

DEEP BRAIN STIMULATION PERSONAL IDENTITY NEUROENHANCEMENT

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Neuroethics in Context: East meets West 2013

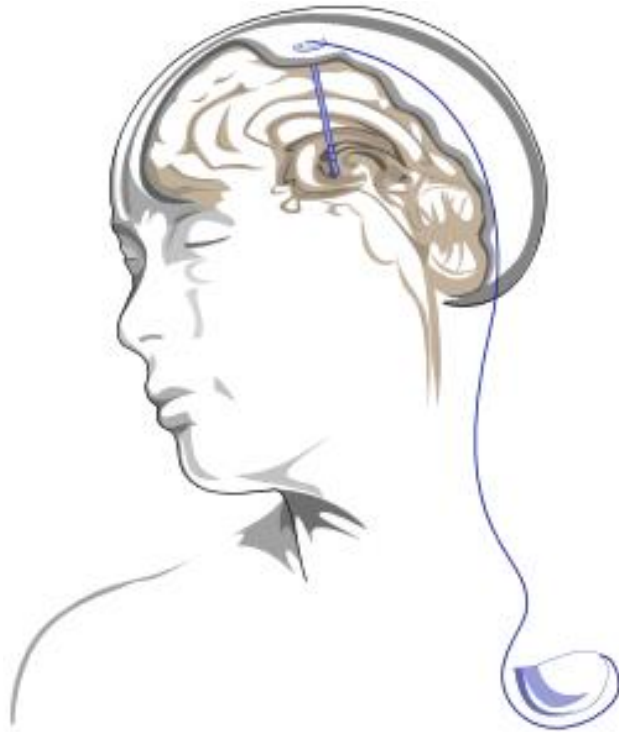
DBS: Brain pacemaker

Deep brain stimulation (DBS) is a surgical procedure used to treat a variety of disabling neurological symptoms—most commonly the debilitating symptoms of Parkinson's disease (PD), such as tremor, rigidity, stiffness, slowed movement, and walking problems. The procedure is also used to treat essential tremor, a common neurological movement disorder. At present, the procedure is used only for patients whose symptoms cannot be adequately controlled with medications.

National Institute of Neurological Disorders and Stroke

http://www.ninds.nih.gov/disorders/deep_brain_stimulation/deep_brain_stimulation.htm

DBS: Brain pacemaker



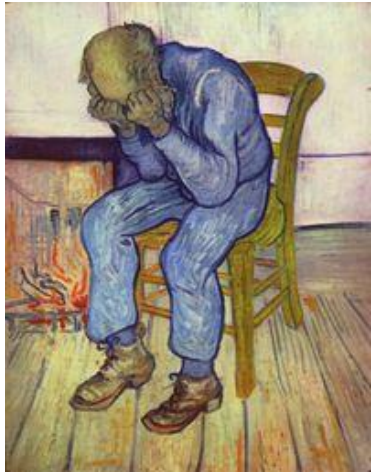
- *The lead* (the electrode)—a thin, insulated wire—is inserted through a small opening in the skull and implanted in the brain. The tip of the electrode is positioned within the targeted brain area.
- *The extension* is an insulated wire that is passed under the skin of the head, neck, and shoulder, connecting the lead to the neurostimulator.
- *The neurostimulator* (the "battery pack") is usually implanted under the skin near the collarbone.

http://www.ninds.nih.gov/disorders/deep_brain_stimulation/deep_brain_stimulation.htm

DBS: Clinical indications

- Recent past (20+ years):
 - Parkinson's disease
 - Essential tremor
- Present (5+ years):
 - Tourette Syndrome
 - Epilepsy
 - Major depressive disorder
 - Treatment-refractory OCD
- Future:
 - Addiction
 - Schizophrenia
 - Alzheimer's disease
 - Morbid obesity

Parkinson's Disease



- Debilitating and progressive disorder in which the chemicals that facilitate electrical transmission between nerve cells are depleted.
- Symptoms usually begin with trembling of the lips and hands, loss of facial expression, and muscular rigidity.
- As it progresses it may bring on body tremors, particularly in muscles at rest. Movements become slow and difficult; walking degrades to a shuffle. After many years physical incapacity may occur.
- Dementia occurs in at least 50% of the patients; depression is also common. Free Dictionary

