

Neuroscience through the Headlines: Social and Ethical Issues in Communicating Brain Research



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What do we mean by neuroscience?



American Psychiatric Association
DSM-5 Development

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“Patients with mental disorders deserve better. NIMH has launched the [Research Domain Criteria \(RDoC\)](#) project to transform diagnosis by incorporating genetics, imaging, cognitive science, and other levels of information to lay the foundation for a new classification system. Through a series of workshops over the past 18 months, we have tried to define several major categories for a new nosology. This approach began with several assumptions:

A diagnostic approach based on the biology as well as the symptoms must not be constrained by the current DSM categories,

Mental disorders are biological disorders involving brain circuits that implicate specific domains of cognition, emotion, or behavior,

Each level of analysis needs to be understood across a dimension of function,

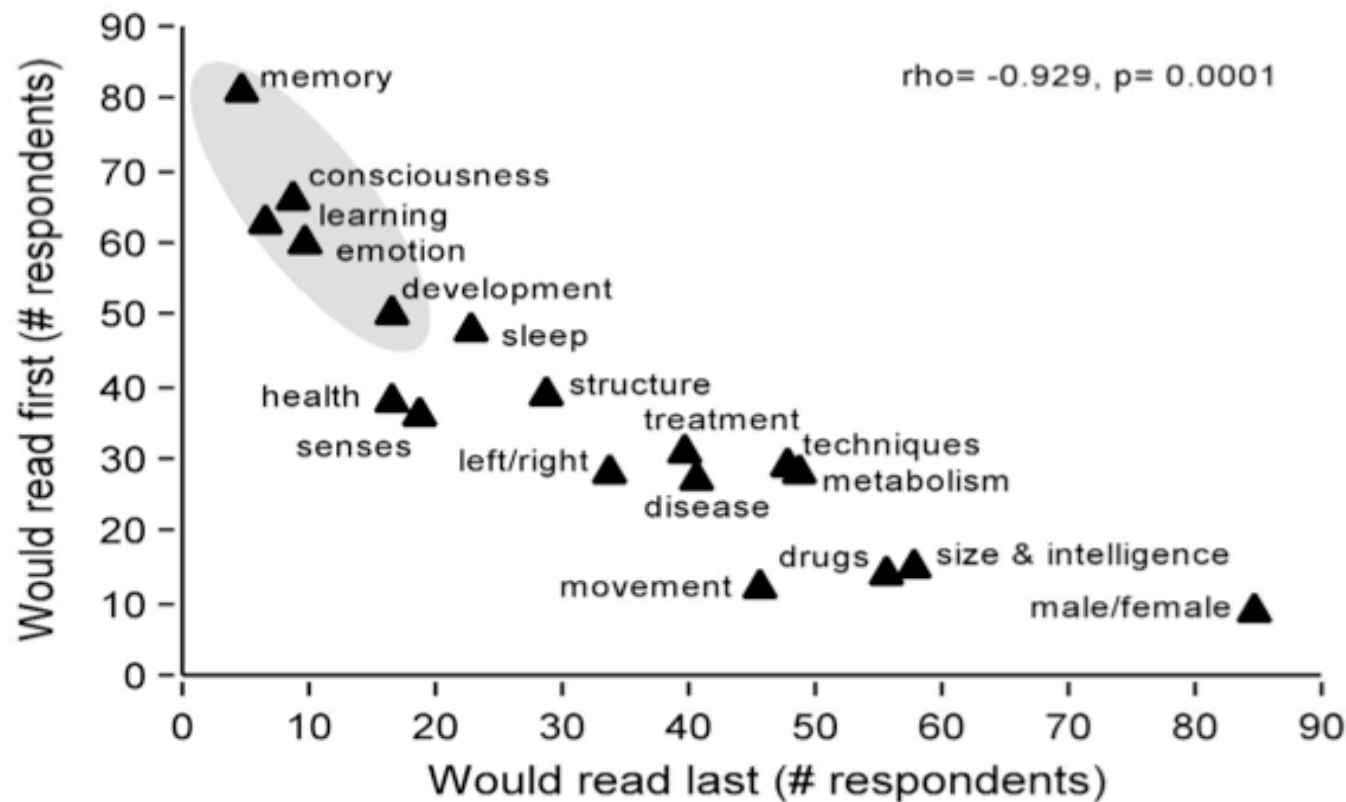
Mapping the cognitive, circuit, and genetic aspects of mental disorders will yield new and better targets for treatment”.



