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## The academic perception of the public


Tutorial: public perception of science  
 Utrecht University

Trudy Dehue  
 Philosopher and sociologist of science  
 g.c.g.dehue@rug.nl


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Dutch National Research Agenda | Contact




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European Research Council  
Horizon 2020

**Helga Nowotny**  
 President European Research Council

There is much work to do about the  
 academic perception of the public

helga nowotny




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**Mode 1 science**  
 Science on the Olympus



**Mode 2 science**  
 Science on the agora




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## European Science Foundation (ESF), 2012



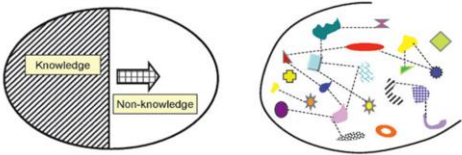
ESF Forward Look - ESP-COST 'Frontier of Science' joint initiative  
**Responses to Environmental  
 and Societal Challenges for  
 our Unstable Earth (RESCUE)**

[www.esf.org/uploads/media/rescue.pdf](http://www.esf.org/uploads/media/rescue.pdf)



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**KNOWLEDGE AS CLOSED  
 UNIFORM SYSTEM**

**KNOWLEDGE AS AN OPEN AND  
 DIVERSE SYSTEM**



the arrow on the left-hand side represents the mode of 'science finds the answers and tells the others what to do', whereas on the right-hand side, science is integrated in each cluster and provides one of the sources of knowledge needed to describe the problem and find the solution.
p.28


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## A radically interdisciplinary and transdisciplinary environment

Within the vision of an open knowledge system, **RESCUE Collaboration** emphasises the design and funding of a Radically Inter- and Transdisciplinary research Environment (RITE).
 p.27


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**De Omslag**

Te vinden met: 'omslag.nu dehue academische vrijheid'



**IN: DE TAAL VAN DE UNIVERSITEIT**  
**Tegen academische vrijheid**  
 De taal van academische vrijheid doet de wetenschap en de democratie tekort.


DOOR Trudy Dehue


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The sorrow of science is that it's only admired for what it can't be.

Because it constantly has to keep up the appearance of realism it starts to believe in it at that.


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1929


Early 20<sup>th</sup> century Vienna Circle  
Logical empiricism/positivism

Realism: definite knowledge based on neutral observation and logic  
'the view from nowhere'


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What is immediately given?



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Where do the name tags come from?

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Weintraub, D. A., 2006

# IS PLUTO A PLANET?

<p><b>NO</b></p> <p>Pluto is not a planet, because it is too small. At one time, astronomers thought Pluto was bigger than Mercury. Now we know Pluto is only half the diameter of Mercury. That's too small for Pluto to be a planet.</p>	<p><b>YES</b></p> <p>Pluto is a planet. It is the tenth-largest object that goes around the Sun. Although it is smaller than Mercury, Pluto is two and a half times the diameter of Ceres, the largest asteroid. That's large enough for Pluto to be a planet.</p>	<p><b>FACTS</b></p> <p>From pages 52–53 of Ten Worlds                  Diameter of Mercury: 3,032 miles.                  Diameter of Pluto: 1,430 miles.                  Diameter of Ceres: 590 miles.</p>
<p><b>NO</b></p> <p>Pluto has a very elliptical, or oval-shaped, orbit around the Sun. In other words, its orbit is not a circle. At times Pluto is closer to the Sun than Neptune is. So Pluto is not a planet.</p>	<p><b>YES</b></p> <p>Mercury also has a very elliptical (oval-shaped) orbit around the Sun. Mercury's orbital eccentricity—a measure of how elliptical an orbit is—is nearly as great as Pluto's. Yet Mercury is a planet. So is Pluto.</p>	<p><b>FACTS</b></p> <p>From page 52 of Ten Worlds                  Mercury's orbital eccentricity: 0.21.                  Pluto's orbital eccentricity: 0.25.</p>
<p><b>NO</b></p> <p>Newly discovered Eris is larger than Pluto, which proves Pluto is not a planet.</p>	<p><b>YES</b></p> <p>Eris is indeed larger than Pluto, so we should call Eris a planet, too. It's the first new planet found</p>	<p><b>FACTS</b></p> <p>From pages 52–53 of Ten Worlds                  Diameter of Pluto: 1,430 miles.                  Diameter of Eris: 1,500 miles.</p>

