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Editorial

Biological *v.* psychosocial treatments: a myth about pharmacotherapy *v.* psychotherapy

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Summary
Despite evidence for their comparable efficacy, psychotherapy faces a dramatic decline relative to pharmacotherapy in psychiatry. A deep ideological reason for this decline centres on the belief that psychotherapy is a psychosocial treatment whereas pharmacotherapy is a biological treatment. Modern cognitive neuroscience demonstrates that this distinction is a myth.

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The decline of psychotherapy

Pharmacotherapy is undoubtedly the primary treatment for most mental illnesses and psychotherapy is on the decline. Trends in the USA are especially revealing. For example, from 1998 to 2007 there was a significant increase in the percentage of out-patients who received pharmacotherapy alone to treat their mental disorder, which was mirrored by a significant decline in the use of psychotherapy alone as well as psychotherapy in combination with pharmacotherapy.[1] Furthermore, the average number of psychotherapy visits significantly reduced, almost 20% from 9.7 to 7.9 visits between 1998 and 2007.[1] These shifts were so momentous that by 2007 over 50% of out-patients, regardless of their mental health condition, received only pharmacotherapy.[1] Similar trends are seen in the recent character of psychiatry residency training programmes in America, which are illuminating because residency programmes are like the canary in the coal mine for psychotherapy's future. Recent US surveys of programme directors and residents show that many programmes do not provide the minimum amount of clinical care, supervision or didactic training to psychiatry residents for them to be considered competent therapists in cognitive–behavioural therapy (CBT) or psychodynamic psychotherapy.[2] A multisite US study of residents found that most residents (62%) believed that 'I plan to incorporate my psychotherapy training in my practice after residency, but psychopharmacology will be the foundation of treatment for most of my patients', and 42% of residents did not plan on pursuing more psychotherapy training and 20% were neutral regarding additional training.[3] These trends are troubling because they point towards a growing gap between real-world clinical practice and state-of-the-art evidence for psychotherapy's efficacy: a recent overview of meta-analyses with over 137 000 participants concluded that both psychotherapy and pharmacotherapy are effective for most psychiatric disorders, with no consistent differences between them in overall efficacy.[4] Moreover, for most disorders, combining pharmacotherapy with psychotherapy shows enhanced efficacy relative to monotherapy.[4] Therefore, why is psychotherapy on the decline?

There are many complex reasons for this decline. National expenditures on psychotherapy in the US significantly declined, nearly 35% from $10.94 billion to $7.17 billion between 1998 and 2007, or, proportionally, from 71.0% to 44.7% of the national out-patient mental health expenditure.[1] There are also financial disincentives to provide psychotherapy built into psychiatrists' fees, and the pharmaceutical industry spends billions annually promoting pharmacotherapy, whereas no organisation representing psychotherapy's interests has similar financial and political leverage.[1] Similarly, private industry has a financial incentive to influence policy makers to prioritise pharmacotherapy because psychotherapy offers few profit opportunities once a therapist is trained. Conversely, pharmacotherapy offers enormous profit opportunities because, among other things, prescription bottles must always be refilled. The greater time commitment and effort required for psychotherapy is likely another factor,[1] although this is probably less of a deterrent for patients since generally patients prefer psychotherapy over pharmacotherapy.[5]

However, in this editorial, we focus on a deeper ideological reason for the dramatic decline of psychotherapy. This ideological reason is the (implicit) belief that pharmacotherapy is a 'biological treatment' whereas psychotherapy is a 'psychosocial treatment' and, because of this difference, pharmacotherapy is a more scientifically valid treatment. This ideological belief appears to be a natural extension of the brain disease model of mental illness: if all mental illnesses are caused by pathological neural processes, then therapies that specifically target these neural processes must, by definition, be more scientifically valid because they target the essential aspects of the disease, whereas

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'psychosocial treatments' such as psychotherapy do not. If this is the ideological lens through which clinicians and policy makers view the treatment of mental illness, it is not surprising that psychotherapy is on the decline.

