



# Imagery in action. G. H. Mead's contribution to sensorimotor enactivism

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Accepted: 30 September 2021 / Published online: 14 October 2021  
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## Abstract

The aim of the article is to outline several valuable elements of Mead's pragmatist theory of perception in action developed in his *The Philosophy of the Act* (1938), in order to strengthen the pragmatist legacy of the enactivist approach. In particular, Mead's theory of perception in action turns out to be a forerunner of sensorimotor enactivist theory. Unlike the latter, however, Mead explicitly refers to imagery as an essential capacity for agency. Nonetheless, the article argues that the ways in which Mead refers to this capacity do not necessarily place it in opposition to enactivist non-representationalism. On the contrary, as a synthetic process of *re-presenting* of present and past sensorimotor elements, imagery can be seen as the hallmark of a pragmatically inspired sensorimotor enactivist approach that bypasses the opposition between representationalists and non-representationalists.

**Keywords** Enactivism · Pragmatism · Act · Perception · Representation

## 1 Introduction

Among the various versions of the recent pragmatic turn in second-generation cognitive science,<sup>1</sup> many share the common background of assuming that cognition should be considered not as a producer of veridical representations but rather a form of practice, namely a skillful activity that implies a capacity to generate action structures. In this respect, the pragmatic turn is mainly reflected in enactivist theories

<sup>1</sup> On the distinction between first and second generation of cognitive science see Lakoff and Johnson (1999); Johnson (2010). On the pragmatic turn in cognitive science, see Crippen and Schulkin (2020); Madzia and Jung (2016); Mazdia (2017); Engel et al. (2016); Menary (2016); Gallagher (Gallagher, 2016a, 2016b, 2017, 2014); Johnson (2010); Chemero (2009); Testa and Caruana (2020); Johnson (2007, 2010); Rockwell (2005); Heras-Escribano (2021); Fonseca Fanaya (2021); Dreon (2021).

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of cognition. Enactivism overlaps with various approaches to understand embodied, embedded, extended, affective minds as action-oriented (4EA). The recent interest in pragmatist authors arises precisely to respond to a possible integration of the different, sometimes conflicting, approaches into a unified inquiry program. More specifically, the pragmatist turn allows enactivism to further emphasize the organism-environment sensorimotor interaction, the organic nature of the relationship between means (sensory stimuli) and ends (performance of conduct), and the active role of emotional tendencies as co-constitutive conditions of cognitive processes. It provides their phenomenological and perceptual-motor basis with a ‘pragmatic’ view of cognition directed not only at perception but also at perceptual judgments, appraisal processes of affective-emotional and higher-order phenomena such as judgments of practice and memory, and the active role of the milieu in the evolution of the cognitive processes. Indeed, an increasing number of authors agree that the roots of enactivism lay not only in phenomenology and ecological psychology but also in Pragmatism (Johnson, 2007; Di Paolo, Rohde, De Jaegher 2010; Engel 2010; Menary 2011; Di Paolo et al., 2017; Gallagher, 2017).

Charles S. Peirce, William James, John Dewey, and George H. Mead have written extensively on cognition from a naturalistic perspective, and many of their theses are compatible with the various versions of enactivism.<sup>2</sup> Their non-reductive naturalism allows us to rethink the nature of the mind and brain, human action, perception, cognition, and the very concept of nature, not accepting a mechanistic definition of nature as presupposed by science. Accordingly, their anti-dichotomic and anti-dualistic approaches offer functional elements to develop an integrated view on human cognition that aims at constructing integrated explanatory hypotheses about how the organism interacts with the environment. Furthermore, their pluralistic methodologies may contribute to integrate different perspectives: physicalist, mentalist, and phenomenalist.

<sup>2</sup> Ward et al. (2017: 369) identifies three enactivist currents that developed since *The Embodied Mind: Cognitive Science and Human Experience* (Varela et al., 1991), which can be traced back to three different versions in terms of cultural references. *Autopoietic* enactivism (De Jaegher & Di Paolo, 2007; Di Paolo, 2005; Thompson, 2007; Weber and Varela, 2002), which follows Merleau-Ponty in his attempt to provide a third way between realist and idealist conceptions of the relationship between the mind and the world together with a reconceptualization of the idea of the body, and Hans Jonas in claiming the enactivist attempt to explain cognition in terms of biodynamics is grounded on the phenomenological evidence of the continuity of life and mind. *Radical* enactivism (Hutto & Myin, 2013, 2017) presents a strongly anti-representationalist approach that rejects cognitivism in favor of a dynamic pattern of adaptive environmental interactions nature of the mind. And *sensorimotor* enactivism. Despite the varieties of approaches, Gallagher (2017: 6) summarizes seven background assumptions that characterize the pragmatic, action-oriented enactive approaches: 1) cognition emerges from processes that involve the intertwining of brain, body, and environment; 2) the meanings attributed to the world are structured by cognition and action, and 3) the same cognitive processes acquire meaning through their role in the context of action rather than through representational mapping of the environment; 4) the coupling and coordination across brain, body, and environment are dynamical; 5) enactivist approaches emphasize an extended, intersubjective and socially situated nature of cognitive systems and 6) ground higher cognitive functions in sensorimotor coordination as well as in affective and autonomic aspects of the body; 7) higher cognitive functions, such as reflective thinking, is the products of skillful know-how and coupled often with situated and embodied actions.

Among enactivists informed by pragmatist authors, Ezequiel A. Di Paolo, Thomas Buhrmann, and Xabier Barandiaran make explicit references to James, Dewey, and Mead in their book *Sensorimotor Life* (2017) to expand their enactivist approach to perceptual processes and the sensorimotor contingencies involved in them. In particular, they begin their book referring to James' conception of the mind as not simply a mirror passively reflecting an order that exists out there, but rather as an active transformer of the world around us (James 1878).<sup>3</sup> They also quote from Dewey's 1896 article on 'The Reflex Arc Concept in Psychology' to highlight the passage from the classical cognitivist "sandwich model" of the mind (Hurley, 1998), according to which action and perception are considered as two discrete elements of cognition and the direction of influence is predominantly from perception to action, to a more enacted approach in which perception and action are closely intertwining in a continuous, closed sensorimotor circuit (Di Paolo et al., 2017: 17).