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1902 - 1994

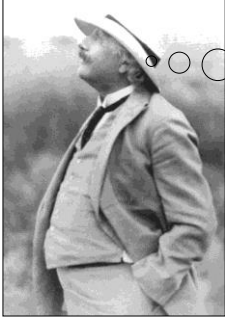


1935



translation 1954

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“Erst die Theorie entscheidet darüber, was man beobachten Kann.”

Without a theory one cannot observe.


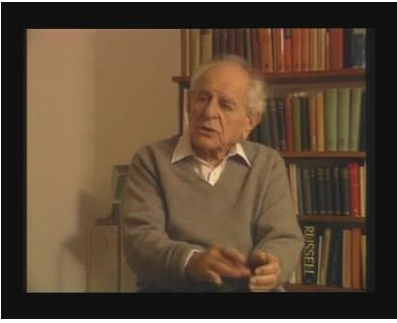
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Youtube: 'Popper dogmatisme'

Karl Popper at the age of 86  
'One can't just observe'




'In the name of certainty more damage has been done than in the name of uncertainty'


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Bruno Latour  
1947 -



1987




2004


Realistic realism: science shapes reality



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1994, Bruno Latour on Dutch tv  
(youtube: Latour Noorderlicht)




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Present-day philosophers/sociologists of science:

Doing research is not so much a matter of discovery as a matter of carving out paths in reality.

If we keep up the metaphor of discovery, many people will have to walk the paths carved out *for* them but *without* them.

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**Technological research products shape realities**



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[nuffieldbioethics.org/publications/](http://nuffieldbioethics.org/publications/)

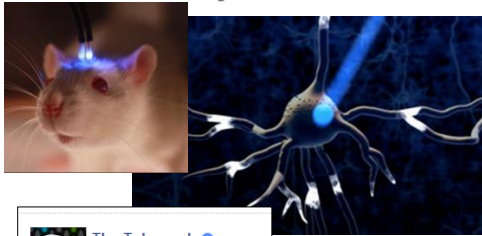
And there is much more to come.




2014

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**The Telegraph**  
Scientists use light to control brain with flick of a switch



 **The Telegraph**  
Vind ik leuk 2.197.329

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## Poverty in the Netherlands

Armoede per gemeente, vastgesteld op basis van de definitie van de CBS (2012). De armoede wordt gedefinieerd als het percentage van de bevolking dat minder dan 12,4% van de bruto inkomens voorafschot heeft.

Armoede per gemeente	Aantal gemeenten	Percentage van de bevolking
12,4% - 14%	10	12,4%
14,5% - 16%	15	14,5%
16,5% - 18%	5	16,5%

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## Meer kinderen groeien arm op

NRC 3-12-13

More kids grow up in poverty

**DEFINITIE**  
Wat is armoede?

Armoede is volgens de Verenigde Naties het niet kunnen voorzien in de eerste levensbehoeften. Maar over een precieze definitie is continu discussie. Welke levensomstandigheden gelden als armoedig en welke huishouders zij? Het CBS en SCP brengen gezamenlijk een rapport uit, maar konden het niet eens worden over de definitie.

**Het CBS bespreekt de kans op armoede aan de hand van de zogenaamde 'lage-inkomensgrens'.** In de praktijk wordt de armoedegrens berekend aan de hand van het bijstandsniveau van 2010, dat elk jaar wordt gecorrigeerd voor inflatie.

**Het SCP beschrijft armoede op grond van het 'twee-maartoerekenendebat'.** Iemand is arm als hij of zij geen tijd heeft voor de minimale noodzakelijke. Het normbedrag is gebaseerd op een budget voor voeding, kleding, wonen en recreatie.

**Het CBS verwacht volgend jaar nog een stijging van de armoede,** het SCP een daling.

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Were the students counted in?

And the poor riches?

