TRANSFORMING BEHAVIOUR CHANGE:
BEYOND NUDGE AND NEUROMANIA[1]

Jonathan Rowson
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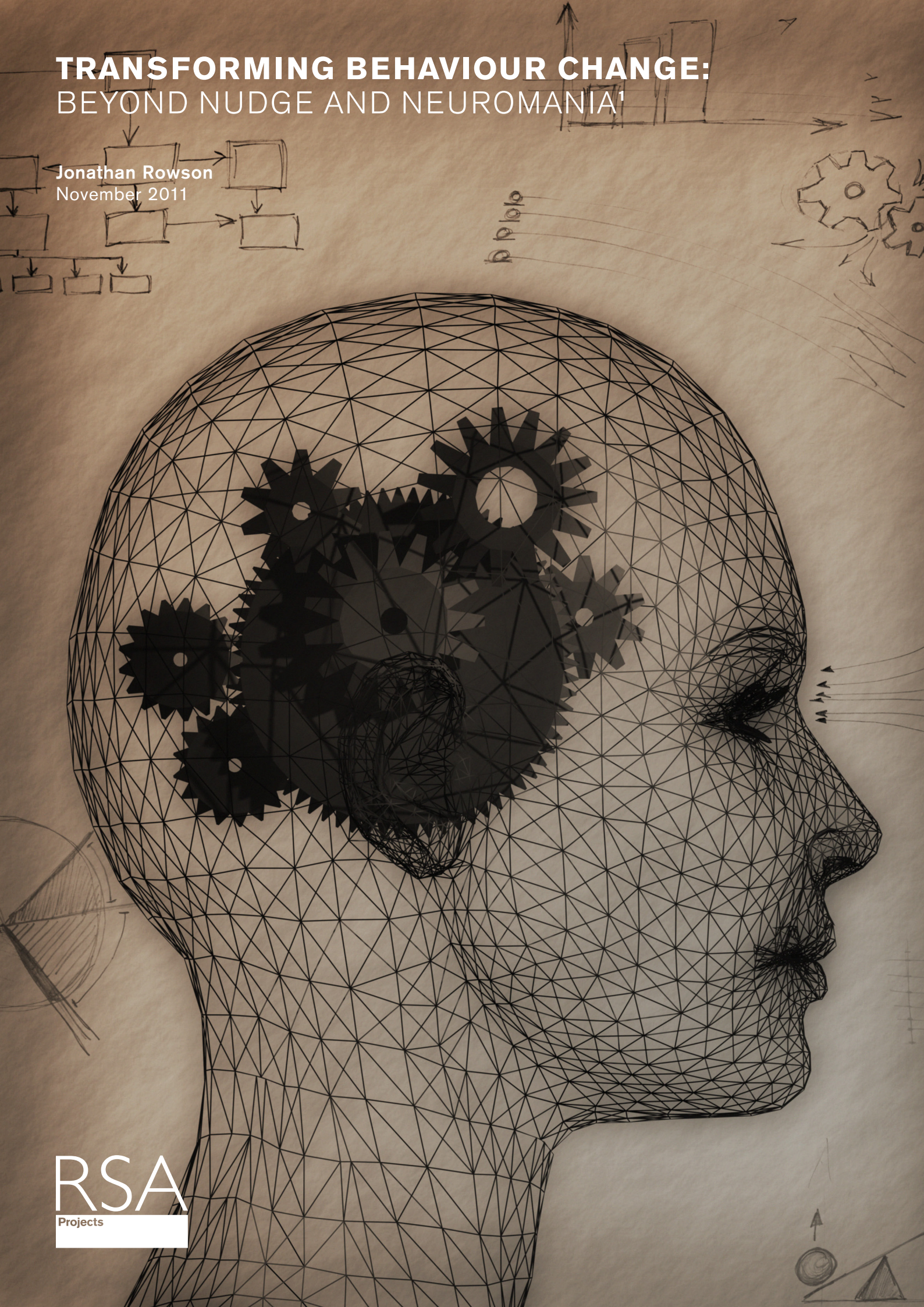

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1 This report is an extended version of a keynote talk presented at 'Neurosociety: What is it with the Brain these Days?' Säid Business School, University of Oxford, 7 December 2010, [Online], Available: http://www.sbs.ox.ac.uk/centres/insis/neurosociety/Documents/Rowson.pdf

ABOUT THE RSA

The RSA has been a source of ideas, innovation and civic enterprise for over 250 years. In the light of new challenges and opportunities for the human race our purpose is to encourage the development of a principled, prosperous society by identifying and releasing human potential. This is reflected in the organisation's recent commitment to the pursuit of what it calls 21st century enlightenment.

Through lectures, events, pamphlets and commissions, the RSA provides a flow of rich ideas and inspiration for what might be realised in a more enlightened world; essential to progress but insufficient without action. RSA Projects aim to bridge this gap between thinking and action. We put our ideas to work for the common good. By researching, designing and testing new ways of living, we hope to foster a more inventive, resourceful and fulfilled society. Through our Fellowship of 27,000 people the RSA aims to be a source of capacity, commitment and innovation in communities from the global to the local.

ABOUT THE SOCIAL BRAIN PROJECT

The notion of a rational individual who makes decisions consciously, consistently and independently is, at best, a very partial account of who we are. Science is now telling us what most of us intuitively sense — humans are a fundamentally social species. Science cannot, however, tell us what to do with this knowledge, and it is up to us to shape our lives accordingly.

Since its inception in early 2009, the Social Brain project has sought to make theories of human nature more accurate through research, more explicit through public dissemination, and more empowering through practical engagement. We are now building on this work with a new initiative linking theory and practice, provisionally called the RSA Social Brain Centre, which seeks to support personal development and wellbeing, inform social and educational practice and improve financial and environmental behaviour.

ABOUT THE AUTHOR

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CONTENTS

EXECUTIVE SUMMARY:

- This report seeks to temper and deepen the public discussion about the increasingly important relationship between Neuroscience, behaviour and society. By critically engaging with developments in self-knowledge we introduce a learning process that is acutely relevant to modern social challenges.

- Developing a sophisticated understanding of the relationship between our social challenges, our behaviours and our brains requires an intelligent response to two major cultural developments. The first is the growing ascendancy of neuroscientific interpretations of human behaviour, leading to fears of reductionism and pharmaceutical control. The second is behaviour change becoming an explicit goal of government policy, leading to fears of Government manipulation and coercion.

- The RSA critically engages with these two developments by introducing an alternative approach to behaviour change that is grounded in public and professional interest in brains and behaviour. We seek to move the debate away from the threatening idea of 'science as authority', justifying moral judgements, medical interventions and policy positions, towards the more productive notion of 'science as provocation', helping people foster the kinds of self-awareness and behaviour change they are seeking to develop.

- The best way to allay concerns about reductionism is not to ignore the brain, but to understand it better. Our brains should be understood as extended and relational nervous systems, always functioning within social systems and utilising cultural tools.

- When viewed from this perspective, neuroscientific evidence looks like an important card in the explanatory deck for human behaviour, but it is not a trump card, and should not be played as such. Instead, insight into our brains begins to play an important role in corroborating other forms of knowledge through inductive reasoning about human behaviour, rather than being used to support the reductive and deterministic arguments that are rightly resisted.

- In this context, we examine what it means to be living in an age characterised by 'neurological reflexivity', in which enlightened self-awareness includes a capacity to shape the social and biological conditions that underpin our action.

- The growing popular resonance of 'the brain' makes it not merely functionally social but also potentially *socialising* i.e. a cultural reference point through which we can collectively reflect on the importance of our relationships and how we communicate, as indicated by RSA exploratory research with the general public, police officers and taxi drivers.

- This sort of reflexive process, in which our awareness of the social and biological conditions of our action influences how we act, is particularly timely and needful for developing the mental complexity and core competencies recommended by the Organisation for Economic Cooperation and Development (OECD) as necessary for successful lives in well-functioning societies.

- Becoming more reflexive about our social and biological constraints, and cognitive frailties more generally, is the kind of transformative learning that we want to engender as widely as possible, as part of the RSA vision of 21st century enlightenment.

- We believe the impact of this learning is most tangible through how we shape our habits, take decisions and regulate our patterns of attention.

- Taken together, these insights have helped to inform the conceptual basis of the RSA Social Brain Centre, introduced here, to be launched in 2012.

INTRODUCTION

> *With a rising interest in Neuroscience, we have an opportunity, which we must not squander, to sophisticate our understanding of ourselves.* — **Iain McGilchrist**[2]

This report examines how we might best help people help themselves and each other to make good use of the emerging science of human nature. The discussion builds on work of the RSA Social Brain project over the last two years to unpack the theoretical basis, social need and practical value of the RSA Social Brain Centre, to be launched in 2012.[3]

This practical initiative responds to two major trends relating to brains and behaviour. First, the proliferation of knowledge about the brain in particular has raised legitimate concerns over how this knowledge might be brought to bear on social issues, ranging from the over-reliance on pharmaceutical products for mental health to pseudoscientific educational practices.[4] Secondly, the popularity of 'Nudge' and the explosion of interest in Behavioural Economics has turned behaviour change into an explicit goal of public policy.[5] In the UK, this has led to the creation of a Behavioural Insight Team in the Cabinet Office, leading to fears amongst some of Government manipulation and control.[6]

Both trends create challenges for the public understanding of science, and raise questions about the relationship between science and society more generally. Some believe that the scientific insight into our natures may help us to shape our behaviours and cultures for the better, as suggested by the enormous and largely positive media attention given to *The Social Animal* by David Brooks.[7] However, there is also an underlying fear that if left unchecked, science will become *scientism*, where instead of helping to inform public discussion, the objectifying instrumentality of 'science' will be used to suppress public dissent.

Many of the 'new' insights into human nature that are currently in vogue are not actually new. What is new and significant is their intellectual provenance. Aristotle understood that we are creatures of habit, while Hume grasped long ago that reason was infused with emotion, and that there appeared to be no discrete source of agency in our psyches.[8]

Such ideas are entertained when they are uttered by philosophers, but they carry much greater epistemic warrant and rhetorical force when they arise from findings in social and behavioural sciences, and even more so from 'evidence' in natural sciences. Neuroscience[9] and evolutionary psychology, for example, can be misused to justify policies and practices that are really old political value judgments with a new cloak of legitimacy.[10] Raymond Tallis is a leading sceptic in this regard, describing the misplaced cultural reverence for Neuroscience as 'Neuromania', and the desire to explain human behaviour in evolutionary terms as 'Darwinitis'.[11]

And yet we do seem to be going through an important cultural learning process. As the opening quotation of McGilchrist suggests, it is not merely the rise of Neuroscience but the rising interest in it that we need to harness. Since the profileration of scientific knowledge on human nature shows no sign of abating, the aim is to move the debate away from the threatening idea of 'science as authority', justifying moral judgements, medical interventions and policy positions, towards the more productive notion of 'science as provocation' — helping to foster the kinds of reflexive behaviour change promoted by our new centre, helping us address the collective challenges we face.

2 McGilchrist, I. (2009). *The Master and His Emissary: The Divided Brain and the Making of the Western World.* New Haven: Yale University Press.

3 'Social Brain Centre' is a working title that may change before the launch. Further details on this centre are presented in section five.

4 See, for example, *Brain Waves Module 1: Neuroscience, Society and Policy.* The Royal Society, January 2011*; Brain Waves Module 2: Neuroscience: Implications for Education and Lifelong Learning.* The Royal Society, February 2011. The LSE Bios Centre have also critically engaged with this issue. See http://www2.lse.ac.uk/BIOS/publications/Working%20Papers/Brain_SelfandSociety_WP.aspx

5 Dolan, P, Hallsworth, M, Halpern, D, King, D, & Vlaev, I. (March 2010*). MINDSPACE: Influencing Behaviour Through Public Policy.* London: Institute for Government.

6 See, for example, Curtis, A. (2010, 16 November). *From Pigeon to Superman and Back Again,* [Online], Available: http://www.bbc.co.uk/blogs/adamcurtis/2010/11/post_1.htm/

7 Brooks, D. (2011). *The Social Animal: A Story of How Success Happens.* New York: Random House; Brooks, D. (RSA Events, 19 May 2011). *The Social Animal,* [Online], Available: http://www.thersa.org/events/audio-and-past-events/2011/the-social-animal

8 Phillipson, N, & Millican, P. (RSA Events, 12 May 2011). *Hume at 300,* [Online], Available: http://www.thersa.org/events/audio-and-past-events/2011/hume-at-300

9 There is no such single 'thing' as Neuroscience, but is has become common practice to use this generic term to refer to brain science as a whole. See http://en.wikipedia.org/wiki/Neuroscience for details of the constituent disciplines.

10 See, for example, Alexander Linklater's response (Letters, Issue 164, September 2009) to Matthew Taylor's article, Left Brain, Right Brain (Issue 163, October 2009) in *Prospect* magazine.

11 Tallis, R. (2011). *Aping Mankind: Neuromania, Darwinitis and the Misrepresentation of Humanity.* Durham: Acumen Publishing. See also Taylor, M. and Tallis, R. (RSA Events, 5 July 2011). *Neuromania: The Possibilities and Pitfalls of our Fascination with Brains,* [Online], Available: http://www.thersa.org/events/video/vision-videos/neuromania-the-possibilities-and-pitfalls-of-our-fascination-with-brains

Neuroscience is a new card in the explanatory deck for human behaviour, and a powerful one, but it is not a trump card, and should not be played as such.

WHAT THIS REPORT IS *NOT* SAYING

The report seeks to promote new forms of debate on the relationship between brains, behaviour and society, so it is worth beginning by pre-emptively addressing five of the most pervasive misunderstandings that often hold back the discussion. First, *we are not offering a panacea*. Behavioural insights seek to inform rather than replace other perspectives on the world. To say that the science of human nature is relevant to policy and practice does not mean that it will solve all our problems or that it will replace conventional policy instruments like taxation or educational reform. Indeed, this discussion is certainly shaped by the larger forces that it seeks to inform, including global capital, political institutions, social structures, cultural traditions and ecological systems.

Secondly, *we are not seeking to resolve ancient philosophical mysteries*. Our work does touch on fascinating perennial questions on the nature of identity, human agency, and the relationship between mind and body but our principal concern is not to resolve whether or not, for instance, we have free will, or the exact ontological relationship between mind and brain. Thirdly, *we are not reductionists*. An interest in the educative value of Neuroscience does not mean uncritical reverence for it, nor a tacit acceptance for its imperial warrant to subsume insights from other disciplines. Being fascinated by the brain, and mindful that it has evolved, does not mean fully accepting what Raymond Tallis calls 'the materialist orthodoxy'.[12] Neuroscience is a new card in the explanatory deck for human behaviour, and a powerful one, but it is not a trump card, and should not be played as such.

Fourthly, *we are not trying to obscure values with facts*. No matter what we learn and know about human nature, the question of how we should live and what we should care about remains a value judgment and a matter for collective deliberation. Finally, and perhaps most importantly, *we are not trying to control people*. The science of human nature can and is used in this way, but it is not going to go away, and it also has emancipatory potential that needs to be highlighted.

We want to disseminate knowledge about human nature as widely as possible, and in a form that has salience and practical relevance for the people who want to change their own behaviour on their own terms. If knowledge is power, then knowledge about how to change our own behaviour ought to be particularly empowering. We have tried to demonstrate this with the general public seeking to improve decisions and change habits, with police officers working on communication and with taxi drivers seeking to save fuel.[13]

In light of the above, Raymond Tallis rightly argues that we need to guard against 'neuromania' i.e. the complete identification of persons with their brains and the misconceived hope that an improved understanding of the brain will tell us how to live well. It is also important to recognise that natural sciences enjoy greater epistemic warrant than social sciences and humanities, and that this represents an intellectual and cultural hazard. We believe this warrant can be curtailed with the right critical engagement, which is what we hope to offer here, but first we need to pre-emptively guard against pervasive misunderstandings.

THE COMICAL PROMISCUITY OF THE 'NEURO' PREFIX

A growing body of work outside of natural science features 'neuro' as a prefix, including neuro-theology, neuro-aesthetics, neuro-ethics and neuro-economics.

This kind of development was predicted by Harvard Sociobiologist E.O Wilson as part of a positive process of unification between sciences and humanities that he called 'consilience'. Yet for many, the somewhat comical spread of the neuro-prefix suggests a creeping biological reductionism.[14]

Exactly what 'neuro' signals is unclear. A consistent finding is that far from diminishing human agency or ignoring social context, Neuroscience is serving to make us more aware of the malleability of our brains and the inherently social nature of actions.