Depression



- A mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration. These problems can become chronic or recurrent and lead to substantial impairments in an individual's ability to take care of his or her everyday responsibilities.
- Depression is common, affecting about 121 million people worldwide.
- Depression is among the leading causes of disability worldwide.
- At its worst, depression can lead to suicide, a tragic fatality associated with the loss of about 850 000 thousand lives every year.

http://www.who.int/mental_health/management/depression/definition/en/

Obsessive Compulsive Disorder



- OCD affects ca. 2% of the general population.
- Symptoms include intrusive thoughts (obsessions) and repetitive behaviors (compulsions) that persist despite the patient's attempts to eliminate them.
- The obsessions and compulsions are accompanied by marked, overwhelming anxiety
- Patients tend to avoid objects or situations that provoke obsessions or compulsions. Their functioning becomes increasingly limited by avoidance behaviors and they are burdened by shame and demoralization.

Patient experience: positive



- “If stimulation is switched off, I am dead; when on, I am alive.” (Parkinson’s)
- “I never before had such energy, neither motor nor intellectual. I rediscovered the joie de vivre, pleasure, laughter.”(Parkinson’s)
- “All of a sudden your hands that have been shaking like crazy all your life, are just rock steady... It just changes your life dramatically.” (Essential tremor)

Patient experience: positive



"It was literally like a switch being turned on that had been held down for years," she said. "All of a sudden they hit the spot, and I feel so calm and so peaceful. It was overwhelming to be able to process emotion on somebody's face. I'd been numb to that for so long."

Dobbs, D. 2006 A Depression Switch? The New York Times

- "Thanks to these doctors I now have my life back... The pain, fear, anxiety and depression are pretty much completely gone and I am now a very happy, healthy, working, active, fulfilled and grateful individual."

Outcomes Of Deep Brain Stimulation For Depression Sustained For One Year
<http://www.medicalnewstoday.com/articles/115705.php>

Patient experience: negative

- “The ordeal of the operation was so profound that a sense of anticlimax began to hover over me... Back home in the suburbs you're a normal bloke, but you feel like you've been to another planet.”
- Richard is having to write now rather than act, because he's suffering from a side-effect of the operation known as dysarthria or slurred speech. He finds that his speech therapy is like going back to acting classes - think loud and speak slow.

Patient experience: negative

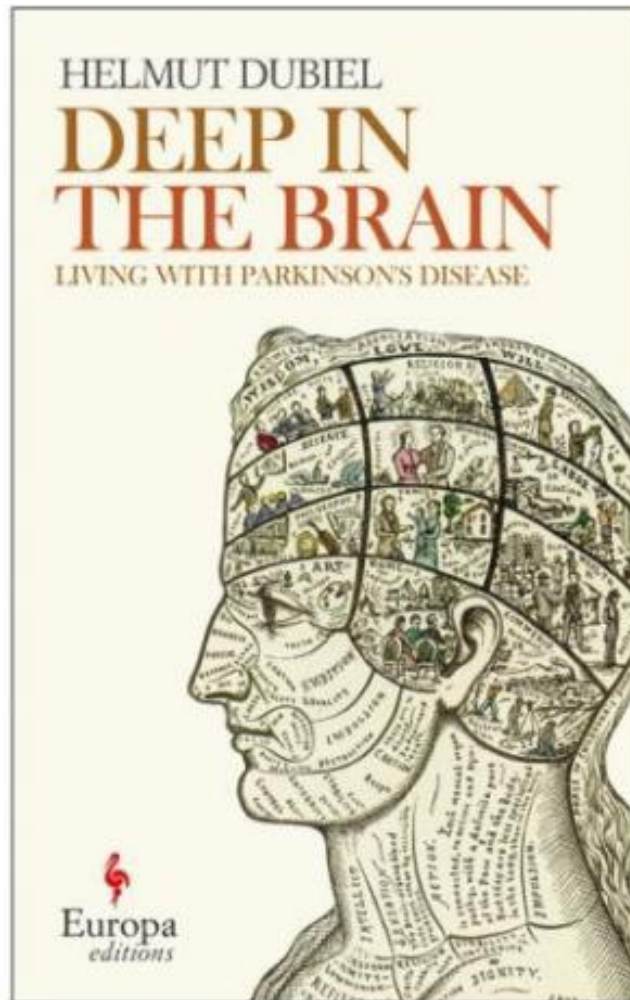
- Patient admitted to psychiatric hospital for a manic state resulting from DBS.
- A mood stabiliser failed to control his symptoms, which included megalomania and chaotic behaviour that resulted in serious financial debts. He became mentally incompetent.
- Adjustment of the stimulator resolved the mania and restored his cognitive capacity for insight and rational judgment. Yet this resulted in a return of his motor symptoms, which were so severe that the patient became bedridden.
- This left the patient and his healthcare providers with a choice between two mutually exclusive options: to admit the patient to a nursing home because of a serious physical disability, despite intact cognitive and affective capacities; or to admit the patient to a chronic psychiatric ward because of a manic state, despite restoration of good motor function.