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## Psychologist Peter Zachar and psychiatrist Kenneth Kendler


Zachar and Kendler *Philosophy, Ethics, and Humanities in Medicine* 2012, 7:4  
<http://www.peh-med.com/content/7/1/4>

**RESEARCH** **Open Access**


The removal of pluto from the class of planets and homosexuality from the class of psychiatric disorders: a comparison

Peter Zachar<sup>1</sup> and Kenneth S. Kendler<sup>2\*</sup>




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Homosexuality has always existed?


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Saint Augustine (354-430) 34


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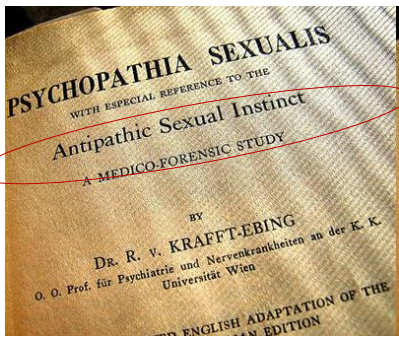

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Oscar Wilde (1854-1900)



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Richard von Krafft-Ebbing (1840-1902)

1886


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DSM-I 1952                      DSM-II 1968






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US, 21st century                      Russia, 21<sup>st</sup> century






If the other option is being bad, most people prefer to have a disorder.


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John E. Fryer, psychiatrist at the 1972 convention of the American Psychiatric Association




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1972

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Eventually homosexuality was removed from the DSM.

But it became an ever more true reality.

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### Tests of homosexuality

**Kinsey's Heterosexual-Homosexual Rating Scale**

What is the "Kinsey Scale"?

How do I take the test?

Are there other scales available?

[Kinsey Scale Test is now available!](#)

0 - Exclusively heterosexual with no homosexual  
 1 - Predominantly heterosexual, only incidentally homosexual  
 2 - Predominantly homosexual, but more than incidentally homosexual

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### correlational research of homosexuality

Older Brothers	Heterosexuals (cm)	Homosexuals (cm)
0-1	~179	~178
2+	~181	~177

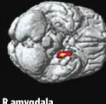

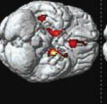
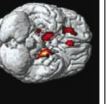


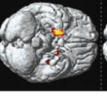
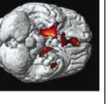
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### epidemiological research of homosexuality

County contains no gay and lesbian residents  
 County has below average proportion of gay and lesbian residents  
 County has above average proportion of gay and lesbian residents


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### Brain research of homosexuality


	Heterosexual Man	Homosexual Woman	Heterosexual Woman	Homosexual Man
L amygdala				
R amygdala				

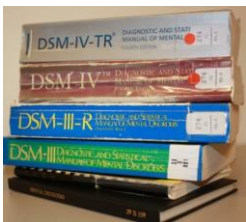
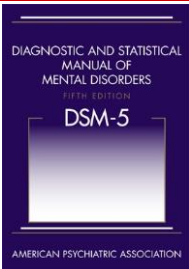

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### Genetic research of homosexuality




**THE GAY GENE**  
HOW SCIENCE REVEALS THE HOMOSEXUALITY LINK OF WHO & FORGON RESULTS FROM THE WOMBTOP CONCEPTION


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One of my main examples: what counts as a mental disorder?



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### Reification


Literally: turning definitions into things


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**Reification:**  
 step 1  
 define characteristic X as disorder Y



step 2  
 argue that disorder Y 'expresses itself in' characteristic X  
 or  
 that characteristic X is 'a symptom' of disorder Y



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**Drapetomania**  
 The mental disorder that making slaves fugitive





Samuel A. Cartwright, 1851

Find it with "Diseases and Peculiarities of the Negro Race"



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A 21<sup>st</sup> century example ([www.nuvigil.com](http://www.nuvigil.com))





Not the shiftwork but SWD as the cause of exhaustion


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Reification

Literally: turning definitions into things  
 Stated differently: suggesting that nature tells us what should count as a disorder  
 Denial that science creates realities


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http://www.nature.com/news/2011/110905/full/news.2011.514.html#comments

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**nature**  
international weekly journal of science

nature news home news archives special reports features news brief nature journal

**Mental disorders affect more than a third of Europeans**

Treatment of those afflicted is 'usually deficient'.

