

# Public Trust in Science and Open Access Publishing

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# What am I Going to Talk About?

- Public trust in science
- Public understanding of science
- Trust: a few reminders
- Fostering meaningful trust in science
- Recent failures and scandals
- Key issues, risks and opportunities



# Public Trust in Science

- Is surprisingly high!
  - Not because we don't deserve it
  - But because expressed levels of trust in all sectors of society are relatively low



# 2005 OST/MORI Poll

- 86%: Science makes a good contribution to society
- 82%: Science will make our lives easier
- 71%: The benefits of science outweigh the risks
  - 44% *disagree* that the risks outweigh the benefits
- Trust in scientists is consistently positive
  - Constant over the last few years EXCEPT
  - Declining among *Guardian/Independent/Observer* readers
  - These are keener on a national debate about science
- “Good” associations (advancement, progress) outweigh “bad” (boring, dangerous)
- Science an “issue of concern” for 1%



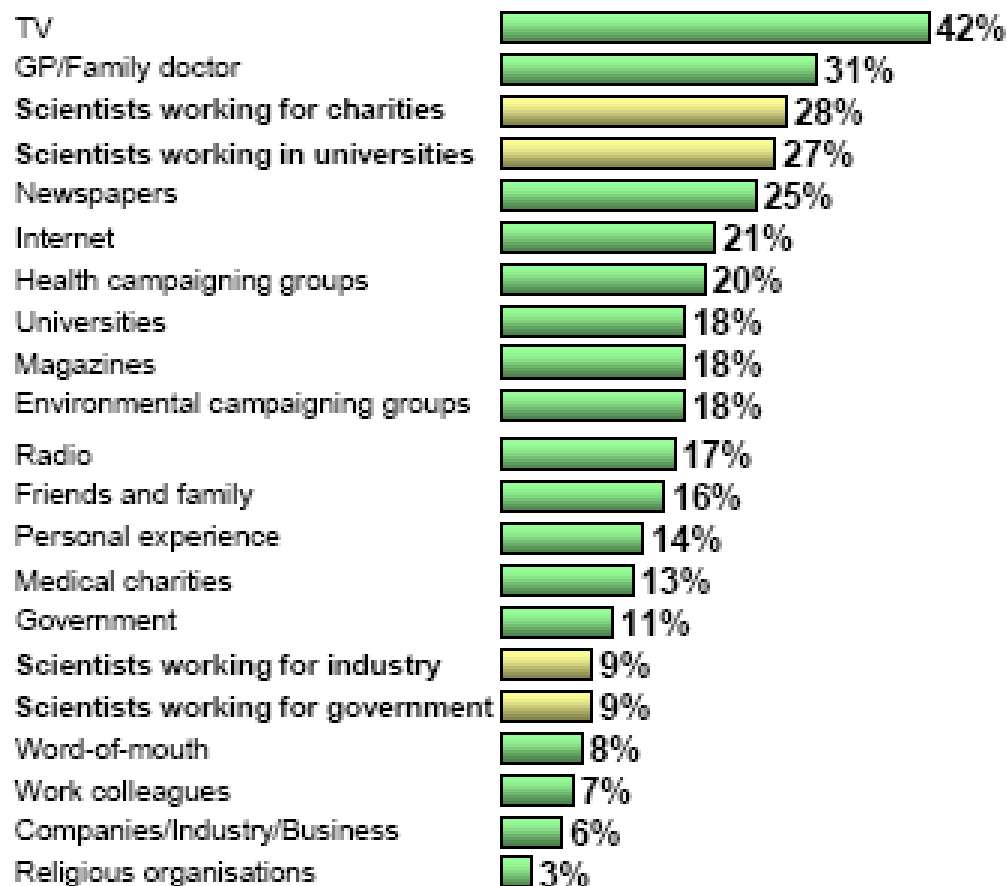
# Public Information

- Preferred sources of science
  - Scientists (trusted variably depending on funding sources)
  - Popular media
    - TV (84%)
    - Newspapers (57%)
    - Radio (35%)
    - Magazines (33%)
    - Internet (30%)
  - Museums/science centres (13%)
- 95%: Young people should have a grasp of science
- 59%: Do not feel informed about scientific developments
  - 67% of women
  - 71% DEs
- 49% Hear too little
- 7% Hear too much



# Valued Sources of Scientific Information

Q Which, if any, of the following do you value as a source of information, support or advice about science?