Changes in personality

- Positive changes that are appreciated: Tremors are gone, depression is alleviated, there is increased motivation, decreased fatigue, anxiety and tension – “successful treatment”
- Negative changes that are unwanted: Speech dysfunction, reduced working memory and processing speed, weight gain, acute depression, pathological crying, mania, decreased mood, apathy, social withdrawal, alienation – “complications”

Personality and personal identity

- DBS may result in profound changes in behaviour, mood and cognition
- Are these changes in personality a threat to personal identity?
 - Depends on the nature of the underlying condition DBS is being used to treat
 - Depends on whether changes in personality were the aim of DBS or an unintended (unforeseeable) side-effect.
 - Depends on the nature of the changes (to which aspect of personality)
 - Depends on how profound the changes are
 - Depends on whether the changes are perceived as treatment or enhancement
 - Depends on your theory of identity



At the time of diagnosis

- I had just been appointed a full professor, while retaining my position as deputy director of a small but prestigious research institute. At the time, my ambition and energy level were ample for two jobs. I was successful. I was publishing books and monographs on a regular basis, and they found readers... I was the crown prince of the institute. (p. 50)
- Once I received the diagnosis, however, a gradual process of alienation arose between the institute and me, which would conclude three years later with a humiliating dismissal. (p. 50)

The year following diagnosis

- I changed radically. It was surely not a transformation caused by verifiable changes in brain physiology, but rather a psychological adjustment to a biorhythm that had become utterly unpredictable due to the illness and medication (p.50)
- I became estranged from many colleagues and friends whom I had known for ages (p. 52)
- By early afternoon my hands already began to shake so severely that even typing on a keyboard became exhausting” (p. 53)

When Parkinson's is full blown

- It robs a person of the ability to continually reinvent himself. It forces him into a cramped cycle of ever-identical activities ... One's life becomes similar to that of a plant: silent, without transcendence and autonomy. (p. 60)
- There is ... just existence in an atrophied form (p. 60)

Medical perspective

- According to the surgeons' criteria, the operation was a full success. My tremor disappeared, as well as the dyskinesias which had tormented me... My movements were fluid and relaxed. My medication intake could be drastically reduced. (p. 84)

Personal perspective

- In my case the operation had merely replaced the plague with cholera. I simply had the impression that during the entire first year the upshot of this major and extremely expensive surgery had been to replace one set of grave symptoms with another.
- Yet I also had to admit that in general my tremor, the torturous dyskenesias, and the “off” conditions were simply gone” (pp.93-94)

The worst side effect of DBS

- My volume is too low, and my articulation is poor, slurred. (p.94)
- My speech is soft and “washed out.” (p. 116)
- By turning off the pacemaker my voice returned, sonorous and clearly enunciated, only slightly hoarse. (p. 118)
- I can't talk while I walk

The worst side effect of PD?

- Now I walk through the streets and count the oncoming pedestrians who look at my asymmetrical shuffling gait with curiosity or alienation (p. 109)

F. Baylis, *The self in-situ* 2011

- A narrative account of personal identity that is thoroughly relational
- Persons are constituted by their personal (intimate) relationships as well as their public (social and political) memberships and interactions.
- A dynamic interpersonal activity based in narrative, that is both fostered and challenged by the world in which we live and the stories that we are able to construct and maintain.

Relational identity

- My identity is neither in my body (*viz.* the somatic or biological account of personal identity) nor in my brain (*viz.* the psychological account of personal identity).
- My identity is in the negotiated spaces between myself (my biology and psychology) and others.

