

The question of bodily representations: What does the research say? What does the psychomotor clinic say?

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Summary

The notion of body representation is much studied by research. Body schema (BC) and body image (BI) are two aspects. A third aspect was, for a time, considered in the early 2000s but abandoned in 2025. The term "representation" refers etymologically to a "highlight". After a century of uncertainty, BS is now understood to be based entirely on proprioception with the support of the vestibular system and the occasional contribution of the vision of movements. The theory of HF is still a work in progress in the field of neuroscience. Nevertheless, the psychomotor clinic allows us to have theoretical support. The importance of speech in testifying to the knowledge of the names of the different parts of the body leads to the clarification of the notion of somatognosia which also presented theoretical confusions. Thus, we now know that somatognosia does not belong to the body schema at all.

Keywords

Body representations, body schema, body image, somatognosia, psychomotor skills, neuroscience

Introduction

In the 1980s, the teaching of psychomotor skills in France had neither current knowledge nor free access to flourishing research. The theoretical references were mainly psychoanalysis, pedagogy and the writings of our founding fathers¹. This training has enabled generations of psychomotor therapists to have a very successful career and to develop the profession. Nevertheless, 40 years ago, the concepts of body schema, body image and somatognosia, although they did refer to representations, were not yet sufficiently precise. This is no longer the case. After having clarified the etymology and semantics of the term "representation," we will try to take stock of these three expressions, the current vagueness of which considerably hampers clinical practice, theoretical support, the teaching of psychomotor skills and the credibility of our profession in the eyes of colleagues in other disciplines. To improve the definition of bodily representations, since this is the term consecrated by research, we will therefore rely on the international literature, but without neglecting the crucial importance of clinical experience.

The notion of representation

Etymology (Larousse étymologique, 2014)

The term "representation" is to be linked to those of presence, present, present, present and presentation. All are words of Latin origin that derive from the preposition *prae* which refers to "forward" and *essere*, the infinitive of the verb to be. We therefore find the notions of to be or to put forward. *Praesentare* is a Latin verb that means to present. The word "presence" originates from the Latin *praesentia*. Etymological dictionaries do not specify whether the emphasis is temporal or spatial.

Semantics (Le Petit Robert de la langue française, 2025)

Presence is the fact of being in the place we are talking about. It is also assiduity or company. To be in the presence of one another is to be face to face, even in opposition to each other.

1 Young professionals were also strongly urged to use the couch.

To be present is to witness something. It is to be there. What is present is what is conscious to us, what we think about at a given moment. It is also what is present. The present is now.

To present means to make known, to introduce, to show, to arrange (on a display), to give something to someone (to present one's papers), to present arguments (to present one's defence) or one's good presence (to present well) and to include (to present qualities and/or defects).

To present oneself has the meaning of appearing in front of someone or a situation (to present oneself for an exam, an election). A medicine comes in the form of tablets or syrup.

A presentation refers to a person's appearance in society, an exhibition (a fashion show), a package or a presentation.

A representation is therefore the action of putting something back before someone's eyes. It is to make an absent object or a concept perceptible by means of an image, a sign or a figure. It is the process by which an image is presented to the senses. It is a theatrical term (to perform a play on stage). To be in a performance means to show oneself or to show oneself. It is also to act in someone's place or in his name.

Philosophy (Philosophical Dictionary, 2021)

Some authors refer the term "representation" to three different worlds:

- The external world which contains, among other things, "all natural and therefore objective entities"
- The inner world, which is "that of psychological entities, is the sensible impressions, the creations of the imagination, the sensations, the emotions, the feelings, the states of mind, the inclinations and the desires"
- The third world, which is "that of thoughts constituted by linguistic expressions."

"In the subjective sense, representation is sensible in nature and is similar to a mental image. In the objective sense, representation is logical in nature" (Comte-Sponville, 2021).

Philosophy proposes that the term representation refers the object of imagination or belief to non-immediacy (hence the "re" of representation), unlike the object of perception which is there in the present and as if in person.