In light of this, does the prefix 'neuro' have to be a signal of reductionism or a status claim about scientific value? Could it instead be used merely to highlight the general relevance and occasional salience of the distinct features of our relational nervous systems?

12 Tallis, R, & Taylor, M. (RSA Events, 5 July 2011) , op. cit.

13 Grist, M. (2010). *STEER: Mastering our Behaviour Through Instinct, Environment and Reason.* London: RSA. Please check http://www.thersa.org/projects/social-brain for the forthcoming publications on the completed research projects with police and taxi drivers: *Adaptive Coppers: Exploring Adaptive Challenges in Policing* (RSA, forthcoming 2011) and *Steering Towards Fuel Efficiency* (RSA, forthcoming 2011). Both are working titles.

14 Wilson, EO. (1998). *Consilience: The Unity of Knowledge.* New York: Knopf 1st Edition.

It is not strictly the brain that 'thinks', 'feels', 'decides', but the person.

NEUROPHOBIA: THREE REASONS TO BEWARE OF BRAIN-BASED EXPLANATIONS.

I now see my reluctance to apply the term Alzheimer's to my father as a way of protecting the specificity of Earl Franzen from the generality of a named condition. Conditions have symptoms; symptoms point to the organic basis of everything we are. They point to the brain as meat. And, where I ought to recognise that, yes, the brain is meat, I seem instead to maintain a blind spot across which I then interpolate stories that emphasize the more soul-like aspects of the self.
— Jonathan Franzen[15]

Knowledge created by the methods of natural science tends to be more reliable than the knowledge created by social science, even if it may not always be relevant or useful for practical purposes. In light of this fact, Raymond Tallis's term 'neuromania' seems to be a form of satire, targeted at those who abuse the epistemic warrant carried by natural sciences, by mis-applying it to social and ethical issues. This misuse of scientific knowledge, made possible by the esteem in which it is held, is the first source of what might be called 'neurophobia'— fear of brains. If Neuroscience is thought to be inherently imperial, seeking to flood the social realm and supplant its major disciplines, then strong defensive reactions are entirely natural. However, Nikolas Rose is one of many who argue against this kind of overreaction, suggesting that the 'threat' from Neuroscience is no greater than the threat from psychoanalysis around a century ago.[16]

A second note of caution is the 'seductive allure of Neuroscience explanations'. This 'allure' was illustrated in a famous study in 2008 which revealed that adding references to the brain or Neuroscience has explanatory power, even when it adds no explanatory content. So if you begin any given explanation with the expression 'brain scans have shown' or 'Neuroscience tells us' people are more likely to believe you, without saying what the scans show or why it matters. Moreover, it was the brain and Neuroscience as such, and not merely psychological or other justifications that made the impact.[17]

A third reason to be careful is 'the mereological fallacy' outlined by Bennett and Hacker which says that we should avoid ascribing to parts, in this case the brain or neurons, that which is really the function of the whole, i.e. the person in context.[18] It is not strictly the brain that 'thinks', 'feels', 'decides', but the person. French social theorist Alain Ehrenberg[19] builds on the pervasiveness of this fallacy by arguing that the relationship between Neuroscience and society is: "Not about the objectification of the self, but the personification of the brain." In other words Neuroscience is often misused to provide a pseudo-objective basis for theories of the self, which in fact often amounts to ascribing personal properties to impersonal neural matter.[20]

NEUROPHILIA: THREE HELPFUL INJUNCTIONS FROM NEUROSCIENCE.

It is important that neurophobia is addressed and contained, because Neuroscience has enormous social relevance, and carries at least three important injunctions.

The first injunction — don't forget about biology — seems relatively modest but is often viewed as controversial. While the social and the biological can be kept apart for descriptive and explanatory purposes, they are part of the same world, and inextricably linked. Moreover, the brain is tangibly part of our body in a way that 'the mind' is not. We may have transcendent experiences, but we are an integral part of nature.[21] Cognitive Scientist Francisco Varela deepens the importance of this point, by arguing that cognition is 'enactively embodied' in that thought emerges literally from our handling of the environment. The implication, according to Varela, is that the mind cannot be separated from the entire organism, and crucially in the context of social brains, the entire organism includes other people:

The primordial or pre-verbal quality of affect makes it inseparable from the presence of others... In order to see why this is so, it is best to focus on the bodily correlates of affect, which appear not merely as external behaviours, but also as directly felt, as part of our lived body. This trait of our lived body plays a decisive role in the manner in which I apprehend the other, not as a thing but as another subjectivity similar to mine as later ego. It is through his/her body that I am linked to the other, first as an organism similar to mine, but also perceived as an embodied presence, site and means of an experiential field. This double dimension of the body (organic/

15 Franzen, J. (2001). My Father's Brain. *The New Yorker,* 10 September 2001, quoted in Lock, M. (2010). Seduced by Plaques and Tangles: Alzheimer's Disease and the Cerebral Subject. In Ortega, F. & Vidal, F. (Eds.), *Neurocultures: Glimpses into an Expanding Universe.* New York: Peter Lang Publishing Inc.

16 Rose, N. *"Who do you think you are?" Governing Persons in a Neurobiological Age*, Keynote at 'Neurosociety: What is it with the Brain These Days?' Saïd Business School, University of Oxford, 7-8 December, 2010. See power point slides of this talk at: http://www.sbs.ox.ac.uk/centres/insis/neurosociety/Documents/Rose.pdf

17 Skolnick Weisberg, D, Keil, FC, Goodstein, J, Rawson, E, & Gray, JR. (2008). The Seductive Allure of Neuroscience Explanations. *Journal of Cognitive Neuroscience, 20 (3), 470–477.*

18 Bennett, M, & Hacker, PMS. (2003). *Philosophical Foundations of Neuroscience.* Oxford: Blackwell Publishing.

19 Speaking at an LSE Seminar on *Personhood in a Neurobiological Age,* 13 September, 2010.

20 There is a deeper philosophical question of whether personal properties are limited to 'the person', and a further quagmire about the relationship between the whole and its parts more generally. For a detailed exploration of these issues, see Wilber, K. (1997). An Integral Theory of Consciousness, *Journal of Consciousness Studies, 4 (1), 71-92,* [Online], Available: http://www.imprint.co.uk/Wilber.htm

21 The question of what exactly is meant by 'transcendent' and how it links to 'nature' is important, but beyond the scope of this paper. We hope to explore this theme in a forthcoming RSA project on *21st Century Spirituality.*

These sorts of neuroscientific insights can both corroborate and challenge our existing understanding.[24]

lived) is part and parcel of empathy, the royal means of access to social conscious life, beyond the simple interaction, as fundamental intersubjectivity. **— Francisco Varela**[22]

A mere acknowledgement of the brain does not automatically create a living awareness of Varela's 'fundamental intersubjectivity'. Nonetheless, a biological perspective on social relations may help us to relate to people as complex living systems influenced by other systems, rather than as disembodied Cartesian 'minds' cut off from the world. Perhaps this perspective gives a firmer empathetic basis to connect with each other through our shared embodiement, with all that this means in terms of susceptibility to pain, hunger, stress, loss, mortality, illness and joy.[23] This point is similar to what Giddens felt was the central insight of Wittgenstein's philosophy, that self-understanding is connected integrally to the understanding of others.[24]

Moreover, we are learning about the brain at an accelerating rate,[25] and can no longer offer a responsible account of behaviour without engaging with this work, for instance through acknowledging biological constraints (e.g. myelinisation in adolescence and diminishing plasticity with age) and opportunities (e.g. ongoing neural plasticity, neurogenesis).[26]

These sorts of neuroscientific insights can both corroborate and challenge our existing understanding. In this sense Neuroscience provides ammunition for inductive arguments (i.e. providing support for claims). For instance, while speaking at the RSA, Paul Howard Jones supported his arguments about children playing computer games with some neural images. The argument was about the role of computer-game playing in cognitive development, and the neural images corroborated evidence for the pleasures of challenges relating to the meanings and structures of the games, particularly the importance of rewards being intermittent rather than continuous.[27] Such an approach is helpful, because it views the brain as an important part of the person in context, and the evidence base, but not as the sole or even primary reference point:

Observable changes at the level of the brain (…) do not imply irreversible outcomes. Instead, they provide a source of evidence that should be considered alongside psychological and behavioural data to address specific questions. When all these sources of evidence 'match up', we can be more sure about the findings and recommendations that they individually and collectively help generate.[28]

This corroborative use of Neuroscience seems valid and promising because we don't do anything without our brains being involved in some way, however trivial or meaningless. However, a view of the person as being *nothing but* his or her neurons leads to less convincing arguments of a deductive (conclusions following from premises) or reductive (understanding complex wholes by reducing them to constituent parts) nature, which are always more contentious. Surely the most compelling explanations of human behaviour should cohere across what is known about social norms and structures (sociology/anthropology/cultural theory) individual agency (psychology/philosophy/linguistics) *and* biology (cognitive and social Neuroscience)?

THE BIRTH OF NEUROSCIENCE
Numbers of papers published annually in the neurosciences 1958-2008

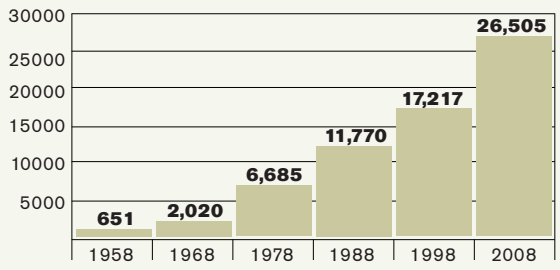

FIG 1: Data from LSE Bios Centre.
http://www2.lse.ac.uk/BIOS/research/brainSelfSociety/publications.aspx

The second major injunction from Neuroscience is that recognising our biological nature means accepting that our brains have *evolved*. Social scientists and policy makers are rightly wary of explanations based on evolution, because they have been misused to justify various nefarious ideologies. For instance, Herbert Spencer coined the term 'the survival of the fittest' based on a misreading of Darwin, and Milton Friedman's classic article on economic methodology states as a natural law that the fittest (most efficient) firms prosper and the unfit ones fall behind.[29] More recently, Raymond Tallis coined the term 'Darwinitis' to refer to the misrepresentation of Darwin.[30]

22 Varela, F. (1999). Steps to a Science of Inter-being. In G. Watson, S. Batchelor & G. Claxton (Eds), *The Psychology of Awakening (pp. 71-89).* New York: S. Weiser.

23 Frith, C. (March 2010). Lecture: *The Social Brain.* University of Lancaster, [Online], Available: http://www.lancs.ac.uk/sci-tech/events/events_archive.php?event_id=440

24 Giddens, A. (1976). *New Rules of Sociological Method.* New York: The Anchor Press.

25 Rose, N. (2010), op. cit.

26 Blakemore, S, & Frith, U. (2005). *The Learning Brain: Lessons for Education.* Oxford: Blackwell Publishing.

27 Howard-Jones, P. (RSA Events, 4 July 2011). *What is the internet doing to our brains?,* [Online], Available: http://www.thersa.org/events/video/vision-videos/dr-paul-howard-jones

28 Howard-Jones, P. (2011). *The Impact of Digital Technologies on Human Wellbeing: Evidence from the Sciences of Mind and Brain (p. 11),* [Online], Available: http://www.nominettrust.org.uk/sites/default/files/SoAInternetandthebrain_0.pdf

29 Friedman, M. (1954). *Essays in Positive Economics.* Chicago: The University of Chicago Press. As described in J. Gowdy, Background 2: The Social Brain and the Diffusion of Pro-Social Behaviour, [Online], Available: http://garrisoninstitute.com/reader/gowdy_papers/John_Gowdy_Social_Brain_Garrison_Institute_Jan2011/John_Gowdy_Social_Brain_Garrison_Institute_Jan2011/index.html

30 Tallis, R. (2011), op. cit.

...brain development is a process of co-evolution, in which genetic factors combine with cultural transmission to produce social norms and behaviour.

Given the misuses of biology in our intellectual history, it is no wonder that social scientists are wary of it. However, we need to be careful not to confuse evolutionary psychology in general which can help to explain *some* psychological traits in terms of their adaptive value, with Social Darwinism, which is an ideologically driven account of evolution that lionises competition in the name of nature, or Psychological Egoism that contends we are always motivated by self-interest. This sort of corruption of evolutionary theory is widespread, and unhelpful. Even Richard Dawkins, often wrongly considered the ultimate Social Darwinist, now suggests that the book for which he is famous, *The Selfish Gene* has a misleading title. He now claims he was arguing for the uniquely human capacity to override our genetic drives, and that his book should instead have been called *The Cooperative Gene*.[31] Recent mathematical modelling by Martin Nowak goes further and argues that cooperation is in fact one of the main drivers of evolution.[32]

However complicated or politically sensitive, facing up to evolution means recognising the disparity between the living conditions that gave rise to our brains over millennia of biological evolution, and the accelerated cultural evolution of the last few centuries and decades. This deep disparity is a defining feature of who we are and why we sometimes feel that our natural impulses may not be 'fit for purpose'. Moreover, rather than view evolution as the survival of the fittest in the sense of 'physical and mental fitness', it is perhaps more revealing to frame 'fittest' in the sense of 'most fitting', i.e. the survivors are those whose behaviours and resources fitted the demands of their environments the best.

The third injunction from Neuroscience is that recognising that the brain has evolved obliges us to reconsider the importance of post-natal development, for the brain we are born with clearly changes not merely throughout childhood but throughout the lifespan. As Cognitive Scientist Andy Clark puts it (in the style of an advert for Knorr stock cubes):

Take 390 grams of soft white-gray meat, tweak it, and pummel it, leaving the surface heavily convoluted. Place in a suitable (mobility enabled) container, and steep for a few years in human society. Let the preparation grow, roam, mature, and watch in amazement as human thought and reason slowly emerge from the motley pot of bones, muscles, sinews, sense organs, neurons, and synapses…[33]

"Steep for a few years in human society" refers to the central role of social learning in our neural development. This 'steeping' develops the whole person, but also shapes the brain in path dependent ways. From early in postnatal development, synapses proliferate, followed by a period of pruning. Blakemore and Frith compare the process to young plants in spring that can grow wild, and need to be trimmed back to survive.[34] Moreover, myelin sheaths covering neuronal axons are added over a period of years, increasing the transmission speed of neurons in the frontal cortex throughout adolescence. It has been suggested that such myelinisation is related to the acquisition of self-control, an important factor when assessing our expectations for self-control in adolescents; while studies on stress in the early years, have indicated that the brain as such does not always fully recover from neglect in infancy.[35]

A deeper point, highlighting our social nature, is that brain development is a process of co-evolution, in which genetic factors combine with cultural transmission to produce social norms and behaviour. Given the genetic homogeneity of the human species, the wide variation in degrees of cooperation observed in human societies points to a cultural or environmental origin.[36]

A further example of genetic and cultural co-evolution is the distinct human trait of parents allowing others to look after their offspring. Speaking at the RSA, Anthropologist Sarah Blaffer Hrdy examined our widespread use of 'alloparents', whereby adults frequently rear children that are not their own. A variety of adaptive pressures make it necessary for parents to leave their offspring with other relatives or acquaintances, thereby forging trust. She argued that this level of sustained cooperation over the relatively long child rearing years is one the main ways that human parenting differs from most other animals.[37]

31 Midgley, M. (2010). *The Solitary Self: Darwin and the Selfish Gene.* Durham: Acumen Publishing.

32 Nowak, M. (RSA Events, 5 April 2011). *Supercooperators: The mathematics of evolution, altruism and human behaviour,* [Online], Available: http://www.thersa.org/events/video/vision-videos/martin-nowak

33 Clark, A. (2008). *Supersizing the Mind: Embodiement, Action and Cognitive Extension.* Oxford: Oxford University Press.

34 Blakemore, S, & Frith, U. (2005), op. cit.

35 Ibid.

36 Henrich, J. (2004). Cultural group selection, coevolutionary processes and large-scale cooperation. *Journal of Economic Behavior and Organization,* 53, 3-35. Quoted in Gowdy, J. (2011), op. cit.

37 Blaffer Hrdy, S. (2009). *Mothers and Others: The Evolutionary Origins of Mutual Understanding.* Cambridge MA: Belknap/Harvard University Press; See also Blaffer Hrdy, S. (RSA Events, 16 July 2009). *Mothers and Others,* [Online], Available: http://www.thersa.org/events/video/archive/sarah-blaffer-hrdy---mothers-and-others

CO-EVOLUTION IN ACTION: IS THE LEFT HEMISPHERE GRADUALLY COLONISING OUR EXPERIENCE?