Still more interesting, Di Paolo et al. (2017: 33) include a lengthy quote from Mead's essay on 'The Physical Thing' (1932) as a forerunner of the sensorimotor enactivist approach they are promoting. Their reference to Mead's work is particularly worth noting because he is perhaps the least popular classical pragmatist among philosophers of mind and neuroscientists but most likely the most suitable for an integrated approach to different perspectives on cognition (Baggio, 2019a, 2019b; Madzia, 2016; 2013; Nungesser, 2016). In particular, Di Paolo et al. find in Mead's essay a description of action and perception as an organization of sensorimotor couplings, of opposing tendencies to act and of inhibiting processes of some of these tendencies which contribute to connoting, together with the innervated tendency, how behavior is enacted. As Mead puts it:

the resistance which the volume of a body offers to the hand, or to any surface of the body, and the tendencies to manipulate it when seen at a distance, are organized in various ways. [...] My thesis is that the inhibited contact responses in the distance experience constitute the meaning of the resistance of the physical object. They are, in the first place, in opposition to the responses actually innervated or in prospect of being innervated. They are competitors for the field of response. [...] Inhibition here does not connote bare nonexistence of these responses, for they react back upon the prepotent response to determine its form and nature. [...] The act is a moving balance within which many responses play in and out of the prepotent response. What is not done acts in continual definition of what is done. (Mead, 2002/1932: 127–8).

In 'The Physical Thing', Mead synthesizes a theory of perception in action that he extensively developed during the years in various essays gathered posthumously in *The Philosophy of the Act* (1938). In his volume, it is possible to find a well-articulated and thorough answer to the question raised by Di Paolo et al., namely: «what is it to act in the first place, how to distinguish action from other physical happenings or an "incidental" movement of a limb»? (Di Paolo et al., 2017: 29).

In what follows, I argue that Mead's theory of the act, and in particular his description of perception in action, has several valuable elements to strengthen the pragmatist legacy of sensorimotor enactivism (O'Regan & Noë, 2001; Noë, 2004,

<sup>3</sup> For an enactivist reading of William James, see Baggio (2021).

2012; Di Paolo et al., 2017). Yet, unlike enactivist anti- and non-representationalism, Mead explicitly recurs the imagery as an essential capacity for agency. However, the ways in which he refers to this capacity does not necessarily place it in antithesis to enactivism. Instead, as a synthetic *re-presenting* process (Thompson, 2007; Di Paolo et al. 2018) of present and past sensorimotor elements, the imagery seems to be the hallmark of a pragmatically inspired sensorimotor enactivist approach. Unlike anti- or non-representationalist approaches, in fact, a pragmatist approach to perception in action gives the imagery a central role in explaining the ability of virtually re-presenting the ongoing continuation of an act. This approach to imagery seems to mediate between a radical anti-representationalist enactivist approach, a non-representationalist approach that considers imagery as an act of visual experience, and a representationalist approach according to which we should keep some kind of representations.

## 2 Mead's theory of the act

The act is a core notion in Mead's Pragmatism. He used it from his earliest works, as in 'A Theory of Emotions from the Physiological Standpoint' (2001/1895), in which he detected in the instinctive act related to the physiological changes of the organism involved in the first body movements preparatory to the reaction to the sensitive stimulus the transition from purely instinctive responses to the emergence of first expressions of consciousness.<sup>4</sup> He then took up the act in 'The Definition of the Psychical' (Mead, 1903), a long article in which, after a critical examination of the epistemological assumptions of the psychological theories of his time, he refers to James' psychological functionalism and Dewey's organic circuit hypothesis<sup>5</sup> to point to the act as to the fundamental concept for an adequate definition of the psychical sphere. Accordingly, psychologists can catch the psychical phenomenon not as content – the *what* – but as *how* it functions in the different phases of the act where the relationship between organism and environment is expressed. That is, in the coincidence between perception and action that the organism's ongoing conduct manifests. Replacing the mechanistic explanation of the stimulus-response relationship adopted by experimental psychology of the time with the idea of a sensorimotor circuit, Mead aimed to highlight the organic nature of the sensorimotor process

<sup>4</sup> Mead has elaborated his theory of emotion together with his colleague and friend Dewey (1971/1894, 1971/1895), with whom he collaborated from 1892 to 1904. Dewey (1893) himself admitted his debt to Mead concerning both the description of the relationship between vegetative functions and motor functions and the hypothesis about non-human emotional attitudes.

<sup>5</sup> When Dewey and Mead arrived at the University of Chicago in 1894, they developed a psychological theory that would include a theory of consciousness in terms of organic functions. In particular, they elaborated a phylogenetic hypothesis concerning consciousness from the sensorimotor processes, overtaking both the limits of an idealistic interpretation of sensations and the risks of a reductionist physicalism. Their research produced a theory of emotion and a theory of organic circuit published by Dewey in the famous 1896 paper (Dewey, 1972/1896), namely an organicist interpretation of human action that substituted the dualistic perspective underlying the distinction between stimulus and response.

in which stimulus, organism's selective capacity, and motor response are regarded as intertwined and interdependent phases rather than discrete and distinct elements.

Despite these early formulations, a complete elaboration of Mead's theory of the act can be found in the posthumous *The Philosophy of the Act* (1938). Here Mead incorporated what he had developed on emotions and organic circuit, depicting the act as a continuous event in which perception and action are intertwined and goal-oriented (Mead, 1938: 364), and in which ideo- and sensorimotor systems maintain the vital process by shifting organism's attention to new controlled co-ordination of outgoing impulses and activities.

Taking for granted that the act is a unique synthetic process in which the uninterrupted relationship between organism and milieu unfolds, Mead distinguishes four phases of the act.