Relational identity

- Dynamic process that emerges over time within networks of relations of mutual recognition and accommodation.
- The desires, beliefs, values, emotions, intentions, memories, actions and experiences that make up a person's self-narrative are shaped by self and others in particular socio-cultural and socio-political contexts.

Relational identity

- There is no authentic “true” self to be protected from profound changes
- There is only a dynamic socially, culturally, and politically constituted self.
- It is only in interaction with others and through their instantiation of, or resistance to, a storied and projected self, that a person can experience either affirmation or disruption.

Relational identity

- The balance between how we see ourselves and how others see us
- Requires minimal uptake of one's preferred or one's performed self-narrative.
- The preferred self-narrative is the story of who the person wants to be
- The performed self-narrative is the story of who the person can be given the ways in which her life is constrained.

Is DBS a threat to identity?

- Personality and personal identity are not the same: “A change in personality, whether gradual or abrupt, subtle or radical, temporary or permanent, does not in and of itself make for a change in personal identity.”
- Both the underlying illness and DBS can lead to radical changes
 - Distort relationships of mutual recognition and accommodation
 - Limit the stories one can create and maintain
 - Shift one’s sense of self and place in the world

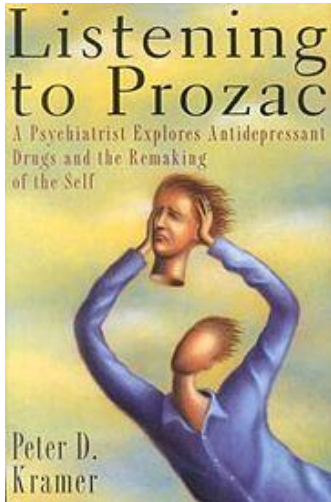
The “I” is everpresent

- 66% report a feeling of strangeness and unfamiliarity with themselves after surgery
 - “I don’t like myself any more”
 - “I haven’t found myself again after the operation”
- 20% report concerns about the mechanism of change
 - “I feel like a robot”
 - “I feel like an electrical doll”

Is DBS a threat to agency?

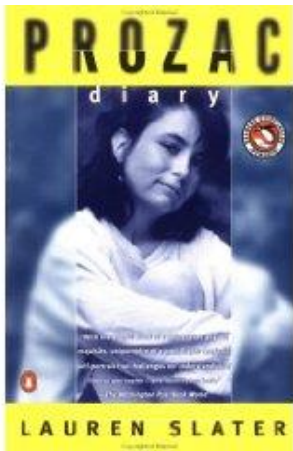
- Important difference between underlying illness and DBS
- What is threatening is the mechanism of change with DBS
 - Artificial stimulation to the brain
 - Slight change in placement of electrode “can change a patient’s feelings in second from laughter to feeling bad” (Debonel)

Listening to Prozac, Peter Kramer



- Tess takes Prozac for depression and her personality radically changes; she becomes more confident and socially at ease.
- When Kramer took her off Prozac, Tess asked him to prescribe the drug again, for, although she is no longer depressed, she said, "I am not myself."
- Carl Elliott -- Prozac is not so much curing mental disorders as changing the patient's sense of self.

Prozac Diary, Lauren Slater



Soon after being relieved of her psychiatric symptoms, Slater recalled going to her bookshelf to select something to read. Most of her books were in "the disciplines of psychology, philosophy, and theology," such as Søren Kierkegaard's *Fear and Trembling* and Victor Frankl's *Man's Search for Meaning*. "But now, well, now I stood by my bookshelves a little lost. They were full of death and anxiety, the spines seeming to exude cold clouds. I had no desire to read Kierkegaard."

Slater became concerned that this drug, which had relieved her of her "disabling obsessive symptoms" had also "tweaked the deeper proclivities of my personality. Who was I? Where was I? Everything seemed less relevant—my sacred menus, my gustatory habits, the narrative that had had so much meaning for me. Diminished."

Tod Chambers, Should the Buddha Have Taken Prozac? 2001

Prozac or DBS for neuroenhancement?

- The Prozac revolution showed everyone that tweaking neurochemistry can dampen and sometimes extinguish depression – but only through a generalized approach, hitting the entire brain. (“Carpet-bombing,” one neuroscientist calls it.)
- The network approach [which incorporates neurochemistry into the concept of the brain as a circuit board or wiring diagram], on the other hand, focuses on specific nodes, pathways and gateways that might be approached with various treatment – electrical, surgical or pharmacological.