The myth of the biological *v.* psychosocial treatment distinction

We argue that the biological/psychosocial distinction separating pharmacotherapy and psychotherapy is a myth. If one takes the brain disease model of mental illness to its logical conclusion, this myth becomes apparent. To understand why, it is necessary to briefly outline the growing consensus in cognitive neuroscience about how the brain works. This emerging consensus is embodied in a new theory of brain function which integrates many findings from neuroscience, psychology and the cognitive sciences into a single framework: the free-energy principle.[6] The starting premise of the free-energy framework is that the environments we inhabit are complex and changing and the brain must constantly adapt to these conditions. This framework concludes that the brain attempts to adapt to its environments by minimising its 'free-energy', where free-energy is the difference between the brain's models of its (subjective and objective) environments, and the actual environmental inputs it receives.[6] Put simply, free-energy is prediction error.[6] Within this framework, *learning* and *top-down processes* (e.g. beliefs, goals, evaluations) are the primary drivers of neural functioning and synaptic plasticity in the brain because they are the key mechanisms for minimising free-energy in real-time, and also at larger time scales (e.g. days to years).[6] Top-down processes can minimise free-energy by changing synaptic activity to optimise the brain's inferences about the causal structure of its environment to explain away (minimise) prediction error. Conversely, learning, by definition, modifies behaviour because it changes how the causal structure of the environment is encoded in the brain through synaptic efficacy (i.e. plasticity). Thus, learning can minimise free-energy through action which changes environmental inputs so that inputs are consistent with predictions. Note the circular causality here, because changing synaptic efficacy necessarily affects top-down processes, and *vice versa*.[6] For these reasons, experience-dependent synaptic plasticity is fundamental to free-energy minimisation, where 'experience-dependent' is understood both as a bottom-up process driven by environmental inputs, and a top-down process driven by the brain's models of its environments.[6]

Crucially, the free-energy framework entails a neurobiological hypothesis about the pathogenesis of mental disorders which is remarkably consistent with CBT theories.[7] In brief, many of the signs and symptoms of mental disorders can be mechanistically explained as emerging when this machinery goes awry, resulting in maladaptive inferences, which, by definition, produce maladaptive learning and behaviour, which further entrenches these inferences.[7] This resonates deeply with CBT, which casts most psychiatric symptoms as stemming from pathological beliefs or inferences (e.g. hallucinations, delusions, ruminations, cognitive distortions, depressogenic schemas) or pathological learned behaviours. Indeed, CBT specifically targets learning and top-down processes in order to finely tune neural functioning in the patient. For example, behavioural modification techniques, such as systematic desensitisation, aim to change learned emotional and behavioural responses to events. Furthermore, when therapists employ Socratic questioning/guided discovery with their patients to help them identify and evaluate their cognitive distortions (e.g. all-or-nothing thinking, catastrophising) or automatic thoughts (e.g. 'I'm so worthless'), therapists aim to restructure the patient's (often entrenched) top-down processes which are structuring and shaping the patient's experience of their self, others and the world – a restructuring that is quintessentially dependent on the plasticity induced by the experience of a therapeutic relationship.

Therefore, the biological/psychosocial treatment divide between pharmacotherapy and psychotherapy is a myth because the target of both therapies is diseased neural functioning. Their difference lies only in their method for delivering therapeutic neurobiological changes. On the one hand, pharmacotherapy uses a *broad modulation* of neurochemistry through a chemical agent which is designed to help facilitate the reorganisation of the brain in a way that frees the patient from pathological neural processes. On the other hand, psychotherapy, particularly CBT, uses a *tailored modulation* of neurochemistry through a patient–therapist relationship which counteracts (e.g. learned emotional or behavioural responses), eliminates (e.g. ruminative thoughts) and/or restructures (e.g. depressogenic schemas) the forces that drive pathological neural processes. Evidence for the thesis that psychotherapy is a biological treatment comes from neuroimaging studies which suggest that, across major psychiatric disorders, psychotherapy normalises and/or reorganises neural functioning, and these neural changes are associated with symptom improvement.[8] Furthermore, psychotherapy and pharmacotherapy affect the brain in both similar and different manners,[8] suggesting that their neural mechanisms of therapeutic action are not wholly overlapping, which may explain why combined therapy is superior to monotherapy.[4] Further support comes from the immense evidence from basic research supporting the free-energy framework's claim that learning and top-down processes are fundamental drivers of neural functioning and synaptic plasticity,[6,9,10] which psychotherapy, particularly CBT, specifically targets to induce therapeutic change. One could argue that these different methods form the basis for the biological *v.* psychosocial treatment divide, but that makes the distinction vacuous. To insist that pharmacotherapy is a 'biological treatment' whereas psychotherapy is a 'psychosocial treatment' based solely on the method of delivery deflates the very meaning of the word 'treatment' because it ignores the common therapeutic target (i.e. what is being *treated*) shared by both therapies.