But she also argues that "there is no objection, from a lexical point of view, to considering perception, however immediate, as a representation of its object."

The notion of representation is therefore multiple. Literal and figurative meaning, spatiality or temporality, common points and differences with perception, it has not derived much from its Latin etymology, "mise en avant." The question that arises is that of the immediacy or not of representation. If philosophy accepts, even half-heartedly, that there could be a common temporality, then we could turn back to our familiar clinical concepts: there is no sensation, only perception is to be considered (Pireyre, 2021). This choice to deny the existence of sensation, supported by literature, refers to the great importance and unavoidability of the affective and/or cognitive processing of sensation.

Because turning only to the notion of sensation leads us to consider only the presentation of the object to our senses, and to see the past sensory image "return" would then be re-presentation. To prefer the notion of perception is to accept the simultaneity of the journey of sensory information throughout our central nervous system and its affective-cognitive processing. For some philosophers, it is also representation.

I propose to accept the idea, which is very consistent with the psychomotor clinic, of a representation that is intertwined – necessarily... – with perception, whether the object of the representation is current or past. In both cases, something comes to the fore and then becomes present, at the forefront, for example, of our consciousness. The foreground, in both cases, must refer to different affective-cognitive mechanisms that I will not address here.

The notion of body representations is very current in neuroscience. Research is abundant and it is impossible to be exhaustive. Only part of the literature related, directly or indirectly, to

psychomotricity has been partially taken into account in this article.

It is the concepts of body schema and body image that occupy many of the authors. It should also be noted that this old psychomotor terminology, full of defects and qualities, is still relevant at the international level in 2026.

However, Schwoebel and Coslett (2005) propose that body representations fall under a conceptual triad including body schema, "structural body description" (SBD) and body image. Let's see what this is.

Schwoebel and Coslett (2005)

For these two authors,

- The body schema is "a dynamic representation relating to the relative position of the different parts of the body coming from a multitude of sensorimotor inputs." It is "an internal dynamic representation based on proprioception. It involves motor commands. »

- The structural description of the body is a kind of "topological map of the body provided by visual inputs ; this map allows the definition of bodily boundaries and relational proximity." The impossibility of pointing to named parts of the body on themselves or on others (the autotopoagnosia described by Pick, 1922) would be a pathology of the DSC.

- Finally, the image of the body is "a lexico-semantic representation including the naming of the different parts of the body, their functions and their relationships to objects."

Schwoebel and Coslett's (2005) proposal has met with great resonance: Laiacona, Allamano et al. (2006), Taylor, Wiggett et al. (2007), Berlucchi and Aglioti (2010), Bassolino and Serino (2021), Raimo, Boccia et al. (2021), Sattin, Parma et al. (2023), Mazurchuk, Fernandino et al. (2024), Vallar (2024) and Raimo, Gaita et al. (2025) are just a few examples. But in 2025, Dos Santos, Baleia et al. find no evidence in the imaging of the reality of Schwoebel and Coslett's DSC. They even go so far as to say that "the lack of a consensual taxonomy as well as methodological inconsistencies suggest that the question of body representations should be considered in development." Mozo and Ruiz-Sanchez de Léon (2025) confirm their methodological reluctance: "We observe considerable terminological confusion" in research on body representations.

Neuroscience is therefore at this point, in a lack of clarity, confusion, of the question of bodily representations. If the notions of body schema and body image are not questioned and seem to be bodily representations, are they the only ones? And what about somatognosis, this concept which, for many psychomotor therapists, refers to the verbal naming of the different parts of the body ?

Let us therefore stick, while waiting for a conceptualization refined by neuroscience, to these three concepts : schema, image and somatognosis. We will see that for the latter, vagueness is still the order of the day, but some data will still allow us to move a little towards clarification. If only to say that it (somatognosis) is not reliable either to the schema or to the image. It could perhaps enter the very closed circle of bodily representations.