What does the public want to know about the brain?

Suzana Herculano-Houzel

Departamento de Anatomia, Universidade Federal do Rio de Janeiro, 21941-590 Rio de Janeiro – RJ, Brazil



Some very hot topics

- **Neuroimaging:** what do we really see when we look inside the brain?
- **Consciousness and coma:** is there anybody in there?
- **Deep brain stimulation:** is psychosurgery back?
- **Brain enhancement:** is it ethical to boost human cognitive skills with drugs or using brain computer interfaces?
- **Social neuropsychology:** neuroscientific basis of social interaction
- **Brain and law:**
 - can we look into the brain to seek the truth?
 - are we really responsible for our actions?



NEUROSCIENCE

«Between the science and the public stand the media»



Blakemore C. Neuroscience and the media:
the need for communication.

Neuroscience 1993; 57; 217-226.

Neurotalk: improving the communication of neuroscience research

Judy Illes, Mary Anne Moser, Jennifer B. McCormick, Eric Racine, Sandra Blakeslee, Arthur Caplan, Erika Check Hayden, Jay Ingram, Tiffany Lohwater, Peter McKnight, Christie Nicholson, Anthony Phillips, Kevin D. Sauv , Elaine Snell and Samuel Weiss

Box 1 | **Specific challenges for neuroscience communication**

Complexity of the brain

Conveying information about intricate molecular pathways, their interactions and their impact as understanding about the brain continues to emerge from varied neuroscience subspecialties.

Personal, philosophical and religious salience to mind and body

Advancing scientific inquiry into brain function and biology-based causes of behaviour that challenges the nature of 'belief', leading to new definitions of normal behaviour, increased understanding of how humans think and learn, and potentially socially charged attributions of moral responsibility.

Burden of CNS disease and impact on public health

Addressing the overwhelming personal and societal impact of diseases of the CNS, which engenders high awareness of, unfettered hope for and unsubstantiated hype around neuroscientific discoveries relating to diagnoses, treatments and cures.

Stigma of neurological and mental health disorders

Navigating negative social perceptions that persist about the causes of, and reasons for, mental health disorders and make meaningful public discussions about these conditions difficult if not impossible.

Recommendations and impact on neuroscience communication.

Recommendation	Impact on Neuroscience Communication
Promote a cultural shift	Investment and professional incentives that promote communication and engagement with the public. Interaction of neuroscientists with the public at all career stages. Venues and opportunities for the public to learn directly from neuroscientists and to share views about advances in neuroscience.
Create communication specialists	Neuroscience communication specialists who are skilled in engaging and interacting with the public. Legitimized efforts of neuroscientists who enjoy and are eager for public engagement opportunities. New partnerships between science journalists and public relations professionals and the neuroscience community.
Enable research on neuroscience communication	New methods for communicating neuroscience to the public based on empirical data. Identified gaps in and barriers to neuroscience communication. New era of responsiveness to public desire and need for knowledge about neuroscience.
Cumulative Recommendation Significantly improve the essential conversations between the public and neuroscientists about the science and the ethical, social, and policy implications of ongoing research.	



The journalist as an “early warning system”

Journal of Medicine and Philosophy
1999, Vol. 24, No. 2, pp. 108–129

0360-5310/99/2402-0108\$15.00
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The Journalist's Role in Bioethics

Albert Rosenfeld

March of Dimes Birth Defects Foundation

ABSTRACT

In the late 1950s and early 1960s, emerging advances in the biomedical sciences raised insufficiently noticed ethical issues, prompting science reporters to serve as a sort of Early Warning System. As awareness of bioethical issues increased rapidly everywhere, and bioethics itself arrived as a recognized discipline, the need for this early-warning press role has clearly diminished. A secondary but important role for the science journalist is that of investigative reporter/whistleblower, as in the Tuskegee syphilis trials and the government's secret plutonium experiments. Because the general public gets most of its information from the popular media, ways are suggested for journalists and bioethicists to work together.

