

Jaspers, the Body, and Schizophrenia: The Bodily Self

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Abstract

Karl Jaspers laid the foundations of contemporary psychopathology. Among Jaspers' contributions was his powerful vision of psychiatry as a crucial way to shed light on the human condition and existence by integrating the scientific study of psychic diseases with a theoretical approach focused on human experience. This perspective should be revitalized. In the present paper we start from the role Jaspers assigns to the body when discussing the notion of 'personalization'. We explore the relationship between a minimal notion of the self, the 'bodily self', and its potentiality for movement – the self's 'power for action'. Based on recent empirical evidence, we then propose a connection between the implicit bodily self-experience and important psychopathological aspects of schizophrenia by showing that schizophrenic patients exhibit a disruption of implicit bodily self-knowledge. We propose that the bodily nature of the implicitly experiencing self might enable the continuum of experience along which *all* visions of the world are located – both in healthy and psychotic individuals. The power for action might provide the possibility to give form to the *bodily presence* characterizing in the first place our being selves.

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Introduction

One of the great merits of Karl Jaspers consisted of introducing a subjective psychology to the field of psychiatry by relying on the methods of phenomenology and interpretive psychology (*verstehende Psychologie*) inspired by Wilhelm Dilthey. Jaspers indeed made available to psychiatry the distinction between *erklären* (explaining) and *verstehen* (comprehending), clarifying the crucial importance of studying patients' *erleben*, and challenging the subject-object distinction (*Subjekt-Objekt-Spaltung*) while privileging the relational character of human existence. As Herbert Spiegelberg wrote in his *Phenomenology in Psychology and Psychiatry. A Historical Introduction* [1], 'What impressed [Jaspers] about Husserl's phenomenology was, in ascending order, its usability for the description of the experiences of the mentally ill, the discipline of Husserl's thinking, his conquest of psychologism, and his insistence on the clarification of unnoticed assumptions' [1, p. 174]. Indeed, Jaspers' masterwork *Allgemeine Psychopathologie* [2, 1913, English transl.] opens with a lengthy chapter on phenomenology.

Jaspers [3] himself acknowledged many years later how influential Husserl's thought was for developing his psychopathology: 'I found confirmed what was already at work in me: the urge to the things themselves [*Drang zu den Sachen selbst*]. In a world full of prejudices, sche-

matisms, conventions, this was at the time like a liberation. Husserl made the comparatively strongest impression on me. True, I did not consider his phenomenological method a philosophical procedure, but as he himself had considered it at first, as descriptive psychology. I used it as such, gave such descriptions in psychopathology, and formulated the method in its principles for use in psychopathology' (1958, p. 386).

The relationship between Jaspers and phenomenology is a very intricate one, but it does not concern us here. In this paper we start from the role Jaspers assigns to the body when discussing the notion of 'personalization', i.e. the I-quality of self-awareness. We further develop the relationship between the bodily self and its motor potentialities and examine its pertinence to a new take on the psychopathology of schizophrenia.

Jaspers' Psychopathology, Movement, and the Bodily Self

In chapter 4 of *General Psychopathology*, Jaspers addresses the relationship between the objective and subjective expression of psychic phenomena. According to Jaspers, any knowledge we may have of the psychic life of others comes to us through 'the understanding of expression' [2, p. 256]. He writes: 'The psychic quality, the inward element, can be seen in the outward form and movement of the human body, made visible to us as expression' [2, p. 256]. Indeed, our understanding of others' behavior, according to Jaspers is not obtained by means of an inference by analogy ('conclusions by analogy are a myth' [2, p. 254]), but at the very moment of perception, in a 'lightning flash'. Such immediate understanding is possible to the extent that the perceived expression can be linked to one's own possibility for experience.