Base: 1,831 UK adults aged 16+, September – November 2004

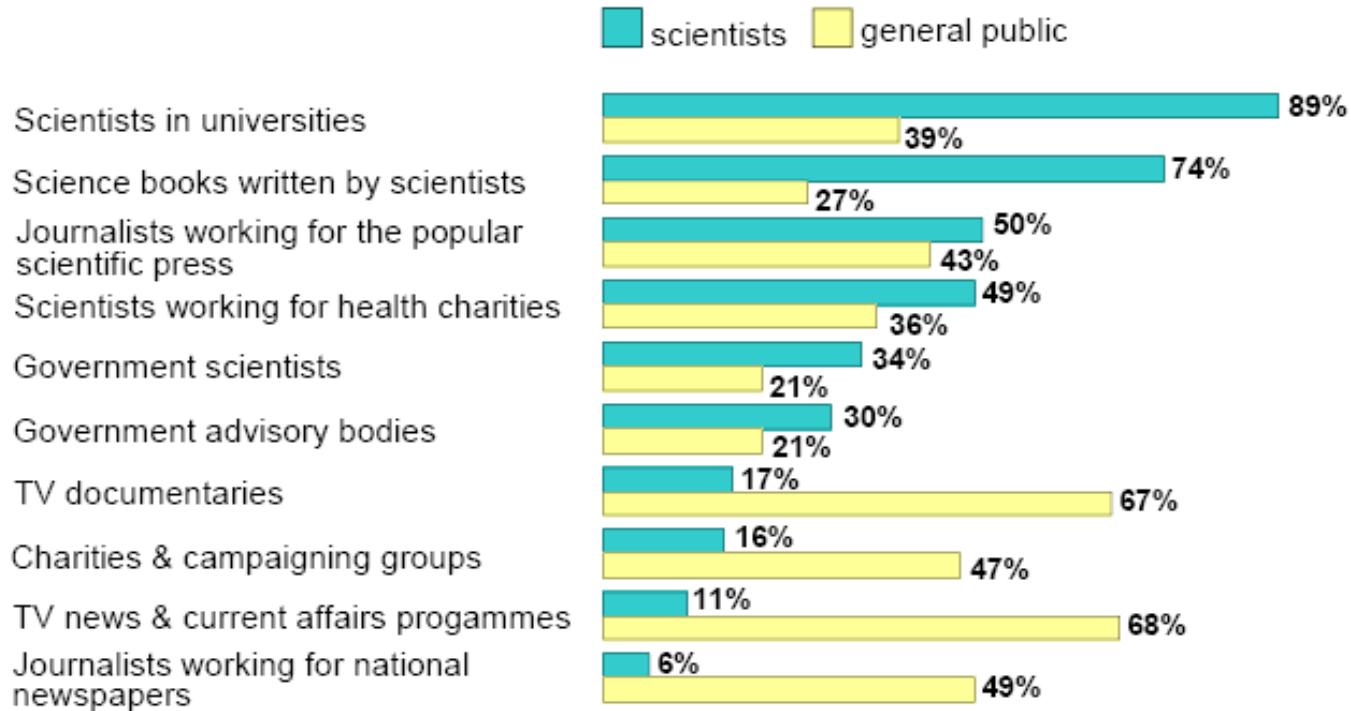
Source: MORI



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# Not What the Scientists Think!

Q36/38 Which would ..... trust to provide accurate information about scientific facts?



Source: MORI

Base: All respondents (excluding scientists at Research Council-funded establishments) 1,540



# Factors Underlying Trust

- Competence
- Credentials
- Experience
- Honesty
- Appearance not important
- Funding sources
  - Charities & universities good
  - Government & industry bad
  - “Campaign groups” bad (phrasing?)
  - Perceived problem of independence



# Regulation

- Large public ignorance about regulation of science
- 2005: 6% are aware that scientists regulate themselves
- 2003 MORI/*Nature* poll: What does the phrase “scientific peer review in scientific publications” mean?
  - 25%: Scrutiny of other scientists’ work
  - 28%: Nothing
  - 5%: Other incorrect answer
  - 43%: Do not know



