizes the role of bodily engagement with material-cultural artifacts. Both approaches promise to deliver a rich, empirically supported picture not only of the brute, objective, anatomical and material facts about fossil hominins (what Gamble, Gowlett, and Dunbar, central protagonists of SCT, call the “What you see is what there was” approach to archaeology and paleoanthropology – 2014, p. 28). They claim to offer us a glimpse into the mind and even the experience of our ancestors.

Disciplinary differences notwithstanding, there is, in principle, no reason why SCT and MET could not be engaged in dialogue in the hopes of developing a more comprehensive account of the of the ancestral hominin mind and its evolution. To date, however, there has been little crossover between the two (though see Aston, 2019; Barona, 2021; Coward, 2016, 2018; Coward & Gamble, 2008a; Mithen, 2010). This is a genuinely missed opportunity, given indications from both sides that there is a basis for complementarity: SCT’s proponents have emphasized that social cognition is materially distributed (Dunbar et al., 2010; Gamble et al., 2014, p. 111), while Malafouris, the leading exponent of MET, has praised the theoretical advances of a social-centred approach (2016, p. 70, though the praise is tempered by a critical note - p. 81). Further, both parties acknowledge that the social and the material-cultural are interconnected and should not be treated as entirely discrete aspects of cognition and behavior. But SCT and MET maintain conflicting views concerning the priority of the social and the material-cultural, and neither has provided an adequate account of their interrelation.

I will argue in this paper that this gap between the social and the material is a more problematic and pressing lacuna for both approaches than their respective advocates have realized. The gap is precisely the materiality of the social (viewed from SCT) and the sociality of the material (viewed from MET). And these are one and the same thing: the sociomaterial human body as it appears and expresses itself between embodied subjects. The expressive sensory morphology of this body is the true interface and locus of hominin sociality and the orientation point of material culture. And it likely evolved, I propose, under selective pressure to facilitate this distinctive mode of hominin sociomaterial being. I will develop an account of the sociomaterial body based in an approach I call *esthesiology* (borrowing the term from Merleau-Ponty, 2003), a study of evolved bodily sociomateriality informed by phenomenology and recent work in 4e cognitive science.

¹ I use the term “hominin” to refer to the various species of the lineage prior to *Homo sapiens* since the last common ancestor with bonobos and chimpanzees.

I begin with a selective presentation and preliminary critique of SCT and MET, identifying the gap between them as a mutual and urgent blind spot (Sect. 2). I then lay out the framework of esthesiology as an approach that promises to fill the gap between SCT and MET (Sect. 3.1). I apply esthesiology to the human body, considering aspects of its morphology and appearance as distinctively adapted (or exapted) for cooperative sociality (Sect. 3.2). I discuss the constructive and critical consequences for SCT and MET (Sect. 4) and conclude with some indications for further development and application of the esthesiological framework (Sect. 5).

Before beginning, two notes, one methodological and one terminological, are required. As my project is eclectic, a concern inevitably arises concerning the compatibility of the various frameworks I will bring into dialogue with one another (SCT, MET, 4e cognitive science, phenomenology, late Merleau-Ponty). My general strategy here will be constructive and ecumenical: In the hopes of staging a productive dialogue, I will assume commensurability between these various approaches and push that assumption as far as I can. In the end, however, there may be deep theoretical conflicts between some of or all these approaches. As we shall see, SCT's and MET's understandings of mind and cognition, and MET's understanding of materiality, are not only complemented but also challenged by the esthesiological framework. I touch on those concerns towards the end of the paper, once I have harvested as much fruit as I can by assuming commensurability. I use the term "sociality" throughout to refer to all aspects of an animal's social being, including cognitive, affective, interactive, and perceptual aspects.²

2 Social cognition theory and material engagement theory: complementary but disconnected approaches to the prehistoric hominin mind

2.1 Sociality: social cognition theory

Traditional accounts of what makes humans distinct from nonhuman animals put rationality at the centre of the story. Transposing the classical picture into an evolutionary context, we can imagine a form of early hominin life in which the environmental demands to solve ecological puzzles drove the development of more advanced cognition. By contrast, the Social Intelligence Hypothesis in its broadest form holds that it is the demands of living in complex social environments rather than non-social ecological demands that drive increases in intelligence in animals (Johnson-Ulrich, 2018). The most well-known Social Intelligence Hypothesis is the Social Brain Hypothesis, according to which relevant measures of animal (especially

² In this sense, "sociality" is simply the abstract noun formed from the adjective "social" taken in its strictest, descriptive-zoological sense. This usage departs from the common meaning of the term, however, according to which "sociality" just means "sociability." It is a curious feature of the term, and may betray something of widely held values or a typical human way of being social, that the adjective "social" and the two abstract nouns formed from it (i.e., "sociality" and "socialness") tend in their colloquial usage towards meaning "friendly," "prosocial," or even "extroverted," and often carry a positive evaluative connotation.

primate and hominin) brain size scale with social rather than ecological complexity. The Social Brain Hypothesis has been applied to hominin evolution most thoroughly by Robin Dunbar and colleagues. Combining archaeology, evolutionary psychology, paleoanthropology (Dunbar et al., 2014; Gamble et al., 2014), and Dunbar's time budget models for primate behaviour (Dunbar, 2016), these researchers have developed an increasingly rich picture of fossil hominins' social cognition and behaviour. Also within the family of social intelligence hypotheses is Tomasello and colleagues' more specific Cultural Intelligence Hypothesis (Herrmann et al., 2007; Herrmann & Tomasello, 2012; Tomasello, 2008, 2014), according to which hominin intelligence evolved specifically to deal with the *sociocultural* domain. As my focus is on hominin evolution, and in that context Tomasello's and Dunbar and colleagues' theories share similar assumptions about the nature of social cognition and its evolution, I will treat them together as Social Cognition Theory (SCT), noting differences between them where they are relevant.³

Gamble et al. (2014, p. 40) claim that sociality is "the great evolutionary invention of the primate family." Tomasello echoes that "what most clearly distinguishes non-human primates from other mammalian species cognitively is their complex skills of social cognition" (2014, p. 76). Different primate species live in socially structured groups of various kinds. A major advantage for all primates of increased group size is greater protection from predators. However, larger groups also mean more stressors. Greater daily travel and foraging time is required to obtain sufficient resources for the large group, and social time with allies is required to establish and maintain social cohesion. Meanwhile, ingroup competition for resources and power leads to conflict that can at times be violent and injurious to individuals while also unsettling group cohesion. According to the Social Brain Hypothesis, these challenges and stressors put a selective pressure on primates to develop the social cognitive skills to cope – whether competitively or cooperatively – in the group setting. Primates are comparatively a highly intelligent taxa, with higher brain-to-body-size ratio and encephalization quotient than most other mammalian taxa (Roth & Dicke, 2012).

However, big brains are extravagantly expensive from a metabolic perspective. With the time demands resulting from the social and ecological requirements of larger groups comes the doubled demand for more nutrition to fuel the big brains those large groups select for. Dunbar and colleagues have developed time budget models that predict how primates must spend their days to satisfy the nutritional and social demands of their form of life (summarized in Dunbar, 2016). They predict that early hominins would have been under considerable time pressure to satisfy their social and nutritional needs. It is these demands that supposedly drove hominin innovations in cognition, communication, technology, and sociality. Dunbar and colleagues are thus able to offer an archaeologically supported and abductively reasoned (if admittedly still speculative) gradualist account of the emergence of various landmarks of human evolution such as tool use, fire use, laughter, music, language, and more.

