A Principled Argument, But Not a Practical One

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Bendtsen’s article “Communicating With the Minimally Conscious” (Bendtsen 2013) explores a promising avenue for applying our mental imagery method (Owen et al. 2006) in the clinical setting. As this research is now evolving into the foundations of novel clinical services, both her initiation of this conversation and the optimistic appraisal of incorporating brain–computer interfaces (BCIs) in medical practice are timely contributions to the medical ethics literature. We agree with Bendtsen’s assertion that there are, in principle, no conditions that preclude the use of functional magnetic resonance imaging (fMRI) in communicating medical decisions. Indeed, applying fMRI in this manner would likely permit patients who are behaviorally nonresponsive yet retain some residual level of cognitive function to reclaim elements of well-being lost to their initial injury. Nevertheless, a number of obstacles inherent to the assessment of disorders of consciousness (DOC) serve to complicate the practical implementation of this technique in the healthcare setting. By outlining these limitations, we seek to set realistic expectations for family members, proxy decision makers, and healthcare practitioners, who will be involved in the process of clinical decision making on behalf of the patient.

The first limitation associated with this application of fMRI derives from the fact that a significant minority of patients are simply unable to remain motionless inside the MRI scanner, despite repeated efforts to settle them prior to imaging sessions. The resulting movement artifacts render the imaging data uninterpretable, thus precluding the use of fMRI to acquire useful information about residual awareness. Alternative imaging methods that are less susceptible to patient movement, such as electroencephalography (EEG; e.g., Cruse et al. 2011), may prove more useful in these unique situations.

A second limitation stems from the fact that some patients will provide inconsistent results, which may be due to fluctuation of attention span when engaging in the mental imagery task. For example, a patient may be identified as a candidate for BCI communication based on evidence of fMRI command following in initial tests, yet provide inconsistent results during follow-up imaging sessions. While Bendtsen acknowledges this problem, she does not fully consider its epistemological and ethical ramifications. From an epistemological standpoint, inconsistent results diminish our confidence in the presence of residual cognitive ability and may negatively affect future decisions regarding a patient’s suitability for BCI communication in the medical setting. From an ethical standpoint, as negative results derived from our paradigm are merely inconclusive, rather than indications of absence of awareness, disclosing inconsistent (e.g., both positive and inconclusive) findings to family members can be a source of great confusion. Indeed, it is not at all clear what the best advice ought to be for families in the face of inconsistent results. A probabilistic model, which effectively tracks our degree of confidence that a given DOC patient possesses some degree of decision-making capacity, may help mitigate these problems.

A third limitation is the possibility of patient mental exhaustion that results from a protracted imaging session required for unequivocal fMRI results. This limitation will restrict the number of questions that can be asked during any single imaging session and may be financially prohibitive for some medical institutions, given the high cost of MRI scanning time. To date, the most successful reported case of BCI communication using our mental imagery method involved a patient who answered five consecutive autobiographical questions correctly (Monti et al. 2010). Including the five minutes of imaging data required to interpret the answer to each question, along with the time intervals between questions and diagnostically relevant anatomical scans, this imaging session required more than one hour of imaging time. Since some medically relevant questions...
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Sheer vulnerability marks the patient in a minimally conscious state (MCS) who was previously diagnosed persistently vegetative: retaining a certain level of awareness but otherwise being profoundly impeded from engaging with the outside world (Posner et al. 2007, 360). That it is even a question of, as Wilkinson and Savulescu (2012) recently inquire in their title, “Is it better to be minimally conscious than vegetative?” is evidence enough. This being the case, it is the responsibility of those who attempt communication with these patients to do so in an exceedingly thoughtful manner. 

REFERENCES