# Bad Effects of Regulation

- Institute of Ideas survey, October 2007
- 37% of scientists think that regulation reduces trust
  - People think that something must be wrong
- “Often these checks make the public think something must be wrong; otherwise why check up so much? In my own case I have given up animal-based research due to the bureaucracy and time-wasting involved”
- “The fact that it needs controlling implies it is dangerous but gives no information about what the dangers are or how more or less dangerous they are than everyday activities”
- “It is now assumed that scientists are up to no good and attempts to prove that we are behaving appropriately only enhance the belief that something is being covered up”





# Trust and Trustworthiness

- Trust
  - An attitude X has about Y
  - X believes that Y is honest/reliable ...
- Trustworthiness
  - A property of Y
  - Y is honest/reliable ...
- Y can be trusted without being trustworthy
- Y can be trustworthy without being trusted
- X gains from Y being trustworthy, but can only ensure that Y is trusted
- Y gains from being trusted, but can only ensure that Y is trustworthy



# Costs & Benefits of Trust

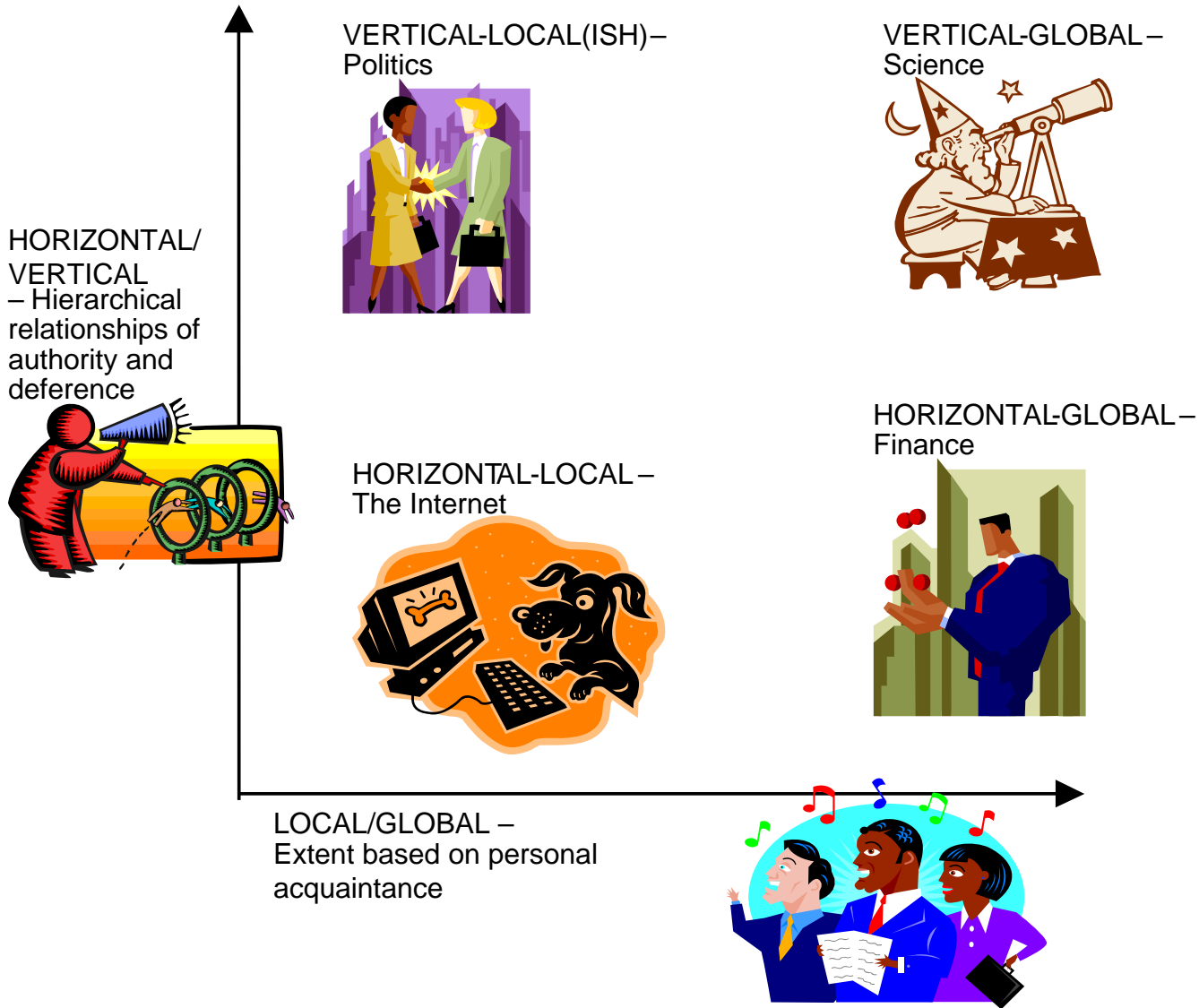
	Trustworthy	Untrustworthy
Trust	<b>Maximal benefits of cooperation</b>	<b>Loss (gain) of assets risked</b>
Mistrust	<b>Opportunity costs</b>	<b>Nothing risked, nothing gained</b>

