Social neuroscience: bringing an end to the destructive and misguided “social” versus “biological” in psychiatry

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Psychiatry is the branch of medicine that demands the most careful appreciation and understanding of social, as well as psychological and biological, aspects of patients and their health problems. For many psychiatrists, this complexity is at the heart of the medical specialty's appeal.

However, this reality also provides a challenge that has resulted in entrenched positions being adopted by some professionals and members of the lay public, who view clinical issues and entities in a simplistic, polarized way as being *either* “social” or “biological” in nature and origin. Such thinking is often driven by politics and ideology and it is a major impediment to public understanding, professional relationships, development of effective services, and, crucially, to patient care (1).

Any experienced psychiatrist knows that excellent care involves careful and skillful attention to biological, psychological and social issues and that in any particular clinical case these are commonly intertwined in a way that does not allow simple reductionism. Indeed, dealing with this complexity in a pragmatic, clinically effective manner is the core business of psychiatry.

Set within this clinical and scientific context, it is, therefore, a pleasure to read the paper by Cacioppo et al (2), which focuses on the developing field of social neuroscience and the potential contributions it can make to psychiatry. The paper is clear and well-balanced and the main arguments in favour of the relevance and

importance of social neuroscience for psychiatry are persuasive.

The concept of social neuroscience was introduced early in the “Decade of the Brain” (the 1990s) and brings together the increasingly powerful tools of neuroscience to explore the brain mechanisms that underlie social interactions and behaviors (3). At a theoretical level, it makes enormous sense to put effort into understanding the neuroscience of social behavior in both its normal forms and when impaired within the context of psychiatric illness. At an empirical level, there are many interesting findings emerging that point to a bright future for this field.

Together with the overlapping and similarly rapidly developing fields of cognitive neuroscience and affective neuroscience and with improving tools like functional imaging and molecular biology, social neuroscience has a great deal to offer for further understanding of many of the clinical problems experienced by psychiatric patients. Together, these are areas that will bridge the gap between the molecular and biological systems and the complex experiences of the patients we see in the clinic.

It can be expected that these approaches will allow a reconceptualization of the major clinical entities in psychiatry that will allow movement away from crude diagnostic classifications based on symptom descriptions and towards diagnostic approaches that are based upon the normal and abnormal workings of the brain and which are supported by laboratory tests, as is usual in other branches of medicine (4,5).

We must, of course, be realistic about time scales and what can be achieved. Whilst being appropriately optimistic, it is important to be aware of the chal-

lenges and be cautious in accepting early findings too readily even if those findings have tempting plausibility. The acid test in science is independent replication and confirmation through convergent, complementary experimental approaches. Many studies in the neuroscience literature are substantially underpowered, which has the undesirable result that many of the published results that are “nominally significant” will actually represent false positives (however plausible they appear) (6). Thus, as has been the case in molecular genetics (7), there will be a need for large samples (probably thousands rather than the tens of participants that are common in many neuroscience studies published to date), collaboration between researchers and an emphasis on independent replication.

Cacioppo et al raise the intuitively plausible point that so-called “endophenotypes” are likely to be genetically and biologically simpler to study than a psychiatric disorder itself. To date, genetic studies have not shown this to be the case (8). Thus, whilst it may prove to be the case, there is not yet persuasive evidence to support the assertion. Indeed, a substantial body of research experience backed up by theoretical work and common sense suggest that no approach to unraveling the complexity of causation and triggering of psychiatric illness will be easy – and social neuroscience is most unlikely to be an exception.

An area not highlighted by Cacioppo et al that will be important to understanding the normal and abnormal working of the brain relates to large-scale computer modeling. For example, the Human Brain Project, funded by the European Union, seeks to model

the development of neuronal networks and understand emergent properties using intensive computing for bottom-up modeling of human brain function (9). The hope is that this project, which focuses on multilevel integration, will help to build the foundations that are needed to reconstruct and simulate the human brain and its diseases. Together with other large-scale initiatives in neuroscience (9), such approaches are likely to improve understanding of psychiatric illness.

In conclusion, social neuroscience has much to offer over the medium to longer term in improving understanding of complex aspects of psychiatry. In the shorter term, it can be expected that the very existence of the field will help to combat the annoyingly persistent

and wholly unhelpful naïve “either/or” thinking about mental health that categorizes things as being “social” or “biological”. That will be of enormous benefit to psychiatry and its patients.

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Will better psychiatric treatments emerge from top-down or bottom-up neuroscientific studies of affect?

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Cacioppo et al (1) discuss how the emerging social neuroscience perspective may promote understanding and treatment of psychiatric disorders. They argue that all these disorders are embedded within social structures that strongly influence our thoughts and feelings.

This is true. Still, it remains ambiguous how top-down enculturated perspectives to human minds will yield fundamental insights to psychiatric therapeutics beyond what psychiatry has already achieved. Aside from debatable attractions of modern brain imaging, embraced finally by psychological sciences, how might social neuroscience provide new psychiatrically

useful perspectives that are not already reasonably well developed in biological psychiatry?

Certainly it is wonderful that social psychology is finally studying the brain, with many unique contributions, such as illumination of brain substrates of empathy (e.g., 2). Still, an enormous challenge for human social neuroscience is to provide new therapeutics. Another is for social and affective neurosciences to coordinate their efforts, especially better integration of top-down social and bottom-up neuroevolutionary perspectives. Such work remains rare.

I was delighted that Cacioppo was among the first to adopt my 1998 text *Affective Neuroscience: The Foundations of Human and Animal Emotions* (3) for classroom use. That vision served as one springboard for his advocacy of “social neuroscience”, which followed historically upon “social psychophysiology” initiatives (4). But it would be

useful to more fully harmonize top-down, human focused approaches with bottom-up cross-species affective neuroscience ones. Integration of knowledge bases is essential to minimize the likelihood of related approaches talking past each other, and promoting splintering that was common in 20th century psychology.

How shall we integrate diverse neuroscience approaches to yield new psychiatric insights? Clearly, investigators of human and animal emotions need to seek unified research strategies, with neuroevolutionary issues being a centerpiece, while not emulating many flaws of modern evolutionary psychology, with speculations about the evolution of human cortico-cognitive tendencies, that remained unintegrated with cross-mammalian affective processes (5).

Likewise, many issues that concern human social neuroscience are emergents of social learning, that remain