- (1) The first phase is the *impulse* to act, rooted in the physiological pre-disposition of the organism to react to a sensible stimulus. This impulse is at the basis of the reactions of the vascular and sensorimotor systems to sensory stimuli so that the reachability of the peripersonal space around the body as it dynamically interacts with the environment is rooted in the body's predisposition to act on external stimuli (Mead, 2001).<sup>6</sup>
- (2) The impulse phase to act is inextricably intertwined with the *perceptual* phase through which the organism selects some stimuli at a distance. Coordination between visual perception and active selection of the sensory stimulus is the basis of the motor preparation to act, namely the ideo-sensorimotor system of approaching or moving away from the stimuli. On this point, Mead is remarkably akin to James' theory of direct perception, namely the continuity existing between our psychological functions and our dealings with the natural and social environment at the roots of the anticipatory mechanisms in the sensorimotor systems (James, 1890/1981).<sup>7</sup> According to Mead, perception arises within an act that is already going on. It implies inhibition of the process of moving toward or away from a distant stimulus arising «from the presence in the organism of alternative completions of the act». These alternatives are under the control of «excited adjustment of the organism to the contact response to the distant stimulus» (Mead, 1938: 159).
- (3) The third is the *manipulatory* phase of perception. It is the most crucial phase for two reasons: a) It is the contact experience that allows the organism to verify what was hypothesized in the ideo-sensorimotor anticipations; b) thanks to manipulation, the organism forms a complete awareness of the sensory stimulus, giving rise to a first meaning attributed to that object. By "meaning", Mead means, pragmatically, the use that the organism can make of that object. On this Mead is akin to an enactivist idea of sense-making, namely an agent's interested

<sup>6</sup> In another work, Mead clearly distinguishes between impulse and instinct, the first being «subject to extensive modifications in the life-history of individuals» much more extensive than those to which the instincts of lower animal forms are subject (Mead, 2015/1934: 337).

<sup>7</sup> See Berthoz (2000: 25).

perspective of meaning on the world (Di Paolo et al., 2017: 22). It is also worth noting that Rizzolatti and Sinigaglia (2008) recently refer to Mead, mentioning his 1907 article, ‘Concerning Animal Perception’, in support of their thesis that the manipulatory phase is at the basis of pre-conscious comprehension processes connected to the mirror system. In that article, in fact, Mead reiterated the importance of the perceptual-manipulatory capacity, arguing that the manipulative phase was the distinguishing aspect between human and non-human animal perception, and thence between the cognitive abilities of human and non-human animals.

- (4) The manipulative phase is followed by the *consummatory/aesthetic* appreciation phase. As Mead puts it, the consummation phase is «the final character in experience», and is not part of the perception. It is commonly called “consummation”. The analysis of this phase takes place through the selective process of identifying those characters that constitute the parts of the act connected in a synthesized whole, «but a whole of physical things which are the conditions or means of the act, not the act itself» (Mead, 1938: 451).

### 3 A sensorimotor enactivism plus imagery

The impulse, visual, and manipulatory perception phases are the most significant for comparing Mead and enactivism, particularly with sensorimotor enactivism, which aims to understand perception in terms of the capacity for perceptually guided activities. Sensorimotor enactivism focuses on the highly complex cognitive activities that happen in concrete movements involved in sensorimotor life, trying to make sense of how biological agents can become «sensorimotor agents», namely «forms of life that are constituted as self-sustaining, habitual organizations in the structural and functional interrelations between their acts, skills, and dispositions» (Di Paolo et al., 2017: 7). For this reason, sensorimotor enactivism conceives perception as an active exploration of the environment rather than the construction of an internal model, focusing on cycles of sensorimotor coupling between organism and environment (Varela, 2002: 424), and analyzing the traits of perceptual experience in terms of the relationship between sensation and embodied activity. As Varela et al. (1991: 173) argue, «perception consists in perceptually guided action and (2) cognitive structures emerge from the recurrent sensorimotor patterns that allow action to be perceptually guided» (Varela et al., 1991: 173). Moreover, Alva Noë (2004: 66) maintains that perceptual phenomenology is «a kind of skillful activity on the part of the I animal as a whole» (Noë, 2004: 2), determined by the relationships between how objects are presented from a particular perspective and the possible movements I can perform from that perspective. What we perceive is determined by what we do, or what we know how to do, and by what we are ready to do. Perception is thus something we do as percipients possessing enactive sensorimotor cognitive capacities, i.e., a way of acting through which perceptual experience acquires content. In other words, the sense of the perceptual presence of an object as a whole requires «that we take ourselves to have access, now» to the whole object, which is «virtually present» to us (Noë, 2004: 63). Perceivers find out how things are thanks to

their «practical understanding of the way movements produce changes in sensory stimulation» and of their being «coupled to the world in such a way that movements produce sensory change» (Noë, 2004: 66). Perception is, therefore, virtual, i.e., the perceptual experience depends in its entirety on the possession and exercise of the sensorimotor skills needed to access the details of the environment.

All this is close to Mead's description of perception in action. According to Mead, perception is involved in the organism's act and conditions how it carries on interacting with the environment. It is an activity in which the inhibition of contact responses to distant stimuli gives rise to imaginative anticipation of the object and attribution of meanings, i.e., possibilities, or rather modes of usability of the elements towards which the organism is directed. Perception thus results in an activity of considerable proportions in which occurs the relationship between a highly developed organism, or as Di Paolo et al. call it, a "sensorimotor agent", and an object or an environment about which the selection emphasizes certain features. Following Mead, this relationship is part of an act in which the sense of what Noë calls the "virtual" presence of an object may be rooted in what Mead would refer to as the imagery of past experience passing into the ongoing act in the perceptual object (Mead, 1938: 76). In fact, on the one hand, by the expression "virtually present", Noë means that our sensorimotor capacities afford us to perceive the whole object, i.e., we expect our body movements to bring other pieces of the object into view. On the other hand, this expectation presupposes that that object or something similar has been experienced to expect specific results from our change of perspective based on our body movements. In other words, although we do not need a representation of all the details in consciousness to have an understanding of the object in front of us but only a sense of the presence of the whole object, this sense of presence is based on a sort of projection based on past experience of it. The question is then: what is the nature of such experience?

