We should practice criticism “... as a historical investigation into the events that have led us to constitute ourselves and to recognize ourselves as subjects of what we are doing, thinking, saying ...”

(Michel Foucault)
Neuron to Neighbourhood....

Translational Research: From Neurons to Neighborhoods

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Thomas R. Insel, director of the National Institute of Mental Health, outlines emerging paradigm shifts in the study, treatment, and perception of mental illnesses in the second President's Lecture on Neuroscience.

Hosted by Boston University Center for Neuroscience on April 28, 2009.
Introduction

What kind of creatures do ‘we’ think we are, us human beings?
How have we come to think of ourselves in this way?
And with what consequences for the way we are ‘governed’ and the way we govern ourselves?
Governing subjects

- Giambattista Vico (1725): “Government must conform to the nature of the men governed”

- Every strategy for governing conduct presupposes something about this ‘nature’
  - Members of a flock to be led
  - Children to be educated
  - Subjects whose character must be trained
  - Social citizens whose security is to be secured
  - Psychological persons whose mental state is to be moulded

- Will C21 be century of Neuro?

- If so with what consequences for how we are governed and how we govern ourselves?
In liberal welfare democracies of twentieth century

Authorities began to take charge of health and illness
- Physical state of population – deterioration, degeneration
- Health of the population - fitness

Mental health of population became problematized

No longer merely division of sanity/madness, marked by walls of asylum

Management of mental health in range of practices
- Child guidance clinics, Mental hygiene, Social work, Psychotherapies....

Psy disciplines take shape within this new network of practices for management and maintenance of mental health

Disciplines of mental health
The Psy Complex in C20

- Selves inhabited by deep interior psychological space
  - Psy locus of personhood, personality, beliefs, affects...

- Psy space charted out by the disciplines
  - Intelligence, personality, trauma, repression, unconscious...

- Psy was generous discipline
  - gave itself away to others on condition that they speak and judge like little psychologists.

- Psy experts as technicians of subjectivity
  - Authority legitimate because based on objective knowledge.
  - Managing subjectivity, first in the name of the norm
  - Then in the name of the autonomous, authentic self, realizing potential in society
Neurochemical Selves in the late C20: marketing hope


Xanax (alprazolam)
_American Journal of Psychiatry_, 1993

Adderal (d and l amphetamine)
_American Journal of Psychiatry_, 1997

Prozac (fluoxetine)
_American Journal of Psychiatry_, 1995
Neuro – a new figure of the human?
The birth of neuroscience (1962)

“There is urgency in effectuating [a] quantum step in an understanding of the mind; not only as an academic exercise of scientific research; not only to understand and alleviate mental disease, the most crippling and statistically significant of all diseases; not only to create an entirely new type of science through vastly improved intercommunication between minds and hence to survive this present world crisis and advance to a new quantum jump ... in human evolution; but perhaps through an understanding of the mind to learn more about the nature of our own being”

Francis O. Schmitt, speaking at the first anniversary of the Neuroscience Research Program in February 1963
“The half-century’s accumulation of knowledge of brain function has brought us face to face with the question of what it means to be human. We make no pretension that solutions are at hand, but assert that what makes man human is his brain…. Things mental, indeed minds, are emergent properties of brains.”

C21: From knowing the brain to governing (through) the brain?

- **Neuropsychiatry**
  - Beyond psychopharmacology – integration of neurobiology into clinical practice of psychiatry.

- **Social neuroscience**
  - Will uncover the neurobiological basis of sociality, bonding, maternality, affiliation, trust, empathy, love … and make actionable

- **Neuropolicy**
  - Knowledge of brain will enable us to avert, predict, prevent psychopathology and problematic conduct, optimize human capacities

- **Neurolaw**
  - Neuroscientific discoveries will transform legal system, witness interrogation, deception detection, responsibility, reform and prevention.

- **Neuroeconomics**
  - Neurobiology will uncover bases of economic behaviour and decision making

- **Neuromarketing**
  - Neurobiology will reveal why individuals choose certain brands

- **Neuropolitics**
  - Neurobiology will reveal the neural roots of our political attitudes and affiliations

- **Neuroeducation**
  - Educational practices will become based on knowledge of the brain.