A further example of co-evolution is Iain McGilchrist's now famous argument that the left hemisphere is gradually colonising our experience. While the brain hemispheres are connected by the Corpus Callosum, and both are involved in everything we do, if we cease to ask *what* the hemispheres do e.g. language, reasoning, creativity, forecasting and instead ask *how* they do it we find very significant differences in the two hemispheres.

For instance the left hemisphere tends to decontextualize issues while the right contextualises, the left tends to abstract while the right makes vivid and concrete, the left seeks instrumental feedback while the right prefers affective responses, and the right hemisphere appears to be much more receptive to evidence that challenges its own position. The evidence for these differences, and many more, is meticulously unpacked by McGilchrist in a cautious but extensive inductive argument.[38]

McGilchrist understands that there is insufficient evolutionary time in Western cultural history for left or right hemisphere dominance to manifest at the structural level of the brain. His claim is not that the left hemisphere is getting bigger or denser or better connected than the right. The point is that the left hemisphere's 'way of being' is more culturally contagious than the 'way of being' of the right hemisphere. The suggestion is that slowly but surely the left hemisphere's perspective shapes our culture in such a way that the culture begins to respond to it as the dominant one.

The fear is that we may reach what McGilchrist calls 'a hall of mirrors' in which the explicit, instrumental, defined, confident, abstract voice (not unlike the current voice of the materialistic orthodoxy in Neuroscience) is the only one we believe in, while the relatively implicit, intrinsic, fluid, visceral perspective of the right hemisphere begins to sound diminished and irrelevant.

"If I am right, that the story of the Western world is one of increasing left-hemisphere domination, we would not expect insight to be the key note. Instead, we would expect a sort of insouciant optimism, the sleepwalker whistling a happy tune as he ambles towards the abyss." **—The Master and his Emissary**[39]

Reasons for neurophilia therefore include the recognition that Neuroscience is not an alien invader threatening to supplant the social sciences, and that a biological perspective is invaluable in highlighting the fact that our brains have evolved, and that our brains develop after birth through a process of social learning. A proper engagement with Neuroscience allows us to see that our brains are bio-social organs, a perspective that is becoming more prevalent in the emerging field of Social Neuroscience.[40]

38 McGilchrist, I. (2009), op. cit.

39 Ibid. See page 237.

40 Nikolas Rose argues that there are different kinds of social Neuroscience. Some are based on neuroimaging, some are based on animal studies, some are based on genetics, and that it is a mistake to speak of 'Social Neuroscience' as a single perspective, because these differing methodologies have very different framings of the 'social'. He cites John Caccioppo's work as an example of neuroscientific work that gives a relatively rich account of the importance of the social as a manifold phenomenon, and goes beyond one individual reacting to another individual. For an overview of the field, see For an overview of the range of current work in the field see http://en.wikipedia.org/wiki/Social_neuroscience.

1.WHY SHOULD WE CARE THAT *THE BRAIN* IS SOCIAL?

The brain is social in at least two distinct senses. Evidence from neuropsychology, anthropology, molecular Neuroscience, neuroimaging and social Neuroscience tells us that our brains are functionally social in the sense that they appear to have evolved through and for social interaction. However, 'the brain' has also become reflexively social, a shared object of interest and concern that directly impacts on our perception of ourselves and of each other, and how we behave. We sophisticate ourselves not merely by passively learning about the brain, but talking to each other about how what we learn applies to our adaptive challenges.

The emerging scientific view of human nature confirms that we are a fundamentally social species. 'Fundamental' here means that our sociality is primary, and ontologically constitutive of our capacity to reason and use tools, including language.[41] To say the brain is fundamentally social means that the main purpose and function of the brain is to help us regulate social relations, where 'social' refers to human interactions and the attendant norms, biases, mores and institutions.[42]

1.1 FUNCTIONALLY SOCIAL: BEING A SOCIAL BRAIN

Until recently, conventional wisdom in cognitive science was that brains process information and make calculations based on perceived self-interest.[43]This perspective generated the prevailing metaphor of brain-as-machine, or brain-as-computer, and underpinned the standard economic model mentioned below. However, this guiding metaphor has been challenged from a number of perspectives.[44] For instance, Dunbar and Shultz's Social Brain hypothesis[45] indicates an interesting link between cortex size and mean group size, and it appears we may have relatively big brains because we live in large groups. They argue that our brains are built to solve complex social problems like finding and redistributing resources, group decision making, maintaining group cohesion and dealing with potential enemies and trading partners. While this account seems plausible, the argument has been challenged, and may not be compelling enough by itself to make sense of the claim that the brain is 'social'.[46]

As already indicated, the brain is also social in the way it learns, and has evolved not merely to process information, but to facilitate social interaction, social learning, imitation, cultural assimilation, and empathy. As Neuroscience has matured, and social Neuroscience has emerged as a distinct and legitimate discipline, it has become clear that our nervous systems are not discrete and bounded, but integral parts of other more complex systems, ranging from molecules to selves to societies:

The telereceptors of the human brain have provided wireless broadband interconnectivity to humans for millennia. Just as computers have capacities and processes that are transduced through but extend beyond the hardware of a single computer, the human brain has evolved to promote social and cultural capacities and processes that extend far beyond a solitary brain. To understand the full capacity of humans, one needs to appreciate not only the memory and computational power of the brain but its capacity for representing, understanding, and connecting with other individuals. That is, one needs to recognise that we have evolved a powerful, meaning-making social brain.[47]

This 'wireless broadband interconnectivity' perspective may be supported at a cellular level by the presence in the human brain of *Von Economo* or spindle neurons. These cells are in evidence in intelligent mammals like dolphins and some primates, but they are particularly prevalent in human beings and it appears they evolved to enable people to make rapid decisions in social contexts.

These specialized projection neuron types have been identified in cortical areas that are positioned at the interface between emotional and cognitive processing. Given their characteristics, it has been speculated that Von Economo neurons are designed for quick signalling of an appropriate response in the context of social ambiguity.[48]

41 Vygotsky, L. (1962). *Thought and Language.* Cambridge: MIT Press; Mead, M. (1934). *Mind, Self and Society. Chicago:* University of Chicago Press.

42 Anthropologist Timothy Ingold argues that the 'social' should be extended to include non-human relationships too, but that is beyond the scope of our current concerns: Ingold, T. (2010, 5 February) *The Social Brain,* [Online], Available: http://www.youtube.com/watch?v=jgMr8_tV3ko

43 Sen, A. (1977). Rational Fools: A Critique of the Behavioural Foundations of Economic Theory. *Philosophy and Public Affairs,* 6 (4), 317.

44 Philospher and Neuroscientist Raymond Tallis gives a particularly trenchant critique of this metaphor, arguing that is based on a misunderstanding of what is meant by 'information'. Tallis R. (2010), op. cit.

45 See, for example, Dunbar, R, & Schultz, S. (2007). Evolution in the Social Brain. *Science*, 317 (5843), 7 September, 1344-1347. For details of the 7 year research project relating to the social brain hypothesis, see also http://www.icea.ox.ac.uk/research/lucy-to-language/

46 For example, Anthropologist Tim Ingold also challenges Dunbar's account from a number of perspectives, See Ingold, T. (2010), op. cit.

47 Cacioppo, J, & Patrick, W. (2008). *Loneliness: Human Nature and the Need for Social Connection.* London: W.W. Norton and Company. See also Cacioppo, J. (RSA Events, 8 September 2009). *Connected Minds: Loneliness, Social Brains and the need for community,* [Online], Available: http://www.thersa.org/events/video/archive/professor-john-cacioppo---connected-minds-loneliness,-social-brains-and-the-need-for-community

48 Sherwood, C, Subiaul, F, & Zadiszki, T. (2008). A natural history of the human mind: tracing evolutionary changes in brain and cognition. *Journal of Anatomy,* 212, 426-454, (433) in J. Gowdy, (2011), op. cit.

It has been argued that these neurons help humans to adjust quickly to rapidly changing social situations, and hypothesize that the VENs and associated circuitry enable us to reduce complex social and cultural dimensions of decision-making into a single dimension that facilitates the rapid execution of decisions. Other animals do not appear to have such elaborate social and cultural contingencies to their decision-making and thus do not require such a system for rapid intuitive choice.[49]

Most of these neurons are formed *after* birth and develop according to social and environmental influences, suggesting that there may be developmentally sensitive periods for acquiring the critical neural patterns of intimacy and trust that prepare the brain for social bonding and empathy, as well as the kinds of social learning and cultural transmission that shape pro-social behaviour through childhood and adulthood.

Neuropsychologist Chris Frith provides further foundations for the social brain hypothesis by arguing that it is grounded in two distinct systems in the brain: the automatic mirroring system and the more deliberative mentalising (mental simulation) system.

While 'mirror neurons' have not yet been conclusively observed in human beings their existence in macaque monkeys[50] provide a plausible explanation for the human ability to read the goals and intentions of others, and for empathy, because it corroborates what we know about social cognition.[51] For instance, while observing expressions of emotion in faces, we imitate in our own faces, even when the face is presented so quickly that we are not consciously aware of the expression. Further examples include experiencing pain as our own in situations where another person sitting close to us is given an electric shock, or response times in finger movements slowing considerably while observing another person's hand that has those particular fingers constricted. Related findings lead Chris Frith to argue that "The contagious effects of the experiences and actions of others align us with the group, and prime group goals rather than selfish interests".[52]

'Prime' is a key word here because the mirroring system reveals us to be automatically social in that our brain responds to the actions and experiences of others as if they were one's own. However, group goals are often antithetical to the goals of other groups, and other studies have suggested that our automatic 'pro-sociality' is bounded by our identification with certain kinds of people whom we view to be part of our group. For instance, Caucasians show a stronger neural signature of pain when observing another Caucasian in pain, as opposed to a Chinese person, and the converse also applies.[53]

This kind of implicit racial prejudice has been shown in a wide variety of studies, developed at 'Project Implicit'.[54] The reason we do not imagine ourselves to be as susceptible to such prejudice as these studies would suggest we are is that given enough time (even a few seconds) to think about the situation, our frontal lobes inhibit these automatic responses. An optimistic interpretation is that consciousness exists precisely to help in this way, making our social lives less tribal and automatic, and more cohesive and reflective.

A recent paper by Baumeister and Masciampo[55]develops this point in depth, and defends the value of conscious thought. Outside of cognitive science, it might seem odd to defend the value of conscious thought, which we assume to be an important and powerful human trait. However, within cognitive science, conscious thought is sometimes considered to be largely superfluous to human behaviour[56] and/or beyond our control.[57] The counter argument is that we have consciousness because we need it to create sequences and sentences, without which we would struggle to communicate complex ideas:

To function in a culture, the animal requires psychological traits that enable it to interact with the often invisible realities that comprise culture, such as moral values, social norms, honour codes, libel laws, rules of war, group mission, objectives, legal technicalities, gossip, voting, negotiations, and paying on credit. In that perspective, the function of conscious thought is to enable the physical body to deal with the cultural system. Sure enough, those invisible realities consist of and require the sorts of meaningful sequences that conscious thought is apparently needed to process, including sentences and narratives, causation and responsibility, numbers, and of course logical rationality.[58]

We also need conscious thought to simulate action so that we can understand goals and intentions and communicate them to others, and for inferring explanations of events, and constructing plausible reasons. Conscious thought is creative in this way, and builds models of the world that are not designed to accurately represent the way things are, but rather to be coherent enough that they would convince other people:

49 Allman, J, McLaughlin, T, Hakeem, A. (2005). Intuition and autism: a possible role for Von Economo neurons. *Trends in Cognitive Science,* 9, 367-373, in J. Gowdy, (2011), op. cit.

50 Rizzolatti, G, Fadiga, L, Gallese, V, & Fogassi, L. (1996). Premotor cortex and the recognition of motor actions. *Cognitive Brain Research,* 3 (2), 131–141; Rizzolatti, G, Fadiga, L, Fogassi, L, & Gallese, V. (1999). Resonance behaviors and mirror neurons. *Arch Ital Biol,* 137 (2-3), 85–100.

51 Frith, C, & Frith, U. (2010). The Social Brain: Allowing Humans to Boldly Go where no species has gone before. *Philosophical Transactions of the Royal Society B: Biological Sciences,* 365 (1537), 165–175.

52 Frith, C. (2010), op. cit.

53 Xu, X, Zuo, X, Wang, X, and Han, S. (2009). Do You Feel My Pain? Racial Group Membership Modulates Empathetic Neural Responses. *Journal of Neuroscience,* 29 (26), 8525-8529.

54 See Project Implicit https://implicit.harvard.edu/implicit/

55 Baumeister, RF, & Masicampo, EJ. (2010). Conscious Thought is for Facilitating Social and Cultural Interactions: How Mental Simulations Serve the Animal-Culture Interface. *Psychological Review,* 117, 945-971.

56 Bargh, J, & Chatrand, T. (1999). The Unbearable Automaticity of Being. *American Psychologist,* 54, 462-479.

57 Libet, B. (1985). Unconscious Cerebral Initiative and the role of conscious will in voluntary action. *Behavioural and Brain Sciences,* 8, 529-566; Wegner, D. (2002). *The Illusion of Conscious Will.* Cambridge MA: The MIT Press.

58 Baumeister, RF, & Masicampo, EJ. (2010), op. cit.

...social context is not an afterthought, a variable to be controlled, but the defining feature of how we think, learn and decide.

59 Baumeister, RF, & Masicampo, EJ. (2010), op. cit.

60 Full references, detailing the original sources of these ideas, can be found throughout the document.

61 Gergen K. (1994). *Realities and Relationships: Soundings in Social Construction.* Cambridge MA: Harvard University Press.

62 Dan Ariely, interviewed by Matthew Taylor. 'Better the devil you know', *RSA Journal*, Winter 2010.

Conscious thought is not for monitoring unconscious execution processes — but furnishing accounts that others will approve is one of its important jobs, and it creates explanations by simulating how the action most likely occurred rather than from direct control. Its occasional mistakes about environmental events again indicate merely that conscious thought is a construction, and educated guess, rather than a direct pipeline to the truth.[59]

Summing up the above findings, from archaeology and anthropology we learn that the relatively large human brain size is a function of the complexity of our social networks, and the role of alloparenting in fostering trust. From social Neuroscience, we learn that our nervous systems do not end at our skins but are in constant communication and interchange with other nervous systems. From molecular Neuroscience, we learn that humans have a relatively large number of spindle neurons that appear to be important in rapidly resolving social ambiguity. From studies with monkeys we learn of mirror neurons as the neural basis of imitation and empathy, and infer their existence in humans based on corroborating evidence from social psychology. From neuropsychology we learn that consciousness appears to be purpose-built not for motor control, but for facilitating social interaction by simulating events, processing sentences and sequences, and thereby facilitating social interaction. This knowledge, taken together, contextualises what it means to say that our brains are functionally social.

EVIDENCE FOR SOCIAL BRAINS[60]

- **Archaeology:** Brain size is correlated with complexity of social networks (Dunbar and Shultz, 2007)
- **Biological Anthropology:** Pervasive 'alloparenting', looking after the offspring of others (Blaffer Hrdy)
- **Social Neuroscience:** Clear physiological responses to subjective isolation (Cacioppo & Patrick, 2008)
- **Molecular Biology:** Von Economo 'spindle' neurons for social ambiguity more numerous in humans (Allman et al., 2005)
- **Primatology:** 'Mirror neurons' in macaque monkeys, indicating neural basis for empathy, corroborated by studies of human social cognition (Rizzolatti et al., 1996)
- **Neuropsychology:** Function of consciousness appears to be for mental simulation, and communicating of sequences to others (Frith, 2010, and Baumeister & Patrick, 2010)
- **Behavioural Economics:** Decisions based on 'doing the right thing' and altruistic punishment (Ariely, 2010)
- **Public Health:** Six degrees of connection and three degrees of influence (Christakis and Fowler, 2010)

The evidence that the brain is fundamentally social and largely automatic suggests that the notion of a rational, profit-maximising individual who makes decisions consciously, consistently and independently is, at best, a very partial account of who we are. However, what follows from this critique is not completely clear. The challenge is that in lieu of a clear alternative to this individualist conception of human nature, it continues to fuel our false consciousness of social and political reality, as Psychologist Kenneth Gergen indicates:

Because the individual has the capacity for reason and evaluation we can place our faith in democratic institutions. Because the individual is motivated to seek gain and minimise loss we believe the free market can prosper. Because individuals harbour the capacity for love and commitment, the institutions of marriage and family can form the building blocks for community.[61]

The models of rational self-regarding individuals that have underpinned our faith in democracy, reliance on the market, and trust in social institutions were not based on naivety, but rather on misplaced parsimony, i.e. the belief that these were the best models to help us plan our economies and organise our societies. However, a variety of social, political and environmental challenges, including the behavioural demands of climate change and the perceived causes of the current economic crisis, makes this model seem increasingly unhelpful.[62] The model fails to grasp that social context is not an afterthought, a variable to be controlled, but the defining feature of how we think, learn and decide. Economist John Gowdy unpacks the central relevance of this point for policy as follows:

The most serious shortcoming of the standard economic model — the mathematical formulation is called the Dynamic Stochastic General Equilibrium (DSGE) model — is that it must assume that human behaviour is self-regarding. The mathematical constraints of the model dictate that decisions of one individual cannot be influenced by the behaviour of others.