³ The Social Brain Hypothesis continues to be debated (DeCasien et al., 2022; Dunbar & Shultz, 2023; Shultz & Dunbar, 2022). For present purposes, all that is required is the weaker claim that social complexity is *a* selective pressure operating generally on the evolution of primates, especially hominins, not the stronger claim that it is *the* factor shaping *brain growth specifically in all or most* (social) animals.

Tomasello offers a similarly gradualist account of the emergence of a distinctively human form of life throughout the hominin evolutionary sequence. For Tomasello, a critical distinction between human and nonhuman great ape social cognition is that human sociality is more cooperative whereas that of other great apes is more individualistic and competitive (2014, p. 4 f.). Early hominins first developed a new mode of face-to-face, pre-linguistic, collaborative social cognition: joint attention. This entailed a new, perspectival thinking, in which we are each aware that the other has a distinctive perspective on the same thing or situation. Joint attention provided the foundation for the later emergence of collective intentionality, and the properly objective thinking (a “view from nowhere”) by which it is defined (2014).

The main bone of contention between SCT and the approach I will advocate below concerns the underlying account of sociality and social cognition that SCT claims early hominins were using their big brains for. The heart of sociality for SCT is *theory of mind* (ToM – i.e., mentalizing, mindreading). Social cognition, on this view, is about having a theory about minds that allows you to understand the contents of your own and other minds. This allows us to understand statements such as “I know that she knows that he believes in Santa Clause.” This statement exhibits three levels of intentionality. The maximum level of intentionality that a primate is capable of appears to scale with frontal lobe volume (Dunbar, 2009). Research suggests that normal adult humans demonstrate something in the range of 5–7 levels, nonhuman primates are limited to one or two (the research is somewhat contentious), and fossil hominins presumably fell somewhere in between. Dunbar (2014) even proposes that different levels of intentionality may correspond with quite specific levels of religious organization and sophistication.

2.2 Materiality: material engagement theory

While sociality takes centre stage in SCT, Material Engagement Theory (MET) emphasizes the centrality of material culture in hominin cognition and evolution (Malafouris, 2013). Of course, stones and bones have long been the bread and butter of archaeology and paleoanthropology. Distinctive about MET, however, is an understanding of mind and cognition that allows us to see material culture not just as the indirect trace of minded activity, but rather as a co-constituting component of mind and cognition. This is because for MET, materiality and mind are not mutually exclusive categories. Drawing on 4e accounts of cognition and actor network theory, MET sees the mind as made up in part by its very material engagements. MET thus challenges classically cognitivist and brain-bound accounts of cognition that have often been assumed in cognitive archaeology.

MET’s material emphasis is intended to counteract a perceived anthropocentric bias in the human sciences. For MET, agency is not a property of isolated, brain-bound minds that then take up some external object by means of a body to achieve some goal. Rather, brain, body, and material enter into a process together through which agency arises as an emergent property. Commenting on the example of the blind person’s cane, Malafouris sees this as illustrating “the gray zone of material engagement, i.e., *the zone in which brains, bodies, and things conflate, mutually catalyzing and constituting one another*” (2013, p. 5 – emphasis in original). It is this

coalition of the human brain, body, and material culture that Malafouris sees as the driving force of human cognitive evolution.

Given its influences and aspirations to counter the bias towards anthropocentrism in the human sciences, it is perhaps not surprising that, while MET does not *in principle* deny the role of the social, it has had little to say about prehistoric hominin sociality. However, the omission risks leaving the reader with the impression that social and material accounts are in conflict with one another in our understanding of human cognitive development. While for Malafouris and MET, the mind-material coalition “drives human cognitive evolution” (2013, p. 5) for Dunbar, the development of increasingly complex sociality is “the prime mover” in hominin brain growth and cognition (Dunbar, 2016, p. 59). In the following, I will argue that this state of latent tension between SCT and MET will be inevitable until we develop a bridging strategy to reconcile the two.

2.3 The gap between social cognition and material engagement

SCT and MET are innovative theories focused on different aspects of human cognition and experience. What is the relationship between these different aspects, and between these two theories? To date, little work has been done to connect SCT and MET⁴, despite acknowledgment from proponents of both views that a fuller understanding of the prehistoric hominin mind must account for the integration of technological and social intelligence (see below). I want to propose that there is a blind spot in SCT’s and MET’s understandings of the hominin mind, and the challenge of linking up our understanding of hominin material culture and sociality will prove irresolvable so long as this gap is not filled.

Let us begin with SCT, focusing on the version based on the Social Brain Hypothesis defended by Dunbar and colleagues. I indicated above that SCT is premised on theory of mind (ToM, i.e., mindreading, mentalizing). ToM is vulnerable to critique from phenomenological and 4e-oriented approaches to mind and sociality, which regard ToM as painting an overly intellectualized picture of human (and nonhuman animal) sociality (e.g., Barona, 2021; Barrett et al., 2021; Zahavi, 2014). Explicit, mentalizing cognition is SCT’s paradigm for understanding social cognition. Propositional attitudes about other minds (e.g., *I think/believe/hope/know*, etc., that she *thinks/believes/hopes/knows*, etc.) are seen as the core of sociality. Thus Gamble et al. confidently assert that “We have been able to show that the skills on which the kind of sociality that humans have depend on a capacity known as mindreading or mentalizing – the ability to understand or infer what another individual is thinking.”⁵ But

⁴ Coward (2016, 2018) and Coward and Gamble (2008a) explore the role of material culture in shaping hominin social networks and scaling up cognition, but without questioning underlying assumptions about sociality. Aston (2019) and Barona (2021) critique the theoretical underpinnings of SCT and develop MET-inspired accounts of the social dimension of material culture that complement the emphasis on the sociomateriality of the hominin body that I will propose below.

⁵ 2014, p. 18. While Tomasello is more nuanced in recognizing distinctions between various levels and kinds of intentional directedness, even his joint attention is underwritten by the cognitive mechanism of “recursive mind reading” (2014, p. 48), and he is equally insistent on the centrality of ToM to our understanding of human sociality (e.g., 2008, p. 3 f.).

has it in fact been demonstrated that such inferential and intellectual thinking about thinking is where the foundation and better part of our social lives is to be located? What about the bodily, perceptual, and emotional dimension of sociality? As Leudar and Costall (2009) note, ToM (or ToMism) often assumes an “unexamined distinction between mind and behaviour” (p. 4) and that other minds can only be given indirectly through the detour of theorizing or simulation. ToM tends to take these assumptions “not as *assumptions* at all, but as well-established, inescapable facts of the matter” (p. 4).