- **Military and security apparatus….**
Biopolitics

‘Life itself’ (not just how it is lived) has entered politics

- Political contestations about the management of our very vitality as human living human beings, and the forms it could or should take.

- A field of transactions between each and all, Between the one and the many
Biopower and Biopolitics

- The ways in which ‘vitality’ of human beings as living creatures, individually and collectively enters political calculation and contestation

- Three elements for an analysis
  - **Truth** – knowledge of life, in particular generated by biology, biomedicine and neuroscience
  - **Power** – authorities of life and vitality, who articulate the truths and advise us how to live
  - **Subjectivity** – reshaping ideas of who we are as human beings, personhood, identity, belonging, and our vital similarities and differences from others

- **Neuropolitics**
  - a particular configuration of truth, power and subjectivity
  - The brain itself becomes a target, a means, an opportunity for the government of each and of all.
  - Governing through and in the name of the brain
The (bio)politics of health

- **C20:** growth of apparatus for regulating individual and collective life in the name of health
  - (First) the prevention of illness
  - (Second) the production of health
  - (Third) the maximisation of well being

- **Medical authorities, medical gaze and medical ethic spreads through society**
  - By 1950s in Europe, maintenance of healthy ‘body politic’ as an obligation of State, of expertise, and of each individual: a ‘somatocracy’ (MF)
  - Management of life itself in the name of health: not just corporeality, but also subjectivity
  - Health as a subjective desire and an obligation of citizenship
  - Economisation of health – the macroeconomic and microeconomic consequences of (ill)health

- **C21:** Beyond state – multiple networks of corporeal and cerebral pedagogy
  - From economisation to capitalisation of health – new links of health and wealth.
  - Beyond health and illness - from normalisation to modulation?
  - Dispersed networks for continuous monitoring and modulation of human bodily and mental capacities.
Governing vitality today

- The Politics of Life Itself
  - Molecularization
    - Engineering life at the molecular scale
  - Optimization
    - Maximising the potential of life
  - Subjectification
    - Becoming somatic individuals
  - Expertise
    - Biomedical experts managing life itself
  - Bioeconomics
    - Rise of bioeconomy, intense capitalisation of biology, biomedicine and biotechnology
    - New entanglements of health and wealth
    - Translational imperative in a promissory culture
Molecular Biopolitics

Molar to Molecular
The neuromolecular gaze
The plastic brain
Imag(in)ing the mind
1. A neuromolecular gaze

- Brain construed as an organ like any other organ
  - Anatomised into neurons, synapses, receptor sites, ion channels, etc. explained in terms of specific properties.

- ‘Normal’ variations in perception, cognition and emotion envisaged at this level
  - Blurs boundaries between states and traits, between psychology, psychiatry and neurology.

- Mental disorders and pathologies as anomalies within those molecular systems
  - Blurs boundaries of organic vs. functional disorders.

- Manipulations of brain operate at this level
  - From molar (chemical cosh) to molecular (smart drug)

- Neuroreductionism
  - “one cell at a time” in simple animals
  - But how to get from cell to system?
  - How to get from simple to complex…
2. A visible mind

• Imaging structure and “function”
• New engines of visualization of living brain as it thinks, feels, desires…
  • responses to art and work of specific painters
  • to music and to specific composers or performers,
  • religious beliefs
  • grief, envy, love, hate, fear and other emotions
  • volition and acts of will ….

• Simulating mind in the brain
  • Gaze of the neuroscientist seems to walk among the mind itself
  • Inferring mental states from neuroimaging data
  • Despite multiple technical, epistemological questions!