The relationship between bodily movement, expression and psychic life is clearly delineated in the seventh section of the first chapter of *General Psychopathology*, where Jasper addresses the topic of the awareness of the self. He clearly states that the ways in which the self becomes aware of itself are multiple. Jaspers lists four formal aspects of self-awareness: the feeling of activity, i.e. the awareness of being active, the awareness of unity, the awareness of identity, and the awareness of being distinct from the outer world.

We briefly focus here on the first aspect. Jaspers [2] writes: 'All psychic life involves the experience of a *unique and fundamental activity*. Every psychic manifestation, whether perception, bodily sensation, memory, idea,

thought or feeling carries *this particular aspect of "being mine"*, of having an "I-quality", of "personally belonging". We have termed this "*personalisation*" (p. 121).

In the following sections we explore the relationship between a minimal notion of the self, the 'bodily self', and its potentiality for movement, the self's 'power for action' (see Gallese and Sinigaglia [4, 5]). On the basis of recent empirical evidence we then propose a connection between implicit bodily self-experience and important psychopathological aspects of schizophrenia.

Minimal Self and Bodily Self: Looking for the Basic Experience of One's Own Body

Since Jaspers, the multileveled notion of self has been constantly investigated in psychopathology. Building upon a phenomenological perspective, Parnas [6, 7] recently delineated three levels of selfhood. At the first, pre-reflective, level there is the implicit awareness that this is 'my' experience ('ipseity'). At the second level of selfhood there is the more explicit awareness of being the invariant subject of experience and action. Finally, the third level of selfhood pertains to the social or narrative self. The concept of prereflective (or minimal) self is currently being debated both in cognitive neuroscience and in philosophy. Indeed, it is not clear which empirical features such a self is presumed to possess and which kind of experience concurs in shaping this implicit sense of being oneself. In particular, one of the central issues is the contribution of bodily experience to the constitution of the minimal self. On the philosophical side, however, phenomenology clearly emphasizes the necessity of embodiment of the self for many aspects of self-experience (i.e. the first-person perspective, the 'mineness' of the phenomenal field, the sense of being an agent). Furthermore, as argued by Cermolacce et al. [8], in phenomenology, 'the field of experience is not yet considered to be *subjective* because this predicate already implies that there is a subject. For phenomenology, the very idea of the *subject* articulates itself in experience. In this sense, the manifestation and appearing of experience are the *conditions* for the experience of the subject in question.'

This philosophical standpoint has important implications for the empirical studies, especially for those investigating the neural correlates of self-consciousness or self-representations. Rather than searching for the neural correlates of a predefined, explicit, and reflective self-knowledge, the aim of empirical research should be to investigate which kind of experience (and how) allows an implicit

and prereflective self-knowledge to emerge. For example, assuming the importance of embodiment of the self for self-experience, as suggested by phenomenology, two interesting questions arise. What is the basic experience of ourselves as bodily selves? What enables us to implicitly distinguish ourselves, as bodily selves, from other human bodies? Contemporary research answers this question by focusing mostly on the notions of body ownership, sense of agency, and first-person perspective.

Body ownership refers to 'the perceptual status of one's own body, which makes bodily sensations seem unique to oneself' [9]. Empirical evidence shows that the experience of our body as our own mainly relies on multisensory integration, which is conditioned by the possibility – or not – to perform actions with a given body part [10–12].

Sense of agency refers to the sense of being the one who generates an action. We recognize ourselves as an agent when there is congruence between self-generated movements and their expected consequences. However, as argued by Marc Jeannerod [13], 'sense of agency also arises in many situations where action representation is formed, but no movement is executed'. Because circumstances where actions remain covert are frequent in our daily life, 'the existence of an overt behaviour should not be a prerequisite for self-identification'. Such circumstances occur, for example, in the case of motor imagery [14] or motor simulation, which is a functional mechanism taking place during the observation of others' actions and having the mirror mechanism as its neural counterpart [5, 15–17].