Perhaps we have to face up to the disarming thought that the early 21st century view of human nature does yet lend itself to clear policy levers, because the very idea of 'policy levers' is grounded in a worldview of individual conscious agents rationally responding to financial incentives.

Without the assumption of independent preferences the whole mathematical edifice of the DSGE model comes crashing down like a house of cards, and with it many if not most of the tools of contemporary economics (marginal analysis, constrained optimization techniques) and policy recommendations (privatization, more trade).[63]

Despite the evidence for our fundamentally social natures, we persist in acting as if the assumptions hidden in DSGE, particularly independent preferences, amounted to our best available model of human motivation and decision making. However, some Economists have attempted to update their models. For instance Paul Ormerod introduces the role of 'the bandwagon effect' into a classical economic demand model, revealing the challenge of incorporating the impact of people making economic decisions on the basis of other people's decisions, and not merely because of self-regarding calculation based on price. Ormerod highlights why policy-makers have been slow to accept the fundamental influence of social networks:

There is an inherent uncertainty about the impact of policy in a world in which network effects are important, which no amount of cleverness can overcome…This is not a comfortable world for the policymaker. But it is how large sections of the world really are. Ignoring network effects means that we carry on with the same model, spending vast amounts of money, with at best a rather hit-or-miss success rate as the evidence of the past sixty years has shown.[64]

The full range of links between a critique of classical economics, the rise of behavioural economics, the role of social psychology, and the findings of Neuroscience (and all the disciplines and perspectives in between) is difficult to track, and beyond the scope of this paper. However, the fulcrum that connects these forms of inquiry is the search for alternative ways to predict and explain social phenomena. Science does not give us unshakeable axioms on which to build new economic theories, and probably never will. However, it does seem to have presented a view of human nature that is inconsistent with DGSE, and this model is now anomalous in the Kuhnian sense, creating pressure for a paradigm shift in the social sciences.[65] Such a shift is already underway, and is evident in, for example, the political leaders of France and the UK beginning to measure national wellbeing as opposed to relying exclusively on GDP as a measure of progress.[66]

However, what if recent government interest in behaviour change and initiatives to measure wellbeing are understood not so much as a move away from the world view of 'homo economicus' but rather an attempt to shore up its weaknesses? Perhaps all that we are witnessing is just enough engagement with the new evidence to appease critics, while keeping the prevailing neo-liberal worldview intact?

Time will tell if this sort of accommodation is sufficient to address our challenges. In any case, it is not at all clear what a more radical adjustment would like. David Brooks makes some tentative suggestions in his book *The Social Animal*, for instance suggesting that formal education should pay much more attention to how to build fulfilling relationships and how to select a marriage partner, but he concedes that while so many of the relevant findings are still in dispute, this is "a perilous enterprise."[67]

Perhaps we have to face up to the disarming thought that the early 21st century view of human nature does yet lend itself to clear policy levers, because the very idea of 'policy levers' is grounded in a worldview of individual conscious agents rationally responding to financial incentives. If individuals are constituted by evolutionary biology, highly sensitive to social and cultural norms, embedded in and shaped by complex social networks; if their behaviour is largely habitual, if they care about relative rather than absolute value, are bad at forecasting, and are more rationalising than rational, policy-making appears to become even harder than it already is. Perhaps this means we should consider other ways of making good use of this knowledge in the meantime?

63 Gowdy, J. (2011), op. cit.

64 Ormerod, P. (2010). *N Squared: Public Policy and the Power of Networks.* RSA Pamphlets, Essay 3. London: RSA.

65 For details of Kuhn's theory of the history of science, see http://en.wikipedia.org/wiki/The_Structure_of_Scientific_Revolutions

66 Thomas Kuhn, T. (1962). *The Structure of Scientific Revolutions.* Chicago: The University of Chicago Press.

67 Brooks, D. (2011). *The Social Animal: A Story of How Success Happens (p. 377).* New York: Random House, [Online], Available: http://www.thersa.org/events/video/vision-videos/david-brooks

Such neuromyths can be seen as our culture's first attempts to grasp something of immense complexity and importance.

1.2 REFLEXIVELY SOCIAL: HAVING A SOCIAL BRAIN

We are all somewhat subject to our social brains, in that we are not fully aware of the social and biological influences that shape our habits and inform our decisions. Christakis and Fowler's evidence on the influence of social networks seems to support this claim, by indicating that we are connected to everybody by six degrees and that we are influenced by and can influence others up to three degrees.[68] Their studies suggest that our body weight, our wellbeing, our loneliness and our ability to stop smoking are hugely influenced by the people we associate with, and much more than we typically accept.[69]

However, even when we consider such evidence, we do not necessarily link it to whatever we understand of our social brains. Indeed, we appear to lack a rich understanding of the general public's attitudes to brains in general. As a first step towards remedying this important issue, we asked a random selection of about fifty RSA Fellows to state the two most important things they knew about their brains. The following is an indicative selection:

- It's malleable/flexible and is significantly shaped within first two years of life
- It has huge capacity that I don't use
- If it dies, I die
- The two hemispheres, left and right
- It is the connections that create and enhance individuality
- There is a larger gap between left and right hemispheres with male brain
- It needs a lot of oxygen, therefore blood to work
- There's a left and a right brain; it has a lot of spare capacity
- I don't know what I know
- It's in my head and I can tap into it at will
- Left and right side
- Evolving continually based on experience
- Learning and age
- 2% body mass but uses 20% of energy!
- It keeps the body going automatically
- The subconscious resources are necessary and need to be trusted
- It's much more complicated than I am capable of understanding
- But some of it still thinks like a lizard

The point of sharing these comments is to illustrate how the brain is being co-opted as part of our individual and collective identity, while people struggle to find truth in the context of widespread misinformation. It is worth reflecting on the genesis of these kinds of ideas, because it tells us something about the public understanding of science, and therefore speaks to the wider purpose of the Social Brain project.

For example, William James, writing for the general public more than a century ago, ventured the very reasonable comment: "I doubt whether people achieve 10% of their intellectual potential". 10% here is used figuratively, but very quickly this comment morphed into the idea that "people make use of 10% of their capacity" and 'capacity' soon morphed into brain. The causes of this development are disputed, but one of the more plausible accounts is that journalist Lowell Thomas casually restated the point by saying "We only use 10% of our *brains*." Unfortunately, he made this point as if it were a direct quote from William James, and did so in the preface to the best-selling self-help book of all time: *How to win friends and influence people*. The myth has never lost its steam since.[70]

Such neuromyths can be seen as our culture's first attempts to grasp something of immense complexity and importance. When we mock people for forming such ideas, we may be guilty of projecting an erroneous view of how such ideas develop, rather than seeing them as a powerful illustration of precisely why our view of human nature needs updating.

It should not surprise us that neuromyths spread, because we are now more aware of our cognitive frailties, including the power of 'word of mouth', the desire for easy answers, selective perception and memory, inferring causality from correlation, post-hoc explanations, exposure to biased sample, reasoning by representatives, misleading film and media portrayals, exaggeration of a kernel of truth, or terminological confusion.[71] These kinds of heuristics and shortcuts are classic faults of what Ben Goldacre calls 'Bad Science'.[72] However, in our daily lives we not think or act like natural scientists, so such heuristics should not be viewed acts of deviance, but rather precisely the kinds of behaviour we should expect given our updated view of human nature.

68 The three degree claim is contested by Russell Lyons in a recent paper 'The spread of evidence — Poor medicine via flawed social network analysis.' See http://arxiv.org/abs/1007.2876.

69 Christakis, N. (RSA Events, 25 February 2010). *Connected: The amazing power of social networks and how they shape our lives*, [Online], Available: http://www.thersa.org/events/video/archive/nicholas-christakis-connected; Christakis, N, & Fowler, J. (2009). *Connected: The amazing power of social networks and how they shape our lives.* London: Little, Brown and Company.

70 Beyerstein, BL. (1999). In Lilienfeld S, Lynn SJ, Ruscio J, & Beyerstein BL. *50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Behaviour.* Hoboken, NJ: Wily-Blackwell.

71 Ibid.

72 Goldacre, B. (2009). *Bad Science.* London: Harper Perennial.

A more accurate understanding of the brain may gradually become a core component of cultural literacy, but in the meantime we should perhaps show more respect for enthusiasm about the brain and the symbolic or semiotic role it seems to play in our lives. As suggested, the rising *interest in* Neuroscience is the cultural opportunity, not just the Neuroscience itself.[73] For instance, in one of our deliberative workshops about the brain, in which we shared five key principles of decision making that were grounded in neural and behavioural sciences, a participant made a simple but profound point about the process of learning about his brain:

I felt it applied to me and maybe had an evolutionary basis and was shared by everyone.[74]

This simple line captures the link between personal identity, biological understanding and social belonging that is the core of the RSA's Social Brain project. The awareness that there are natural facts underlying our behaviour is significant because it means that when we talk about, for example, *our* decisions, *our* habits and how *we* pay attention, we are aware that not it is not just my brain, but *the* brain that is involved, and *the* brain is something we all share. In addition to being a biological organ that is shaped for social purposes, when viewed as a common reference point the brain is socialis*ing* too, and a precious tool to galvanise the forms of pro-social behaviour the RSA seeks to promote.[75]

'Pro-social' behaviour is best understood through comparison with anti and a-social behaviour. Anti-social behaviour reflects an active disregard for social norms, but pro-social is best viewed in contrast with a-social behaviour, of the kind outlined in Adam Curtis's famous documentary 'The Trap', whereby people operate within permissively accepted social norms and circumstances, but do not actively question them, or seek to shape them.[76]The difference between being subject to your social conditions, and becoming aware of how we might relate to those conditions as issues to be considered and circumstances to be changed, is huge. In this sense pro-social behaviour is really a demand for a shift in the way we know ourselves and others, and our work attempts to help people make and reinforce that transition towards more reflexive forms of behaviour.

We examine reflexivity in more detail in section two, but in this context reflexivity stands for an understanding of the underlying principles of some activity that yields the power to change it. This change is achieved by using the underlying principles for a different purpose: using them in a different way than has previously been the case; or replacing them with other principles. A 'reflexive' approach to behaviour-change therefore requires that one becomes aware of the general principles that underlie behaviour.

For example, one could learn that eating fat is bad for one's heart, but the approach we endorse involves learning that eating fat is bad for one's heart and that, for several reasons, some of which are based on reward mechanisms in the brain, it is very hard for humans to resist eating it, but by trying X or Y one can best avoid temptation. The latter is a reflexive form of learning — learning not only about what might be done, but also why and how it is done.[77]

1.3 BEYOND NUDGING

> *It is easier to nudge people downhill than to nudge them uphill.* — **Tim Chatterton**[78]

The importance of this reflexive perspective is highlighted by considering alternative approaches to behaviour change. 'Nudge', a form of libertarian paternalism outlined by Thaler and Sunstein,[79] is paternalistic in that it assumes to know what is good for you (e.g. to save for a pension, or avoid being knocked down) but it is liberal in the sense that it merely nudges you towards these objectives (e.g. by making the pension a default you can opt out of, or by painting 'look left' at crossings) while leaving the choice in your hands. The nudge approach involves shaping our 'choice architecture' on the basis of what is known about the automatic, unconscious aspects of our nature (e.g. we rarely change default settings).

'Nudge' has clearly caught the zeitgeist, but has become a catchall term to cover any change in the environment that affects behaviour. Critiques have been offered from a variety of perspectives, including Economist Paul Ormerod suggesting it needs a network perspective, Anne Coote suggesting it is ultimately about conformity[80], and Tim Harford of the Financial

73 Ibid.

74 Grist, M. (2010, p. 16), op. cit.

75 In the Oxford talk, I argued that because it is subject to complex natural laws and being 'shared by everybody', the brain can almost be thought of as a new kind of weather. It is something we are equally subject to, something that changes over time, something both predictable and unpredictable, something with extremes, something that reacts similarly to similar stimulus. If you ask people to talk about their minds, you are getting personal and intrusive, but talking about brains keeps it social and shared because you have a common objective reference point.

76 Curtis, A. (Producer, Director, Writer). (2007). *The Trap: What happened to our dream of freedom?* [Television documentary series]. London: BBC, [Online], Available: http://en.wikipedia.org/wiki/The_Trap_(television_documentary_series)

77 Grist, M. (2010), op. cit.

78 DCLG Behavioural Research Network Meeting, London, February 28th 2011.

79 Thaler, R, & Sunstein, C. (2008). *Nudge: Improving Decisions about Health, Wealth and Happiness.* New Haven CT: Yale University Press.

80 Coote, A, Olliff-Cooper, J, & Butler, P. (RSA Events, 4 November 2010). *Cutting It: 'Big Society' and the new austerity,* [Online], Available: http://www.thersa.org/events/video/vision-videos/panel-discussion4

...the deepest problem with nudge is that it is not transformative.

Times highlighting that the philosophy of 'libertarian paternalism' on which nudge is based could easily become merely paternalistic, or as Harford puts it: to nudge is one thing, to nanny quite another.[81]

In the UK, the first stage of the behaviour change agenda has been about applying nudge-style interventions to shape choice architectures, thereby saving some public money and marginally improving public health.[82] Such an approach is commendable as far as it goes, but as Aditya Chakrabortty commented in The Guardian, so far the application of nudge to public policy looks like "cute technocratic solutions to mainly minor problems."[83] We need to delve deeper into how our engagement with the science of human nature may be socially beneficial.[84]

The deepest problem with nudge is that it is not transformative. Indeed, darkly, this may be why it is so popular. Nudge changes the environment in such a way that people change their behaviour, but it doesn't change people at any deeper level in terms of attitudes, values, motivations etc. In this respect, nudge creates what psychologist Paul Watzlawick calls 'first-order change' rather than second order change.[85]

Watzlawick uses dreams as an example to contrast first-order change, what happens in the dream, with second-order change, which is waking up. First-order change refers to the ongoing and generally superficial changes that constitute everyday experience, changes that are relative to a given frame of meaning. Second-order change is the change in the frame, the change of change, and in Watzlawick's given example, it means, aptly, waking up.[86] While nudge purports to be about maximising choice, it changes behaviour by stealth rather than engagement. Far from waking people up, this approach is underpinned by a crypto-behaviourist perspective that seems designed to keep us asleep.[87]

The 'Think' approach is more democratic, and contends that if we deliberate collectively as rational agents responsive to argument, we will find a suitable course of action and collectively follow it through. 'Think' therefore seeks to change our behaviour through the conscious, controlled aspects of our nature, and places faith in reason and reflection. This process also recognises our social nature, because it is the co-presence of others thinking alongside us that matters as much as the thinking itself, helping us change our attitudes and reflect on our values, while also acting as commitment devices.[88]

What is lacking in other behaviour change approaches, however, is a *holistic* model that recognises that our controlled and automatic systems are intertwined and mutually reinforcing. We also need an approach that is *reflexive* because, for reasons mentioned above, engaging with knowledge about our brains and behaviour literally changes the subject. Moreover, people are extremely interested in finding out about their own natures, and while 'Nudge' and 'Think' rest on an unhelpful dichotomy between controlled and automatic processes, our 'Steer' approach tries to align strategies for behaviour change with human nature as it operates holistically across contexts, helping to foster the transformative learning we need to make significant and enduring changes to our behaviour.[89]

81 Harford, T. (2009). *To nudge is one thing, to nanny quite another,* [Online], Available: http://timharford.com/2009/09/to-nudge-is-one-thing-to-nanny-quite-another/

82 Behavioural Insights Team, Cabinet Office. (2010, October 31). *Applying Behavioural Insight to Health.* London: Cabinet Office Behavioural Insights Team.

83 Chakrabortty, A. (2010). 'Cameron's hijacking of Nudge theory is a classic example of how big ideas get corrupted', *The Guardian*, 7 December..