SCT proponents often gesture towards accounts of cognition and sociality that contest or complement the cognitivist, mentalizing account. Gamble et al. accept that sociality coevolves with “brains, bodies, materials and surroundings” (2014, p. 123; cf. Coward & Gamble, 2008b) and recognize that social cognition is externalized across material networks of artifacts (p. 111). They even assert that “hotter,” more bodily, emotional, and sensory modes of sociality must have a role to play in the story of the evolution of hominin sociality (p. 50–53) alongside the “cooler” channel of mentalizing, and that emotional intelligence and bonding are as important as the intellectual dimension of sociality. But in the absence of a rich account of these non-cognitivist aspects of sociality, SCT defaults to cognitivist, ToM-based accounts of the distinctiveness of human sociality, thus marginalizing the role of bodily perception, interaction, and affect in sociality. The following passage from Dunbar is exemplary:

Although the cognition that underpins the sense of “feeling close” is far from clear, one thing that comparative and developmental psychologists agree on is that it involves some form of “social cognition.” Our best guess as to what this entails has become known as “theory of mind,” mindreading or mentalizing. (2016, p. 43–45)

Even when it comes to accounting for *feeling* close, for the lack of richer, embodied resources to understand sociality, SCT resorts to thinking about thinking. But this “best guess” elides a great deal of primate sociality, and the supposed “agreement” overlooks considerable scholarship on the ontogeny of social cognition. Even if one grants that normal human sociality somehow “involves” higher order cognitive achievements like those described by ToM, many researchers contest the primacy and centrality of these capacities within the holistic picture of human and primate sociality (Leudar & Costall, 2009; Zahavi, 2014). In the context of developmental psychology in which Dunbar himself situates this assertion, for example, the focus on ToM neglects the bodily, perceptual, and emotional developments of primary intersubjectivity (Trevarthen, 1979), which is likely distinctively human (Moll et al., 2021) and the bedrock of higher-order sociality and cognition (Jardine & Szanto, 2017; Zahavi, 2014, 2017 p. 98). Even in quotidian human interactions, we may question how central mentalizing is to our social life. My immediate understanding of the behaviour of passersby on the streets or teammates and opponents on the football field, my rapid assessment of the general demeanour of a student who walks into my office, and my emotional and practical domestic engagements with my partner all involve a great deal of sociality, some of which is arguably even quite complex and

recursive, but which does not obviously depend on the intellectual achievements of ToM. We may be even more sceptical about the presence and centrality of ToM in the sociality of prehistoric hominins, with their more limited intelligence and the probable absence of language to facilitate ToM (Barrett, 2017).

It is beyond the scope of the present paper to provide a comprehensive survey of contemporary work on social cognition and empathy. Regardless of where one stands on the nature of ToM, its relation to more basic modes of sociality, and its distribution in the animal kingdom, it seems uncontroversial that at least some role must be ascribed to what we might call, in contrast to *mindreading*, *body-reading* (cf. Gallagher, 2005, p. 227); and in contrast to indirect (i.e., inferential or simulative) social *cognition* (in the narrow sense of the “cognitive”), direct social *perception*: a basic, perceptual, and bodily level of sociality alongside mindreading and perhaps foundational for it (Krueger, 2018). If, as Tomasello asserts, humans are the “world’s experts at mindreading” (Tomasello et al., 2005, p. 675), it may well be at least in part because of their foundational skills in and adaptations for body-reading.⁶

Let us turn now to MET. While MET shifts the emphasis of research in cognitive archaeology towards material culture, MET like SCT also officially seeks to avoid any overemphasis on one aspect of the complex ensemble that constitutes human cognition. Malafouris recognizes that the social and the bodily, alongside the cultural-material, are also “essentially inseparable parts of the ontological compound we call the human mind” (2013, p. 14). Yet his paradigm-defining book on MET (Malafouris, 2013) says almost nothing about sociality and how it should be understood within MET.⁷ In the absence of such an account, MET’s material culture is overburdened to account for hominin sociality and the transmission of cultural knowledge. Without an account of sociality that coheres with its broader theoretical commitments, MET risks either being interpreted as reductionistically materialistic (cf. van Mazijk, 2022) and individualistic, or having ToM appended to the theory. Neither option is attractive from MET’s perspective.

3 Reconnecting sociality and materiality: the sociomateriality of the appearance of the hominin body

In this section I will provide an account of the hominin sociomaterial body that may be able to correct for MET’s and SCT’s joint blind spot. First, though, I want to suggest a consequence of the reasoning behind the Social Brain Hypothesis that has been little appreciated in SCT’s emphasis on brain-bound cognition. If it is true that selective pressures for complex, cooperative sociality operated on prehistoric hominins, we should expect that these forces operated not only on intellectual cognition and brain size. If affectivity, perception, and the body itself can better facilitate the

⁶ Aston (2019) is skeptical about prospects of the attempted turn to more embodied and distributed understandings of sociality from proponents of SCT so long as the latter retain their commitment to ToM.

⁷ Even in a contribution to a volume on intercorporeality (Malafouris & Koukouti, 2017), a theme primarily focused on the relations between two animal or human bodies, MET has nothing to say about the social as such or its relation to human-material intercorporeality. Gallagher and Ransom (2016, p. 342) also note the omission.

relevant sociality, we should expect the selective pressures would have operated on them as well. And here, the body may be shaped both insofar as it perceives and acts, *and* insofar as it is perceived, acted-upon, and acted-with. This is all the truer if we accept an embodied understanding of cognition and sociality, such as I will advance in this section. Alongside the Social Brain Hypothesis, we should consider a Social Embodiment Hypothesis.

To put the view I will develop rather too crudely (and spatially), what is lacking from SCT is the *materiality* of social cognition, while what is lacking from MET is the *sociality* of material engagement. These two lacks are in fact one and the same thing, the obverse and reverse sides of a common lack: a rich notion of *sociomateriality*. And this is precisely the manifest *sociomaterial* body of prehistoric hominins. The multimodal appearance of this body is the interface of materiality and sociality. This body is the first material engagement, the first social engagement, the first sign. Manufactured tools are secondary tools, ToM is secondary sociality, and conventional languages (even one's so-called "mother" or first language) are second languages. As Merleau-Ponty puts it, "The very first cultural object, and the one by which [all others] exist, is the other's body as the bearer of a behavior" (2012, p. 364).

It is understandable that paleoanthropology and cognitive archaeology are hesitant to speak of the appearance of ancestral hominin bodies. There is warranted scepticism surrounding the reconstructions of fossil ancestors' appearance.⁸ Unlike skeletons and lithic technologies, the soft stuff of our bodies, the muscles and sensory organs, do not fossilize. However, the same is true of language and social cognition, but this has not prevented abundant and productive speculation concerning their evolution (Tomasello, 2014, p. 152). As Darwin himself remarked, in a letter to Alfred Russell Wallace, "Without speculation there is no good and original observation."⁹

3.1 The theoretical framework: esthesiology

To get this appearance of the body and its social significance correctly into focus, then, we need a theoretical framework for its interpretation. To that end, I propose *esthesiology*. I borrow the name and general strategy from Merleau-Ponty, though he only roughly outlined it in a late lecture course from 1959 to 1960 titled "Nature and Logos: The Human Body" (2003, p. 201 ff.). I will elaborate esthesiology with the support of recent work in phenomenology and 4e cognitive science. My approach is thoroughly based upon and inspired by Merleau-Ponty's work, and there is nothing quite the equivalent of this esthesiology available in the landscape of contemporary 4e work. Further, it is a special virtue of Merleau-Ponty's thought to seek constructive mediation between opposing intellectualist (SCT) and empiricist (MET, roughly) tendencies of thought (cf. Kee, 2019). For these reasons, the reference to Merleau-Ponty is indispensable. At the same time, the following will not be an exercise in Merleau-Ponty exegesis. I will adapt esthesiology to the more generic framework of much contemporary work in 4e cognitive science inspired by phenomenology, rather

⁸ For the latest efforts in this area, see Wiseman (2023) and Shui et al. (2023). For review and critique, see Campbell et al. (2021) and Diogo et al. (2023).