Finally, first-person perspective may be referred to the phenomenological idea that the world *appears* as constrained by a mobile embodied self, i.e. by the spatially located point of view, the orientation, and the attitudes relative to the subject's sensorimotor background capacities [8].

In sum, all the notions adopted by contemporary research to answer the question of how we distinguish ourselves, as bodily selves, from other human bodies refer to a crucial role of the motor system. In the same vein, it has been recently proposed [4, 5] that there is a sense of body that is enactive in nature and that enables the capturing of the most primitive sense of self as bodily self. According to this perspective, 'the body is primarily given to us as "source" or "power" for action, that is, as the variety of motor potentialities that define the horizon of how we can interact with the world we live in' [4]. Such a primitive sense of self as bodily self is conceived of as being antecedent to the distinction between sense of agency and

sense of ownership. Accordingly, Smith [18] explained the concept of bodily self as follows: 'The bodily self is a physical agent. Knowledge of oneself as bodily is fundamentally knowledge of oneself as agentive; such knowledge is grounded in both experience of oneself as instantiating a bodily structure that affords a limited range of actions, and experience of oneself as a physical agent that tries to perform a limited range of actions over time.'

One might argue that there are a lot of bodily experiences (e.g. headache, hunger, satiety, etc.) that certainly convey a sense of mineness without being related to action. However, such a sense of mineness, which essentially consists of attributing feelings and sensations to one's body, presupposes a sense of self as a bodily self. First, I recognize myself as a bodily self (i.e. power for action), then I can attribute body sensations to myself.

In different studies from our group, we recently investigated the existence of a motor-related representation of the bodily self and its implicit, rather than explicit, nature. In a behavioral study [19], right-handed participants were required to perform a laterality judgment task of rotated left- and right-hand stimuli. Importantly, the hand to be judged could be either the participant's own hand or another person's hand. It is well known that participants perform mental motor rotation of body parts by simulating a motor rotation of their own body parts to match that of the observed stimulus [20]. Such mental simulation process shares the same temporal and kinematic properties with actual body rotation in space [20–22]. Indeed, longer mental rotation times are needed for stimuli orientations corresponding to body part positions which are difficult to maintain [20–24]. Since previous studies [25, 26] demonstrated that the left-right judgment of body parts recruits the visuomotor representation of one's own body, we hypothesized that the laterality judgment should be easier when the displayed stimulus is one's own dominant hand. The results confirmed this hypothesis, showing that faster responses specifically occurred for the participants' dominant hand. We interpreted these results as an indication of the fact that the motor experience of one's own body, even at a covert level, allows an implicit and prereflective bodily self-knowledge to emerge, thus, leading to self/other distinction. In a control experiment of the same study [19], we also investigated how well participants could discriminate between their own hands and those of others. We employed the same stimuli as in the laterality judgment task. However, in this case, participants were required to explicitly judge whether or not the displayed hand corresponded to their own hand. In this case, no faster responses for par-

ticipants' dominant hand were found. Capitalizing upon this evidence, we proposed that implicit and explicit recognition of the bodily self dissociate and only an implicit recognition of the bodily self, mapped in motor terms, facilitates implicit bodily self-processing.

In a subsequent fMRI study [27], we tested the hypothesis that the sensorimotor system plays a pivotal role in the implicit self/other distinction during the laterality judgment task. We highlighted a neural network for the general representation of the bodily self encompassing the supplementary and presupplementary motor areas, the anterior insula, and the occipital cortex, bilaterally. Crucially, the representation of one's own dominant hand was primarily confined to the left premotor cortex. Accordingly, previous neuroimaging results associated with the laterality judgment task, using both corporeal and noncorporeal stimuli, showed activation in several dominant spatial-motor processing regions, including the posterior parietal (superior parietal and the intraparietal sulcus), premotor and primary motor cortices, the supplementary motor area, and the cerebellum [28–34]. However, only for the premotor cortex was a higher specificity for the mental rotation of body-related stimuli, compared to objects, specifically proposed [30, 35]. Finally, based on our results and considering the role proposed for the premotor cortex in body awareness [35–37], we concluded that this brain area may represent one of the essential anatomical and functional bases for the motor aspect of bodily selfhood.