To begin with, what does neuroscience say about the body schema?

Body schema

Pireyre (2021) reviewed the complex history of this concept and showed how authors, from the beginning of the twentieth century to the 2010s, erred in a major confusion that was cleared up with imaging techniques. It was only about ten years ago that technology made it possible to prove, with supporting images, the reality of the body schema. Since then, research has continued its work. Our references begin with the article by Schwoebel and Coslett cited above.

Berlucchi and Aglioti (2010) propose that the body schema is part of a sensorimotor map of the body based mainly on proprioception. It is involved in action and interaction with the environment. The SC is not conscious.

For Raimo et al. (2021), the SC is "a sensorimotor representation of the body that guides action and allows the adjustment of posture and movements." These authors endorse the proposals of Schwoebel and Coslett.

Saetta et al. (2021) consider the SC as "an implicit and continuously updated representation of the position of the limbs in space. Proprioceptive inputs allow direct access to the performance of routine motor acts. »

Ahn ((2022) argues that SC involves sensorimotor abilities to control movement and posture.

Acknowledging the SC/IC debate that is still "open," Sattin et al. (2023) also reject the notion of structural description of the body and prefer to stick to the taxonomic dyad SC and IC. The body schema is the product of sensorimotor information. Their article is a review of questions to which the reader is invited to turn.

Mazurchuk et al. (2024) and Vallar (2024)² refer to Paillard (1999) for whom "the SC is a dynamic representation of the current positions of the different parts of the body. This representation of the body can be considered low-level." "

Gatti et al. (2024) do not talk about BS but point to "the existence of sensorimotor experiences widely recognized by the literature as one of the major sources of the construction of the representation of the body."

Calabro (2025) envisions SC as "an unconscious sensorimotor representation crucial for spatial coordination and movement automation."

Mozo and Ruiz-Sanchez de Léon (2025) also endorse the triad theory of Schwoebel and Coslett.

All these references seem to share the idea of a body schema based on sensorimotor and, particularly, proprioceptive information. This is in line with Assaiante et al. (2014) who propose the same ideas. Pireyre (2021) adds the need for support of the vestibular system, as each change in position – even a small one – leads to a change in the center of gravity. Similarly, in adults, the vision of movements must intervene to guide the upper limb during a very precise task requiring very fine movements. The vision of movements is not necessary when performing routine gestures. The body schema therefore requires a good triple coordination proprioception-vestibular-vision of movements.

Let us now turn to the notion of body image (BI).

Body image

Compared to that of body schema, the notion of HF seems much more complex in research. Knowing that Dos Santos, Baleia et al. (2025) advise abandoning the triad of Schwoebel and Coslett (2005), we need to read very closely what the research says. Most often, the body image is referred to cognitive-perceptual-emotional mechanisms. It is sometimes considered to be conscious, but the authors do not explain what they mean by this term, which can possibly refer to psychoanalytic conceptualization but also to automatic or voluntary functioning. Let's see that.

- Raimo, Gaita et al. (2025) refer to HF as a "non-action-oriented" body representation. It includes aspects of the location of different parts of the body, body boundaries, body proportions, shapes and weights. It plays a role in the "localization of sensations," which would be called somatotopy in neurology and psychomotricity. On the other hand, it involves "primarily" the visual experience.
- For Berlucchi and Aglioti (2010), the CI is conscious while the SC is not. For the rest, the theoretical reference is still Schwoebel and Coslett.
- Mazurchuk et al. (2024) the CI envisaged is the one proposed by Paillard (1999). It is a semantic representation that includes long-term knowledge of body parts. It is linked to a "psychiatric conception of image and self-conception³."

2 We note the precision of Vallar (2024) who tells us that as of May 30, 2024, a PubMed search on SC and IC yielded no less than 5900 references!