Key words: bioethics, journalist's role, press.

fMRI in the public eye

Eric Racine, Ofek Bar-Ilan and Judy Illes

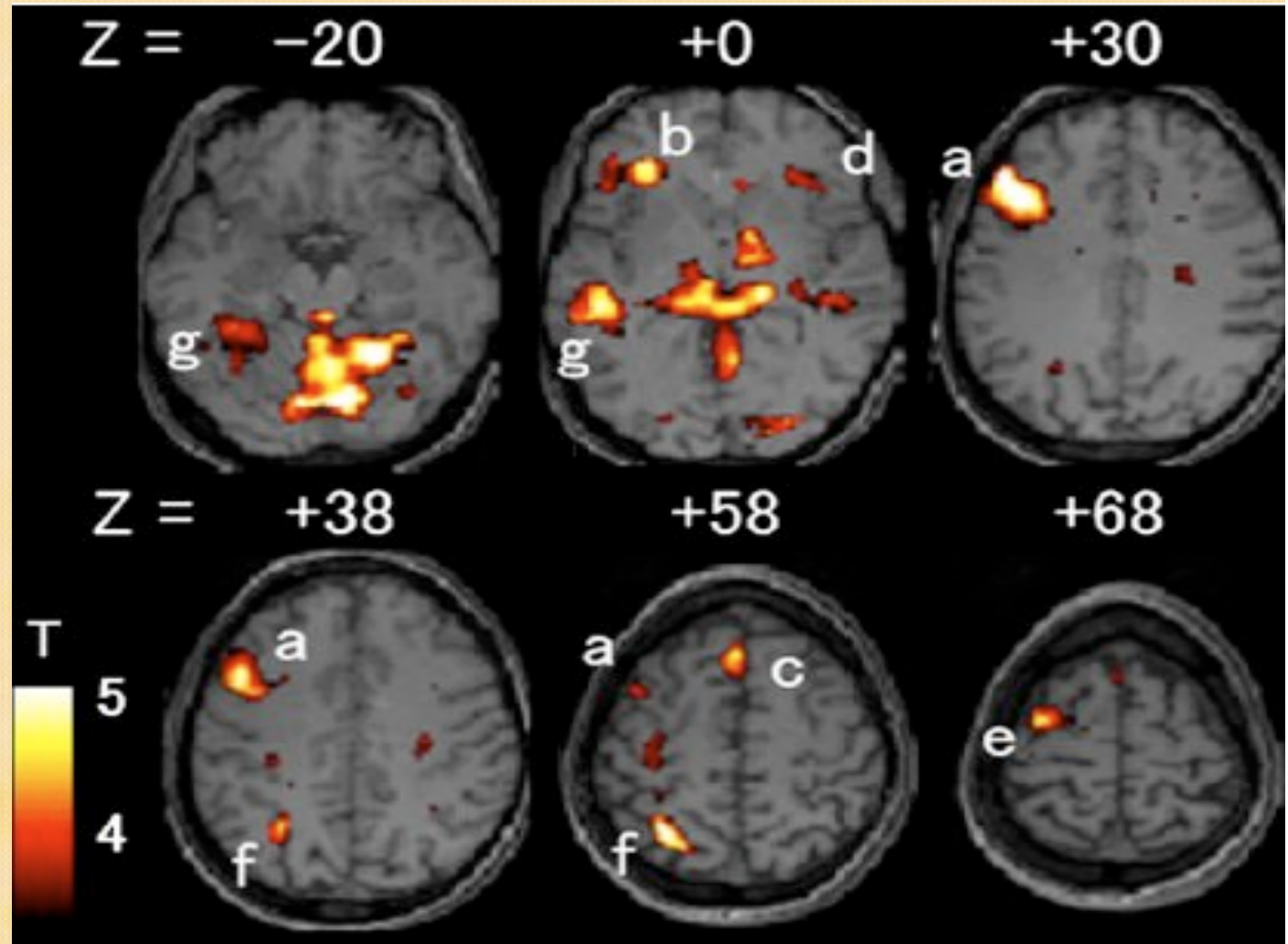
Abstract | The wide dissemination and expanding applications of functional MRI have not escaped the attention of the media or discussion in the wider public arena. From the bench to the bedside, this technology has introduced substantial ethical challenges. Are the boundaries of what it can and cannot achieve being communicated to the public? Are its limitations understood? And given the complexities that are inherent to neuroscience, are current avenues for communication adequate?