84 This report was completed just before the publication of the Neuberger Report on the House of Lords Science and Technology Inquiry into Behaviour Change, which makes a similar argument about the limitations of nudge. That report is not examined here, but we did respond on Guardian CIF on the day the report was released: http://www.guardian.co.uk/commentisfree/2011/jul/19/nudge-is-not-enough-behaviour-change?INTCMP=SRCH

85 Watzlawick, P. (1974). *Change: Principles of Problem Formation and Problem Resolution.* New York: W W Norton & Co.

86 Ibid.

87 Curtis, A. (2010), op. cit.

88 Smith, G, & Stoker, G. (2009). *Nudge Nudge, Think Think: Two Strategies for Changing Civic Behaviour,* [Online], Available: http://www.civicbehaviour.org.uk/documents/nudge_nudge_think_think_PJ5May2009.pdf

89 Rowson J. (2010, June 15). *Changing Behaviour Change,* [Online], Available: http://www.leftfootforward.org/2010/06/changing-behaviour-change/

90 Heifetz, R, & Laurie, D. (December 2001). The Work of Leadership. *Harvard Business Review,* 79 (11), 130-141.

91 From Eric Svaren, Groupsmith.com. Adapted from Heifetz, R. & Laurie, D. (1997). The Work of Leadership. *Harvard Business Review*, January-February, 75 (1), 124-134; and Heifetz, R. & Linsky, M. (2002). *Leadership on the Line.* Boston: Harvard Business School Press.

92 Taylor, M. (June 2010). *21st Century Enlightenment.* RSA Pamphlets, Essay 1. London: RSA.

2. REFLEXIVE SOLUTIONS TO ADAPTIVE CHALLENGES

> *The most common leadership failure stems from attempting to apply technical solutions to adaptive challenges.* — **Heifetz**[90]

Harvard Professor Ron Heifetz makes a useful distinction between technical problems and adaptive challenges in this regard, which highlights the kinds of behaviour change we are most interested in. Adaptive challenges require changes in attitudes and perspectives and not just behaviours, and they can only be addressed by the people who have them, which is why they are difficult to identify and easy to deny.

TECHNICAL PROBLEMS VS. ADAPTIVE CHALLENGES

(Table adapted from Heifetz and Laurie, used with permission of Groupsmith.com[91])

Technical Problems	Adaptive Challenges Adaptive Challenges
1. Easy to identify	1. Difficult to identify (easy to deny)
2. Often lend themselves to quick and easy (cut-and-dried) solutions	2. Require changes in values, beliefs, roles, relationships, & approaches to work
3. Often can be solved by an authority or expert	3. People with the problem do the work of solving it
4. Require change in just one or a few places; often contained within organizational boundaries	4. Require change in numerous places; usually cross organizational boundaries
5. People are generally receptive to technical solutions	5. People often resist even acknowledging adaptive challenges
6. Solutions can often be implemented quickly—even by edict	6. 'Solutions' require experiments and new discoveries; they can take a long time to implement and cannot be implemented by edict
Examples	
▪ Take medication to lower blood pressure ▪ Implement electronic ordering and dispensing of medications in hospitals to reduce errors and drug interactions ▪ Increase penalty for drunk driving	▪ Change lifestyle to eat healthily, get more exercise and lower stress ▪ Encourage nurses and pharmacists to question and even challenge illegible or dangerous prescriptions by physicians ▪ Raise public awareness of the dangers and effects of drunk driving, targeting teenagers in particular

Understandably, policymakers prefer technical solutions, which use existing expertise to target discrete measurable problems, and although nudge is informed by behavioural science, it remains a technical solution. Adaptive challenges tend to be messier and require people to change themselves in order to deal with emergent risks and opportunities, which is why policy-makers tend not to engage with them as much, and perhaps rightly so. A diet pill is a technical solution to weight loss, while creating and maintaining a new exercise habit is an adaptive challenge. Individuals paying a few pounds extra for carbon offsetting is a technical solution to greenhouse gas emissions as is raising taxes on flying, while getting people to fly less *for environmental reasons* is an adaptive challenge.

RSA's 21st century enlightenment mission is sometimes explained simply as the belief that "we cannot go on like this".[92] 21st century challenges vary enormously in scope and scale, but the major issues of our time including climate change, enduring financial instability and demographic changes are adaptive in nature, in that facing up to them means changing our attitudes, beliefs and values, and not merely carrying on as blissfully (or perhaps not so blissfully) ignorant consumers as our behaviour is changed for us.

Such a transformation in human capability may not happen quickly, but the contention here is that cultivating the widespread interest in brains and behaviour might help us to accelerate the adaptive process. In the language of adult development theorist Robert Kegan, the RSA

...the RSA is striving to gradually help people develop from being the conditions of their action, passive subjects, shaped by biological and social constraints we cannot control, to having those conditions, whereby we proactively shape our lives with an awareness of them.

is striving to gradually help people develop from being the conditions of their action, passive subjects, shaped by biological and social constraints we cannot control, to having those conditions, whereby we proactively shape our lives with an awareness of them.[93]

The RSA has already begun this process, conducting deliberative workshops with the general public hoping to improve personal and professional decisions, police officers seeking to improve communication at an organisational level and with the public, and taxi drivers seeking to save fuel.[94]However, it might still be suggested, that while attempting research is commendable, does it really have anything to do with the brain as such?

EXPLORING ADAPTIVE CHALLENGES IN POLICING

With permission of the Metropolitan Police's Strategy, Research and Analysis Unit, we conducted deliberative research with fifteen police officers from varied units and ranks. We wanted to gauge what role, if any, distilled knowledge about brains and behaviour might have in helping police to do their jobs well. It was hypothesised that by encouraging self-awareness and openness to experience, we might improve patterns of communication between themselves and with the general public.

In consultation with Senior Officers we adjusted our original Steer principles to attempt to speak directly to the concerns of police officers. The first three principles touched on issues relating to controlled and automatic systems in the brain, while the other two focussed on social psychology.

- Use your habitat to shape your habits.
  How does the working environment shape your automatic behaviour?
- Trust your gut, but remember to pay attention.
  Your intuition, based on professional experience, is powerful, but how can you remain vigilant in situations where something genuinely new is happening?
- Take your time, literally.
  There are three main decision speeds — automatic, reflective and 'mulling' — and it is good to know which you use most and why.
- Be influenced by others, but know your own voice.
  You need others to help you think, but beware of groupthink.
- Don't let consistency get in the way of learning.
  The desire to reduce cognitive dissonance often prevents us from understanding what really happened.

Two sample quotes from the discussions:

"A lot of police decision making is done with the expectation of fear, criticism or scrutiny. You can expect your choices to be poured over, often for reasons of agenda or different priorities."

"I felt that I actually put some of the principles into action on a regular basis. Seeing them written down and being able to refer to them was very useful."

A final version of this report will be available on the RSA website later this year.

2.1 A PROFOUND RHETORICAL QUESTION

"*What is it with the brain these days?*" was the rhetorical question posed at a recent Oxford University conference on 'neurosociety', and the question is profound *because* it is rhetorical.[95] In the process of wrestling with what exactly 'the brain' refers to, the extent to which it determines our behaviour and policy, and how far its influence extends, 'the brain' is becoming a cultural reference point through which we reflect upon whom and what we are.

In the light of the rapid developments in Neuroscience, we suggest the brain can therefore be viewed in two main ways. The ultimate arbiter on how the organ operates and influences behaviour is natural science, but 'the brain' is also a cultural concept, loosely and unscientifically referred to in innumerable ways in every walk of life. In this sense we are interested in opportunities to use these amorphous references to the brain in conjunction with credible Neuroscience as a tool to foster broader patterns of reflexivity.

Social Theorists Fernando Vidal and Francisco Ortega seem to support this premise and refer to 'the brain's symbolic efficacy'. They argue that the efficacy is "'symbolic' not in the sense that it is somehow unreal, but that it derives less from mechanisms or features that inhere in [Neurosciences] than from their meanings and usages". As an example they cite the 'prestige' of neuroimages, which they attribute to the general authority of the visual over the textual, the privileging of images in medicine, but also "the belief that scientific images represent reality in the mode of mechanical objectivity, and can therefore be unquestioningly trusted".[96]

93 Kegan, R. (1992). *The Evolving Self.* Cambridge, MA: Harvard University Press.

94 See respectively Grist, M. (2010), op. cit. Rowson J. (forthcoming 2011). *Reflexive Coppers: Exploring Adaptive Challenges in Policing* (provisional title). London: RSA; and Rowson, J, & Young, J. (RSA, July 2011). *Inside the Mind of a Cabbie*, [Online], Available: http://www.thersa.org/__data/assets/pdf_file/0003/409224/Inside-the-Mind-of-a-Cabbie.pdf

95 See Neurosociety conference (7-8 December 2010) 'What is it with the brain these days?', Saïd Business School, University of Oxford, [Online], Available: http://www.sbs.ox.ac.uk/centres/insis/neurosociety/Pages/default.aspx

96 Vidal, F, & Ortega, F. (2011). Approaching the Neurocultural Spectrum: An Introduction. In F. Vidal, & F. Ortega (Eds), *Neurocultures: Glimpses into an Expanding Universe* (p.5). Frankfurt: Peter Lang. p5

This cultural susceptibility to 'the brain' is hazardous, but it is presents an enormous opportunity to promote forms of questioning and self-awareness that might otherwise be hard to stimulate.

The brain can be visualised in a way the mind cannot, and the visual is assumed to be a transparent representation of something meaningful and trustworthy. Perhaps for this reason, Crawford describes the brain scan as a "fast acting solvent of critical faculties".[97] Moreover, an even more troubling thought, developed by Anthropologist Emily Martin, is that there is something about the modern world that makes us particularly susceptible to the idea that we are our brains, and that the brain-based picture of humanity is a sound one:

"If a more reductionistic and brain-based picture of human action displaced our current everyday mental concepts, it would not be because (it) had won in the court of scientific opinion. It would be because the environment we live in (and that scientific theories are produced in) had shifted so that a brain-centered view of a person began to make cultural sense."[98]

This cultural susceptibility to 'the brain' is hazardous, but it is presents an enormous opportunity to promote forms of questioning and self-awareness that might otherwise be hard to stimulate. The RSA refers to *neurological* rather than neural reflexivity because we are engaged in a collective and critical response to the social impact of the study of the brain rather than the brain as such. As indicated already, 'the brain', properly understood, does not refer to a discrete physical organ, but to our entire embodied nervous system, and this system is *always* embedded in a wider social, cultural and technological context.[99] While mindful that scientific perspectives can be misused, used selectively, or over-interpreted, we nonetheless see this emerging neurological reflexivity in a positive light, and view 'the brain' as a cultural tool that can liberate or oppress, depending on how it is used.

The purpose of engaging with neural and behavioural sciences is to move away from a naïve perspective of freedom as unfettered individualism, towards an autonomy that is grounded in informed self-awareness, including a deeper recognition of the social and biological conditions that define our actions. Although it is beyond the scope of this paper to develop the point fully, this discussion does speak to the distinction between negative liberty as freedom from interference, and positive liberty as self-mastery, originally outlined by Isaiah Berlin[100] and the critique of the modern form of market freedom developed by Adam Curtis in 'The Trap'.[101]

As Matthew Taylor has argued, the kinds of capabilities called for to address modern challenges necessitate forms of reflexivity, in which we succeed in relating to aspects of our nature we were previously entirely subject to, in a more objective and creative way:

Sociologists identified reflexivity — our capacity to reflect on the conditions of our action, and thereby shape our own lives and identities — as a key component of twentieth century selfhood. The RSA suggests that 'Neurological reflexivity' — the capacity to reflect upon and directly to shape our mental processes — may be a key feature of the twenty first.[102]

'Reflexivity' is not a term of everyday language, but a simple way to describe it is 'self-awareness in action'. Without an appreciation for the recursive nature of self-awareness and behaviour we will not be able to achieve the forms of agency or autonomy that are implicitly or explicitly demanded of us to adapt to modern challenges. Supporting this point, billionaire philanthropist and founder of The European Central University, George Soros, has stated that reflexivity is absolutely central to his own financial success *and* his decisions on how to invest his money for social good:

It is a very curious situation. I am taken seriously; indeed a bit too seriously. But the theory that I take seriously and, in fact, rely on in my decision-making process is completely ignored.[103]

Far from being esoteric, reflexivity is relevant to any situation with thinking participants. In Soros's account of reflexivity, the basic cognitive function of thinking is to understand the world in which we live, but there is also a participating (or manipulative) function that seeks to change the situation to our advantage. When the direction of causation is from world to mind, reality is supposed to determine the participants' views; but when the direction of causation is from the mind to the world, the intentions of the participants have an effect on the world.[104]

Moreover, these functions often interfere with each other because the independent variable of one function (mind, in world) is the dependent variable of the other (world, in mind) so neither function has a genuinely independent variable, making predictions about human behaviour and the social world radically indeterminate.[105] Soros uses this model to explain how pricing distorts market fundamentals because of their role in signalling future value.

97 Crawford, M. (2008). The Limits of Neuro-Talk. *The New Atlantis,* Winter (19), 65-78.

98 Martin, E. (2000). Mind-Body Problems. *American Ethnologist,* 27 (3), 575.

99 Siegel, S. (March 2010). Climate, Mind and Behaviour Conference. Garrison Institute; Clarke, A. (2004). *Natural-Born Cyborgs: Minds, technologies and the Future of Human Intelligence.* USA: Oxford University Press.

100 Berlin, I. (1969). Two Concepts of Liberty. In *Four Essays on Liberty.* Oxford Paperbacks.

101 Curtis, A. (2007), op. cit.

102 Taylor, M. (2008). *Changing Minds: Preparing for an era of Neurological Reflexivity.* London: RSA, [Online], Available: http://www.thersa.org/events/video/archive/matthew-taylor

103 Soros. G. 'The Theory of Reflexivity'. The MIT Department of Economics World Economy Laboratory Conference Washington, D.C. Delivered April 26, 1994.

104 Soros, G. ' Lecture 1: General Theory of Reflexivity.' The CEU Lectures: George Soros on The Economy, Reflexivity and Open Society. Budapest: Central European University. Delivered October 26, 2009, [Online], Available: http://www.soros.org/resources/multimedia/sorosceu_20091112

105 See Taleb N. (2010) *Black Swan.* London: Penguin Books. Nassim N. Taleb writes about 'the scandal of prediction' in this regard and the inevitability of unforeseeable low probability high impact events called 'Black Swans'. He discussed related themes with David Cameron at the RSA, [Online], Available: http://www.thersa.org/events/video/archive/david-cameron-in-conversation-with-nassim-taleb

One of the best ways to honour our questioning nature is to regularly call our nature into question.

A more recent example would be the debate about the Alternative Vote system in the UK, which was informed by historical comparisons of voting behaviour, predicated on the idea that people would vote the same way (mind as constant, world as variable) regardless of the voting system, which fails to account for Soros's participating function.[106]

Soros also argues that the importance of understanding reflexivity has grown:

The philosophers of the Enlightenment put their faith in reason. Reason was supposed to work like a searchlight, illuminating a reality that lay there, passively awaiting discovery. The active role, that reason can play in shaping reality, was largely left out of the account. In other words, the Enlightenment failed to recognize reflexivity. This resulted in a distorted view of reality but one that was appropriate to the age when it was formulated.[107]

The RSA's 21st Enlightenment mission is grounded in the idea that human development can be actively shaped by reflecting on the best available knowledge about our natures (cognitive function) and using this knowledge to shape our behaviours (participating function). We believe this kind of reflexive process underlies the kinds of competence succinctly described by Harvard psychologist Robert Kegan as:

Detaching or distancing ourselves from both the socialising process of the surround and from our own internal productions, albeit in such a way that does not prevent us from connecting and joining in community and personal relationships.[108]

Such a task is not an easy one, because it amounts to a demand for transformative learning. Yet if human capability is worth fighting for at all, it has to be about more than just informational learning — a change in the contents of our knowledge but no change in the 'form' that processes, values and constructs that knowledge. Instead, we can benefit from thinking more about the 'form' that we need to go beyond, which means learning more about the social and biological conditions of that form, including our brains.

Neuroscience allows us to form a more objective relationship to our brains, while at the same time recognising the influence of our brain on our experience of subjectivity. Neuroscience also appears to tell us that most of our behaviour is automatic, so conscious reflexivity should not be viewed as a default mode of being, but more like a form of praxis through which we periodically reconfigure our automatic behaviour. Rather than view the growing prominence of the brain as a threat to our freedom, we can form a relationship to it that is grounded in inquiry. In essence, one of the best ways to honour our questioning nature is to regularly call our nature into question.