3 « Self-conception)

- Raimo, Boccia et al. (2021) also refer to CI as "perceptual, conceptual and emotional bodily aspects that are not involved in action."
- In 2023, Sattin, Parma et al. recognize that HF is still a controversial concept with no consensus definition. Referring to the American Psychological Association's Dictionary of Psychology, they prefer "a conscious, visual and explicit HF of how our body appears to us when seen from the outside in a reference position. It helps us to feel and locate the stimuli that imprint itself on our skin." Other sources lead them to speak of an HF related to identity: "It is important to define HF because it is one of the components of our identity." It is also our silhouette with its contours and shape. All this gives us "feelings of satisfaction or not." HF is thus a multidimensional construction made up of cognitive, perceptual, affective and behavioral components. Its development is influenced by complex interactions between neurophysiological, socio-cultural and cognitive factors. HF disorders are more likely to be found in the cognitive, perceptual and affective domains.
- Calabro (2025), finally, offers us a HF referred to consciousness, of a cognitive and perceptual nature that influences the awareness we have of ourselves and our emotional states. HF disorders manifest themselves particularly in depression, anxiety, and eating disorders.

As we can see, research has not yet decided on a consensual definition of CI. Some common points among our authors can be noted: the notion of representation, the role of perception, emotions, cognitive functioning as well as, sometimes, our own gaze or that of others and the notion of bodily limits. The differences in our bibliographical references are played out in the fields of sensation or perception, emotions or feelings and whether or not the "affective" is taken into account. Similarly, not all our authors refer to the notion of "socio-cultural".

A very big pitfall, too, that research seems to be stumbling over is the lack of distinction it makes between sensation and perception, emotion and feeling. Our authors do not take into account the differences between these terms. However, psychomotor therapists know that sensation and emotion are physiological mechanisms, whereas perception and feeling are affective mechanisms (Pireyre, 2021).

A crucial aspect seems to me to be society's view of our bodies and the consequences of this view on everyone. This can lead us to imagine a "superficial" HF, such as the one proposed by Schilder (1980) and which is not referred to unconscious mechanisms in the psychoanalytic sense of the term. The psychomotor clinic teaches us that there is also a deep HF that we will talk about now.

In psychomotor skills, superficial HF disorders can be a source of complaint by some patients. And it is understandable that the insistent and repeated gaze of passers-by on a body or one of its injured, malformed or disabled parts is a source of suffering. It is impossible, at first, not to take into account the patient's expression of this difficulty. However, one phenomenon must be distinguished: even if the psychomotor therapist must take into account the "superficial" side⁴ of this phenomenon, is this suffering not overdetermined by a difficulty located at the level of the deep HF?

I have proposed a psychomotor theory of the composite image of the body (Pireyre, 2021). This conceptualization seems to have garnered some echo in the profession. It corresponds to the "deep" CI I mentioned above. Today, I will complete my proposal by referring to the links between the organism and the psyche. The organism corresponds to the materiality of the body, its "mechanics," its constitution, its tissues, its fluids and its functions. The psyche could correspond to the "affective and cognitive systems." Thus, at the beginning of life, the immature psyche must develop in an immature organism that it must "invest and appropriate." In this way, when the time comes, to produce a human subject who "inhabits correctly" his body. This meeting of an immature organism and a psyche that is also under construction (but comes second⁵) represents the construction of the CI. Of

⁴ Using this term here does not mean "minimizing."

⁵ Before the development of the psyche, we can imagine a kind of necessity to develop. This could be the notion of *conatus* (the tendency to persevere in one's being put forward by Spinoza). The desire, always turned towards others, to which Dolto referred when she theorized HF cannot be present in utero, in the absence of a true self/other distinction

course, research, which is very much oriented towards sensorimotor and cognitive mechanisms, is rather silent in this field. But the psychomotor clinic has taught us that the sensorimotor and the cognitive, which we take into account in our care, are "enslaved" to the affective system, the human being being above all a being of perception and feelings, an affective being.