Mead would reply that it is of the nature of imagery. In particular, the prosecution of the act depends on our responses to the imagery of what is distant in space-time to determine how we would act with respect to it. That is, to the organism's response in perception to a future that is already in the perceptual world in the moving present, which carries out the function of calling forth the movement toward the distant object and receiving the confirmation of contact experience. The content of imagery, therefore, is not disembodied. Instead, it is of the same nature as that of percepts (Mead, 2015/1934: 340–1), for imagery is «so merged with the objects and attitudes with which it functions», as well as «with incipient muscular reactions, that it is difficult to define and isolate it in our actual experience» (Mead, 2002/1932: 96). As Mead also argues in the essay on 'The Physical Thing' (Mead, 2002/1932: 127), objects and acts are presented in the higher nerve centers, but these different objects and acts generally involve the innervation of the same muscles and organs, so that the domination of any set involves the inhibition of the organizations of the centers, although they may be excited. Imagery is thence «the experience of the individual organism that is the percipient event in the perspective» (Mead, 2015/1934: 344) which is formed based on some past experiences of inhibited responses (Mead, 1938: 72) so that the organism's response in perception to a future is already in the perceptual world in the moving present. As Mead puts it:

Whatever has passed from past conduct into the situation belongs to the situation as a whole. The acquired skill of the animal is definitely seen in the new objects that appear. Imagery so far as it passes into objects belongs to them as objects as genuinely as their visual and tactual characters. The thing that one sees as hard has this hard content in it as genuinely as it has in it the color whose nuances we speak of as responsible in some sense for this character of hardness. There may be tactual imagery, as this term is ordinarily used in psychological analysis, or this analysis may find motor imagery alone. I am at present only insisting that this character is in the same sense in the object as that in which we identify the color and feel of the object as characters of the object. [...] On the assumption already made of these characters emerging with the situation, we must also recognize the emergence of this so-called imagery as a part of the same situation. (Mead, 1938: 73).

Imagery may also be defined as a function of the synthesis of past sensorimotor perceptions. In this respect, memory allows us to better select, or economize on, stimuli from outside. It should be noted, however, that imagery is not confined to memory. It refers to the past only insofar as «it has a future reference in some real sense» (Mead, 2015/1934: 344; Mead, 2002/1932: 96).

To sum up, in imagery, there are both immediate sensory data, the sensations that affect the subject, and the past experiences which contribute to our reconstruction of the present situation, providing guidance as to what the continuation of the act will entail. Such guidance, especially regarding the imagery of the next steps of the act, concerns our response to the stimuli that cause our present sensations, presented as hypothetical projections as to the subsequent response of the external environment to our behavior.

#### 4 Imagery as *re-presentation* of habitual sensorimotor response

Mead's reference to imagery seems to create a gap between his sensorimotor theory of the act and the anti- or non-representationalist enactivist approaches according to which action and perception are unified without any representational mediation between them. In particular, drawing on imagery, also defined as «representational reference» to objects (Mead, 1938: 223), Mead seems to adopt a representational point of view. Indeed, he does not even seem to be too concerned with the problem of the representational nature of imagery. This is partly due to the fact that in line with James and Dewey, he considered the debate of the representational nature of the mind to be a vestige of an older, Kantian-inspired psychology that focused on mental content rather than the psychophysiological processes related to afferent sensory stimulation to which they focused.<sup>8</sup> This is also the main reason why their

<sup>8</sup> Actually, during the second half of the nineteenth century there has been a debate between “presentationists” and “representationists”, who ultimately drew on the opposition between Humean and Kantian approaches to knowing processes. Following the entry written by C. S. Peirce for the Baldwin's *Dictionary of Philosophy and Psychology* (CP 5.607 [1902]). See Bergman, (2007), according to the “presentationists” perception was a two-sided consciousness in which there is nothing intellectual or intelligible and in which the percept appears as forcibly acting upon us so that in perception the awareness of an active object and of an acted subject are as indivisible as the sense of exertion and the sense of resistance in a muscular effort. Representationists, on their side, denied the bilaterality of consciousness, considering it

psychological theories desubstantiate psychic content to emphasize its functional role in conduct. Actually, the stance about the nature of representations is much debated in cognitive science both outside of and within enactivism.<sup>9</sup> It is not our intention to cover the various aspects of the debate here, also because such debate is often fuelled by a fundamental confusion about what is meant by representation (Aizawa, 2014). Yet it suffices here to mention that according to enactivists, our implicit understanding of the reality around us is grounded in our sensorimotor skills, so that there is no need to resort to any form of representationalism for an account of action. For instance, Gallagher suggests that representation even minimal, like Clark and Grush's Minimal Robust Representation (MMR), and Rowlands' Pre-Intentional Acts (PIAs), plays no role in any aspect of action as deliberation, planning, or expression of intentions and that successful learning and action require neither propositional mental representations nor semantically interpretable brain representations (Gallagher, 2018; Gallagher, 2017).<sup>10</sup> He argues that it is difficult to understand how a constituent part of the action, such as the motor control aspect can be considered as independent from the object or situation it represents, and he

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Footnote 8 (continued)

the product of a mental abstraction. If the presentationists considered perceptions as ultimate facts experienced but not understood, the representationists, on the other hand, argued the need of a physical theory of reality in which to include perceptions as representing the real fact. To sum up, the representationists regard the percept as a kind of mental image from which a hidden cause can be inferentially ascertained, while the presentationists hold that the percept is an active force and perception is a direct consciousness of duality. See also Ward (1893).