⁹ Letter from 22 December 1857 (Wallace, 1916, p. 131).

than presenting it in the richer but more abstruse framework of Merleau-Ponty's own late philosophy. I do this in line with the ecumenical strategy stated in the Introduction to this paper, and because I believe there are original insights into human evolution germinating in "Nature and Logos" that can profitably be integrated into any account of human evolution without taking on the rest of Merleau-Ponty's philosophical vision.

3.1.1 Embodiment and expression

Phenomenologists emphasize the embodiment of the mind. Mind and first-personal experience are intimately bound up with the body. This body-mind is, as Husserl (1989) and Merleau-Ponty stress, a curiously two-faced creature: on the one hand, it is my subjective, experiential openness onto the world, the locus of consciousness and my ability to feel, perceive, act, and think within the world; on the other hand, it is an objective, material thing in the world, visible and touchable to other subjects and constrained by the laws of nature like other spatiotemporal objects. In late texts, Merleau-Ponty refers to these intertwining aspects of the body as its *sensing* (roughly, subjective) and *sensible* (roughly, objective) aspects (2003, p. 209 ff.; 1968, p. 131 ff.). These aspects are internally related, like two sides of a sheet of paper. What happens to one side will invariably have consequences for the other.

Because of this internal relation, bodily actions, expressions, and gestures are not merely accidentally associated with their first-personal, subjective counterpart. Rather, the body is the very expression and incarnation *of* the mind. One will immediately think of facial expressions and deliberately communicative gestures, and these are certainly important examples. But perhaps even more basically, my perceptual, behavioural, and volitional intentions are, to some extent, visible in my bodily comportment itself. The movements of my eyes, my posture, the orientation of my body, and my reaching hand all exhibit something of their correlated experiential, psychological aspect. A contemporary way of putting it is to say that emotion, for example, or motor or perceptual intention, are partially *constituted* by their expression or other bodily factors involved in their execution or realization (Gallagher, 2017a; Krueger, 2018).¹⁰

The full significance of the expressive embodiment of the mind for zoology has not been widely appreciated. In those living beings for whom being seen (or not seen) is an issue of vital importance, the being's visual appearance and expressive repertoire adapt along with the vision of those animals who may see it (or fail to see it). This is true of the colouration of many flowers, invisible to the human eye but not to the eyes of bees and birds; and of the tiger's stripes, compelling camouflage to the dichromatic vision of its prey but less so to the trichromatic vision of humans. There is a *coevolution* of the sensing and sensible aspects of an animal's body with its conspecifics and its biotic and abiotic environment.¹¹ When we consider the precise morphology and occasional conspicuousness, even garishness, of the appearance

¹⁰ On Merleau-Ponty's general understanding of expression, see Fóti (2013) and Landes (2013).

¹¹ This is an insight Merleau-Ponty appropriates from Portmann (1967). See Merleau-Ponty (2003, p. 186–190) and Kee (2023).

of living creatures, along with the metabolic investments required to generate and maintain these traits, it is somewhat surprising that greater, more detailed attention is not paid to the evolutionary significance of the social-expressive appearance of the human body.

3.1.2 Empathy (and the like)

If we accept that mind is embodied and expressive, there is suddenly much more to *perceive* in others' bodily activity. Contrary to the cognitivism of ToM, embodied and phenomenological accounts of sociality centre on *empathy* in a somewhat technical sense of that term (see Zahavi, 2014). The most basic level of empathy is a sort of direct social perception (cf. Krueger 2019), understood as basic access to the other's experience through perception (or "quasi-perception" - Jardine, 2022, p. 76 ff.) of the other's body. This is what Merleau-Ponty calls "esthesiological empathy" (1964, p. 168 ff.) or what Jardine (2022), following Husserl, calls "animate empathy." What I initially perceive in the other is another *sensibility* – an affective and *sensorimotor* receptivity and agency towards the world – rather than a mind and its thoughts. In seeing your head position and the movement of your eyes, along with a bit of contextual and background understanding, I simply see that you are seeing, and perhaps even *what* you are seeing (cf. Merleau-Ponty, 1964, p. 169). I have access to your mind and experience (or, more cautiously, access to a constitutive aspect of them) through their embodied expression. This access does not involve any inference or higher order intellection. This is not to deny that we are capable of higher-order social cognition, and phenomenological accounts may grant that social understanding as a whole is a complex of abilities rather than a monolith (Maibom, 2020, p. 6; Zahavi, 2014, p. 101).

The phenomenological account of empathy does not require a matching condition (Zahavi, 2014, 113). I can empathically perceive that you are sad, or watching a film, or deep in thought, even if I myself am not in the same state. Nor does the phenomenological account restrict empathy to targeting emotional and narrowly cognitive states (i.e., feelings and thoughts), the paradigm examples for most theories of empathy. Esthesiological empathy targets the other's sensory, motoric, basic affective, or volitional state. These are the paradigm cases of empathy and the foundation for higher-order social cognition.

Phenomenological accounts of empathy typically focus on *access* to the other's experience, the most basic epistemic level of sociality. To understand the full significance of the evolution of the human body and its adaptivity for sociality, however, we must consider the whole range of social phenomena mediated by bodily appearance and expression. This may include, for example, emotional contagion, motor mimicry, and other causal interactions (cf. Gallagher, 2017a), as well as things we intentionally do to directly affect one another's mental states. Esthesiology concerns not only how we epistemically access one another's mental states, but also how we causally, affectively influence them.

3.1.3 Esthesiology

On the basis of this understanding of the empathic, expressive embodiment of animate beings, Merleau-Ponty proposes esthesiology as an approach to the emergence of a distinctively human variation of animal life (2003, p. 203 ff.). Esthesiology should focus on “the miracle that is a sense organ” (p. 209) as this two-sided, sensing-sensible being, and understand the human body on the whole as an “organ of the for other” (p. 210, 218) adapted for sociality. It should situate the human body in an evolutionary (and comparative-zoological) context to understand how, “before being reason, humanity is another corporeity” (p. 208). While Merleau-Ponty’s esthesiology survives only in sketches, research in primatology and human evolution from the ensuing 65 years allows us to flesh out the skeleton of esthesiology that Merleau-Ponty provided. In the following section I will present some of those details. Esthesiology provides us with a rich framework for interpreting and integrating a wide range of findings concerning the morphology and appearance of animal bodies (Kee, 2023, Forthcoming).

Let me conclude this brief introduction to esthesiology with a claim that, to my knowledge, has not been made before, but one that I believe clearly follows from the tenets of esthesiology and the basic presuppositions of SCT concerning primate and specifically hominin sociality: *The most important material, perceivable feature of the hominin environment is the morphology and appearance of conspecifics’ bodies.* These bodies, not tools or language in and of themselves, are the locus of cultural learning. Or, if one prefers not to identify a single locus in the distributed network of cognition, we can say that the appearance and morphology of the other’s mind-body is a central node of that distributed network and one that has not received due attention amid the infatuation with the unobservable hominin brain and its cognition, and visible material culture. Indeed, the importance of this sensible, expressive body would have been even greater if there was a long period during which our lineage developed increasingly complex cooperative sociality prior to language (as the primary advocates of SCT hold) and if language itself evolved first in the gestural modality (as many theories of the evolution of language hold).

