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## The interaction between implicit and explicit awareness in anosognosia: Emergent awareness

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patients with brain damage (e.g., stroke) or without (e.g., hysterical conversion). In this framework, the assessment of one's own (e.g., motor) performance depends on access to a plurality of information sources (e.g., motor, proprioceptive, visual attention), which is performed in parallel at both the conscious (explicit) and unconscious (implicit) levels. The existence of distinct pathways (explicit and implicit) for motor control and self-monitoring makes it possible to envisage different forms of anosognosia, involving different degrees of dysfunction in one or the other of these levels, or in both.

Mograbi and Morris make now one further valuable step by showing that Alzheimer's patients may have preserved emotional reactivity to their failures, even when denying them. This last point is very important in the evaluation, treatment, and rehabilitation of anosognosic patients or dementia, and the management of their deficits, because patients may exhibit unconscious affective responses to these and this may in turn influence their behavior and impairments in everyday life.

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## The interaction between implicit and explicit awareness in anosognosia: Emergent awareness

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**Abstract:** The dissociation between implicit and explicit forms of awareness has been described in various neurological diseases. The way in which these forms of awareness integrate in order to permit the necessary unitary experience of self remains unclear. Here, the hypothesis that a form of emergent awareness (i.e., the emergence of a verbal acknowledgment of deficits as a consequence of attempting to act) may represent a link between implicit and explicit components is proposed for discussion.

The existence of various different subtypes of anosognosia is the topic of an intense debate in neuroscience and neuropsychology due to its potentially twofold contribution, both in comprehension of awareness mechanisms and in clinical approaches to neurological diseases (Marcel et al., 2004; Ramachandran & Ramachandran, 1996). By means of a comparative analysis of the literature concerning implicit awareness for motor deficits in hemiplegia

and cognitive deficits in dementia, the authors suggest an updated version of the Cognitive Awareness Model (Agnew & Morris, 1998). In this model, they propose that two types of comparators (Type 1 and 2) are damaged in the different expressions of anosognosia and in dissociations between implicit and explicit awareness.

Thus, the question that remains in large part unanswered concerns how implicit and explicit forms of awareness can integrate to give the habitual, global, individual experience of unitary self-awareness.

The authors suggest considering awareness as an emergent feature of brain functioning, endowed with strong integrative power. This view finds confirmation in studies of neuroimaging in anosognosia after stroke that show the involvement of very large cortical and subcortical networks (Fotopoulou et al., 2010; Moro et al., 2011).

From a phenomenological perspective a specific subtype of awareness, called precisely “emergent awareness” has been described (Crosson et al., 1989). In this condition, subjects who are unaware of the consequences of their deficits deny their paralysis when verbally asked, but they become in some way aware of their deficits when faced with a request to perform an action. This indicates that an intention to act (and/or actually acting) may modify explicit, verbal knowledge of the deficits. Moreover, it induces the use of strategies aimed at correcting their behavior, which are not employed in subjects who do not show any signs of emergent awareness (but have, for example, spared implicit awareness; Moro et al., 2011). Finally, emergent awareness might guide decision-making processes in complex contexts, for example, during procedures requesting a subject’s consensus to medical treatment (Clinical Competence; Gambina et al., 2013).

A related question also concerns the possible role of emergent awareness in Personal Data Base updating. Recent lesional studies (Moro et al., 2011; Vocat et al., 2010) in anosognosia for hemiplegia have shown the involvement of memory networks in the persistence of symptoms over time. In line with this, the CAM model emphasizes the role of autobiographical conceptual memory, self-knowledge, and sense of personal efficacy in building the Personal Data Base (PDB). This sends long-lasting memory information to the comparator systems to compare them to information concerning the results of actual performance. In self-knowledge processes, implicit elements, such as memories, meaning and beliefs concerning social roles in specific social context, cognitive styles, and competences are necessarily included. In updating PDB with respect to new conditions, implicit and explicit memory need to be

integrated in the formation of long-lasting memory representations.

The mechanisms underlying emergent awareness have until now not been clear, but the involvement of cognitive and metacognitive processes (necessary to intention, monitoring, and evaluation of performance) and executive processes (for action, memory, speech, etc.) makes this form of awareness a possible candidate as one of the components of integration between implicit and explicit awareness (and memories).

This hypothesis is also supported by lesional results showing that, while implicit awareness deficits are linked to lesions involving the middle temporal cortex and the white subcortical frontal matter (anterior and around the basal ganglia), the lack of emergent awareness is linked to lesions of pathways connecting the parieto-temporal and frontal cortices (Moro et al., 2011; Vocat et al., 2010).

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