Functional neuroimaging techniques, such as functional MRI (fMRI) and positron emission tomography (PET), have evolved as key research approaches to studying both disease processes and the basic physiology of cognitive

phenomena in contemporary neuroscience. In the clinical domain, they carry hope for guiding neurosurgical mapping, monitoring drug development and providing new approaches to disease diagnosis and management at early, possibly even presymptomatic stages. However, issues relating to these capabilities, such as technical readiness and the possibility of disease screening in advance of effective therapeutic intervention, raise substantial ethical challenges for investigators, health care providers and patients alike. In basic neuroscience, increasing numbers of non-health-related fMRI studies that touch on our personal values and beliefs have also forced us to expand our ethical perspectives¹. The wide dissemination of this research, growing applications of the technology and continuously




Please, can you provide me a picture of the brain areas involved in...





Available online at www.sciencedirect.com

 ScienceDirect

COGNITION

Cognition 107 (2008) 343–352

www.elsevier.com/locate/COGNIT

Brief article

Seeing is believing: The effect of brain images on judgments of scientific reasoning ☆,☆☆

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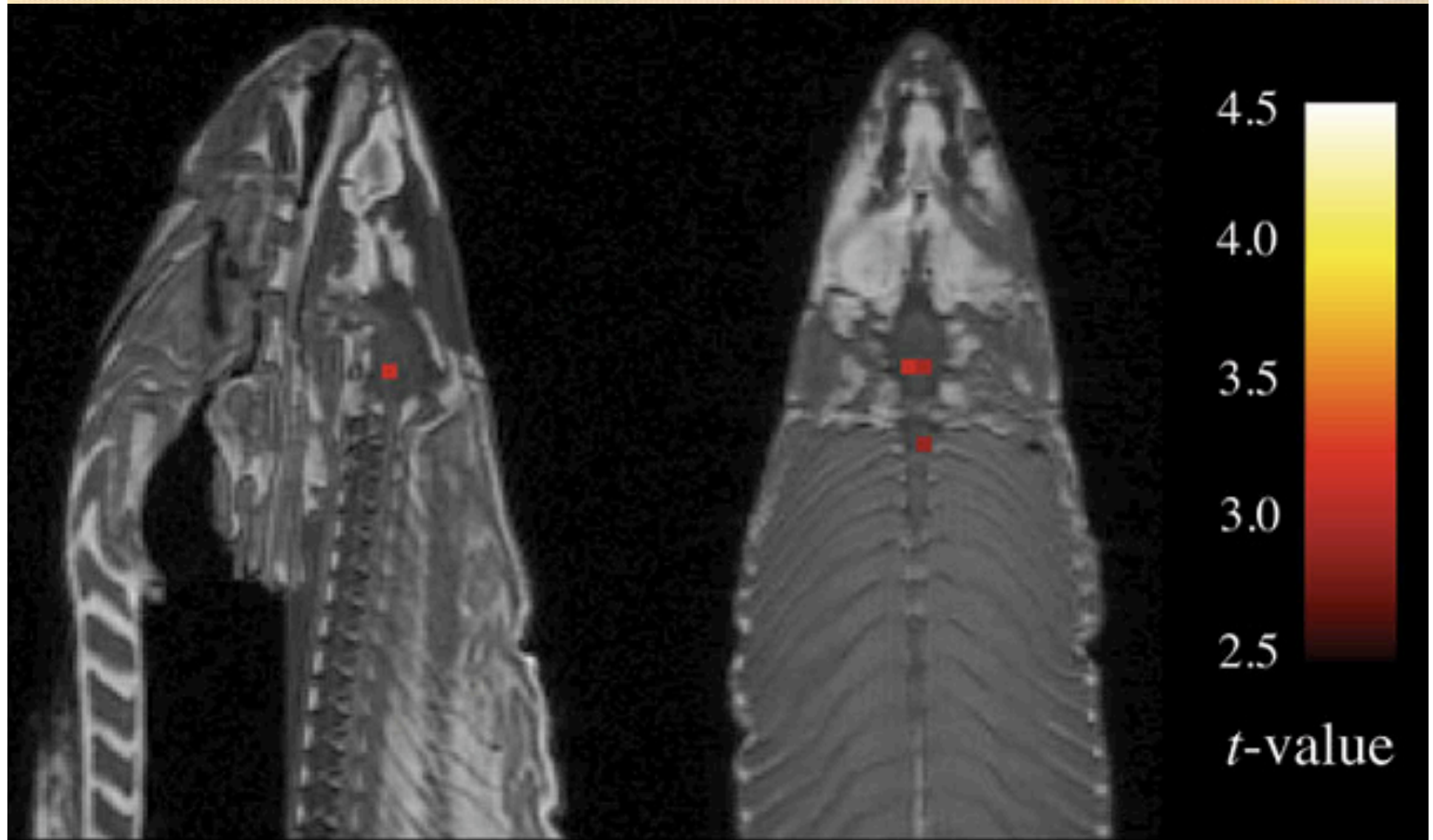
... A Particularly Persuasive Influence