Overall, our data seem to support the existence of a prereflective sense of bodily self encased within the sensorimotor system, which might help us to implicitly differentiate our own body from that of others.

Loss of the Implicit Awareness of the Bodily Self in Schizophrenia

Studies using different methods (behavioral, fMRI, TMS studies) suggest that the recognition of one's own body is independent of the recognition of other people's bodies. For instance, a specific neural network dedicated to 'self-body' recognition has been described, which is, at least partially, distinct from that responsible for general body-related information processing [38–40]. This is not surprising if one considers that from our own body we combine visual information with, at least, somatosensory, proprioceptive, and motor information [39], whereas for others' bodies we have mostly visual information available to us.

However, the human ability to implicitly recognize one's own body has been demonstrated also by using a visual matching task [41–43]. In this task participants are presented with three gray-scale, vertically aligned pictures representing a body part (hand, foot, arm, and leg). They are asked which of the two stimuli, the upper or the lower one, matches with the central target. Participants show the so-called 'self-advantage effect', i.e. a better performance with one's own rather than others' body parts [41–43]. Moreover, this effect is stronger for dynamic than for static stimuli [43]. This evidence supports the hypothesis that bodily self-recognition is based on a sensorimotor representation (for a review, see [44]).

In a previous study from our group [45], we proposed that the bodily self-advantage is the expression of implicit, rather than explicit, and body-specific knowledge, based mainly on the sensorimotor representation of one's own body effectors. Healthy participants were implicitly (i.e. visual matching task) or explicitly (i.e. self/other discrimination task) required to recognize either their own body effectors or inanimate objects. Only in the implicit task did we find higher accuracy for self than for others' body effectors. In contrast, we did not find the self-advantage when an explicit recognition of one's own body effectors was required. Moreover, both self/other and implicit/explicit effects were absent when participants processed inanimate objects. These results suggest that, first, the body self-advantage relies upon a sensorimotor rather than a mere visual representation of one's own body, and second, they underline the differences between the body and other objects. The idea of a dissociation between implicit and explicit self body processing is in agreement with both neuropsychological studies [46–48] and infancy research [49, 50]. What is important here is that the sensorimotor representation of oneself, as bodily self, can emerge when implicitly rather than explicitly accessed, even when tested (1) by an improper motor task (like the laterality judgment task) and (2) by using static rather than dynamic body stimuli. On the other hand, explicit self-recognition probably requires attention and memory abilities not required in the implicit task. In this case, the explicit recognition of one's own body parts seems to be more vulnerable to errors than the sensorimotor knowledge we implicitly hold about the same body parts.

Recently, we used the same tasks as in Frassinetti et al. [45] with first-episode schizophrenia (FES) patients in order to test whether a specific bodily self-advantage effect is either preserved or lost in these patients [51].

Indeed, the schizophrenia spectrum has been described as a psychiatric condition associated with a 'self-

disorder'. This has been differently indicated as a disorder of the 'minimal self' or 'ipseity' [6, 52, 53], or as a disembodiment of the self [54, 55]. It would mainly consist of a loss of the 'implicit structure of the body' [54, p. 95]. In agreement with this perspective, we found that FES patients did not show the self-advantage effect in the implicit task. Furthermore, both groups of participants did not show a self-advantage in the explicit task. However, in this task FES patients showed a higher percentage of self-misattribution errors with respect to control participants [51]. Similarly, when Daprati et al. [56] previously investigated bodily self-knowledge in schizophrenia by testing patients' sense of agency, they found that hallucinating and deluded schizophrenic patients misattributed the alien hand to themselves. Other empirical evidence supporting the idea of a weaker or more flexible sense of bodily self in schizophrenia comes from studies investigating the sense of body ownership in schizophrenic patients [57]. All in all, there is enough evidence suggesting that bodily self-knowledge is disturbed in these patients.