We do not need Neuroscience to be reflexive, but it helps. While the question of human *nature* is by no means the exclusive preserve of *natural* science, our respect for the methods of natural science has obliged us to rethink the role of the social and human sciences in defining who we are, and how we should act. Our awareness of Neuroscience has therefore made us different psychologically, which is not at all the same as saying that Neuroscience shows us we are psychologically different. The point of neurological reflexivity is to yoke biology in the service of an ongoing psycho-social process that is timely and important. The British political sociologist Anthony Giddens coined the term 'reflexivity' as it is being used here:

Social reflexivity is both condition and outcome of a post-traditional society. Decisions have to be taken on the basis of a more or less continuous reflection on the conditions of one's action. 'Reflexivity' refers to the use of information about the conditions of activity as a means of regularly reordering and redefining what that activity is.[109]

Knowledge relating to the brain is now regularly 'reordering and redefining' certain core features of our personal and social activity in diverse areas including marketing[110], healthcare[111], education[112], economics[113]and the environment.[114]

106 Soros, G. (2009), op. cit.

107 Soros, G. 'Lecture 3: Open Society.' The CEU Lectures: George Soros on The Economy, Reflexivity and Open Society. Budapest: Central European University. Delivered October 28, 2009, [Online], Available: http://www.soros.org/resources/multimedia/sorosceu_20091112/opensociety_transcript

108 Kegan, R. (2001). Competencies as Working Epistemologies. In D. Rychen and L. Salganik (Eds.), *Defining and Selecting Key Competencies.* Germany: Hogrefe & Huber.

109 Giddens, A. (1994). *Beyond Left and Right — the future of radical politics.* Cambridge: Polity Press.

110 McLure, S. et al. (2004). Neural Correlates of Behavioral Preference for Culturally Familiar Drinks. *Neuron,* 14 October, 44 (2) 379-387, [Online], Available: http://www.cell.com/neuron/abstract/S0896-6273(04)00612-9

111 Society for Neuroscience (2003). *Translational Neuroscience Accomplishments,* [Online], Available: http://www.sfn.org/skins/main/pdf/gpa/translational.pdf

112 Howard-Jones, P. on behalf of TLRP Seminar Series core team. (2007, May). *Neuroscience and Education: Issues and Opportunities. A Commentary by the Teaching and Learning Research Programme*, [Online], Available: http://www.tlrp.org/pub/documents/Neuroscience%20Commentary%20FINAL.pdf

113 Camerer, C. (2008). Neuroeconomics: Opening the Gray Box. *Neuron,* November 6, 60 (3), 416-419, [Online], Available: http://www.cell.com/neuron/retrieve/pii/S0896627308009033

114 Siegel, D. (2010). *Mindsight: The New Science of Personal Transformation.* New York: Random House.

2.2 REFLEXIVITY AS A CULTURAL IMPERATIVE

In previous outputs, the RSA suggested that Anthony Giddens may have been asking for too much in his calls for reflexivity, mainly because it is not clear that most elements of the population relate to their conditions of activity in the way he thinks they 'have to'.[115] This impression is confirmed by aspects of an OECD study into human competencies which suggests a mismatch between the widespread demands for competencies that requires levels of mental complexity that are not at all widespread.[116]

Based on the available data, only around twenty per cent of the population have reached the so-called 'self-authoring' capacity that appears to underpin genuine 'self-aware autonomy' of the kind we believe is required to adapt to 21st century challenges.[117] This point is developed below, but the concern, as Robert Kegan puts it, is that "The available supply may not meet the increasing demand".[118]

In the context of our 21st century enlightenment mission, one core purpose of our Social Brain Centre is therefore to use reflexivity as a tool to inculcate the self-aware autonomy that the population at large now requires to meet the demands of the modern world. As indicated in section four, we focus this reflexivity on our habits, our attention and our decisions.

STEERING TOWARDS BETTER DRIVING[119]

As part of Shell's national campaign to raise awareness of the benefits of fuel efficient driving, the RSA applied our Steer approach to behaviour change with ten taxi drivers from across the country. We conducted qualitative research with the cabbies, including accompanied journeys and a focus group, to help us discover which behavioural principles would be most useful to understand, and to help us co-create design interventions in their cars in ways that might help them save fuel.

Due to their recognition of the gap between knowing they should do something (e.g. drive smoothly) and actually doing it, the focus on going beyond information dissemination. We shared the idea that our brains can be viewed as two systems, like a pilot and an auto-pilot, and that the challenge with information is that it often only reaches the pilot, but has no impact on the auto-pilot. Given that most driving behaviour is automatic, the key is find ways to shift habitual behaviours, which is why the workshop focused strongly on the relationship between habits and habitats. With the insight of the drivers, we designed four small changes to their driving habitats to help translate the information on fuel efficiency into 'language' more amenable to the automatic system. For instance, to prime the idea saving money by driving 'smoothly' we gave them silk bags to collect payment[120]

Moreover, in light of their strong awareness of other drivers, and their explicit acknowledgment that this was an influence on their behaviour, our behaviour change suggestions involved raising awareness of social contagion rather than just explicit instruction in driving techniques. We therefore concentrated a whole half-hour session on social norms and the power of social networks. This device was partly to motivate drivers to overcome their fatalistic tendencies by showing that what they did had the potential to influence not only their passengers but also the people their passengers influenced i.e. that they may have great power to affect change.

115 Grist, M. (2009). *Changing the subject: How new ways of thinking about human behaviour might change politics, policy and practice*. London: RSA.

116 OECD. (2003). *Key Competencies for a Successful Life and a Well-Functioning Society*. Germany: Hogrefe and Huber Publishers.

117 Taylor, M. (2010), op. cit.

118 Competencies as Working Epistemologies. In DS Rychen, & LH Salganik (Eds.), *Defining and Selecting Key Competencies (p. 196)*. Germany: Hogrefe and Huber Publishers.

119 Rowson, J. and Young, J. (July 2011), op. cit

120 Full details will be in our final report on fuel efficient driving, due in November 2011, but for further details see http://www.guardian.co.uk/environment/2011/jul/21/london-cab-drivers-green-ambassadors?INTCMP=SRCH

3. COMPETENT PEOPLE FOR A COMPLEX WORLD

Many social theorists have highlighted a growing mismatch between the complexity of the world, and our mental capacity to adapt to it. Ray Lifton speaks of 'historical dislocation' in which there is "a loss of a sense of fit between what individuals feel themselves to be and what a society or culture, formally or informally, expects them to be."[121] Kenneth Gergen argues that this loss of fit is at least partly because technological change has given rise to multiple forms of media and 'social saturation' in which we become so inundated with perspectives that "the coherent circles of accord are demolished, and all beliefs thrown into question by one's exposure to multiple points of view".[122]

Adam Kahane, an associate fellow at Oxford's Saïd Business School, recognises that such complexity is not limited to our sense of identity and coherence, and offers an elegant account of why complexity is the best way to characterise contemporary human problems, too. Kahane investigates three varieties of complexity: dynamic, generative, and social. *Dynamic complexity* refers to the spatial and temporal gap between cause and effect, which makes problems hard to diagnose effectively, for example if we ask what caused the events of 9/11 and whether something similar could be prevented from happening again, it is not obvious where we should start our inquiry. In complex human problems, there is often multiple, distributed and contingent causation.

Generative complexity refers to the fact that human problems are not static, and they unfold in unpredictable ways depending on unforeseeable events and how people react to them, so while Iraq might be better off without Saddam Hussein, the reaction to his forced removal creates a new set of problems, and it remains unclear that the situation in the country and the wider world has been improved. And *social complexity* means that the people involved in human problems view it from different perspectives, aims and backgrounds, so problems are often compounded by the lack of a consensus about the nature of the problem, for instance Sunni, Shia and Kurdish perspectives may be difficult to reconcile.[123]

The contention that the world is getting more complex is therefore partly an objective claim about certain kinds of problems that appear to be becoming more widespread, but it is also a subjective measure of our ability to understand and cope with them.[124] To call a problem 'complex' means that it may not be amenable to an instrumental solution, and that it is a problem for which we need to see ourselves, our biases, delusions and limitations, as an endogenous part of the problem. The contention is that as the world becomes more complex, we need to become more complex too, and that becoming more aware of the complexity of our own natures is an important part of that process.

The idea that we develop mental complexity over time is familiar from childhood development, but in adulthood we typically focus on issues relating to skills, competencies, and personality measures like Myers-Briggs.[125]Despite a considerable literature on post-formal thinking which is drawn upon in management theory and the literature on leadership in particular,[126] public policy appears to operate in what Ken Wilber calls 'flatland' i.e. the view that all adults operate at the same level of mental complexity, and differ only in horizontal skills, intelligence, knowledge and proclivities.[127]As Robert Kegan puts it:

We have tended to yoke our conceptions of full mental development with our conceptions of full physical development — i.e. that in both cases we reach our full stature sometime in late adolescence, but of course, that is not the case, and though we may stop growing in our late teenage years, it is imperative that we continue to grow mentally.[128]

Few would disagree with the aim of growing mentally, but it is meant here in a very particular sense of mental complexity, and links directly with our aim to disseminate knowledge of the brain more widely. We believe Kegan is correct in his contention that when policy makers try to change behaviour through incentive structures, environmental influences and choice architectures, they have "an astonishingly naïve sense of how important a factor is the level of mental complexity" because the level of complexity will determine how people respond to the intervention.[129]

121 Lifton, R. (1993). *The Protean Self: Human Resilience in an Age of Fragmentation (p. 14)*. Chicago: University of Chicago Press.

122 Gergen, K. (1991). *The Saturated Self: Dilemmas of Identity in Contemporary Life.* New York: Basic Books.

123 Kahane, A. (2004). *Solving Tough Problems: An Open Way of Speaking, Listening and Creating New Realities (p. 2)*. San Francisco: Berrett-Koehler Publishers.

124 This point was made to me by Roger Dale in a personal communication (January 19 2008).

125 See http://en.wikipedia.org/wiki/Myers-Briggs_Type_Indicator

126 See, for example, Kitchener, KS, & Brenner, H. (1990). Wisdom and reflective judgment: Knowing in the face of uncertainty. In R. Sternberg (Ed.), *Wisdom: its nature, origins and development (pp. 212-229)*. Cambridge: Cambridge University Press; Labouvie-Vief, G. (1992). A neo-Piagetian perspective on adult cognitive development. In R. Sternberg & C. Berg (Eds.), *Intellectual development (pp. 197-228)*. Cambridge: Cambridge University Press; Kramer, D.A. (1990). Conceptualizing wisdom: the primacy of affect-cognition relations. In R. Sternberg (Ed.), *Wisdom: Its nature, origins and development, (pp. 279-309)*. Cambridge: Cambridge University Press.

127 A notable exception appears to be Geoff Mulgan, now head of NESTA, who once advised researchers in the Prime Minister's Strategy Unit to read *A Theory of Everything* by Ken Wilber — a classic treatise on Integral Theory and Adult Development (see post by Dr Robin Wood, then of London Business School, to the Spiral Dynamics Yahoo group, 27 November 2001).

128 Kegan, R. (2001). Competencies as Working Epistemologies: Ways we Want Adults to Know. In DS. Rychen & LH. Salganik (Eds), op. cit.

129 Kegan, R, & Lahey, L. (2009). *Immunity to Change: How to Overcome it and unlock the potential in yourself and your organisation (p. 17)*. Boston: Harvard Business Press. For instructive review see *International Journal of Integrated Care*, Vol. 9, 2 December 2009, [Online], Available: http://www.ijic.org/index.php/ijic/article/viewFile/503/1005

Development, for Piaget, concerned the extent to which an organism succeeded in differentiating itself from (and so relating itself to) the world, and this process continues throughout the lifespan.[130]

Speaking at the Davos Economic Forum in 2006, Bill Clinton seemed to support this perspective, arguing that the challenge of integrating all our best ideas to solve planetary problems was that we needed a 'higher level of consciousness' to make sense of how they inter-relate, and he referred to the work of Ken Wilber, a major theorist on the growth of mental complexity.[130]

This kind of growth in mental complexity may have a neural basis. While studies do not link neuroscience and measures of mental complexity directly, we now know that our brains develop through time and do not merely degenerate. For instance, myelination continues beyond adolescence, adults continue to grow new neurons (neurogenesis) and although neural plasticity reduces with age, it continues throughout the life span. Elkhonon Goldberg, a neuroscientist, contends pattern recognition represents the positive side of ageing and can be understood as the growth in 'neural attractors' or 'generic memories' that are relatively resilient to degeneration. At a descriptive level, these 'generic memories' are an efficient way to store a huge amount of information, so we can re-cognise that we saw a 'car', even if we forget what kind of car, and 'tree' can make us think of both apple trees and family trees. This much is unremarkable, but Goldberg suggests that this kind of generic memory also affords a kind of 'prescriptive knowledge' so that the range of situations to which our 'know-how' can be applied is wider than for people without such broad generic memory. [131] Barbara Strauch has recently developed this idea, arguing at the RSA that the middle-aged brain is more flexible and more capable than previously thought.[132]

3.1 PIAGET FOR 21ST CENTURY GROWN-UPS

Jean Piaget's theory of human development is often considered passé and usually only discussed with reference to children, but the premise of his world view is hugely relevant to the cognitive challenges we face, and applies throughout the lifespan. Piaget used a variety of experiments to illustrate that children frame their experience with internal consistency and logic that become clear when you examine the patterns in their mistakes. These psycho-logics develop through a process of assimilating experience through existing frames of reference and accommodating new perspectives by gradually changing the frames. This ongoing process features a succession of equilibriums, sometimes called 'stages', characterised as sensorimotor, preoperational, concrete operational and formal operational.[133]

However, Piaget is poorly understood because he is identified with these stages of intellectual progress, and characterised as a developmental psychologist. Piaget, however, described himself as a 'genetic epistemologist' and this distinction has relevance in the context of understanding the interplay of biological and social systems. Piaget's focus of concern was the origins (genesis) of knowledge (epistemology) and his model of human development arose from open-systems evolutionary biology. Development, for Piaget, concerned the extent to which an organism succeeded in differentiating itself from (and so relating itself to) the world, and this process continues throughout the lifespan.[134]

There are several important theories of adult development that have grown out of Piaget's insight, but few that take the biological perspective as integral. Classic theories include Lawrence Kohlberg's theory of moral development, George Valliant's progressive 'Wisdom of the Ego' Loveinger's stages of ego development, Kitchener's model of post-formal operations, and Carol Gilligan's critique of the male-centric traditional models.[135] There is also a huge body or theoretical and empirical work described as 'neo-Piagetian'.[136] Moreover, Peter Suedfeld's research on Integrative complexity, which measures our capacity to differentiate and integrate perspectives, is also very relevant to our cognitive challenges and has been applied to issues as diverse as responses to terrorism, predicting violence and understanding the Cuban Missile Crisis.[137]

We focus on Robert Kegan's work because his theory has enormous explanatory power, is empirically grounded, and the social relevance of the challenge of growing in mental complexity is presented very clearly and tangibly.[138] Kegan uses his acute understanding of Piaget to argue that it is this disembedding process that drives the growth of mental complexity in adulthood:[139]

This evolutionary motion is the prior (or grounding) phenomenon in personality; that this process or activity, this adaptive conversation, is the very source of, and the unifying context for, thought and feeling; that this motion is observable, researchable, intersubjectively ascertainable;(…) and that unlike other candidates for a grounding phenomenon, this one cannot be considered arbitrary or bound over to the particularlities of sex, class, culture or historical period.[140]

130 Bill Clinton at Davos talking about Ken Wilber's A Theory of Everything, [Online], Available: http://www.youtube.com/watch?v=GEjKr2gA8Wk; see also, Wilber, K. (2001). *A Theory of Everything: An integral Vision for Business, Politics, Science and Spirituality.* St. Ives: Gateway Publishing.

131 Goldberg, E. (2005). *The Wisdom Paradox: How your Mind can Grow Stronger as your Brain Grows Older.* New York: Simon and Schuster.

132 Strauch, B. (RSA Events, 6 April 2011). *The Secret Life of the Grown-Up Brain, [Online], Available:* http://www.thersa.org/events/video/vision-videos/barbara-strauch

133 Piaget, J. (1952). *The Origins of Intelligence in Children.* New York: International University Press. (Original work published 1936.)

134 Kegan, R. (1992), op. cit.

135 Some classic texts include: Erikson, EH. (1950). *Childhood and Society.* New York: Norton; Loevinger, J. (1976). *Ego Development.* San Francisco: Jossey-Bass; Gilligan, C. (1993). *In a Different Voice.* Harvard University Press; Valliant, G. (1998). *The Wisdom of the Ego.* Harvard University Press; Kohlberg, L. (1981). *Essays on Moral Development, Vol. I: The Philosophy of Moral Development.* San Francisco, CA: Harper & Row.