Seen by research, a body schema with fairly well-defined contours but a still blurred body image should lead psychomotor therapists to review their theoretical positions. As I said in 2021, the body schema refers to proprioception and should now give rise to the development of psychomotor assessment tests, the establishment of a semiology and a reflection on therapeutic processes. CI, on the other hand, could be divided into two, a superficial aspect (the way others look at the body) and the other deep (the composite image of the body). In this way, professionals could, for the time being, divide themselves, if they wish, between the two conceptualizations. Or alternate from one to the other according to the needs – or resistance – of the patient.

There remains a very thorny concept whose definition is extremely confusing: somatognosia.

Somatognosias

Just as the notion of body schema has a very complex history that has unfolded over almost a century, that of somatognosia is the result of old and contradictory conceptions. The ancient authors, most often the fathers of psychomotricity, gave definitions that it is interesting to recall here to fully understand the confusion in which we still find ourselves today. If the notion of somatognosia was originally proposed by neurology, it has been linked to the body schema, which is no longer possible today. What do our authors say?

- For Soulayrac (1956), somatognosia is "an inseparable psychophysiological entity, it represents a form of integration of sensory data containing, while going beyond them, all our gestures, perceptions, representations, emotions, memories in a kind of synthesis that is constantly destroyed and renewed [...] Asomatognosia concerns the body schema. [...] Babinsky and Gertsmann syndromes are found there. »
- Bergès and Lézine (1963) are in line with Soulayrac and describe somatognosia as an essential element of the body schema and psychomotor maturation [...] It corresponds to the recognition of the body, its parts and their relationships [...] It is evaluated by the designation of the parts of the body on oneself and on others or on a representation (doll, drawing). »
- Ajuriaguerra (1974) tells us that "the notion of somatognosia can be used sometimes in the sense of becoming aware of the body and its parts intimately linked to the evolution of practognosia, sometimes as an awareness of the body as a lived reality – implicit knowledge."
- In 2011, Reinalter-Ponsin argued that when we "talk about somatognosis, we are talking about an operative conceptualization. It is the ability to be aware of the structure of the body, to recognize its parts and their relationships with each other. »

These four authors are very important for psychomotricity. They are taught in all Psychomotor Training Institutes (IFPs). To summarize them is to say that somatognosia is associated above all with the body schema and the knowledge of the body. Reading between the lines, we notice in Soulayrac and Bergès Lézine the implication of speech. It will be the naming of the parts of the body about oneself or others that generations of students have learned. But it is still necessary to read between the lines.

In 2024, the Academy of Medicine gives a new definition of somatognosis: it is "the recognition and designation by a subject in terms of his body and its meaning. The notion of knowledge of the body, a complex sensory function, and its ambiguity show that the neurological clinic cannot limit itself to strictly organicist, but also psychopathological perspectives. Especially since somatognosia can be

(Pireyre, 2024). The latter is only set up some time after birth. The last two months of pregnancy, for their part, give rise to the emergence of the me/non-me distinction.

affected in psychiatric syndromes. Among its main disturbances, we will mention: long-lasting and acute forms..." This is followed by a long list of neurological pathologies. The dictionary of the Academy of Medicine then lists the symbols of the word "somatognosis" and the authors who have put them forward: body image (Lhermitte), self-image (L. van Bogaert), spatial image of the body (Pick), body schema (Schilder), schema of our body (Bonnier), postural schema (Head), and bodily transformation (paroxysmal illusion of).

It is then understandable that the medical dictionary will be of no help to us since it cites the ancient authors. But the reference to the recognition and designation of the body does refer to the implication of speech.

Somatognosia therefore seems to refer to the involvement of speech in naming or showing the different parts of the body, as proposed by Bergès and Lézine (1963).

However, it is no longer possible to consider somatognosia as included in the body schema. Because it refers to the position of the different parts of the body in relation to each other as well as to kinesthesia, this sensory modality devoted to movements. Nor can it be considered as the image of the body because it is not directly involved in the organism/psyche links that are set up at the very beginning of aerial life. It is rather a consequence of the establishment of these links. In addition, as we will see below, it uses nerve centers different from those of the SC and the CI. The neuroanatomical bases of these three concepts (SC, IC and somatognosis) are therefore different. Let us return to the international literature, more recent, this time.