We lavish great attention on the matter and form, morphology and appearance, of artifacts. We do the same when it comes to the ecological functionality of the body: the adaptation of the hand for tool use, of the foot for walking. Yet comparable attention has not been paid to the morphology and appearance of the human body insofar as it facilitates sociality. This is by and large true even of 4e- and phenomenologically oriented research on human evolution. For example, Gallagher (2017b) has emphasized the new possibilities of *perceiving* and *acting* facilitated by the upright posture, Barrett et al. (2021) propose a “visual [i.e., *seeing*] brain hypothesis” as an alternative to the Social Brain Hypothesis, and Zlatev et al. (2020) highlight the role of the ability for bodily *imitating* in the development of the original human-specific communication system. But in each case, the emphasis is on *perceiving*, *acting*, or *imitating*. Little appreciation is given to the coevolution of the corresponding *sensible* aspects of the body: the body that has evolved to be *perceived*, to be *acted-upon* and *-with*, and to be *imitated*. It is this lacuna that esthesiology is uniquely qualified to fill.

3.2 Hominin bodies: cooperative sense organs

In this section I will apply the esthesiological framework to interpret some facts about the morphology and appearance of the human body. “Appearance” is understood here as generic to the various sensory modalities, and thus includes not only visible appearance, but also tangible and audible appearances. The guiding hypothesis of esthesiology is that, given the selective pressure placed on early hominins to develop a cooperative, communicative, prosocial form of life, this pressure ought to have acted not only on the hominin brain, but should also be written into the very morphology and appearance of the hominin sociomaterial body. In the simplest case, there would have been pressure to evolve a bodily appearance that is more efficient in displaying the body’s intentions to others. Or, in Merleau-Ponty’s idiom, there was pressure to evolve an organ of the “for-other” whose sensible, outward-facing aspect more transparently revealed its sensing, experiential aspect.

Let us consider some relevant features of the morphology and appearance of the human body in juxtaposition to those of other primates.¹²

3.2.1 Cooperative and expressive eyes

We may begin with a well-established and widely accepted example of how the human body’s appearance has evolved to facilitate cooperative sociality: the cooperative eye hypothesis (Kano, 2023; Kobayashi & Kohshima, 1997, 2001; Tomasello et al., 2007). The human eye exhibits unusually stark contrasts between surrounding skin, sclera, pupil, and iris. These features allow a human’s eye gaze direction to be tracked more easily than that of other primates, whose ocular morphology may even have evolved to camouflage gaze direction (Kano et al., 2022, consistent with Tomasello’s claim, discussed above, that nonhuman great ape sociality is primarily competitive rather than cooperative). Humans can thus rely on eye movements to track others’ gaze direction and visual orientation, whereas other great apes rely primarily on head movements, a far less precise index of visual direction. Human infants learn to track gaze direction in the first year of life and use it as an important cue in socialization and language acquisition. In addition to exhibiting our perceptual orientation, human ocular morphology also allows us to express something about our affective and even cognitive states (Baron-Cohen et al., 2001; Jessen & Grossmann, 2014). Emotional shedding of tears is humanly unique (Vingerhoets, 2013).

The cooperative eye hypothesis is widely accepted, though the specific formulation of it is still debated (Kano, 2023) and the nature and extent of cooperative eyes among nonhuman animals remains something of an open question (e.g., Ueda et al., 2014). But if the morphology of the human eye evolved under selective pressure to facilitate prosocial cooperation, is it not likely that other aspects of our bodily morphology and appearance did as well? We communicate and affect one another, after all, with much more than our eyes.

¹² Kee (2023, Forthcoming) discusses some of these examples in greater detail.

3.2.2 Furless faces

Consider in this context another striking characteristic of the primate order. Many primate species have shed the fur on their faces (and in some cases their rumps). Curiously, there is a strong correlation between primate species that have furless faces and those that have evolved trichromatic colour vision. Changizi et al. (2006) argue that these traits have coevolved, illustrating the principle of the coevolution of the sensing and the sensible presented in the previous section. Colour vision allows primates to detect important social signals concerning the inner state or mood of a conspecific in their furless face or behind (e.g., anger or sexual receptivity). In humans, the blood rushes to the face when we blush, but this display would be wasted if we did not have colour vision to see it and visible facial skin to reveal it. This tight correlation further corroborates the claim that in social species, there is a tendency for the appearance of the body to evolve to serve a social-communicative function.

3.2.3 Visible action and gesture

Returning to *Homo sapiens*, Hewes (1983) observed a distinctive pigmentation pattern in human skin and proposes a communicative function for this trait. The depigmentation of the palms of the hands is unusual among primates, and no other primate has depigmented finger- and toenails as an adult. As a result, the visibility of the hands and fingers, and their movements, is amplified in contrast to the surrounding body, against dark backgrounds, and in twilight or firelight conditions. The hand is naturally outfitted with highlighting of its most important kinematic landmarks. We are increasingly coming to understand just how much of human intention is visible in action itself. For example, subjects can determine whether someone has grasped an apple (proximate intention) with the goal (distal intention) of eating it, throwing it, or handing it to someone else, simply from observing subtle differences in the movements of the hand and arm in the initial grasping motion itself (Ansuini et al., 2014). The hand is hominins' most important practical and technical organ for fine motor skill and may at one time have been their most important communicative organ prior to language proper or if language proper was first manual signed language. The hand's augmented visibility, then, may have facilitated hominin cultural transmission, deictic and pantomimic communication, and even sign language.

3.2.4 Cooperative skin

Taking the preceding observations as a sort of inductive basis suggests the following extrapolation: If the need to facilitate cooperative sociality is a major driver of the evolution of the appearance of the hominin body; and if other primates have shed *some* of their fur to facilitate social communication; then perhaps hominins at some point shed *most* of their fur to facilitate sociality. Call this the *cooperative skin hypothesis*, by analogy with the cooperative eye hypothesis (Kee, Forthcoming). It proposes that furless skin is more expressive, more communicative, and makes it easier for others to see, touch, and affect the underlying sensing state and expressive intentions of the body.

Indeed, even more than the eye, there is a direct link between the skin and our affective state. The skin is an organ both of exteroception and interoception (Cruccianelli & Ehrsson, 2022; Kirsch et al., 2018). As such, the visibility and tangibility of the skin gives us access to the other's inner state. And it can be accessed not only for the epistemic value of knowing what state the other is in. Through social touch we can even directly affect and regulate one another's affective state through the skin, allowing us to calm each other and providing a high-speed channel to emotional bonding. In the skin, the other's sensing (their emotional state) is almost literally tangible. This would have been of tremendous social significance if, as Dunbar and colleagues claim, regulating the stresses of group living and maintaining social bonds were major pressures driving the evolution of the hominin lineage.^{13, 14}

The cooperative skin hypothesis is not mutually exclusive with alternative explanations for hominin fur loss, such as thermoregulation hypotheses or the hypothesis that fur loss occurred as we increasingly used clothing, blankets, or fire for warmth.¹⁵ Further, the cooperative skin hypothesis can be taken in stronger or weaker versions. The stronger version claims that furlessness evolved as a direct result of selective pressure for cooperation. The weaker version simply claims that, whatever the original pressures that led to the trait, furless skin was at some point exapted for cooperative purposes. One observation in support of a stronger claim is the rough correspondence in estimates for when hominins first lost their fur (Jablonski, 2021) and for when a bodily, mimetic form of communication came to the fore (Zlatev et al., 2020), both of which may have occurred in the range of 2 million years ago.