<sup>9</sup> In particular, the debate concerns both the possibility of admitting a representational nature of processes at the neural level and distinguishing between intention and mental representational ability. For instance, there are some authors who, while endorsing the basic intuition of identity between action and perception, arguing that this unity is empirically corroborated, stress that perceptions do require some form of representational mediation (Nanay, 2014; Ferretti & Alai, 2016). On the other hand, others try to maintain the anti-representationalist enactivist position by proposing to distinguish intentionality, understood as a characteristic of embodied organisms directed towards objects and states of affairs, from representation understood as a characteristic of mental states and their respective underlying mechanisms (Schlicht, 2018). Some authors dismiss the issue of the representational nature of cognition by shifting the focus to predictive processing models of cognition that, while maintaining a mechanistic perspective of the brain, offer a new understanding of cognition in terms of a hierarchical predictive processing architecture (Clark, 2013; Friston, 2009; Hohwy, 2013). See also Gärtner and Clowes (2017).

<sup>10</sup> According to Clark and Grush (1999) Minimal Robust Representation (MRR) is an inner emulator circuit which permits the identification «within the system specific states and/or processes whose functional role is to act as de-coupleable surrogates for specifiable (usually extra-neural) states of affairs» (Clark, Grush 1999: 8). Rowlands' theory of deeds as representational (Rowlands, 2006: 113–114; 2012) incorporates and synthesizes, somewhat, Clark's action-oriented representations (AORs) (Clark, 1994, 1997) and Dretske's Representational Theory (Dretske, 1995). In particular, deeds are «things we do» (Rowlands, 2012: 137). To better explain what he means with “deeds”, Rowlands distinguishes between intentional, sub-intentional, and pre-intentional acts. While sub-intentional acts are non-intentional movements of which we are not aware and which serve no purpose connected to action (e.g., movements of tongues or fingers), pre-intentional acts (PIAs) are deeds, namely acts that have a purpose for intentional action. In other words, deeds are «things we do precisely because we have general antecedent intentions we wish to satisfy» (Rowlands, 2012: 137). Gallagher points out that both MRR and PIAs face the same problematic issue, namely: once we attribute to minimal representations the decouplability constraint according to which we can take them “offline” and imagine or remember an action or context, we are saying nothing about representation *in action*.

maintains that representationalism is just «a scientifically abstract way» to think about the action process and that representation is just «a concept under which one still needs all the explanation to be made» (Gallagher, 2017: 106). So that whatever can be regarded as representation is the result of an *interpretation* made not by the acting agent but rather by the scientist who abstracts from the neural motor systems.

Di Paolo et al. (2017: ch 2) define themselves as non-representationalists instead of anti-representationalists. They admit the existence of representing as a family of “complex, late-arriving and mostly socially mediated cognitive activities” (Di Paolo et al., 2017: 27), but deny that it is possible to explain such cognitive activities in terms of other representations, i.e. in terms of internal states bearing cognitive content. More radically than other enactivists, Noë denies any kind of representation. He would not seem even to envisage imagery since, as seen above, the sense of the perceptual presence of an object as a whole would require that we take ourselves to have access to the object in its entirety as virtually present to us. He suggests that we are not forced to the idea of constructing a representation of the entire object in our mind (Noë, 2004: 24). In other words, our sense of perceptual presence is not determined by the representation of all details in consciousness now, but instead consists of our access «to all of the detail, and to our knowledge that we have this access» (Noë, 2004: 63).

It would therefore seem that Mead’s alleged representational stance is not popular with enactivists. Nevertheless, the issue here is about what kind of representational content imagery refers to. As seen above, Mead implicitly addresses this issue by indicating in imagery a sensorimotor synthesis that traces different attitudes to different stimuli to a harmonious relationship through a reorganization of the contents of the stimuli, into which enter the so-called images of the completion of the ongoing act. Objects and acts are presented in the higher nerve centers. However, these different objects and acts generally involve the innervation of the same muscles and organs, so that the domination of any set involves the inhibition of the organizations of the centers, although they may be excited. Imagery thus corresponds to a reality in which the organism has a manipulative sensorimotor experience based on inhibited contact responses in opposition to the responses in prospect of being innervated. The imagery has the function of *re-presenting* in advance the object that forms the basis of the selection mechanism. This re-presentational reference is not to be regarded as a static mapping of the world around us, that is, as an internal state bearing cognitive content; instead, it is found in the relationship of our behavioral attitudes that respond to the act’s performance and the different stimuli that initiated that act. The harmonic relation of these different attitudes occurs through the reorganization of the content of the sensorimotor stimuli. In other words, Mead’s imagery is not a process of finding the most relevant past representations of an ideal “objective” reality which can best fit the actual situation. Rather, it is the expression of a “transaction” between organism and milieu through which past experience is part of the ongoing act of the organism and shows up as affordances or solicitations to further action. The new stimuli coming from the current situation produce possible actions based on the past experience without the neural network needing to objectively represent the past experience as *rules* to determine further actions. The imagery, in fact, does not find the relevant rule to be applied, rather it deals with re-processing the revived

past experiences in the ongoing present. In other words, Mead's imagery can be seen as the acquired experience which is taken up again with fresh momentum in the ongoing act, thanks to what Merleau-Ponty called a "*schéma corporel*", namely a *compendium* of our bodily experience (Merleau-Ponty, 2012/1945: 113) that in the present act recalls past experiences and the acquired habits of action, making the situation immediately recognizable. In particular, the body schema includes a marginal awareness of the body and acts as a dynamic motor system belonging to the realm of habit rather than to that of consciousness.