Abstract

Brain images are believed to have a particularly persuasive influence on the public perception of research on cognition. Three experiments are reported showing that presenting brain images with articles summarizing cognitive neuroscience research resulted in higher ratings of scientific reasoning for arguments made in those articles, as compared to articles accompanied by bar graphs, a topographical map of brain activation, or no image. These data lend support to the notion that part of the fascination, and the credibility, of brain imaging research lies in the persuasive power of the actual brain images themselves. We argue that brain images are influential because they provide a physical basis for abstract cognitive processes, appealing to people's affinity for reductionistic explanations of cognitive phenomena. © 2007 Elsevier B.V. All rights reserved.

Keywords: Scientific communication; fMRI; Brain imaging; Persuasion; Cognitive neuroscience

The dead salmon story



Brain research

2013: EU Human Brain Project, 100 million of euros per year for 10 years + hardware cost (500 million of euros)

USA: Obama's Brain Initiative (Brain Research through Advancing Innovative Neurotechnologies) \$100 million in 2014 (probably for 10 years)

2008: 5,2 billions for brain-related projects (20% of their budget)

2 billion people worldwide suffering from brain-related illness (*Neurotechnology Industry Report, 2008*)

In 2012 more than 630 public and private companies in the USA participated in a neurotech industry

Military has a hefty investment in research on neuroenhancers, brain-machine interfaces and neuroimaging