Summarizing and generalizing the above, esthesiology suggests a *cooperative body hypothesis*. There is a tendency for the sensible (i.e., visible, kinematic, touchable) aspect of the human body to evolve to better express and expose its sensing (i.e., seeing, kinaesthetic, affective) aspect. The sense organs and the human body as a whole are organs "of the for-other," organs to be perceived, acted upon, and acted-with by others.

¹³ Of course, nonhuman primates have their equivalent to social touch in the social grooming practices to which they dedicate considerable time, and which play an important social bonding function. While I am unaware of any research directly comparing the bonding efficacy of furless social touch and furry social grooming, a possible evolutionary mechanism has been proposed from grooming behavior "as a utilitarian action with affiliative meaning among monkeys, to the caress as a purely affective gesture associated with humans" (Grandi, 2016).

¹⁴ I have not specified which human social-tactile relationships are most affected by a possible augmentation or transformation of social touch through furlessness. While any and all prosocial relationships (e.g., sexual partner, family member, friend, etc.) may be relevant here, it would be especially interesting to consider the parent- and alloparent-infant relationship through the lens of attachment theory. While Bowlby's (1969) original presentation of attachment theory assumed the attachment system to be widely shared and similar across the primate taxon, more recent research indicates considerable interspecies variation. Though there is also considerable intercultural variation, the human variation on primate mother-infant attachment is distinctive among the great apes for the typically high degree of parent-infant separation in the first year of life, the reliance on alloparenting, and the combination of sensory (visual, tactile, and vocal) modalities (Hrdy & Burkart, 2020; Myowa & Butler, 2017).

¹⁵ Tuomisto et al. (2018) surveys current biologists' and anthropologists' views on proposed explanations of hairlessness. None of the options offered, however, overlaps to a significant degree with the cooperative skin hypothesis.

I hope that these preliminary esthesiological investigations will convince readers of the importance of the morphology and appearance of the hominin body in the evolutionary story of our lineage, and that this will motivate further esthesiological reflections and investigations. Esthesiology must consider all the senses and their organs. It also requires an account of whether and to what extent humans' basic affectivity and motivations may differ from those of nonhuman animals, whether in quantity or quality (cf. Tomasello, 2019, p. 219 ff.; Kee, Forthcoming). For the visibility of the human body would be socially irrelevant without the appropriate motivations and desire for one subject to reach out to another with hand, eye, and mind.¹⁶ In a metaphor, if there is a circuit running between self and the other, the resistance of this circuit is decreased when our social-communicative bodies naturally facilitate expression and communication. But it is desire, motivation, and interest that determine the voltage of the circuit. The intense visual attraction that normal human infants exhibit for human faces, behaviour, and the sounds of language, and their basic prosocial motivations (e.g., Tomasello, 2008, p. 117 ff.), are all examples of this distinctive motivational orientation. The esthesiological body, as Merleau-Ponty put it, is also a desiring, *libidinal* body (2003, p. 210). Beyond this, Merleau-Ponty also envisioned esthesiology as providing a link from the study of the libidinal-esthesiological body to an understanding of the human as a *symbolic* and ultimately *rational* animal (e.g., p. 190 ff., 208, 211, 219, 226 ff.). Esthesiology has much more ground to cover than what I have offered in this brief sketch, and potentially a great deal more to contribute to our understanding of human origins.

4 Consequences for SCT and MET

4.1 Consequences for SCT

What follows for SCT when we introduce the social body into our understanding of hominin sociality? Again, I will begin by presuming complementarity and suggest what esthesiology may offer to SCT. Esthesiology's rich account of embodied sociality could allow SCT to respond to critiques that its understanding of hominin sociality is too cognitivist (e.g., Barona, 2021; Barrett et al., 2021).

Consider the role of the emotions. Despite their heavy emphasis on ToM in hominin sociality, Gamble et al. (2014, p. 158 ff.) recognize the need to let the emotions do much of the work of social bonding. Given the demands on emotional bonding created by increased group size as the hominin lineage developed, there would have been a need to "amplify the senses" and emotions to facilitate social bonding (p. 158, 171). Gamble et al. speculate that this may have been achieved by music, laughter, and other means, and recognize the importance of material culture in this context

¹⁶ There is in these observations the beginnings of a response to a challenge Overgaard (2019) posed to advocates of direct social perception and the expressive embodiment of mind. Overgaard argues that an embodiment thesis could be true or false independently of the direct social perception thesis. While this may be true from a strictly logical point of view, shifting the focus to a more empirical and evolutionary plane, it is easy to understand why direct social perception and expressive embodiment of mind go hand in hand and even coevolve together.

(Dunbar et al., 2010; Gamble et al., 2011). However, returning to the circuit analogy introduced in the previous section, one can achieve amplification in various ways. One way is to turn up the signal, increasing the voltage operating across the circuit. In our analogy, this would amount to turning up the volume on the subjective side of the self-other circuit, for example, by increasing emotional intensity, desire, or the sensitivity of the senses. Another way to increase the amplitude, however, is to reduce the resistance within the circuit itself. In our analogy, this would happen by making the objective side of the self-other circuit (i.e., the sensible, perceived body of the other) more receptive. This could be achieved by making the sensible body more open to being perceived and acted upon by the sensing body of the other. And this is precisely what esthesiology envisions: an eye that is a more transparent window onto the soul, a skin that is a more permeable membrane between self and other. Despite acknowledging the importance of emotions and materials in sociality, SCT neglects the expressive human body that binds emotions, materials, and sociality together.

A more socially efficient body thus might also help resolve the time budgeting crises facing prehistoric hominins on Dunbar's models (2016). As group and brain sizes increased, prehistoric hominins required more time for all their major activities: social bonding, foraging and eating, and traveling. This left fossil hominins' time budgets stretched to the max as group and brain sizes increased. Dunbar has proposed various biological developments and cultural innovations that would have helped deal with these demands. He sees laughter, singing, dancing, religion, feasting, and emotional storytelling as modes of "virtual touch" allowing us to touch many others at once (Dunbar, 2022). Introducing the social body suggests further ways to make up the deficits. As Dunbar himself notes, firelight effectively lengthens the social day by providing hominins more hours for socializing after the sun has gone down (Dunbar & Gowlett, 2014; cf. Hewes, 1983). But as we have seen, changes in the appearance of the body achieve much the same end, and these features are perhaps most relevant in lowlight and firelight conditions. Similarly, the hairless body of humans, in which the sensing and sensible aspects of the body are in such close contact with one another, may be more efficient for social bonding and allow for different kinds of social bonding compared to the more guarded body of other primates. Before invoking "virtual touch," we may consider the ways in which the body evolved to render our *real* touch more affectively effective. Esthesiology helps us see how the evolution of bodily morphology may have helped hominins solve their time budgeting crises by enabling higher quality social time.

If the embodied account of sociality I am emphasizing can complement and integrate with SCT, a great deal will depend on how the esthesiological level of empathy relates to any higher order, more intellectual modes of social cognition. Esthesiology sees the sensible and sensing aspects of the body are intimately interrelated and suggests that the hominin body specifically has evolved to render its sensing aspects more sensible. It thus implies that a great deal more of the hominin mind is available to the perception and action of others, and that it is available in much greater resolution (e.g., gaze direction can be determined fairly precisely given typical human eye morphology), than SCT accounts typically recognize. Esthesiology reminds us, first of all, that we should be interested not only in whether an animal can achieve multiple levels of social intentionality and how many it can achieve, but also in just how

rich the resolution is on the primary level of esthesiological empathy. This degree of initial resolution plausibly influences an animal's ability to cooperate successfully just as much as the number of higher levels it can achieve.