More generally, Mead's theory of perception in action seems remarkably similar to Merleau-Ponty's reference to the act as an ongoing process in which a body space is situated in an external space, that is in a «practical system» (Merleau-Ponty, 2012/1945: 132).<sup>11</sup> Like Mead, in fact, Merleau-Ponty emphasizes that through our bodies we perceive the environment in which we are situated as a set of «manipulanda» (Merleau-Ponty, 2012/1945: 120), that is, as a collection of familiar bodily actions that envisage a sort of knowledge of the space. As Merleau-Ponty (2012/1945): 127) writes, «there is not a perception followed by a movement, for both form a system which varies as a whole», so that from the subject's perspective, the action is on the same level as perception, being an original way to relating with the objects. The subject is plunged in the world through his own body, so «to move one's body is to aim at things through it; it is to allow oneself to respond to their call, which is made upon it independently of any representation» (Merleau-Ponty, 2012/1945: 161).<sup>12</sup> Independently of any representation, but thanks to imagery,

<sup>11</sup> On the deep similarities between Mead's pragmatism and Merleau-Ponty's phenomenology see Rosenthal and Bourgeois (1991)

<sup>12</sup> The French word "*schéma*" used by Merleau-Ponty has been translated into English as "image", though there is an ambiguity between the notions of body schema and body image (see Carman, 1999). In this respect, Gallagher (1986) distinguishes between the "body image" as an occasion and complex conscious phenomenon that implies the perceptual, cognitive, and emotional aspects, and the "body schema", namely a non-conscious and non-intentional performance operative in the perception in action, in which the body acquires a particular organization in its relations with its environment. It seems that the word "scheme" is more in line with Merleau-Ponty's idea of corporeal schema of movement. As Gallagher (2020: 27) argues, Merleau-Ponty borrows from Head to suggest that movement is organized according to the «taximeter time of the corporeal schema» (Merleau-Ponty, 1968/1964: 173). In particular, Head (1920) explains the movement and the maintenance and regulation of posture through motor capacities and abilities. Specifically, according to Head, the body schema is a postural model of the body that dynamically organizes the impressions produced by incoming sensory impulses in such a way that the final sensation of position turns out to be closely related to something that happened antecedently (see also Gallagher, 2005; Hale, 2019). According to Carman (1999: 219), however, an understanding of Merleau-Ponty's concept of the body schema also presupposes some understanding of the Kantian schematism. In particular, as Kant (1998/1787: B 179) argues, the schema is distinct from the image (*Bilde*). Kant refers to schema as the mode in which imagination proceeds to *spontaneously* (the figurative synthesis is an act of *spontaneity* of imagination) connect an image to a concept throughout time as the homogeneous element common to sensibility and understanding. And as an *act* of synthesis that unfolds in time, the schema can be considered primarily as a *scheme of action* (Baggio, 2019a; Carman, 1999). Therefore, similar to Kant's schema as what determines actively the *sense* through a mode of imagination which belongs to the sensibility (Kant, 1998/1787: B 103), Merleau-Ponty's "body schema" designates the *sens* of the body/world intersection, relating body and world in perception (see on this point Morris, 2004). However, in line with pragmatists refusal of Kantian-inspired psychology that focused on mental content, Merleau-Ponty rejects a representationalist perspective of bodily space as it had been proposed by classical psychology (Merleau-Ponty 2002/1945: 119), explicitly rejecting the notion of *Vorstellung* of

Mead would say. In referring to imagery, in fact, he does not mean to denote an object of consciousness but rather a kind of ideo-sensorimotor activation stimulated by the interaction with the milieu.

Accordingly, Mead's imagery can also be seen as consistent with what Di Paolo et al. (Di Paolo, 2005; Di Paolo et al., 2017) call sensorimotor schemes, in which the sensory elements of perception are revived, and some stimuli of a given motor act are internally rehearsed in working memory, the latter being dependent upon initiating a motor response (Mead, 1938: 188). It can also be seen as consistent with Bartlett's (1932) motor response schema theory, according to which through our past motor experiences, we store sensorimotor stimuli in recognition memory, and these stimuli form the basis of a schema or behavioral rule to determine if we may respond similarly to a new set of sensorimotor stimuli.<sup>13</sup> The motor schemata correspond to object affordances that develop during movement so that actions are driven by implicit knowledge of object attributes. In other words, the pre-figuration, manipulation, and tactile exploration of objects are based on predetermined schemata.<sup>14</sup>

Imagery is, in fact, a collection of sensorimotor data gathered in a dynamic ideo-sensorimotor synthesis that may be of different senses and located at any place in the act, playing the same part that is played by objects and their characteristics. As an anticipation of perception in action, guiding and controlling movements as long as they unfold, and offering to perception some resemblance to the mental manipulation of distant stimuli which activate the sensorimotor system of approaching or moving away from them, Mead's imagery can be regarded more likely as a "motor imagery" that shares some characteristics with motor preparation and others with motor execution (Stephan & Frackowiak, 1996).<sup>15</sup> It can be associated with the inhibitory effects influenced by the current behavioral disposition, as determined by past experience and the circumstances of the present situation, related to the manifestation of neural co-ordinations that appear in the readjustment of our habits of action and objects of reference (Mead, 2015/1934: 341).<sup>16</sup> Put differently, imagery is the expression of our habitual sensorimotor response to familiar situations.<sup>17</sup> So,

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Footnote 12 (continued)

classical psychology, which has its roots in Kantian transcendental "objective" representation, devoid of references to the "empirical" living context of the subject in action (on the kantian references in Merleau-Ponty's theory of perception see also Matherne, 2016).

<sup>13</sup> Cf Evans (1967). For an overview of models of body representation see de Vignemont (2010); Dijkerman and de Haan (2007); Paillard (1991).

<sup>14</sup> As also highlighted by Schmidt (1975: 235), when an individual makes a goal-directed movement, they store four things: «(a) the initial conditions, (b) the response specification for the motor program, (c) the sensory consequences of the response produced, and (d) the outcome of that movement.»

<sup>15</sup> On the correlation between visual images and mental manipulation, see Shepard and Metzler (1971); Kosslyn et al. (1978).

<sup>16</sup> This thesis has recently been empirically confirmed in several studies. See among others Decety (1996); Crammond (1997); Munzert et al. (2009).