Bodily Self, Self/Other Boundary, and Intersubjectivity

Along with the loss of a coherent sense of self, in schizophrenia the relationship and the distinction between self and other may also blur [53]. To what extent are disturbances of bodily self-experience related to social dysfunction in schizophrenia? Does such dysfunction concern the intersubjective domain or is it secondary to disturbances of bodily self-experience? Indeed, from the perspective of phenomenologists, one explanation of intersubjectivity refers to a crucial role of the lived body [58, 59]. That is, before any self-other distinction, intersubjectivity would be based on an immediate perceptual linkage (i.e. identification) with my partner's body. This transfer of corporeal schema would be the basis of intersubjectivity [58], which accordingly should be more properly called 'intercorporeality'.

Empirical evidence suggests that social perception comprises vicarious processes as well as self-regulation processes. Thus, the neural underpinnings of social perception would consist, on the one hand, of multimodal brain regions underlying both bodily self-experiences and the prereflective understanding of the feelings and behaviors of other individuals [60–62]. On the other hand, they would comprise specific brain regions involved with self-experiences and awareness that also seem to differentiate between self and other [9, 63, 64].

In an fMRI study from our group [65], we investigated whether the functional neural basis underlying vicarious processes as well as self-regulation processes are altered in FES. FES patients and healthy participants were required to watch videos depicting other individuals' inanimate and animate/social tactile stimulations. A tactile localizer condition was also included in the study. Results indicated that activation in the ventral premotor cortex for observed bodily tactile stimulations was reduced in the FES group and negatively correlated with self-experience disturbances. We proposed that ventral premotor cortex could be a key structure underlying the breakdown of self-monitoring previously suggested in schizophrenia [66–68], and that such alteration could reasonably lead to the blurring of self-boundaries and confusion in the interrelationship with others. Accordingly, we observed reduced BOLD suppression in pIC during the observation of touch in another individual, indicating an impaired differentiation between self and other conditions during social perception. We proposed that this might reflect a deficit in FES in the prereflective suppression of self-oriented affective arousal, which likely contributes to the differentiation between self- and other-related conditions. Strikingly, no abnormalities were found in FES with respect to shared activation between experienced and observed touch in somatosensory cortices. These results support the hypothesis that disturbances of bodily self-experience may have a crucial role in schizophrenia and that they may account for social deficits in schizophrenic patients more than vicarious processes.

Conclusions

Karl Jaspers has laid the foundations of contemporary psychopathology. One hundred years later, *General Psychopathology* still stands out as an unsurpassed synthesis of theory applied to clinical practice. One of the most modern aspects of Jaspers' contribution rests in his powerful idea of psychiatry as a crucial way to shed light on the human condition and existence, provided that it is able to integrate the scientific study of psychic diseases against a theoretical background focused on human experience. This perspective should be revitalized. We do not share, however, Jaspers' pessimism about the heuristic value of science on these matters. We think that contemporary cognitive neuroscience, if properly theoretically informed by investigating the *Körper*, can shed new light on the *Leib*.

Human existence, according to Jaspers, finds its basic constitutive root in a transcendental structure that neither belongs to the mind nor to the body – it is neither subjective nor objective (see *Psychologie der Weltanschauungen*, 1916).

We propose that the bodily nature of the implicitly experiencing self might enable the continuum of experience along which *all* visions of the world are located – both in healthy and psychotic individuals. We also propose that a key feature of such bodily self might stem from the potentiality for action of the human body, which defines the horizon of the intrinsic pragmatic nature of every inten-

tional relation with the world. The power for action might provide the possibility to give form to the *bodily presence* characterizing in the first place our being selves. As we show here, this approach enables the possibility to start investigating the psychopathological features of schizophrenia by asking new questions to the brain-body system.

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