Furthermore, esthesiology suggests a new question concerning the higher levels of social intentionality that, to my knowledge, has not yet been asked. Given the exemplary availability of the hominin body to esthesiological empathy, we may ask whether in some cases multiple levels of intentionality can be achieved *solely within perception* and without recourse to ToM. Suppose, on a variation on the classic pre-historic, prelinguistic hunting scenario, that three hominins are hunting large prey. They close in on the target from divergent angles and exchange glances. Could it be, on a purely esthesiological level and without recourse to ToM, that *X* sees that *Y* sees that *Z* wants *X* to attack? If so, several levels of social intentionality would be achieved without recourse to any inferential, propositional ToM.¹⁷

Let us assume, though, that at some point in the phylogenetic and normal ontogenetic development of human sociality, some higher modes of reasoning or imagining another's mind come to complement basic empathy. Esthesiology must still provide an account of the relationship between the basic, esthesiological stage of empathy and such higher forms of social cognition. Here we must note a tendency towards a modular understanding of social cognition and the mind more generally typical of ToM accounts (Aston, 2019). Such an understanding of mind and brain does not fit well with the more embodied approach I have advocated. I am more inclined to appeal to a principle of "neural reuse" (Anderson, 2010; Anderson & Penner-Wilger, 2013), which suggests viewing higher order social cognition as an evolutionary elaboration of sensorimotor foundations of basic social perception rather than being an entirely separate modular achievement (Barrett et al., 2021). Such a view highlights the connectivity of the brain rather than its modularity. It also foregrounds the hitherto largely neglected sensorimotor-social *cerebellum* (Barrett et al., 2021; cf. Sereno et al., 2020; Laricchiuta et al., 2022; Ferrari et al., 2022), rather than the cognitive-social *neocortex* championed thus far by Dunbar and colleagues' version of SCT.

With such considerations in mind, the presumed complementarity of esthesiology and SCT begins to appear rather more precarious. It may be that SCT is too firmly rooted in the cognitivist and modular view of the mind to easily be merged with a more embodied account without serious theoretical revision. In any case, the account of empathy provided here challenges at least the centrality of ToM in our account of sociality, and highlights that the various modes of others' intentionality (e.g., perceptual, volitional, narrowly cognitive) may be grasped through different means than ToM typically assumes.

A related issue here is that SCTs have been accused of being anthropocentric and anthropomorphic, since they tend to make a distinctively human, typically language-based mode of social cognition the measure of sociality and social intelligence in nonhuman animals and past hominins (Barrett, 2017). Though it has not been the purpose of the present contribution to pursue this issue, I would propose that esthesiology, with its focus on the sensorimotor and affective levels of sociality, and its

¹⁷ Of course, such social perception would still be mediated by past experience, context, and background knowledge. But this need not entail that the sociality involved is indirect or inferential (Zahavi, 2011).

sensitivity to variations in animal sensorimotor morphology, stands a good chance of providing a rich picture of the social lives of nonhuman animals that is less susceptible to the errors of anthropocentrism and anthropomorphism. In the context of the primatological research discussed above, the sociality of great apes in the wild could be seen in a different light when viewed esthesiologically, revealing an intelligence between “mere behaviour” and ToM. The sociality involved in wild chimpanzees’ group hunting and territorial patrolling behaviours, for example, is still much debated and warrants re-examination through the lens of esthesiology.

I have focused my discussion in this section on Dunbar and colleagues’ version of SCT. To the extent that other versions, such as Tomasello’s, hold the same cognitivist biases, they will be subject to the same concerns and critiques. The emphasis on ToM is mitigated somewhat in Tomasello’s work, especially in recent years. He recognizes diverse ways in which an animal can understand another’s mind (Call & Tomasello, 2008), and his emphasis on a face-to-face, prelinguistic level of sociality underlying language and culture in ontogeny and phylogeny opens the door for easier integration with the esthesiological approach. Nonetheless, Tomasello arguably still articulates that face-to-face sociality in somewhat too cognitivist terms for many advocates of embodied approaches. To my knowledge he has not himself explicitly stated how his view stands with respect to embodied understandings of cognition and sociality, and he has rejected less “cognitive” accounts of sociality in developmental psychology and primatology as “basically behaviourist.”¹⁸ Despite being the originator of the cooperative eye hypothesis (Tomasello et al., 2007), Tomasello offers little further insight into how specific features of primate and hominin morphology are implicated in distinctively primate and hominin modes of sociality.

4.2 Consequences for MET

What constructive or critical consequences would follow were MET to take esthesiology seriously? To begin, let us note one quite general and wholly constructive proposal for integrating esthesiology and MET. MET acknowledges that affectivity and the senses are more essential to the understanding of “human becoming” and “cognition” (including material engagement and sociality) than has commonly been recognized. Nonetheless, Malafouris notes that these aspects of human cognition “are not fully incorporated into mainstream cognitive archaeology, creating unnecessary splits and tensions in the study of cognition, affect, and material culture” (2023). In addition to its prospects for integrating the social and material through the notion of the sociomaterial body, esthesiology’s focus on the senses and affectivity in their relationship with the rest of the hominin mind and behavior can help fill this blind spot in contemporary cognitive archaeology.

The complementary resource is, I believe, very much a desideratum for MET. With its attempt to correct the anthropocentric bias in our thinking about humanity,

¹⁸ Tomasello, 2019, p. 334. As discussed above, the “unexamined distinction between mind and behavior” is one of the hallmarks of ToMism (Leudar & Costall, 2009, p. 4). Those who have followed phenomenology’s contributions to recent social cognition debates will hear in this an echo of the allegation of behaviourism, in my opinion quite inaccurate, raised against the phenomenological account of empathy. See Jacob (2011), and for reply, Zahavi (2011).

MET has urged us to shift our attention to extended material culture, understood not as opposed to the human mind but rather as coconstitutive of it. In doing so, however, MET largely ignores the most important material extension of human culture, cognition, and experience, namely, the sociomaterial extension of cognition mediated by the appearance of other human beings. The esthesiological understanding of human bodily sociomateriality I have outlined above thus serves to complement and correct MET's materialistic bias by providing an approach to sociality compatible with MET's emphasis on embodiment and materiality. If MET truly seeks to acknowledge that "cognition is [...] constrained by the specific kind of body we possess" (Malafouris, 2013, p. 73), then it should not neglect the social morphology and appearance of that body.