• Who can doubt physical basis of mind?
3. A plastic brain

- Brain changes by experience – of course!
- But in 1970s, researchers showed that brain could ‘rewire’ itself after injury in both animals and humans given proper stimulation
- In 1990s, researchers established reality of ‘epigenetics’
- In 1990s researchers discovered ‘adult neurogenesis’
- Brain now an open, dynamic system
  - Changed by, and changeable by, milieu
  - Experience gets under the skin…
- The premise of plasticity underpins new sociality of the brain and strategies for intervention via the brain
Translational Technologies

- A molecular brain
  - that can be engineered
- A plastic brain
  - that can be modulated
- A physical visible basis for mind in brain
  - that can be manipulated
- Neuro can become technological
- Knowing and Intervening
  - Each technology of investigation also the basis of technologies of intervention and for shaping or reshaping human conduct
- New ‘engineers of the human soul’?
Biopolitics today: The Shadow of the Future

governing the future in the face of both fear and hope
- maximising mental capital
- precaution, pre-emption, preclusion
- optimizing the brain
“Mental Capital, “encompasses both cognitive and emotional resources. It includes people’s cognitive ability; their flexibility and efficiency at learning; and their ‘emotional intelligence’, or social skills and resilience in the face of stress. The term therefore captures a key dimension of the elements that establish how well an individual is able to contribute to society and to experience a high quality of life … how a nation develops and uses its mental capital not only has a significant effect on economic competitiveness and prosperity, it is also important for mental health and well-being and social cohesion and inclusion”.

Mental Capital: Governing the future
Governing the name of mental capital
Susceptibility

- Susceptibility as a form of life
- Genomics – from genetic fatalism to genomic susceptibilities
- Brain imaging – susceptibility and resilience written in the living, developing brain
- Premonitory knowledges and practices
  - From epidemiological to individualized (e.g. genetic testing, screening)
  - Bringing future(s) into present and making calculable
  - Hence obligation to act in the present in relation to potential futures
- Resilience – the other face of susceptibility
The economic burden of the pathological brain

The economic burden of the pathological brain

By the year 2020, if current trends for demographic and epidemiological transition continue, the burden of depression will increase to 5.7% of the total burden of disease, becoming the second leading cause of DALYs (disability adjusted life years) lost. Worldwide it will be second only to ischemic heart disease for DALYs lost for both sexes. In the developed regions, depression will then be the highest ranking cause of burden of disease.

Economic cost of severe antisocial behaviour in children – and who pays it

RENEE ROMEO, MARTIN KNAPP and STEPHEN SCOTT

Conclusions The annual cost of severe antisocial behaviour in childhood in the UK is substantial and widespread, involving several agencies, but the burden falls most heavily on the family. Wider uptake of evidence-based interventions is likely to lead to considerable economic benefits in the short term, and probably even more in the long term.

Early intervention approaches to mental health services can save the UK up to £40 million per year

• Early Intervention in Psychosis (EIP) services in mental health are able to save up to £40 million a year
• This ‘invest to save’ approach can begin to release savings even within the first year of service provision
• Cost savings can be quantified within the health sector as well as across wider society
• New research demonstrates the significant social and economic benefits of the EIP model in reducing unemployment and suicide

Schizophrenia, Bipolar, ADHD, Autism… as developmental disorders?
Screen and Intervene - early

The Economic Promise of Biomarkers

2nd Annual Biomarkers Conference: Discovery, development, validation and advancement in biomarkers, London, March 2009

The biomarker market is worth £5.5bn in 2009 and is forecast to grow at a CAGR of 17.5% to £14bn in 2014. - Business Insight, 2008. The development and application of biomarkers have become an increasingly important topic for the pharmaceutical companies.

Biomarkers are not only used in the early development stages in the biotech, but also play a significant role after the drug is approved in the market.

Our 2nd Annual Biomarkers Conference will provide an ideal platform for the attendees to gain an overview of the biomarkers. The conference will enable you to identify and overcome the challenges in the specific therapeutic area and understand the role of development and research in the field of biomarkers.