<sup>17</sup> Mead's imagery can be regarded as the acquired experience which is taken up again in a fresh momentum in the ongoing act, thanks to a "body scheme" or "*schéma corporel*", namely a compendium of our bodily experience (Merleau-Ponty 2002: 113) that in the present act recalls past experiences and the acquired habits of action, making the situation immediately recognizable. In particular, the body schema includes a marginal awareness of the body and acts as a dynamic motor system belonging to the realm of habit.

our constructs are not static pictorial representations. Instead, they are our habitual sensorimotor responses to familiar objects, i.e., patterns of action that allow us to interact with our milieu. The progression of acts and the indefinite reactions they offer are the basis for the construction of patterns of behavior that, when put into constant use, become a habit «and need but to be initiated to run off with facility» (Mead, 1938: 447).<sup>18</sup> Habits constitute, according to Mead, a practical knowledge, or implicit understanding, that takes the form of a “comfortable mastery” of the rules of sensorimotor connection that mediate our relation to already known objects. Organizations of acts in a temporal sense, namely, the organization in their succession, thus permit an indefinite number of reactions, each inhibitory of the others to the extent that any one of these organizations is the pathway of the organism's response in any particular situation. Combining any one set of such centers represents a pattern of behavior in the central nervous system, both concerning things and events. The position of a model of behavior will depend on how the different parts of the entire sensorimotor process can be left to habit. At the same time, the balance between sensory and motor elements is determined by biological (hereditary structure) and social elements.

To sum up, according to Mead, the relationship of anticipatory presentation to processes of perception is where habitual processes are found. Perception is a way of acting in which “feelings of activity” depend on the interactions between the perceiver and the milieu. These interactions require the contribution of all sensory systems. The relation of attitudes responding to the various stimuli that initiate acts is found in imagery, which has a sensorimotor anticipation role in the ongoing act. In particular, it indicates the embodied form of interaction between the organism and the plurality of sensory stimuli coming from the environment, which cannot be identified either with physical processes in the brain nor with the clarity of conscious content. As Mead puts it:

Imagery thus far considered no more exists in a mind than do the objects of external sense perception. It constitutes a part of the field of stimulation to which our attitudes or impulses seeking expression sensitize us. The image of the stimulus we need is more vivid than others. It serves to organize the perceptual attitude toward the object which we need to recognize, as embodied in Herbart's phrase, “apperception-mass.” The sensuous content of the imagery may be relatively slight, so slight that many psychologists have taught that much of our thinking is imageless; but though the adjustment of the organism to the carrying-out of the response involved in the whole act may be the most readily recognized, and thus this part of the imagery be regarded as the most important, there is no reason to question the presence of the sensuous content which serves as stimulation. (Mead, 2015/1934: 342).

Indeed, Mead would have agreed with Noë that it is a mistake to assume vision as «a process whereby an internal world-model is built up» (Noë, 2004: 23), and that the representational weight of the system is reduced by making explicit use of

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<sup>18</sup> See Glenberg (1997). A similar proposal can be seen akin to Foglia and O'Regan's Sensorimotor Approach to Imagery (Foglia & O'Regan, 2016).

our bodily abilities. However, he would also have argued that anticipatory motor imagery is something we experience, in the sense that it is so merged with the objects, attitudes, muscular reactions involved in the act, that it is difficult to define and isolate it as an element totally abstract from what we are experiencing.<sup>19</sup> It is something that «may be found at any place in the act, playing the same part that is played by objects and their characteristics» (Mead, 1938: 224). In this respect, Mead is close to authors like Thomas (1999: 223), who argues that «during imagery the schema is active in much the same way that it is during perception. It still sends out at least some of its ‘orders’ to the perceptual instruments, and selects procedural branches to follow». And he is also in line with the enacted and embodied simulation theory of imagination, according to which imagery experience is a way of apprehending «an object not by means of a phenomenal mental picture, but by *re-presenting* that object as given to a possible perceptual experience» (Thompson, 2008: 408, *italic added*), by way of «mentally enacting or entertaining a possible perceptual experience of that object or scene» (Thompson, 2007: 143).<sup>20</sup>

The contrast between Mead’s alleged representational stance and enactivists’ non-representationalism seems here to be getting less robust. The issue is now the “re-presenting” nature of Mead’s imagery. As far as we have seen so far, we can hypothesize that the re-presenting nature of imagery is compatible with «an act of presenting something to yourself again, or re-presenting» (Di Paolo et al., 2017: 28). The “something” re-presented is part of the sensible stimuli to which our attitudes sensitize us. In this sense, Mead’s imagery as a kind of “re-presenting” is different from other forms of internal representations (Jeannerod, 1994, 1995; Jeannerod, 2001; Jeannerod & Decety, 1995; Lotze & Halsband, 2006; Pearson & Kosslyn, 2015; Kosslyn, 1976; Kosslyn et al., 1979; Munzert et al., 2009), but in some way compatible with “sensorimotor representations” (Butterfill & Sinigaglia, 2014; Jacob & Jeannerod, 2003), or “nonconceptual representation” (Pacherie, 2011, 2018), for it *re-presents* in a “pragmatic” mode the goal of action in a bodily non-conceptual format, that is in a non-propositional format. However, differently from the idea that motor representations are linked to intention with propositional format (Butterfill & Sinigaglia, 2014),<sup>21</sup> imagery can be regarded as a property of a particular field of interacting events, and of the physiological mechanisms of the agent which also make biologically possible the genesis of bodily activities which

<sup>19</sup> It is extremely difficult to define experience. Mead would have agreed with Dewey’s definition that experience is what cognition enters into. According to Dewey, experience is always in the process of becoming, in “transition” (Dewey (1977/1906: 105).

<sup>20</sup> See also Di Paolo et al. (2017: 28); Currie and Ravenscroft (2002). Particularly interesting is also Rucińska and Gallagher’s proposal, according to which in imaginings we re-use the perceptual-motor system in the act of prospecting future actions (Rucińska & Gallagher, 2021; Gallagher & Rucińska, 2021). According to Noë (2004: ch. 6), our practical, rather than explicit and propositional, understanding of sensorimotor dependency patterns is at the basis of our ability to perceptually experience features of the environment with which we are not currently in sensory contact – i.e., features that are currently absent. See also Hurley, 1998.