Kim Smith

Mental disorders affect more than 150 million Europeans — 38% of the population — each year, says a report issued today by the European Brain Council and the European College of



'mental disorders affect more than a third of Europeans'  
'Treatment of those affected is usually deficient'

European Union (EU) as well as Switzerland, Norway

LIFE/SCIENCE PHOTO LIBRARY


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**nature**  
international weekly journal of science


nature news home news archives special reports features news brief nature journal

**Trillion-dollar brain drain**

Enormous costs of mental health problems in Europe not matched by research investment.

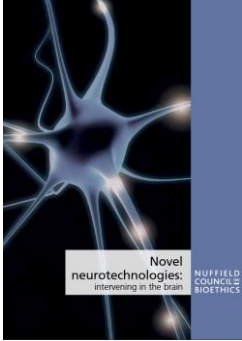
Not only tumors, traumatic brain injury, etc, counted as brain disorders but also headache, sleeplessness, anxiety, bad moods, bad personalities, etc.

The European Commission has announced a new initiative to support research into brain disorders, which could help to reduce the enormous costs of mental health problems in Europe. The initiative will fund research into brain disorders, including mental health problems, sleep disorders, mood disorders and neurodegenerative disorders. The initiative will also fund research into brain disorders, including mental health problems, sleep disorders, mood disorders and neurodegenerative disorders. The initiative will also fund research into brain disorders, including mental health problems, sleep disorders, mood disorders and neurodegenerative disorders.


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Warning by Nuffield Council:

If we classify all problems as brain disorders, we will treat all problems with brain technologies



Novel neurotechnologies: intervening in the brain

NUFFIELD COUNCIL ON BIOETHICS

2014


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**Optogenetica: op afstand aansturen van het brein**

Scientists use light to control brain with flick of a switch





The Telegraph
Vind ik leuk 2.197.329

ADHD: making the invisible **visible**

An Expert White Paper on attention-deficit hyperactivity disorder (ADHD): policy solutions to address the societal impact, costs and long-term outcomes, in support of affected individuals

© Young, M Fitzgerald, MJ Postma

European Brain Council

Shire

2013

ADHD: making the invisible **visible**

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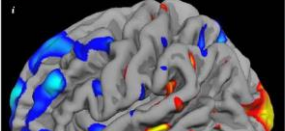
Wednesday 25 May 2013

The INDEPENDENT

Brain scan promises to identify the hidden sufferers of autism

BY JEREMY LAURANCE, HEALTH EDITOR WEDNESDAY 21 AUGUST 2012

Share | Print | Email | A A A



Autism could in future be diagnosed in 15 minutes from a brain scan – saving patients and their families years of suffering from a condition that can go unrecognised for decades.

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Hidden ADHD among adults ('In adults, ADHD expresses itself in less symptoms')

THE WORLD MENTAL HEALTH | Survey Initiative

**Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder**

J. FAYYAD, R. DE GRAAF, R. KESSLER, J. ALONSO, M. ANGERMEYER, K. DEMYTTENAERE, G. DE GIROLAMO, J. M. HARO, E. G. KARAM, C. LARA, J.-P. LÉPINE, J. ORMEL, J. POSADA-VILLA, A. M. ZASLAVSKY and R. JIN

BRITISH JOURNAL OF PSYCHIATRY (2007), 190, 402-409. doi: 10.1192/bjp.bp.106.034389

That creates realities too

Proposal to test the entire working population for ADHD

THE WORLD MENTAL HEALTH | Survey Initiative

The prevalence and effects of adult attention-deficit/hyperactivity disorder (ADHD) on the performance of workers: results from the WHO World Mental Health Survey Initiative

R de Graaf,<sup>1</sup> R C Kessler,<sup>2</sup> J Fayyad,<sup>3</sup> M ten Have,<sup>1</sup> J Alonso,<sup>4</sup> M Angermeyer,<sup>5</sup> G Borges,<sup>6</sup> K Demyttenaere,<sup>7</sup> I Gasquet,<sup>8</sup> G de Girolamo,<sup>9</sup> J M Haro,<sup>10</sup> R Jin,<sup>2</sup> E G Karam,<sup>3</sup> J Ormel,<sup>11</sup> J Posada-Villa<sup>12</sup>