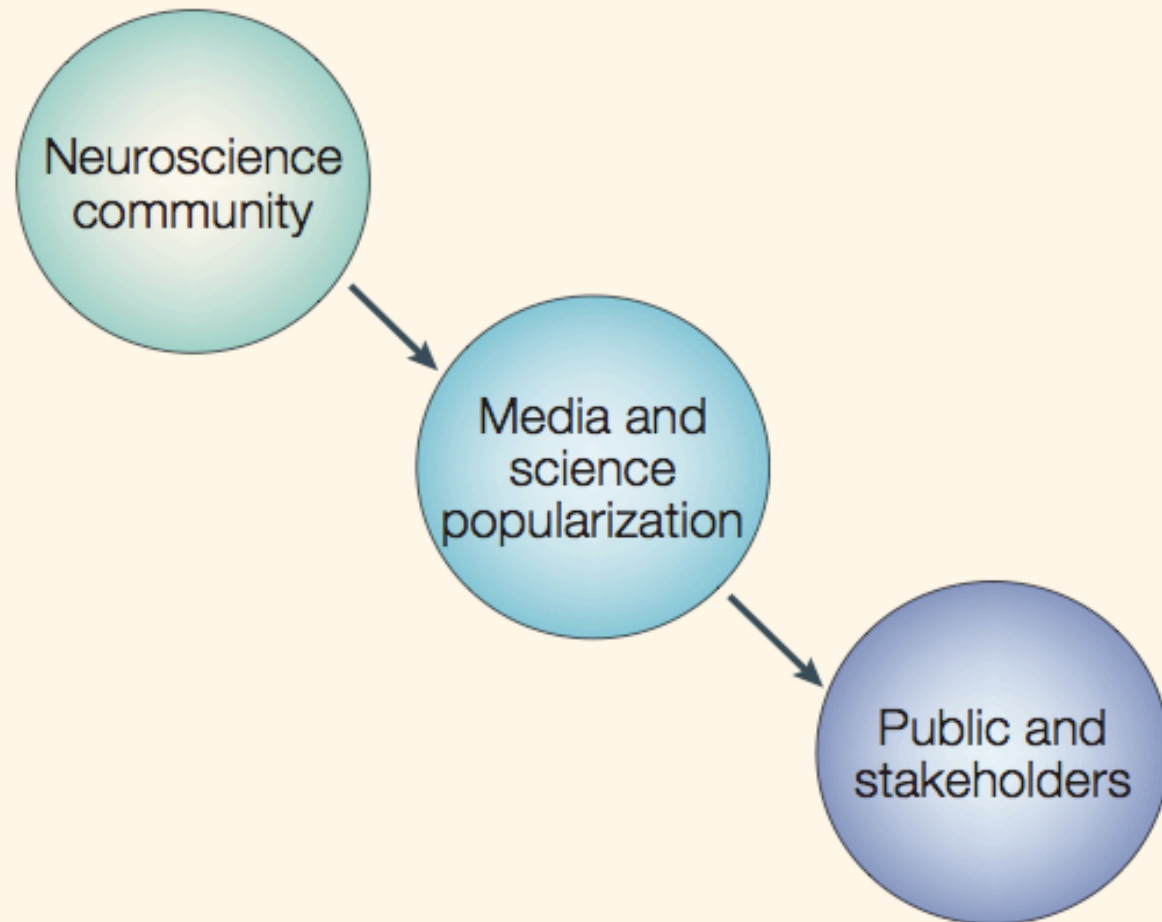


Ready for Battle?

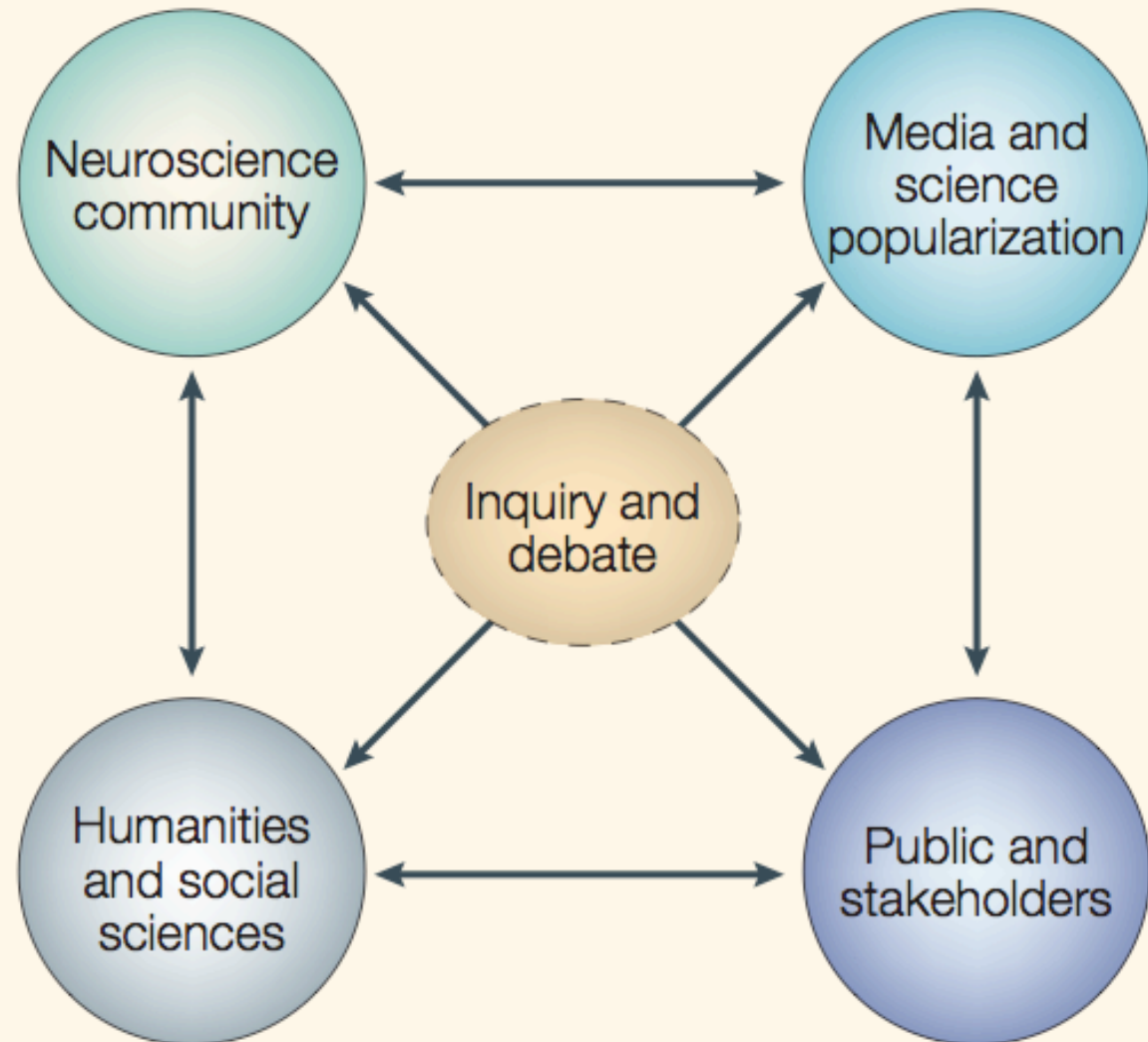
Supersoldiers could result from neurotechnology research