She appropriated the theme but abandoned the name. Today, asking Google Scholar to find references from the keyword "somatognosy" does not lead to much. Or gives a French reference, that of Ajuriaguerra. The verbal name of the different parts of the body is called, in English, "body semantics." This expression does not explicitly refer to language, but we have to make do with what we find!

And we also find Schwoebel and Coslett for whom the triad of body representations includes, as we say here, the SC, the structural description of the body and the image of the body. The latter is also called "body semantics." We could translate it as "body semantics." It is a lexico-semantic representation of the body including the names of the different parts of the body, their functions and their relationships to objects. For Schwoebel and Coslett, body semantics IS the CI or is included in it. This conception is not at all in line with the proposals of the authors cited in the paragraph devoted to CI in this article. None of them alludes to any semantic aspect of CI.

Will the recent literature help us conceptualize somatognasia?

- Laiacona, Allamano et al. (2006) do indeed speak of body semantics and evaluate them using four types of tasks: asking the patient to "point body parts at one's own body; point body parts at a third party; point to images representing isolated parts of the body among four alternatives; judge the accuracy of pointing body parts at a third party after verbal instructions." »
- Van Elk and Blanke (2011) note that there are patients who have disorders in the naming of different parts of the body.
- Auclair and Jambaqué (2015) say that body part naming skills are better when the task is to name body parts involved in the action.
- Mazurchuk et al. (2024) note that the lexical representation of the different parts of the body is lateralized to the left of the brain.
- Dos Santos, Baleia et al. (2025) teach us that body semantics are related to the functional and linguistic knowledge of the different parts of the body and their interactions with the environment.

In summary, there is indeed a somatognosia that can be called "body semantics" – and which translates into verbal knowledge of the different parts of the body. This "body semantics" concerns both the naming and the recognition of the different parts of the body on oneself or on others. It is based on neural networks of its own and different from those of the SC and the CI (see Table 1):

Body Diagram	Body Semantics	Body image ⁶
Extrastriate body area Body area fusiform Premotor cortex Parietal cortex Cortex occipital Cortex somatosensoriel	Left extrastriate body area	Extrastriate body area Prefrontal cortex Bilateral frontal gyrus Parietal cortex Cerebellum Premotor cortex Left intraparietal cortex

Table 1: Brain structures involved in the different types of body representations (Dos Santos, Baleia et al., 2025).

It is clear from Table 1 that the brain areas devoted to our three types of body representations, if they overlap at the level of the extrastriated body area, are generally different. This allows us to say that considering SC, CI and body semantics as three types of body representations is quite appropriate.

Conclusion

Thus, the notion of representation can well be applied to the mechanisms of SC, CI and somatognosis. We could now call the latter body semantics. SC should be confined to proprioception based on the vestibular and the visual. CI, until fundamental research has ruled, would be superficial (it would be society's "gaze" on our body) and profound (it would be the composite image of the body). Body semantics could be referred to the linguistic aspects of knowledge of the body. The current conceptual precision of the body schema and body semantics should lead psychomotor therapists to recast their assessment tools and care processes.

That said, to come-back to the current inaccuracies in research on HF, it would also be very appropriate for the profession to trust the clinic and not expect everything from neuroscience. Because when we "compare" the contributions of the latter with the clinical discoveries developed, theorized, conceptualized, we realize that what patients teach us as well as our clinical sagacity are not out of step with neuroscience. The essential thing is to remain humble, to always seek to confront clinical and literature.

Finally, at a time when the reengineering of the profession seems to be getting back on track, it would be good to take advantage of this to modernize the teaching provided by the IFPs.

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⁶ Here, the overlaps with the composite image of the body are partial.

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