136 For a succinct introduction and overview, see: http://en.wikipedia.org/wiki/Neo-Piagetian_theories_of_cognitive_development

137 See for example: Suedfeld, P. & Leighton, DC. (2002). Early communications in the war against terrorism: An integrative complexity analysis. *Political Psychology*, 23, 585-599.

138 Lahey, L., Souvaine, E, Kegan, R, Goodman, R, & Felix, S. (1988). *A Guide to the Subject-Object Interview: Its Administration and Interpretation.* Cambridge, MA: The Subject-Object Research Group, Harvard Graduate School of Education.

139 Kegan, R. (1992). *The Evolving Self.* Cambridge MA: Harvard University Press.

140 Ibid. See page 44.

It is in the attempt to support this evolutionary motion that we use the brain to foster reflexivity. Becoming aware of 'the conditions of our actions' (Giddens) is about disembeding ourselves, about making object what we were previously subject-to. To illustrate, Kegan makes the point, while describing why a young child at a preoperational level looking at people from a high vantage point thinks the people really are small, rather than merely looking small:

He cannot separate himself from them; he cannot take them as an object of his attention. He is not individuated from them; he is embedded in them. They define the very structure of his attention. For the preoperational child, it is never just one's perceptions that change; rather the world itself, as a consequence, changes.[141]

While most adults may consider themselves free of such constraints, we are all subject to certain structures in our perception that determine how we know things. It is difficult to see our frames of reference because we see *with* them and through them. You might say we are 'subject-to' them, and that we can only begin to move beyond them when we can take them as 'object' and disembed ourselves from them. In this sense 'How we know' is the basis for competencies more generally:

Engineered behaviour and rote learning seldom travel well beyond the narrow contexts in which they were taught….the adult of the 21st century will need to be able to travel across a wide variety of contexts. So when I suggest that 'competence' (is) first a question of how we know, I do not mean this to exclude the question of how we behave or what we know. I just mean that the first question is prior to the other two.[142]

It is important to grasp this point, because it has enormous practical relevance. According to a systematic study commissioned by The OECD the kinds of competencies required for flourishing in the modern world demand forms of mental complexity that are not widely available.[143]

For instance, people need to "interact in socially heterogeneous groups" which is particularly relevant in a pluralistic, multicultural society, but difficult because it involves relating well to others, cooperating, and managing and resolving conflicts. Individuals need to learn how to join and function in groups and social orders whose members are from diverse backgrounds and also how to deal with differences and contradictions that arise. Individuals also need to learn to "act autonomously" which means managing their lives in meaningful and responsible ways by exercising control over their living and working conditions. The abilities to act within a larger context, to form and conduct life plans and personal projects, and to defend and assert one's rights, interests, limits, and needs are also crucial for participating effectively in the wider aspects of society, including the workplace, in personal and family life, but especially in civil and political life.[144]

These kinds of behavioural injunctions do not sound unreasonable, but they ask a lot of our ability to distance ourselves from our social conditioning and our emotional reactions. Having surveyed the literature on relationships, work, schooling and psychotherapy, Kegan highlights what he calls the 'hidden curriculum' of these aspects of society- i.e. the implicit expectations on 'how we know'. Kegan begins by arguing that the overwhelming majority of expected competencies require us to be well socialized, self-reflective, abstract-thinking, and value-bearing persons, but notes that these competencies alone are not sufficient.[145]

We are also required:
(1) *to gain some distance from the socializing press so that we can look at and make judgments about the expectations and claims that bombard us from all directions — whether it be as personal, blunt, and close-at-hand as our children telling us "everyone else's parents let them," or as public and subtle as the messages of male-entitlement (or other arbitrarily advantaged in-groups) that still saturate most democratic societies;* **(2)** *to be able not only to identify an inner life of feelings and thoughts but to take responsibility for the fact that we are the creators (not merely the locus) of those feelings and thoughts — i.e., it is not enough to reflectively identify the origins of our dysfunctional behaviours, thoughts, and feelings in our early family experience, as if we could only become more astute audience members viewing the drama of our inner psychologies; rather we are expected as mature adults to become more like playwrights who can jump on stage and re-author the scripts of the dramas themselves;* **(3)** *and* **(4)** *to create a more complex system of abstractions or values — a whole framework, theory, or ideology — which generates distinct abstractions or values, prioritizes them, and internally resolves conflicts among them.*[146]

141 Ibid. See page 29.

142 Kegan, R. (2001). Competencies as Working Epistemologies: Ways we Want Adults to Know. In DS, Rychen & LH. Salganik (Eds), op. cit.

143 Rychen, DS. & Salganik, LH. (Eds), (2003). *Key Competencies for a Successful Life and a Well-Functioning Society. Hogrefe & Huber Publisher,* [Online], Available: http://www.hogrefe.com/program/key-competencies-for-a-successful-life-and-a-well-functioning-society.html

144 DS. Rychen & LH. Salganik (Eds). (2001) and (2003), op. cit.

145 The RSA has tried to apply this insight to the challenge of public participation. See Rowson, J, Kalman, M, and Dellot, B. (Forthcoming 2011). *The Hidden Curriculum of the Big Society* (provisional title). London: RSA.

146 Kegan, R. (2001), op. cit.

Our emphasis on neurological reflexivity is about raising awareness about these 'reality-framing tendencies of society', including the reality framing tendencies of widespread but often erroneous views of our brains and behaviour.

These last four expectations, outlined by Kegan, and endorsed by the OECD study, are all consonant with the kinds of transformative learning that underpin our vision to our vision of 21st century enlightenment. However, in Kegan's theoretical model of adult development, this kind of perspective on oneself only occurs at the 'self-authoring' level of development, while most of the adult population function at the level of the 'socialised mind'.[147]

As with Piaget, we should not fixate on the stage view, and the implicit hierarchy, but rather stick to the question of what we are expecting people to disembed themselves from, and what we need to do to encourage that kind of way of knowing. Kegan highlights this mismatch as follows:

The expected competencies that I identified in my survey outstrip the third order capacities of "the socialized mind" and call for a qualitatively even more complex "self-authoring mind" which (…) retains but subordinates the mental structures of the third order on behalf of an internally generated authority — which gives the self distance from both its own mental productions and the reality-framing tendencies of society.

Our emphasis on neurological reflexivity is about raising awareness about these 'reality-framing tendencies of society', including the reality framing tendencies of widespread but often erroneous views of our brains and behaviour. This attempt to get people to think and discuss the conditions of their action is one way to attempt to develop mental complexity. This motivation is empirically grounded, because what is known about the distribution of mental complexity in the adult population of modern democratic societies is tentative, but consistent. Even among highly educated, resource-rich, middle-class, professional samples, while the fourth order of mental complexity is certainly present, a majority of subjects in various studies do not appear to have fully developed this level of complexity.[148] Kegan makes it clear why this matters:

The third order, the socialized mind, is an adequate order of complexity to meet the demands of a traditionalist world, in which a fairly homogeneous set of definitions of how one should live is consistently promulgated by the cohesive arrangements, models, and external regulations of the community or tribe. Modern society is characterized by ever-expanding pluralism, multiplicity, and competition for loyalty to a given way of living. It requires the development of an internal authority which can "write upon" existing social and psychological productions rather than be "written by" them.[149]

If one accepts these findings, it means that the requisite competencies may comprise a curriculum that is 'over the heads' of most of the people expected to work with it. This curriculum needs to be presented with a mixture of support and challenge, getting adults to engage in education not merely with a view to skill acquisition but learning about their own forms of biological embodiment and social embededness to grow in mental complexity:

The gap between the mental demands implicit in our suggested competencies and the mental capacities of the "student" actually provides a heretofore missing intellectual foundation for the purposes of adult or lifelong education that is as strong as the foundation which exists for the education of the young — namely, education not merely for the acquisition of skills or an increase in one's fund of knowledge, but education for development, education for transformation.

The RSA's approach to behaviour change speaks to this missing intellectual foundation. In Kegan's terms, we are in the process of helping people to move from *being* the conditions of their action to *having* those conditions, and helping them to shape their lives with an awareness of them.

147 Kegan, R. (2001), op. cit

148 Kegan, R. (2001), op. cit.

149 Ibid. These developmental levels are assessed by the two measures designed to identify the complexity of a person's working epistemology or 'way of knowing'. Other developmental models use different empirical methods, but in Kegan's case the two measures are the Subject-Object Interview (SOI) (Lahey, L. et al. (1988). *A Guide to the Subject-Object Interview: Its Administration and Interpretation.* Cambridge: The Subject-Object Research Group, Harvard Graduate School of Education) and the Loevinger Sentence Completion Test (SCT) (Loevinger, J, & Wessler, R. (1970). *Measuring ego development: Volume I. Construction and use of a sentence completion test.* San Francisco: Jossey-Bass). TheSOI is an hour-long structured interview procedure in the Piagetian tradition in which the subject's construction of real life contents is actively probed until the most complex epistemologies available to the subject have been clarified. The SCT is a written test in which the subject completes 36 sentence stems; each completion is separately analysed and scored, leading to an assessment of the level of complexity of the subject's overall frame of reference.

All these factors (habits, attention and decisions) appear at first to be individualistic and asocial, but turn out, on reflection, to be deeply influenced by social factors.

150 *The Works of Samuel Johnson, LL.D: With An essay on his life and genius, Volume 1 (p. 339).* Google eBook.

151 Grist, M. (2009), op. cit.

152 Biographical page for Karl Friston, Welcome Trust Centre for Neuroimaging, UCL, [Online], Available: http://www.fil.ion.ucl.ac.uk/~karl/ Friston develops this idea in a variety of papers, and the main argument is outlined in Grist, M. (2009), op. cit.

4. TRANSFORMATIVE LEARNING IN PRACTICE: HABITS, ATTENTION AND DECISIONS

If the aim is to 'wake people up' by disseminating behavioural science in a way that allows people to act with an awareness of the conditions of their action, how do we do it? What kinds of knowledge are most helpful? What exactly should we be reflexive *about*? One useful way to structure this awareness is through three related themes that are relevant to almost every important aspect of our behaviour, namely our habits, our attention and our decisions. All these factors appear at first to be individualistic and asocial, but turn out, on reflection, to be deeply influenced by social factors.

There is abundant evidence that we do not behave like 'homo economicus', and it is peculiar that we continue to vaunt a model of rationality that directly and consistently contradicts human judgement. Instead we need to move towards a more *reasonable* form of reflexive rationality, in which we no longer express surprise at humans persistently behaving irrationally in classical economic terms, and begin instead to encourage people at every level of society to make plans and take decisions on the basis of what we know about the social influences, biases and heuristics that shape our framing of choices.

Human beings are often described as creatures of habit, but we find it very hard to form new and positive habits, and then keep them. We argue that we need to move towards proactive habituation in which we recognise the powerful but subtle forces of inertia that prevent people from living the lives they want to live, and help people to shape the habits they want through the provision of institutional and social commitment devices.

Attracting and holding our attention, principally through screen imagery, has more economic value than ever before. This pull from the burgeoning 'attention economy' compounds the fact that our minds naturally ruminate about the past or fret about the future. Far from being an esoteric issue for the private realm, our public health (physical and mental) and social fabric suffers due to our lack of skill in being present and attentive to what is going on within us, around us and between us. We need to place much greater value on embodied awareness and support forms of reflective practice, such as mindfulness, that help people regain some control over what they do with their attention.

4.1 HABITS

> *The chains of habit…are too weak to be felt until they are too strong to be broken.* — **Samuel Johnson**[150]

One of the main ideas to emerge from the Social Brain Steering group in year one of our project is that the dynamics of human behaviour are best captured in a three-part rather than two-part relationship. At the neuroscientific level, it is accurate to divide our brains into a controlled system and an automatic system, in which our automatic and largely unconscious behaviours are supplemented and informed by occasional conscious deliberation. However, when you consider the relationship of these two systems operating within the environment, our behaviour is mostly habitual, which means that we act without thinking in situations that appear familiar.[151]

Habits are important because they define who we are, but also because they can be changed. You breathe automatically, you see automatically, but you think, decide and act habitually. Habits are driven by our automatic (principally limbic) system, and often feel automatic due to the way our brains predict events, and reward us when those predications are accurate, principally through the release of the 'feel good factor' in the form of dopamine. Karl Friston has built a general theory of cognition out of this idea, which contends that our brain is continually interpreting information contextually with a view to acting in the world. We do not perceive as a prelude to considering how to act, but rather perceive in the context of available actions, and our interpretation of the world is suffused with our prediction of what we are expected to do next.[152]

Friston uses an onion metaphor (not anatomically indicative) to explain the relationship between our brains and the world. At the outermost layer, completely automatic, physiological sensory processing happens outside of our conscious awareness. At the next level inwards, habitual learning takes place with our conditioned responses to familiar stimuli happening with minimal thought. At the innermost layer, our controlled processes occur. Deliberation and reflection occurs when the world does not immediately conform to our predictions. The intriguing aspect of Friston's theory is that we predict in different ways, and our predictions are coloured by our self-concept and social conditioning. The ways in which our automatic and habitual processes contextualise the world below consciousness directly circumscribes our ability to learn, because it affects our openness to experience.

Francisco Varela makes a similar claim arguing that it is principally at 'breakdowns' — moments where we do not have a habitual reaction available to respond to an unexpected stimulus, that consciousness is brought forth to reconstitute our 'micro-worlds' — to refashion our interpretation of the lived environment so that we can intelligibly act within it.[153]

Moreover, habituation appears to have a clear neurological basis. Two groups of neurons, ventral tegmental and substantia nigra pars compacta areas, and the dopamine they release, are critical for reinforcing certain kinds of behaviour. In studies with monkeys, it seems that when they learn to expect a squirt of juice after a musical tone, the relevant neurons fired rapidly, but after several iterations of this process, the neuronal firing gradually falls back to baseline. The point is that we adjust to new circumstances very quickly. It is hard for people to keep up enthusiasm for behaviour changes they start, like a new exercise regime, because although you initially get dopamine rewards that reinforce the forming of a novel habit, after just a short time, this reward will wane and you will be relying on willpower, which we know to be scarce and depletable.[154] [155]

Despite this neurological basis for habituation, it is important to grasp that habits are acquired and conditioned behaviours rather than strictly automatic. They are second nature rather than first, and therefore amenable to the influence of deliberation and reflection, and also to changes in our environment. By using whatever conscious control you have, you can shape your living conditions, your 'habitat', such that your automatic system is not given the fuel of familiarity, and your habitual behaviour is not repeatedly reinforced. Through deliberation, you can also change your sense of who you are and what you value. For instance reflecting on social goods with fellow citizens might make you more pro-social, thereby recalibrating habits by no longer seeking the same kind of reward.

The RSA Steer approach seeks to bring people's conscious attention to the power and strength of automaticity, while also respecting the role of conscious deliberation, in particular the role it can play in shaping our habitats.[156] However, while we know a lot about how hard it is to change bad habits, we know much less about how we form good habits. A recent study authored by Phillipa Lally at UCL suggests that it takes about 66 days for a behaviour to become habitual, by which she means completed without thinking about it.[157] In other words it is not easy to form a good habit. You need repeated practice, and to find a way to keep motivation high. As Canadian magician Doug Henning once elegantly put it:

The hard must become habit. The habit must become easy. The easy must become beautiful.

This point explains why habituation has a social dimension. We rarely succeed in changing our habits and thereby shaping our lives in the way we want to if we 'go it alone'. Instead we need what Avner Offer called 'commitment devices'. Offer argues that humans have unhitched themselves from the institutions that are protective against the inherent short-sightedness of the human condition, including religious institutions.[158]

For the hard to become habit, we need social reinforcement, for the habit to become easy we need to shape our habitats accordingly — places to practice and people to teach us or work with, and for the 'easy to become beautiful' we need social rewards, such that the new found habit is socially endorsed. The issue is therefore not so much to change people's habits, but to make the social process of habituation more consciously shared. However, while the social dimension is important, we also need to pay close attention to the way the habituation process arises in ourselves. In Kegan's terms, we need to be less subject to our habits, and make them the objects of our attention.

153 Varela, F. (1999). *Ethical Know-How: Action, Wisdom and Cognition.* Palo Alto, CA: Stanford University Press.

154 The main researchers in this area have developed their ideas over time. For the most recent reference see Ozdenoren, E, Salant, S, & Silverman, D. (2010). *Willpower and the Optimal Control of Visceral Urges*, [Online], Available: http://www-personal.umich.edu/~dansilv/willpower.pdf

155 For full references and further details See Grist, M. (2009), op. cit.

156 Bargh, JA, & Chatrand, TL. (1999). The Unbearable Automaticity of Being. *American Psychologist,* July 54 (7), 462-479.