# Dimensions of Trust

- Global v Local
  - Local trust: trust based on acquaintance
  - Global trust: trust based on remote evidence
- Horizontal v Vertical
  - Horizontal trust: trust between equals
  - Vertical trust: trust based on authority



# Four Types of Trust



# The Wrong Problem

- The issue often raised is: How can we increase trust?
  - Trust is, all things being equal, good
  - Trusting societies are wealthier, happier, stronger
  - But we obviously don't want to trust the untrustworthy



# Not the Optimal Part of the Matrix

	Trustworthy	Untrustworthy
Trust	<b>Maximal benefits of cooperation</b>	<b>Loss (gain) of assets risked</b>
Mistrust		

# The Right Problem

- The REAL problem of trust is:
- How can we create *and maintain* causal links between trust and trustworthiness?
- Maintenance is importance because once a trusted set of signals is established, they can be counterfeited



# The Right Part of the Matrix

	Trustworthy	Untrustworthy
Trust	<b>Maximal benefits of cooperation</b>	
Mistrust		<b>Nothing risked, nothing gained</b>



# Fostering Meaningful Trust: Some Lessons

- We (scientists) cannot take the link between being trustworthy and being trusted for granted
- The public has to rely on remote evidence for trusting
- The public has to respect the authority of that evidence
  - 59% feel uninformed about scientific developments
- It follows that peer review is key
- BUT peer review is under threat
  - 89% of scientists think that scientists trust scientists
  - Peer review has been implicated in scandals



# Failures and Scandals

- Jan Hendrik Schön
  - Fabricated results on organic transistors
  - Jan Hendrik Who?
- Hwang Woo-Suk
  - Fabricated cloning results
  - Significance to stem cell research debate
  - Little lasting general damage
- In each case, peer review was implicated
  - Peer review actually not geared to detecting fraud
  - The problem went deeper in the cases of Schön & Hwang
  - Co-authors went along with it



- MMR
  - Controversy about safety following Wakefield et al in *The Lancet*
  - My own view: nothing wrong with the paper, but its significance totally misrepresented
  - More potent in UK
  - Conspiracy theories against govt rather than mistrust of scientists
  - Irrational risk aversion wrt children
- Durham survey 2006
  - 20%: the govt would NOT withdraw the vaccine even if it were shown to be unsafe
  - Fewer than 2/3 believe there is no link between the vaccine and autism
  - Vaccination well below target levels
  - Several reasons for public mistrust
    - Govt's handling of the BSE outbreak
    - No WMD found in Iraq



# Electronic Dissemination, Open Access, Self-Archiving

- Obviously appeals to scientists
  - Scientists trust other scientists
  - Science happens more quickly than it can be written about
  - Literature is disjoint and inaccessible
    - Cf. BSE
- Open access/self-archiving model
  - General aim to increase dissemination
  - Hence tries to keep as much unchanged as possible outside the electronic dissemination method



# Key Issues and a Complex Relationship

- Peer review remains an essential mechanism
  - “Behind the scenes”
  - Necessary condition: scientists are generally trustworthy
  - The process has to be managed
- Peer review is not sufficient for public trust
  - Still a role for PR and story management
  - 84% get their science news from TV
  - Bob Worcester argument
- Dissemination still has to happen
  - Need to realise the potential
  - Academics are pretty bad at this!
- Publication  $\neq$  peer review
  - Is the dotted line in the right place?
- Curation



# Conclusions

- Science needs to retain authority
- Peer review is an essential part of that
- Academics need access to data & papers
- Publishers need a business model
- BUT the public needs to trust trustworthy science
  - Identifying it (vertical requirement)
  - Disseminating it (global requirement)
- Whatever solution is ultimately reached for Web-based dissemination, the public is a key stakeholder

