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Biological *v.* psychotherapeutic: Friston and psychodynamic therapy

Prosser *et al*[1] cogently argue that psychotherapeutic treatment is no less 'biological' than pharmacotherapy – a point also made by Bowlby, who argued, from an ethological perspective, that behaviour is shaped by evolutionary processes no less than anatomy.[2] However, in linking Friston's 'free energy' principle with cognitive–behavioural therapy (CBT), they fall into the trap of 'brand nominalism' (e.g. Hoover/vacuum cleaner, Coke/soda, Kellogg's/breakfast cereal, etc.). There is a lot more to psychotherapy than CBT; arguably, psychodynamic therapy fits the Friston bill rather better than Beck's baby.

As I (a non-mathematical psychotherapist) understand it, the essence of the free-energy model is the brain's Bayesian shaping of sensory input into experience according to a probabilistic calculus. In healthy psychological functioning, discrepancies between prediction and input are resolved by action to reduce uncertainty and update probabilities. Underlying many psychiatric disorders are relational difficulties arising from outmoded free-energy-reducing models. For the psychologically unwell, both action and the tolerance of uncertainty entailed in updating these models are inhibited.

Psychodynamic therapy addresses this in a number of ways, by: (a) creating a trusting attachment relationship, thereby instating an 'epistemic superhighway',[3] which, by 'borrowing' therapists' brains' free-energy reduction (i.e. their trained Bayesian skills), reduces clients' need to cling to free-energy minimisation at all costs; (b) offering an ambiguous stimulus via the neutral transference-promoting stance of the therapist; (c) promoting 'action', not in the CBT sense of 'experiments', but in exploring the resulting fears and fantasies – i.e. prior predictions – that arise *in vivo* with the therapist; (d) tolerating the free energy liberated by abandoning these predictions; (e) instating more adaptive relational probablisms; and (f) reinforcing the capacity for action and updating in the living/learning everyday world, whether 'natural' or culturally created (e.g. therapeutic day hospitals, group therapy, etc.).

Psychodynamic therapy is thus not, as Freud dubbed it, 'the impossible profession', but the 'improbable profession', in that it helps its clients revise their predictions and, in collaboration with the trusted secure base, to live with, and put to good use, the 'surprise' associated with liberated free energy. These processes are far from exclusively 'top down' as Prosser *et al* suggest, but implicate the amygdala as much as the prefrontal cortex and need to be seen in the context of the synchronous 'social brain' of client and therapist acting in concert.

1 Prosser A, Helfer B, Leucht S. Biological *v.* psychosocial treatments: a myth about pharmacotherapy *v.* psychotherapy. *Br J Psychiatry* 2016; **208**: 309–11.

2 Holmes, J. *John Bowlby and Attachment Theory (2nd edn)*. Routledge, 2013.

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Evidence, not ideology, should guide the use of psychotherapy

Prosser and colleagues[1] argue that any distinction between pharmacotherapy and psychotherapy is a fallacy, as both treatment modalities ultimately target underlying disturbances in neural circuitry. However, the justification of psychotherapy on the basis of its ability to deliver neurobiological changes, as the authors argue, is flawed. Specifically, they assume that mental disorders are simply brain diseases and that behavioural aberrations can be accounted for by disordered neurobiological processes. Despite the tremendous resources dedicated to uncovering the biological basis of mental illness, we have yet to identify a reliable biomarker for any mental disorder.[2] Therefore, proposed mechanisms of neurobiological actions of psychotherapy for mental illness are reductionistic at best and highly speculative at worst.

The reformulation of psychotherapy as a neurobiological treatment is yet another example of the creeping trend towards neuroessentialism.[3] The evidence for the efficacy of psychotherapies in the treatment of mental disorders stands by itself, and grounding this in speculative theories of its neurobiological action has no added value. Further, the authors seem to equate psychotherapy with cognitive–behavioural therapy, although a number of other therapies, including psychoanalytic psychotherapy, have demonstrable efficacy,[4] with the therapeutic effects best conceptualised as occurring through the therapeutic relationship rather than reductionistic neural mechanisms.