157 Lally, P, van Jaarsveld, C, Potts, H, & Wardle, J. (2010). How are habits formed: Modelling habit formation in the real world. *European Journal of Social Psychology,* October, 40 (6), 998–1009, [Online], Available: http://onlinelibrary.wiley.com/doi/10.1002/ejsp.674/abstract

158 Offer, A. (2006). *The Challenge of Affluence: Self-Control and Wellbeing in the United States and Britain since 1950.* Oxford: Oxford University Press.

4.2 ATTENTION

> *Understanding and managing attention is now the single most important determinant of business success.* — **Thomas Davenport and John Beck**[159]

The Positive Psychologist[160] Mihalyi Czikzsentmihalyi once said: 'Where attention goes, energy flows.' The challenge is that we live in an increasingly distracting world with multiple demands on our attention, so we need a method to make our attention, the touchstone of consciousness, more readily available to us.

Technological change in particular makes it difficult to make best use of this precious resource. The internet is barely five thousand days old, so the evidence is rightly contested,[161] but Baroness Greenfield has argued that our reliance on IT may be diminishing our attention spans, undermining our appreciation of narrative and standardising thought.[162]

Richard Watson argues that the downside of permanent connectivity is continual distraction: He refers to the quality of our thinking as increasingly "shallow, narrow, cursory, hurried, fractured and thin". This is problematic because originality largely depends on thinking that is deep. Serious creativity, whether it be in business, science or the arts, is largely dependent on thinking that is calm, concentrated, focused, attentive and above all reflective."[163]

Kenneth Gergen describes the growth of 'absent presence', in which people are physically together but mentally apart.[164] And Nicholas Carr suggests Google may be making us stupid, by undermining depth and reflection.[165]

Taken together, these points suggest we may be paying less *quality* attention, not least to each other. Mobile technology is now ubiquitous, addictive and increasingly prescribed. Sherry Turkle of MIT has shown, with a study of over 500 Children, that feelings of hurt and jealousy relating to parents not being available due to use of technology are now pervasive.[166]

A major challenge in the early twenty first century is to learn to keep control of our attention, and learn how to be more fully present and aware of what we are doing and who we are with. This objective can be achieved in a variety of ways, and various social enterprises have responded to this perceived need, for instance, the Slow Movement, working against 'the cult of speed', while many advocate turning off phones and laptops for a better 'digital/analogue balance'. Such movements and suggestions are valuable, but the most reliable way to improve our attention is to work with our attention on a more intimate and regular basis, which requires some form of reflective practice, through which we improve the quality of our relationship to our own thoughts.

If we are serious about transformative social change, we need to at least be open to the idea that transformation begins at the level of consciousness. Perhaps our first step should simply be to understand ourselves at a more fundamental level, not just from the perspective of science and reason, but experientially and viscerally. We problematize institutions, people, social systems and structures, policies and places, but we rarely problematize our own wayward minds, and typically take them for granted. We see, think and act through our minds, but rarely look at them directly with deep curiosity and discernment. As Tolstoy put it, many talk of changing the world, but few think of changing themselves.[167]

'Attention' is a broader theme than a single form of practice, but the injunction to 'know thyself' needs to be taken as an experiential injunction, and not merely a philosophical one. We typically resist self-knowledge of this form, because even if we periodically glimpse what Tim Parks calls 'the clamour' inside our minds — something that most forms of meditation show you, we are usually too scared to look more closely, and keep the disquieting insight at bay through denial and distraction.[168]

There is a deeper point that the ratio of effort to impact is arguably greatest at the individual level. There is now abundant scientific evidence that we can change ourselves quite quickly and very tangibly, and in ways that make us less stressed, more empathetic, more productive and happier.[169] Richard Davidson's research group has shown significant brain changes as a result of

159 Davenport, T, & Beck, J. (2001). *The Attention Economy: Understanding the New Currency of Business.* Cambridge, MA: Harvard Business School Press.

160 For details of Positive Psychology more generally see http://en.wikipedia.org/wiki/Positive_psychology

161 For a balanced examination of the evidence, see Howard-Jones, P. (2011), op. cit.

162 Greenfield, S. 'Attention, Please'. A review of Carr, N. (2010). *The Shallows: How the Internet is Changing the Way We Think, Read and Remember.* London: Atlantic Books. In *Literary Review,* [Online], Available: http://www.literaryreview.co.uk/greenfield_09_10.html

163 Watson, R. (RSA Events, 21 October 2010). *Future Minds,* [Online], Available: http://www.thersa.org/events/video/vision-videos/future-minds

164 See Gergen, K., [Online] Available at: http://www.swarthmore.edu/Documents/faculty/gergen/Cell_Phone_Technology.pdf

165 Carr, N. (2010). *The Shallows: What the Internet may be doing to our Brains.*New York W. W. Norton & Co.

166 See Turkle, S. (2011, June 1st). *Alone Together,* [Online], Available: http://www.thersa.org/events/video/vision-videos/sherry-turkle

167 The Garrison Institute, based outside New York City, is a notable exception, and places the connection between contemplative practice and social change at the heart of their mission. See http://www.garrisoninstitute.org/ for more details.

168 Rowson, J. (Chair). *Mindfulness: The key to a healthier society?* (RSA Debate, 9th September 2010), [Online], Available: http://www.thersa.org/events/audio-and-past-events/2010/mindfulness-the-key-to-a-healthier-society

169 Halliwell, E, & Heaversedge, J. (2010). *The Mindful Manifesto.* London: Hay House.

...one of the defining rules of 'Nudge' is to 'expect error'.[173]

meditation, associated with the development of greater wellbeing; for instance there is less happening in amygdala and right prefrontal cortex. Before and after brain measures of an 8 week mindfulness course were enough to show a significant difference. More profoundly, areas associated with attention and sensory processing — cortical thickness — are directly related to length of time meditating.

A more recent study suggest that participation in the eight week Mindfulness based stress reduction course is associated with changes in grey matter concentration in brain regions involved in learning and memory processes, emotion regulation, self-referential processing, and perspective taking.[170]

While the Neuroscience is clear about personal and social benefits relating to mindfulness practices immediately after the eight week course, we know that these benefits are directly related to the amount of practice one undertakes, and the challenge of continuing the practice is a challenge of habituation. We need more than self-control, we need access to what Avner Offer calls commitment devices, and imagination about what these might look like in terms of social and technological resources. John Teasdale captured the centrality of this point as follows:

Mindfulness is a habit, it's something the more one does, the more likely one is to be in that mode with less and less effort… it's a skill that can be learned. It's accessing something we already have. Mindfulness isn't difficult. What's difficult is to remember to be mindful…[171]

So how can we remember to be mindful, and be capable of paying attention while surrounded by a million social and technological distractions? There are two promising approaches. The first is technology itself, and its role in literally re-minding us, through applications designed to bring your attention back to the present. However, our current focus is the role of social groups in helping people to maintain their practice. With the RSA Fellowship we are beginning to explore how groups might best be designed (or indeed left alone to emerge) to support the continued practice of mindfulness in a secular framework.[172]

While we need social support to continue to help keep control of our attention, and make mindfulness, broadly conceived, more habitual, we also need to learn to pay attention to the processes through which we reach decisions.

4.3 DECISIONS

RSA Social Brain began as a response to the crumbling foundations of rational decision-making, and a growing appreciation for the fact that the calculating de-contextualising self-interested behaviour that is assumed in much of neoclassical economic theory is rather rare in social practice, where we care more about cognitive consistency, social norms and a desire to feel like we are 'doing the right thing'.[173]

The wider public can benefit from learning about the real underpinnings of their decisions, including the basic divide between instinctive or automatic decisions and decisions that are taken after a period of consideration. It is beneficial for people to reflect on these conditions, and to learn about typical heuristics and biases like the 'endowment effect' which explains our peculiar aversion to loss, our significant discounting of the future relative to the present which impacts on savings behaviour and climate change, and the fact we place more importance on relative rather than absolute value, which is reflected in various studies showing people would prefer a smaller income that was high relative to peers to a higher income in absolute terms that is low relative to peers.[174]

These factors, and much more, are now the subject on an enormous literature. While academics strive to clarify how they relate to each other as part of a process of reworking the foundations of economic models, our role is merely to share these insights with people, and help them to appreciate that rationality is rare, and should not necessarily be expected as normal behaviour. Indeed, one of the defining rules of 'Nudge' is to 'expect error'.[175]

This message that we are not rational is not a simple one to convey, because we also appear to have a somewhat craven need for rationalisation. In fact, the social presumption of rationality is so strong that we are inclined to find and create reasons for our actions, or even invent them, merely to preserve the illusion that our choices are freely chosen.

This social imperative of cognitive consistency is the reason why vegetarians, for example, are frequently cross-examined, often by an entire dinner table, on the rationale and consistency of their preference to avoid the meat that most people eat. At an anecdotal level, it seems the ethical

170 Hölzel, BK. et al. (30 January 2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research,* 191 (1), 36-43, [Online], Available: http://www.psyn-journal.com/article/S0925-4927(10)00288-X/abstract

171 Halliwell, E. & Heaversedge, J. (2010), op. cit.

172 Application to Templeton Foundation: Rowson, J. (December 2010). *Towards a Mindful Society.* (Internal RSA Document).

173 Grist, M. (2009), op. cit.; Grist, M. (2010), op. cit.

174 Haidt, J. (2006). *The Happiness Hypothesis: Finding Modern Truth in Ancient Wisdom.* New York: Basic Books.

175 Thaler, R. ((RSA Events, Thursday 17 July 2008).) *Nudge: improving decisions about health, wealth and happiness,* [Online], Available: http://www.thersa.org/events/video/archive/richard-thaler

and environmental gains achieved through eating less meat are given relatively little attention, compared to the social sanction of highlighting perceived inconsistencies in the individuals making the effort. For example, the inconsistency of wearing a leather belt while avoiding a beef stew appears to be more salient in social company than the fact that, for example, if every American reduced meat intake by one meal a week, it would have the equivalent environmental impact as taking five million cars off the road.[176]

In a recent talk on 'Eating Animals' at the RSA, Jonathan Saffron Foer argued that most meat eaters simply do not want to know about the conditions on factory farms, for fear that it would create unbearable cognitive dissonance. In light of animal suffering, and concomitant environmental degradation, Foer suggests people cannot reconcile their desire to enjoy the taste and cultural appropriateness of meat eating with their desire not to cause unnecessary suffering, so rather than stop eating meat, they prefer not to know about the suffering and the environmental harm:

We have such a resistance to being hypocrites that we would rather be fully ignorant and fully forgetful all the time.[177]

This claim is a strong one, but it is important to make this case because it is fundamental to the social influence on decisions, and supports the need to shape social norms, rather than merely being subject to them, for it is these norms that norm-alise our behaviour.

A similar point about the challenge of pervasive self-justification is made by Tavris and Aronson, who contend that there are very few conscious hypocrites in the world.[178] Indeed our capacity to rationalise our behaviour as being consistent with our beliefs is extraordinary, and we usually achieve this by shifting our beliefs rather than our behaviour, even if doing so paradoxically flies in the face of reason. As Tavris and Aronson put it:

All of us, to preserve our belief that we are smart, will occasionally do dumb things. We can't help it. We are wired that way.[179]

The point here is that our rationales for decisions are related to social values, in this case consistency. The process of neurological reflexivity should serve to make those social processes something we are more aware of, and can shape, rather than merely the conditions that tacitly define who we are. However, this process of learning involves familiarising ourselves with new information to the extent that we no longer have to consciously think about it when it comes up. We make most decisions on the basis of past experience, which is why decisions are closely linked to habits.

Iain McGilchrist makes a helpful distinction between reason and rationality in this regard, which is grounded in the divergent etymology of the two terms.[180] 'Reason' is human common sense, it is context sensitive, value-driven, metaphorical and suitably tentative, while 'rationality' is more machine-like, deterministic and true only relative to its own axioms which have been created, but are often wrongly treated as if they were real. McGilchrist suggests that "it is a distinction that has been understood and expressed in language since ancient times, and therefore is likely to have a substrate in the lived world (for McGilchrist, the two brain hemispheres)."[181]

Our tacit acceptance of homo-economicus may be partly the result of an over-reliance on rationality at the cost of reason, with a related tendency to treat adaptive challenges as technical problems. This point was highlighted by Economist Ha-Joon Chang, who has worked at Cambridge University and the World Bank:

You have to know that academic economists today are not even interested in the real world. In the economics profession today, interest in the real world is an indirect admission that you are not very good. If you are really smart you do really abstract mathematical modelling. If you are a bit less good you do econometrics, basically manipulating statistics. If you are really down in the pits you are interested in the real world…It's a strange academic culture… when you say these uncomfortable things, people refuse to listen to you.[182]

176 For a range of similar facts, see the National Resources Defence Council and Garrison Institute's initiative on creating a 'behavioural wedge' to reduce carbon: [Online] Available, http://www.nrdc.org/energy/files/billiontons4pgr_r3_final.pdf

177 Safran Foer, J. (RSA Events, 17 January 2011). *Eating Animals*, [Online], Available: http://www.thersa.org/events/video/vision-videos/jonathan-safran-foer

178 The same point is made by Robert Kurzban from the perspective that the brain is modular. See http://www.thersa.org/events/audio-and-past-events/2011/why-everyone-else-is-a-hypocrite

179 Tavris, C, & Aronson, E. (2007). *Mistakes were Made (but not by me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts (p. 38).* New York: Houghton Mifflin Harcourt.

180 Greek: nous; logos. Latin: Intellectus; ratio. German: vernunft; verstand. English: reason; rationality See McGilchrist, I. (2009, p. 330), op. cit.

181 McGilchrist, I. (2009), op. cit.

182 Ha-Joon Chang (2010, September 02) *23 Things They Don't Tell You About Capitalism,* [Online] Available: http://www.thersa.org/events/audio-and-past-events/2010/23-things-they-dont-tell-you-about-capitalism (quote at around 27 minutes).

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5. THE NEXT STEPS FOR THE SOCIAL BRAIN PROJECT: THE RSA SOCIAL BRAIN CENTRE

The Social Brain Project was principally about raising awareness of new theories of human nature. The broad emphasis was on marshalling available evidence to reframe default human behaviour as social and automatic rather than individual and reflective, and to consider the social, political and economic consequences of the emerging alternate view. The next stage of Social Brain is about making a distinctive and enduring contribution to the behaviour change agenda.

In 2012, the RSA will launch a Social Brain Centre. With the support of RSA Fellows and key partners, this new initiative will offer research and consultancy, training, and thematic events, on the best available science of human nature, to support individuals, groups and organisations in addressing their adaptive challenges.

We are principally concerned with personal and relational challenges that require reflection on the values and beliefs that underpin behaviours, and challenges that are best addressed by the people who have them. Our work will include training that builds on our reflexive-holistic approach to behaviour change, but we will also host thematic events and offer research and consultancy to address behaviour change challenges in all walks of life. We currently have experience of working with members of the general public, police officers and taxi drivers, but hope to extend into financial behaviour and mental health and wellbeing in the near future.

A detailed description of the Centre will be published in the next few months, but our model of change is currently informed by six working ideas that have emerged from the foregoing argument.

RSA SOCIAL BRAIN CENTRE: Six Working Ideas

1. **We cannot change ourselves without changing each other**
   Most behaviour change does not occur at the level of the individual alone. Not only do we rely on other people to achieve the changes we seek to make, but such behaviours spread through social diffusion, and there is no way of knowing where our influence ends.
2. **Complexity is more often the solution than the problem**
   To navigate a complicated world, we need complex minds. We need to work on having a 'relationship to our reactions', and when faced with multiple perspectives we should be able to both differentiate and integrate them.
3. **It is better to be reasonable than rational**
   Clear thinking matters, but the touchstone of our thought should not be abstract axioms and disembedded logic, but contextual sensitivity and concern for others.
4. **Paying attention is good for you**
   We are what we attend to, and there are increasing demands on our attention. We need some resistance to the power of adverts and the allure of technology. To avoid becoming slaves to the information and tools we use, we need to learn to pay closer attention to what is going on around us, within us and between us on a regular basis.
5. **If we want new habits we should work with our habitats**
   We are creatures of habit, but unlike most creatures we have considerable power to shape our habitats for purposes beyond our basic needs. Behaviour change is not mainly about willpower, but about using self-awareness to shape our environments so that our social and automatic brains align with our goals and values.
6. **The brain is a stimulant**
   The brain is something we all have in common, and share an interest in. We use information about the brain as a socialising device to stimulate collective self-awareness. Through reflecting on the social and automatic nature of the brain, we learn how to change our behaviour for the better.