**ABSTRACT**  
**Objectives:** To estimate the prevalence and workplace consequences of adult attention-deficit/hyperactivity disorder (ADHD) on direct estimation of prevalence in small samples.<sup>11,12</sup> These studies produced adult ADHD childhood cases that persist into adulthood<sup>13,14</sup> or

Occup Environ Med 2008;65:835-842. doi:10.1136/oem.2007.038448

Always check under article for funding by pharma companies


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[www.hcp.med.harvard.edu/wmh/](http://www.hcp.med.harvard.edu/wmh/)

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**THE WORLD MENTAL HEALTH Survey Initiative**




**The World Mental Health Survey Initiative**  
 The WMH Survey Initiative is a project of the Assessment, Classification, and Epidemiology (ACE) Group at the World Health Organization coordinating the implementation and analysis of general population epidemiologic surveys of mental, substance use, and behavioral disorders in countries in all WHO Regions.

- ▶ WMH Historical Overview
- ▶ Participating Collaborators
- ▶ Cross-National Sample
- ▶ Publications
- ▶ Affiliated Studies
- ▶ Archived Users

**Chaired by prof dr Ronald Kessler, Harvard**

*Professor Kessler has been a consultant for GlaxoSmithKline Inc., Pfizer Inc., Wyeth-Ayerst, Sanofi-Aventis, Kaiser Permanente, and Shire Pharmaceuticals, has served on advisory boards for Eli Lilly & Company and Wyeth-Ayerst, and has had research support for his epidemiological studies from Eli Lilly and Company, Pfizer Inc., Orbo-McNeil Pharmaceuticals Inc., and*




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Doing research entails much more than just measuring and calculating

classifying


measuring, counting

interpreting




And what counts as *good* counting, measuring?

Once you have a definition of homicide, poverty etc, many more decisions need to be taken


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**epidemiological research of ADHD**



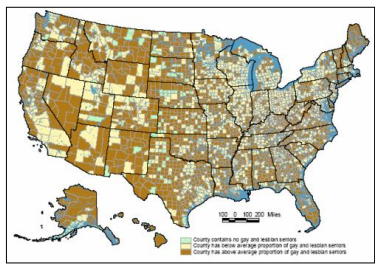
Country	Prevalence Rate
Netherlands	5.0%*
Germany	4.7%*
Belgium	4.1%*
France	3.3%*
Spain	1.2%*
Italy	2.0%*
Lebanon	1.8%*
Australia	1.1%*
USA	6.2%
Mexico	1.9%
Columbia	1.9%
Brazil	5.8%*

Data taken from: (a) Fayyad J, de Graaf R, Kessler R, et al. Br J Psychiatry 2007; 190: 402-409. (b) Ebejer JL, Medland SE, van der Werf J, et al. PLoS One 2012; 7: e417404. (c) de Zwaan M, Gruss B, Müller A, et al. Eur Arch Psychiatry Clin Neurosci 2012; 262: 79-86. (d) Polanczyk G, Laranjeira R, Zalski M, et al. Int J Methods Psychiatr Res 2010; 19: 177-84.


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**epidemiological research of homosexuality**





County contains no gay and lesbian couples  
 County has below average proportion of gay and lesbian couples  
 County has above average proportion of gay and lesbian couples




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Randomized clinical trial (RCT)

*Randomly composed*

Experimental group(s)	 SSRI	Test
Control group	 PLACEBO	Test


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What counts as depression in a rat?

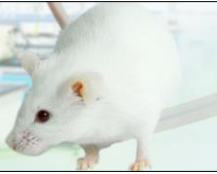



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Being able to sleep pleasantly?





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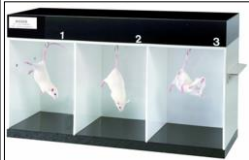
Feeling free to explore its environment?