Although the authors have the noble aim of championing the role of psychotherapy in the contemporary treatment of mental illness, privileging a biological model of mental disorder may actually reduce clinicians' empathy for their patients.[5] In this way, reducing psychotherapy to simply a biological treatment may undermine its effectiveness. Instead, treatments should be evaluated on the weight of the evidence of their efficacy alone.

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Authors' reply: We thank Holmes, & Michaels and Datta, for their interest in our editorial.[1] Both highlight that the link between the free-energy framework[2] and psychodynamic psychotherapy was not discussed and – by this omission – suggest

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that we may believe that psychotherapy equals cognitive–behavioural therapy (CBT). Psychotherapy undoubtedly encompasses more than CBT, but we focused on CBT for two main reasons. First, CBT is arguably the most empirically supported psychotherapy and is commonly used for a wide range of mental and personality disorders, as well as in correctional settings.[3,4] Therefore, we believe that our editorial's CBT focus maximises the impact of our main conclusion: that psychotherapy is a biological treatment.

Second, CBT theories resonate very deeply with the free-energy framework because of the centrality both place on top-down processes and learning.[2] Both consider these processes to be fundamental – in the sense of basic and necessary – to understanding the pathogenesis of psychopathology. In our view, these concepts have tended to not be as central to psychodynamic theories as they are to CBT theories. More importantly, this example of converging lines of evidence from well-established research fields means that our thesis is not 'highly speculative' and not without value, which Michaels & Datta merely proclaim without any evidence for these charges.

Regarding Michaels & Datta's other criticisms, the fact that reliable biomarkers for mental disorders are difficult to identify does not necessarily mean that psychopathology does not have a neurobiological basis, as they suggest. This is because the diagnostic systems used in neuroscientific studies performed to date are woefully inadequate, since the preponderance of evidence suggests that psychopathology is dimensional, rather than forming discrete categories.[5] Accordingly, a more plausible explanation for this biomarker issue is that we have been using inadequate independent variables in our analyses (i.e., the DSM/ICD categories). Thus, the biomarker issue is likely only a methodological/measurement, rather than a substantive, issue for the neurobiological model of psychopathology.

Michaels & Datta also misunderstand the free-energy framework by suggesting that our thesis is just another grossly oversimplified reductionistic theory. The free-energy framework provides a biopsychosocial explanation of the pathogenesis of psychopathology. This is because experience-dependent synaptic plasticity is fundamental to free-energy minimisation,[2] which means that the (social, familial, etc.) environment has a central causal role in neural functioning and its pathologies.

Finally, while we agree that psychodynamic theory is vitally important, Holmes is setting up a false dichotomy between CBT and psychodynamic theory. In brief, the reason is that once you start to understand the pathogenesis of psychopathology using the free-energy framework, core CBT and psychodynamic constructs become integrated into a framework that unifies these psychotherapeutic approaches.

The reason is straightforward: if you want to formalise psychodynamic constructs within the free-energy framework, you will necessarily have to do so in terms of top-down processes and learning, because these are fundamental to how the brain works.[2] Thus, psychodynamic constructs will have to be formalised using concepts traditionally associated with CBT. Equally, we find that two core ideas from psychodynamic theory emerge from the free-energy framework. First, according to the free-energy framework, top-down processes and learned responses are not purposeless; rather, they always serve an adaptive function for the brain (i.e., to minimise prediction error).[2] This means that some top-down processes and learned responses can be likened to the psychodynamic construct of defence mechanisms, since – in essence – these processes defend against uncertainty (i.e., prediction error). Second, since inferences/predictions drive and modulate neural activity at multiple spatial and temporal scales in the brain,[2] much of an individual's mental life is unconscious.

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