<sup>21</sup> Butterfill and Sinigaglia (2014: 120) distinguish between the non-propositional format of motor representation and the propositional format of intention. They therefore consider only one version of intentionality.

are purposeful, skillful and unreflective, as opposed to conscious intentionality which involves a propositional content. In other words, imagery does not present a type of propositional intentionality, but nonetheless shows a kind of proto-intentional semantic dimension, in the sense that the emergence of meaning, namely, the use that the organism can make of that object, is strictly dependent on the behavior linked to sensorimotor perception.<sup>22</sup> In fact, as seen above, the inhibition of responses with respect to contact with the “physical thing” contributes to the emergence of the meaning both of the physical portion of the world to which the subject is addressed and of the possible competing responses within the act.<sup>23</sup> Cognition, in which imagery is involved, is «a development of an organism's selective aptitude in reference to its environment and its re-adaptation following selection» (Mead, 1936: 350–51). An organism's behavior is therefore part of a teleological act that can only be understood in a more complex, organic dynamic of vegetative and ideosensorimotor functions and habits that express both the impulsive and selective nature of the organism in relation to the natural and social environment in which it acts.<sup>24</sup> The re-presenting process would be therefore used in action to select appropriate movements and includes re-presenting stimuli as well as the final state of the acting body. It would include some action features common to many different sequences of joint displacements and postures involving various effectors, some motor patterns through which the current relationship can be transformed into a goal state.

## 5 Conclusion

Mead's theory of the act offers some valuable elements to contribute to a pragmatically inspired sensorimotor enactivist approach that gives the imagery a central role in explaining the ability of virtually re-presenting the ongoing continuation of an act. His approach to imagery seems, in fact, to mediate between a radical anti-representationalist enactivist approach, according to which perception is a process involving contributions from all and only sensorimotor systems, a non-representationalist approach that considers imagery as an act of visual experience, and a representationalist approach according to which we should keep some kind of representations

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<sup>22</sup> Here, again, there is a close affinity with Merleau-Ponty's idea of “motor intentionality” as a “non-propositional format” of intention (Merleau-Ponty 2002/1945: 127. See Dreyfus & Dreyfus, 1999; Bizzi & Hipolito, 2016). I refer here to “proto-intentional” semantic dimension as to the goal-oriented interaction between sensorimotor activations and social and natural environmental stimuli.

<sup>23</sup> On Mead's behavioral theory of meaning see Baggio (2019b, 2020).

<sup>24</sup> This aspect is particularly worth noting because it also allows Mead's theory of the act and his reference to imagery to address overly radical behaviorist interpretations of enactivism. Recently, some authors have tried to rehabilitate a reading of behaviorism which is more compatible with enactivism (Barrett, 2019; Alksnis & Reynolds, 2019; Gallagher, 2019). Although I do not fully agree with the proposals of these authors, I find these attempts particularly useful since, on the one hand, they open up a reflection on the essential but not exclusive role that behavior plays in the constitution of individual and social cognitive processes. on the other hand, they highlight how behaviorism presents a variety of versions that are not all ascribable to an eliminativist view of the mind, e.g., the non-reductionist versions of behaviorism of Mead and Dewey, Merleau-Ponty, Sellars or Rachlin.

and somewhat change the question about the existence or non-existence of representations to one concerning the type of representations. In line with phenomenologically inspired enactivists, even though Mead suggested the relation of imagery to the nervous system, he probably would not have agreed with those who reduce the re-presenting processes to it. Although he hypothesized that the emergence of imagery in the evolutionary process was most probably dependent on the conditions of the central nervous system, he admitted that the way imagery relates to the nervous system was when he operated very obscure. However, he shifted the focus of the question regarding explaining the nature of imagery to the epistemological plane. And although recent neurological research suggests that imagining activates corresponding perceptual visual and motor areas (Farah, 1988, 1989; Kosslyn et al., 1993),<sup>25</sup> Mead most likely would remain skeptical about the possibility of explaining imagery just reducing it to neural activations. As he puts it:

That which goes on in the central tract of the nervous system of the organism can be stated in mechanical terms as in the case of direct perception, but the content of the image, as something that is there, has no counterpart in terms of physical particles unless one retreats to the original experience which is regarded as the source of the later imagery. One interpretation of this situation in which the image cannot be given a definite spatiotemporal position justified by later contact experience is to deny the image existence by granting it only subsistence. The difficulty with this lies in the seemingly causal dependence of the appearance of the image upon certain conditions in the central nervous system—unless we are willing to look upon the image as a mental state that has reality only as such, and inheres in the object only as an importation, which upon analysis loses its external reality. (Mead, 1938: 439).

Most probably, he would partially agree with Di Paolo et al. (2017: 27) that imagery is part of a family of complex, late-arriving, and mainly socially mediated cognitive activities that deserve to be explained, but not in terms of mere static representations. Moreover, like O'Regan and Noë (2001: 950), he would argue that we do not have detailed, pictorial, three-dimensional representations, that it is not the brain's role in vision to recreate such representations of the world from retinal images, and that we do not need them to explain conscious experience. Instead, he would refer those who reduce imagining and representing to brain activation to an epistemological fallacy according to which the scientific conception of perception in action is logically prior to the previous stage of experience, i.e. the act, from which perception and reflection arise. This scientific analysis would reveal the reality of nature, not only as it was but as it remains in experience, leaving the characters of distance and those belonging to the object as object within the life-process hanging without organic relation to perception, i.e. excluded from what the sciences of the brain abstract. In order to avoid this fallacy, Mead argued, it is necessary to retreat to the earlier form of experience, that is to the stage of experience of «bare happening from the standpoint of the individual and of bare duration from the standpoint of the environment» (Mead, 1938: 439).

<sup>25</sup> For an overview of the recent imagery debate, see Jansen (2010); Thomas (1999, 2007).

**Funding** Open access funding provided by Università degli Studi Roma Tre within the CRUI-CARE Agreement.

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