Unidirectional communication in neuroscience



Multidirectional communication in neuroscience



Box 2 | **Impact of recommendations on neuroscience communication**

The overall aim of these recommendations is to substantially improve the essential conversations between the public and neuroscientists about the science and the ethical, social and policy implications of ongoing research.

Promote a cultural shift

- Investment and professional incentives that promote communication and engagement with the public.
- Interaction of neuroscientists at all career stages with the public.
- Venues and opportunities for the public to learn directly from neuroscientists and to share views about advances in neuroscience.

Create communication specialists

- Neuroscience communication specialists who are skilled in engaging and interacting with the public.
- Legitimized efforts of neuroscientists who are keen to engage with the public.
- New partnerships between science journalists and public-relations professionals and the neuroscience community.

Enable research on neuroscience communication

- New methods for communicating neuroscience to the public, based on empirical data.
- Identification of gaps in, and barriers to, neuroscience communication.
- Responsiveness to public desire and the need for knowledge based on scientific evidence.

Advantages and disadvantages of interactive media for neuroscience communication.

Mode	Advantages	Disadvantages
Podcast	<p>Audio or video broadcast that can be downloaded to computer, PDA, or mobile phone.</p>	<p>Can convey a great deal of information in a form that is brief and easily understood.</p> <p>Room for creativity in explanations (graphics, sound effects, humor).</p> <p>Ubiquitous to the Web.</p> <p>Likely to increase within the next five years.</p> <p>Very easy technical distribution via iTunes, YouTube, Blip.tv and many more channels.</p>
Blog	<p>Website used to log activities, thoughts, events, and other media such as pictures and videos; similar to an online daily column.</p>	<p>A contemporary mainstream format for news.</p> <p>Can be updated easily, quickly and frequently.</p> <p>Can include all media (photos, illustrations, interactive graphics).</p> <p>Current gap in the blogosphere for good, accessible neuroscience is a growth opportunity.</p>

Twitter	Text-based posts of up to 140 characters; updates are displayed by followers.	<p>Extremely easy interface.</p> <p>Can be easily and frequently updated.</p> <p>Feeds can be updated by numerous people.</p> <p>Feeds are public and do not require subscription or membership.</p> <p>Dynamic through interactive messaging.</p> <p>Growing audience base.</p> <p>Few feeds are currently focused on neuroscience and represent another a growth opportunity.</p>	<p>Launch of a Twitter feed requires some technical savvy.</p> <p>Must be updated daily to keep audience engaged.</p> <p>Brevity is a given, so communication of complex topics is limited.</p>
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Online Discussion Forum	Public conversation through the World Wide Web (WWW).	<p>Available to the global community.</p> <p>A topic thread can be ongoing.</p> <p>Hyperlinks to brain images and other neuroscience sites augment text-based discussions.</p> <p>Archived for future referencing.</p> <p>Driven both by neuroscientists and non-experts who can suggest topics.</p>	<p>Requires curator to ensure accurate and meaningful dissemination of information and prevent propagation of “neuromyths.”</p>
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Salon

Informal panel discussion in which a host presents topics for debate amongst panelists and audience.

Opportunities to meet neuroscientists.
Moderator can facilitate communication between scientists and public.

Limited to local community.
Topics controlled by moderator.

Can be webcasted live and videotaped for later use.

Often a one-time event.

Clarifications can be made in real-time.

**Café
Scientifique**

Public lecture and discussion, usually in a coffee house or other informal public setting.

Opportunities for neuroscientists and the public to interact in casual setting.

Limited to local community.

“Neuromyths” can be corrected in real-time.

Requires comfort and skill in speaking with public extemporaneously.