Of course, one might reply on MET's behalf that it is perfectly legitimate to have a research *focus* on material culture, and to leave it to others to provide the complementary account of sociality. I suspect, however, that there are shortcomings of MET on its own terms that will only be filled once MET develops an account sociality consistent with its theoretical framework. For example, MET follows Bergson in viewing *Homo sapiens* as *Homo faber*, a being that creates tools and recreates itself through its tools. "No human is ever complete; all humans are prosthetic sites of self-transformation," Malafouris (2015, p. 358) writes, naming this capacity for self-transformation *metaplasticity*. But MET provides no account of how and why such metaplasticity emerged uniquely or to an exceptional degree in the hominin lineage. While certain characteristics of the human brain and body surely have a role to play in this story, I would propose that any complete account of our ability to reinvent ourselves through material artifacts is grounded upon or at least augmented exponentially by our social abilities to imitate others and to see the world and material things through others' eyes. It is only through the plurality of perspectives upon things and, indeed, upon selves, that things and selves cease to be brute, fixed realities and become truly open loci of (meta)plasticity and possibility for endless reinvention. This is a view upon which SCT (especially Tomasello's version) and Merleau-Ponty show striking convergence (Kee, 2020), and about which MET has astonishingly little to say. MET's efforts to overcome anthropocentrism have decentered the *Anthropos* rather too much towards material culture. Esthesiology, by contrast, recognizes that the individual human is eccentric to itself in its distribution across its *sociomaterial* extension, and that the social and material aspects here are inextricably interwoven. It thus marks out an anthropo(ec)centrism in the middle ground between the genuinely problematic anthropocentrism of SCT and the somewhat disingenuous anti-anthropocentrism of MET.

As with SCT, however, there may be theoretical obstacles standing in the way of integrating esthesiology and MET. Like MET, esthesiology understands mind as intimately interwoven with material. The sensing, conscious, "minded" aspect of the body and self are entangled with their sensible, "material" aspect, which is itself in some respects common to the human body, its tools, and its environment. Thus far, I have remained vague on the ontological details of this position, as I have attempted to see how far we can come in reconciling MET, SCT, and esthesiology. A great deal of productive work can occur in the human and cognitive sciences without being fully lucid and explicit about one's ontological commitments. A moment arrives, however,

when one starts to wonder what MET means by terms like “material” and “mind,” apart from the obvious polemic and negative critiques of the conventional representationalist understandings. In drawing from contemporary 4e cognitive science, MET relies heavily on Clark’s extended mind and Hutto and Myin’s radical version of enactivism, rather than turning to the more phenomenologically influenced strands of 4e research. It is by no means clear that MET’s “mind” and “matter” are seamlessly compatible with the “sensing” and the “sensible” of Merleau-Ponty’s late works.

In his final years, Merleau-Ponty viewed the dual-aspect, sensing-sensible body as *flesh* and regarded its exploration as a possible pathway to a new ontology.¹⁹ Such an approach provides a way of seeing the human body as open to and intermingled with its environment and material culture. It is an image of a body that is “caught up in things,” a body for which things are “incrusted in its flesh” and constitute “part of its full definition.” “The world is made of the very stuff of the body” (2007, p. 354). This is a self that is open to the very materials it fashions and subject to being reworked by them. Think, in this context, of the relationship between the exposed flesh of the naked ape and the clothing and other adornments with which it reinvents itself as though with a second skin. Esthesiology allows us to grasp the deep polysemy and analogy of *being* in the Greek *organon*: our mental-material sense organs are of the same stuff as our tool organs. More so than his early writings on phenomenology and embodiment, to which MET pays homage (e.g., Malafouris, 2013, p. 4 ff.), Merleau-Ponty’s late, more ontological writings ooze with materiality (or, better, *elementality*).²⁰ Not only self and thing, as in MET, but self, thing, and *other* are all intimately intertwined in the flesh of the world for the late Merleau-Ponty. These works thus may provide theoretical resources for integrating the social into MET’s understanding of extended cognition.

At the same time, this more material focus in Merleau-Ponty’s late thought does not constitute (at least on my reading) an abandonment of phenomenology and the properly experiential, first-personal dimension of experience. Van Mazijk (2022) has questioned MET and other extended cognition approaches from a phenomenological perspective, arguing that they are objectivist and reduce mind to matter. They thus forfeit the decidedly first-personal, experiential character of the mind, whose study constitutes the proper contribution of phenomenology to the embodied understand-

¹⁹ As noted above, my presentation of Merleau-Ponty’s notion of a sensing-sensible body has not aspired to the same philosophical and, indeed, ontological richness that Merleau-Ponty himself was moving towards in his last writings. I have focused on the characteristics of the notion most relevant to esthesiology as I have reconstructed it here. On the various senses of the term “flesh” in Merleau-Ponty’s late writings, see Hass (2008, p. 201 ff.). For a critique of the late Merleau-Ponty’s work as leading to an ontological impasse, see Barbaras (2019); for reply, see Halák (2021).

²⁰ While I have emphasized the *social* dimension of the flesh and empathy, there is textual basis to support an interpretation of Merleau-Ponty’s late thought, including in “Nature and Logos,” as seeing empathy as much with *things* as with animals and people. Under the rubric of “The libidinal body and intercorporeity,” Merleau-Ponty writes, “This=*Einführung* [empathy]. Body-things, penetration, at a distance, of the sensible things by my body. Things as what are missing from my body in order to close its circuit” (2003, p. 218; cf. p. 312 (note 1 to the Seventh Sketch), 209, 210; 1968, p. 180 f.). If this is Merleau-Ponty’s considered view, then he would depart from the standard view of phenomenologists, from Stein and Husserl down to Zahavi, that empathy is a *sui generis*, *other-oriented* mode of intentionality.

ing of the mind.²¹ The Merleau-Pontian approach I have taken in this paper could provide a possible reply and new theoretical resource for MET that allows it to take the embodiment and materiality of mind in earnest without forfeiting consciousness and the insights of phenomenology. Merleau-Ponty did not shy away from the radical challenge to conventional ontology that thinking the extension and materiality of the sensing-sensible mind-body demands. Sooner or later, MET must rise to the same challenge.

5 Conclusion

I have argued that Merleau-Ponty's account of the sociomateriality of the body as outlined in his esthesiology has the promise to fill the gap between SCT and MET by correcting the former's intellectualist tendencies and the latter's materialist tendencies. But this is only one example of productive work it might do. If further developed and adopted more broadly, this understanding of the morphology and appearance of the human body could help bridge between various of the other determinations of the human being with which we are familiar: the human as a distinctively cultural, technological, social, symbolic, and rational animal, on the one hand; and the human as bearing distinctive anatomical traits, such as a disproportionately large brain, bipedalism, and a fully opposable thumb, on the other. Between the hard stuff, the bones and stones of conventional archaeology and paleoanthropology, and the invisible, unfossilised stuff of human cognition, language, and meaning, there is the soft stuff of the manifest sensing flesh of eyes, skin, and hair, the hinge and interface of the visible and the invisible. Palaeoanthropology and archaeology, the study of past hominins, have tended to focus on stones, bones, and, to the extent that they can, brains, especially the cortical brain that can be modelled by endocast. Paleoanthropology, that is, has been paleo-osteo-lithico-cortico-anthropology. This is natural, given the evidential constraints of the discipline, and admittedly innovations in methods such as isotope analysis and Dunbar's time budget modelling allow researchers to considerably advance from the modest "what you see is what there was" of past research. But esthesiology urges us to go further still and consider the sensing-sensible flesh between the stones, bones, and brains of prehistoric hominins. It urges us to attempt a paleo-*sarkic* anthropology. Even if flesh does not preserve in the fossil record, it might introduce a considerable transformation in our overall picture of prehistoric hominins' sociality if we were to treat the flesh as a significant known unknown. Until it achieves greater prominence in our accounts, neither our evolutionary anthropological understanding of human origins nor our philosophical anthropological understanding of the human way of being and place in the cosmos will be complete.

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²¹ Kee (2018) critiques Radically Enactive Cognition (e.g., Hutto & Myin, 2013, 2017), one of MET's preferred sources on embodied cognition, along much the same lines as van Mazijk's critique of MET and extended mind theories.

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