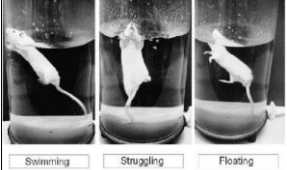

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Tail suspension test



Forced swimming test




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Forced swim test (many on youtube)




 1966 (ad for Ritalin as an antidepressant)

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**if chronic fatigue and mild depression make simple tasks seem this big...**



**Ritalin (methylphenidate CIBA) relieves chronic fatigue that depresses and mild depression that fatigues**

Resilience in accepting life as it is

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21st century

Resilience in mastering nature

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### Testing antidepressants on humans can't be neutral either

**Hamilton Depression Rating Scale (HDRS)**

PLEASE COMPLETE THE SCALE BASED ON A STRUCTURED INTERVIEW

Instructions: for each item select the one "cue" which best characterizes the patient. Be sure to record the answers in the appropriate spaces (positions 0 through 4).

<p><b>1 DEPRESSED MOOD</b> (sadness, hopeless, helpless, worthless)</p> <p>0 <input type="checkbox"/> Absent.</p> <p>1 <input type="checkbox"/> These feeling states indicated only on questioning.</p> <p>2 <input type="checkbox"/> These feeling states spontaneously reported verbally.</p> <p>3 <input type="checkbox"/> Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep.</p> <p>4 <input type="checkbox"/> Patient reports verbally only these feeling states in his/her spontaneous verbal and non-verbal communication.</p>	<p><b>2 FEELINGS OF GUILT</b></p> <p>0 <input type="checkbox"/> Absent.</p> <p>1 <input type="checkbox"/> Self reproach, feels he/she has let people down.</p> <p>2 <input type="checkbox"/> Ideas of guilt or rumination over past errors or sinful deeds.</p> <p>3 <input type="checkbox"/> Present illness is a punishment. Delusions of guilt.</p> <p>4 <input type="checkbox"/> Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.</p>
---	--

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What counts as proof of depression in humans?  
Own story or observation by professional is too subjective?

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### A brain scan is more true to nature ('objective')?


Frontpage commercial NRC, 2010

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**Bijdragen aan gezondheid**

The brain activity between healthy people and those with burn-out differ. This is what researchers from the Nijmegen university have found. For the first time it has been proven that burn-out truly exists.

Radboud Universiteit Nijmegen  één in weten

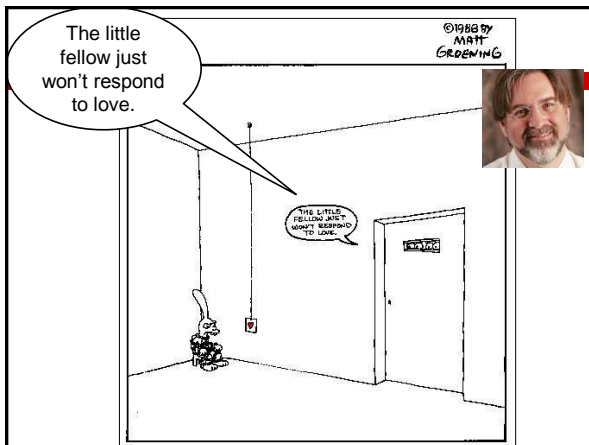
 A brain scan is more true to nature ('objective')?

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The little fellow just won't respond to love.

©1988 by MATT GROENING



Vol 453 | 2 June 2016 | doi:10.1038/nature06976

 nature

**REVIEWS**


**What we can do and what we cannot do with fMRI**

Nikos K. Logothetis<sup>1</sup>


Functional magnetic resonance imaging (fMRI) is currently the mainstay of neuroimaging in cognitive neuroscience. Advances in scanner technology, image acquisition protocols, experimental design, and analysis methods promise to push forward fMRI from mere cartography to the true study of brain organization. However, fundamental questions concerning the interpretation of fMRI data abound, as the conclusions drawn often ignore the actual limitations of the methodology. Here I give an overview of the current state of fMRI, and draw on neuroimaging and physiological data to present the current understanding of the haemodynamic signals and the constraints they impose on neuroimaging data interpretation.