In conclusion, if, as we have argued, the biological *v.* psychosocial treatment distinction between pharmacotherapy and psychotherapy is a myth, then the ideological belief that the former is more scientifically valid than the latter is likewise a myth. Psychotherapy and pharmacotherapy are both biological treatments, and therefore there is no legitimate ideological justification for why psychotherapies such as CBT are on the decline relative to pharmacotherapy.

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From asylum to psychiatric hospital in West Africa

Dami Ajayi

The Federal Neuropsychiatric Hospital Yaba, located in what has become the centre of Lagos mainland metropolis today, has changed names many times but its description as a facility remains the same, a place for respite for patients with mental illness.

Established 108 years ago, it was first called Yaba Lunatic Asylum. Yaba, then a suburb of the Nigeria's economic powerhouse Lagos, was a fitting location as it was customary of mental asylums to be located in far-to-reach places, just like correctional facilities. Prior to the establishment of asylums in West Africa, mentally ill patients were kept by their families in the custody of native doctors where they were contained and sometimes restrained. In 1888, there was a call for local asylums following the death of Adeola, a mentally ill person, who died after being refused admission at the general hospital. Before this time, 'lunatics' were sent as far as Sierra Leone for detention and treatment.

On 31 October 1907, 14 patients were admitted to an abandoned railway building which became the first male ward of the Yaba Lunatic Asylum. At this time, living conditions were almost subhuman, with crumbling buildings, lack of drugs and poor sanitation, but the patients thrived and despite these adversities lived into their sixties. After a brief stint of expatriate doctors in the mid-fifties, the facility (named Yaba Mental Hospital in 1951) was managed by Abraham Ordia, the first Nigerian psychiatric nurse, who commenced insulin coma therapy as well as phenothiazine injectables. Dr Crispin Curtis Adeniyi Jones, a medical doctor trained in Durham, was the first director of the hospital.

Entrance to the Yaba Hospital, Lagos, with remnants of the first hospital building on this site.

In spite of the exponential growth in the numbers of patients (100 in 1925, 200 in 1944, 448 in 1961), staff numbers were hardly sufficient, with an impossible staff/patient ratio. The lone doctor who manned the asylum was inadvertently overworked for he was also responsible for the lepers' colony nearby. It was not until 1961 that the hospital employed two psychiatrists: Dr A. Boroffka, a German, and Dr A. Marinho, the first Nigerian psychiatrist to work in the hospital. At this time, the hospital consisted of three buildings; two were for males and one for females. One of the male wards also housed criminal patients.

The hospital had a convalescent home in Oshodi, a few miles away, for patients with chronic illness who had no place to go. The expansive hospital compound also contained a football field, a vegetable garden and a poultry farm. Proceeds from the garden and farm were kept in a welfare fund which was used to entertain patients and staff at Christmas when a carol-singing party was organised. In 1967, four new wards and a modern cafeteria were built. One year later, Dr Bertha Johnson, a medical officer employed by the hospital, returned from her postgraduate training in psychiatry. She rose in rank to become the hospital's medical director and it was during her tenure that the hospital was modernised to appreciable standards.

Today, the hospital boasts 535 in-patient beds, a modern kitchen/dining hall complex, an administrative block, an out-patient department, a psychology department, and assumes the status of a fully-fledged psychiatric hospital. Wards have been named after various pioneers who worked in the hospital and there is a social centre opened to members of the general public for relaxation and recreational activities. At the hospital's entrance, there is a relic of what was the first ward of the hospital, a disused railway building, preserved to remind us of how this space transitioned from an asylum to a hospital (see photo).

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