Reasons for attending the Conference:
- Share and discuss the growth trends in the biomarkers
- Gain insight into the limitations and applications of the role of biomarkers in drug development and clinical use
- Identify the challenges in the specific therapeutic areas
- Examine the biomarker setup, management and analysis
- Understand the recent advancement in drug modulators at biomarkers
- Learn about the effective biomarker setup and analysis
- Gain an insight into the commercial aspects in biomarkers
- Discuss the latest biomarker area developments and methods of clinical validation

Figure 1: Rising interest in biomarkers and psychiatry. In the past decade, psychiatric researchers, doctors and policymakers have become increasingly interested in finding objective biomarkers that will provide a more accurate and precise means of assessing actual and potential psychiatric conditions. This increased attention to biomarkers is reflected by the rise in the number of scientific articles on this topic. Data were obtained from a search of the ISI Web of Knowledge in May 2009 for articles with the term 'biomarker' and the word stem 'psy' in the topic field. No articles were indexed by ISI for the years 1986, 1987 and 2002. It should be noted that some early articles may have focused on non-psychiatric conditions and only tangentially addressed the psychiatric aspects. (Courtesy of J. Abi Rached, The London School of Economics and Political Science, UK.)
A new ‘cycle of deprivation’ – via the brain?

The role of early experience in shaping behavioral and brain development and its implications for social policy

GERALDINE DAWSON, SHARON B. ASHMAN, AND LESLIE J. CARVER
University of Washington

Sensitive Periods in Brain Development – Implications for Education Policy

Michael SC Thomas and Victoria CP Knowland
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Abstract
Functional plasticity is the ability to change behavior based on experience. Structural changes in the brain occurring with increasing age are sometimes associated with a reduction in functional plasticity, leading to the idea of sensitive periods in development. In this article we assess the implications of recent findings on sensitive periods in brain development for educational policy. We address three points. Can the educational curriculum be optimised by teaching particular subjects at a peak of maximum plasticity for the brain systems involved? Do some skills need to be acquired earlier so that acquisition is optimised only after children reach a certain age? How should educational practice be adjusted to optimise learning for individuals who have passed the age of maximum plasticity?

Keywords
brain plasticity, cognitive development, education, sensitive periods
Screen and Intervene - late

THE LANCET Neurology

Biomarkers for cognitive impairment and dementia in elderly people

Joshua A. Screen MD a, Kathleen S. Mantle MD a, Joseph F. Quinn MD a, Jeffrey A. Kave MD b, John CS Brettler MD c, Thomas J. Mantle md a and a BMJ

Summary

The threat of a looming pandemic of dementia in elderly people highlights the compelling need for the development and validation of biomarkers that can be used to identify pre-clinical and prodromal stages of disease in addition to fully symptomatic dementia. Although predictive risk factors and cerebrospinal fluid measures are important in these efforts, this review describes recent progress in the discovery, validation, and standardisation of molecular biomarkers—small molecules and micro- and large RNAs, and proteins—suggesting the potential for reliable, cost-effective, and readily implementable approaches to identify Alzheimer's disease and its prodrome.

Treatment for MCI: Is the evidence sufficient?

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Editors

Treatment for MCI: Is the evidence sufficient?

Paul S. Aisen, MD

Self-Administered Screening for Mild Cognitive Impairment: Initial Validation of a Computerized Test Battery

Jane B. Tomlinson, Ph.D.
Enory Hill, Ph.D.
Jo Anne Laboff, M.S.W.
Mary E. McGann, M.P.H., M.S.W.

Screen's Test Battery meets high statistical standards and is extremely valuable in both pre-diagnostic and post-diagnostic procedures.

SCREENS TEST BATTERY

The CAMS-MCI
Screen's test battery is named the "Computer Administered Neuropsychological Screen for Mild Cognitive Impairments"—or CAMS-MCI for short.
Build resilience via the brain

Science News

New Brain Nerve Cells Key to Stress Resilience

*ScienceDaily (Apr. 1, 2010) —* UT Southwestern Medical Center researchers have found new clues that might help explain why some people are more susceptible to stress than others.

In a study of mice, the researchers...
Neurotechnologies

- Psychopharmaceuticals
  - Yes, but …

- Cognitive and behavioural therapies
  - Train individuals to recognise and modulate their own pathologies

- Intensive behavioural intervention on parents and children
  - Those incredible years

- Build resilience
  - By parenting
Personhood

An ontological change?