However, fundamental questions concerning the interpretation of fMRI data abound as the conclusions drawn often ignore the actual limitations of the methodology

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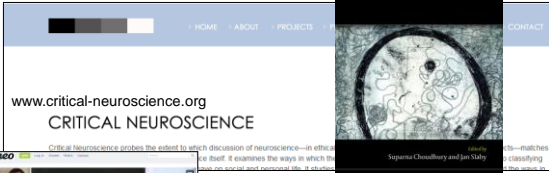
Neurologist prof dr Rien Vermeulen, former head neurology Amsterdam University Hospital: migraine is not visible on a scan. Does that mean it isn't real?



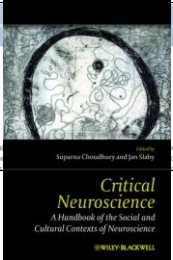
Vermeulen:  
Even a tumor is not visible on a scan. We only see a black spot and need other kinds of experts and knowledge to interpret it.

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### The critical neuroscience network



www.critical-neuroscience.org  
CRITICAL NEUROSCIENCE



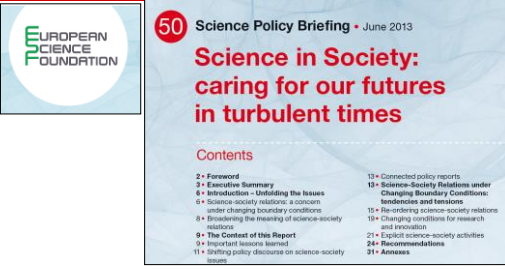
Choudhury & Slaby, 2012

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### Realistic realism (or neorealism):

Only if we acknowledge that science shapes reality can we have a democratic discussion on what kind of reality we want it to create

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50 Science Policy Briefing • June 2013  
**Science in Society: caring for our futures in turbulent times**

Contents

- 2 • Foreword
- 3 • Executive Summary
- 6 • Introduction - Unfolding the Issues
- 8 • Science-society relations: a concern under changing boundary conditions
- 9 • Broadening the meaning of science-society relations
- 9 • The Context of this Report
- 9 • Important lessons learned
- 11 • Shifting policy discourse on science-society issues
- 13 • Connected policy reports
- 13 • Science-Society Relations under Changing Boundary Conditions: tendencies and tensions
- 15 • Re-ordering science-society relations
- 16 • Changing conditions for research and innovation
- 21 • Explicit science-society activities
- 24 • Recommendations
- 25 • Annexes

'the public understanding of the social dimensions of science'


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**Our recommendations touch upon five broad areas:**

1. Linking excellence to relevance and responsibility
2. 'Science-society activities' – integration and separation from research
3. Plurality matters
4. Expanding and creating new spaces for science-society interactions
5. Making time-space for reflexive work


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[www.demos.co.uk/files/Seethroughsciencefinal.pdf?1240939425](http://www.demos.co.uk/files/Seethroughsciencefinal.pdf?1240939425)

The task is to make **visible** the invisible, to expose to public scrutiny the assumptions, values and visions that drive science

**DEMONS** **See-through Science**  
Why public engagement needs to move upstream

**See-through Science**  
Why public engagement needs to move upstream

Inspired by the high profile announcements and BBC, CNN and now space technology, scientists are being heralded from all over the world to attend the 'See-through Science' conference...

the more fundamental questions of what we are doing technology, the more of 'What benefits from it? Do they really appear and if so, how?'

**Scientists need to find ways of listening to and valuing more diverse forms of public knowledge and social intelligence. Only by opening up**

DEMONS can be used to help citizens understand the complex world. It makes about risk and important. But the public also needs access to...

This report was produced in partnership with Open Access Information Agency, 2014.

"green alliance... RSA 


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[www.demos.co.uk/files/Seethroughsciencefinal.pdf?1240939425](http://www.demos.co.uk/files/Seethroughsciencefinal.pdf?1240939425)

The task is to make **visible** the invisible, to expose to public scrutiny the assumptions, values and visions that drive science

**DEMONS** **See-through Science**  
Why public engagement needs to move upstream

**See-through Science**  
Why public engagement needs to move upstream

**Real interest in science is needed. One that does not just admire nor one that only ridicules and rejects.**


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The academic perception of the public

Tutorial: public perception of science  
 Utrecht University

Trudy Dehue  
 Philosopher and sociologist of science  
 g.c.g.dehue@rug.nl