Reliable sources in neuroscience

- First hand sources:
 - Peer-review journals
 - <http://www.nature.com/neuro/index.html>
 - <http://www.nature.com/nrn/index.html>
 - <http://brain.oxfordjournals.org/>
 - <http://www.journals.elsevier.com/cortex/>
 - <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291552-6569>
 - <http://www.journals.elsevier.com/neuroimage/>
 - <http://www.sciencedirect.com/science/journal/09254927>



- Press-release services
- <http://www.eurekalert.org/>
- <http://www.alphagalileo.org/>



- News
- http://www.sciencedaily.com/news/mind_brain/

Databases:

- <http://www.sciencedirect.com/>
- <http://www.ncbi.nlm.nih.gov/pubmed>
- <http://www.apa.org/pubs/databases/psycinfo/index.aspx>

Educational resources

<http://erin.sfn.org/>

<http://www.sfn.org/public-outreach/brainfacts-dot-org?pagename=brainfacts>

<http://www.dana.org>

Guides

<http://www.neuroguide.com/bestbets.html>

<http://faculty.washington.edu/chudler/resources.html>



- Blogs
- <http://www.networkedblogs.com/topic/Neuroscience>





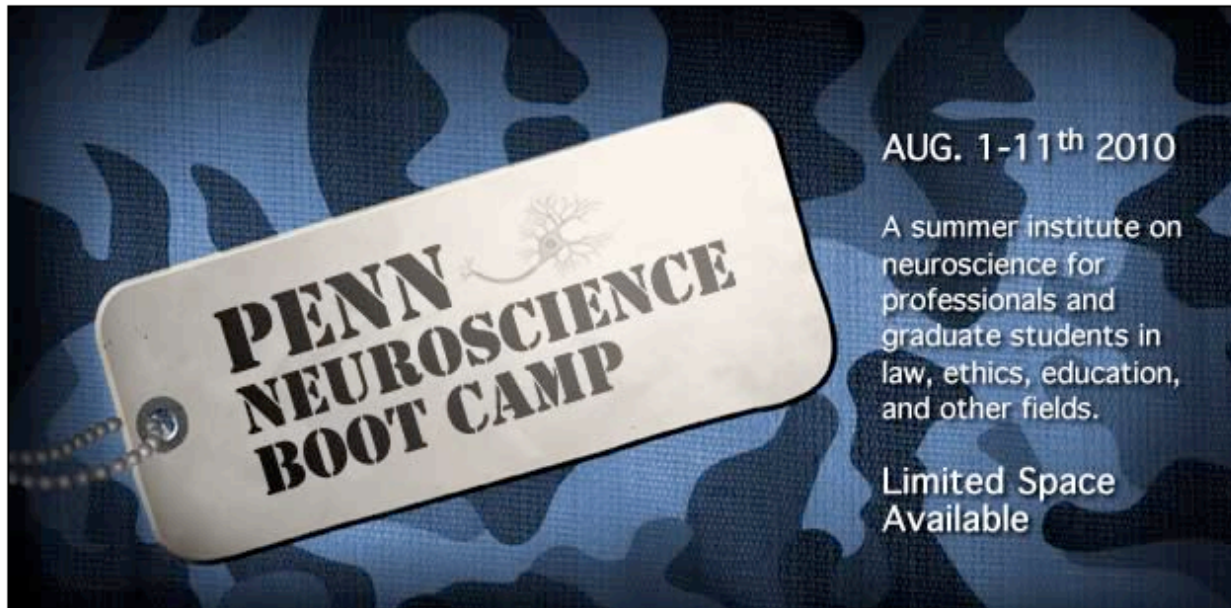
Center for Neuroscience & Society

UNIVERSITY of PENNSYLVANIA

formerly the Penn Neuroethics Program

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Neuroscience Boot Camp



AUG. 1-11th 2010

A summer institute on neuroscience for professionals and graduate students in law, ethics, education, and other fields.

Limited Space Available

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- What happens at Neuroscience Boot Camp?

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If you would like to be updated on upcoming Boot Camp, please join our mailing list.

Anti-Spam: What is 1 + 2?

Name:

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TESTIMONIALS

"The lecturers were outstanding, and they presented basic concepts of neuroscience in ways accessible to non-scientists. In addition, informal discussions with an incredible array of expert attendees refined my understanding of neuroscience and its many applications in sociology, public policy



- **Thank you for your attention!**
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- daniela.ovadia@unipv.it