A new figure of the human?
A mutation in personhood?

- Historical Ontology?
  - What kinds of persons do we take ourselves to be
  - Or others take us to be
    - authorities who seek to shape and mould our conduct
  - How have we come to think of ourselves in these ways?
  - And with what consequences?

- Person = Brain?
  - Cerebral subject (Ehrenberg)
  - Brainhood (Vidal)
  - Neuroreductionism (Martin)

- No – persons with brains, not persons AS brains!
A neural mutation in somatic ethics

- **A somatic ethic**
  - Somatic individuality

- **Kant’s questions:**
  - what can I know? What must I do? What may I hope?

- **Now posed in ‘somatic’ terms:**
  - ‘Soma’ – our ‘biology’ - given salience
  - Somatic experts articulate rules for living
  - We understand ourselves partly in ‘biological’ terms
  - Expectations, hopes shaped in terms of maintenance of health and prolongation of earthly existence.

- **Salience of ‘brain’**
  - Not so much ‘brainhood’ etc
  - But this somatic ethic, now extended to brain
  - Hence ethic of health gives special salience to neurobiomedicine, and practice of working on brain in name of health.
  - Neurobiological prudence
Governing myself through my brain

- Brain becomes a rich source of narratives/techniques for self-making
  - Becoming familiar with one’s brain
  - Drugs, DBS, neurofeedback etc
  - Managers of our own neural states

- Brain as flexible, malleable...
  - Neurosociality – the neural, the psychological and the social

- Technologies of neurobiological self
  - Taking care of one’s brain
  - for the good of each (brain gyms)
  - And of all (burden of brain disorders)
  - Managing one’s own neuro-subjectivity
  - A responsible person with a brain
Conclusion
A Neurobiological Complex?

**complex, n.**

a. A whole comprehending in its compass a number of parts, esp. (in later use) of interconnected parts or involved particulars; a complex or complicated whole.

†2. An interweaving, contexture. *Obs.*

3. *Psychol.* A group of emotionally charged ideas or mental factors, unconsciously associated by the individual with a particular subject, arising from repressed instincts, fears, or desires and often resulting in mental abnormality; freq. with defining word prefixed, as *inferiority, Œdipus complex*, etc.; hence *colloq.*, in vague use, a fixed mental tendency or obsession.

*Oxford English Dictionary Online*
Governing through the brain?

- **Neuropsychiatry**
  - Failure to transform psychiatry into neuropsychiatry – it’s not ‘all in the brain’

- **Neurolaw**
  - Neuroscientific discoveries over ‘free will’ not having impact in CJS, but in programmes of reform and prevention.

- **Neuroeconomics**
  - Neurobiology reframing notions of economic rationality, but whoever thought economic decision making was rational!

- **Social neuroscience**
  - Humans evolved to be social – but sociality recast as dyadic relations between individuals made possible by evolved neural capacities for empathy, theory of mind, mirror neurons etc.

- **Neuroeducation**
  - Educational practices must be based on knowledge of the brain but its not clear what impact this is having.

- **Neuropolicy**
  - Rise of policies of ‘screen and intervene’, governing the child through the family, optimisation via nudge and steer, a familiar mode of governing

- **Military and security apparatus ………..**
Remaking the human?

- **Neuroscience**
  - Not a ‘revolution’ in what it is to be human – humans remain persons with minds, intentions, mental states etc.
  - But those now premised on new forms of knowledge
  - And emergence of new forms of expertise
  - But new possibilities in understanding and governing ourselves

- **Governing through the brain (and in the name of the brain)**
  - Not biological reductionism but multiple biological possibilities
  - A ‘political economy of hope’ (Novas)
  - Not a matter of ‘normalisation’, therapy or ‘enhancement’
  - But calculated modulation of capacities in the name of sociality

- **A neurobiological complex**
  - A difference that makes a difference?
Thank you for your attention!

Gracias por su atención!