



# Fostering research integrity: just a regulatory issue?

Steven Hill

UKRIO Conference

23 May 2014

Most researchers are honest...

...but misconduct happens

# How much misconduct?

High profile cases

Surveys: 7-40%

Statistical analysis

regulation

more common

rare

accidental

well-meaning

deliberate  
misleading

ignorance  
incompetence

dishonesty

culture change

The concordat to support research integrity



Multi-agency

Collaboratively developed

Principles based

Signatories



Scottish Funding Council  
Promoting further and higher education



Department for  
Employment  
and Learning  
www.delni.gov.uk



Cyngor Cyllido Addysg  
Uwch Cymru  
Higher Education Funding  
Council for Wales



# Compliance with the concordat is a condition of HEFCE grant

*'The institution is required to comply with the Concordat to Support Research Integrity published by Universities UK in July 2012 [...] Institutions in receipt of research grant from the Council are also required to provide assurance of their compliance with the Concordat through the annual assurance return to the Council and following any guidance that the Council may provide. For 2013-14 only, in recognition that compliance by some institutions may require a period of time to achieve, institutions in receipt of research grant from the Council may provide assurance either of their compliance, or that they are working towards compliance, with the Concordat.'*

# Culture change

Awareness

Training

“Contrary to the rules of philosophers of science, who advise testing hypotheses by trying to refute them, people (**and scientists, quite often**) seek data that are likely to be compatible with the beliefs they currently hold.”

Daniel Kahneman  
*Thinking, fast and slow*



# Culture change

Awareness

Training

Openness

“To take full advantage of modern tools for the production of knowledge, we need to create an open scientific culture where as much information as possible is moved out of people’s heads and laboratories, and onto the network.”

Michael Nielsen

*Reinventing discovery*

Open research...

...can be checked

...is better research

# Willingness to Share Research Data Is Related to the Strength of the Evidence and the Quality of Reporting of Statistical Results

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## Abstract

**Background:** The widespread reluctance to share published research data is often hypothesized to be due to the authors' fear that reanalysis may expose errors in their work or may produce conclusions that contradict their own. However, these hypotheses have not previously been studied systematically.

**Methods and Findings:** We related the reluctance to share research data for reanalysis to 1148 statistically significant results reported in 49 papers published in two major psychology journals. We found the reluctance to share data to be associated with weaker evidence (against the null hypothesis of no effect) and a higher prevalence of apparent errors in the reporting of statistical results. The unwillingness to share data was particularly clear when reporting errors had a bearing on statistical significance.

**Conclusions:** Our findings on the basis of psychological papers suggest that statistical results are particularly hard to verify when reanalysis is more likely to lead to contrasting conclusions. This highlights the importance of establishing mandatory data archiving policies.

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## Introduction

Statistical analyses of research data are quite error prone [1,2,3], accounts of statistical results may be inaccurate [4], and decisions that researchers make during the analytical phase of a study may lean towards the goal of achieving a preferred (significant) result [5,6,7,8]. For these and other (ethical) reasons [9], many scientific journals like *PLoS ONE* [10] and professional organizations such as the *American Psychological Association* (APA) [11] have clear policies concerning the sharing of data after research results are published. For instance, upon acceptance for publication of a paper in one of the over 50 peer-reviewed journals published by the APA, authors sign a contract that they will make available data to peers who wish to reanalyze their data to verify the substantive claims put forth in the paper. Nonetheless, the replication of statistical analyses in published psychological research is hampered by psychologists' pervasive reluctance to share their raw data [1,12]. In a large-scale study Wicherts et al. [12] found that 73% of psychologists publishing in four top APA journals defied APA guidelines by not sharing their data for reanalysis. The unwillingness to share data of published research has been documented in a number of fields [13,14,15,16,17,18,19,20] and is often ascribed in part to the fear among authors that independent reanalysis will expose statistical analytical errors in their work [21] and will produce conclusions

that differ from theirs [22]. However, no published research to date has addressed whether this rather bleak scenario has a bearing on reality.

Here we study whether researchers' willingness to share data for reanalysis is associated with the strength of the evidence (defined in terms of the statistical evidence against the null hypothesis of no effect) and the quality of the reporting of statistical results (defined in terms of the prevalence of inconsistencies in reported statistical results). To this end, we followed-up on Wicherts et al.'s requests for data [12] by comparing statistical results in papers from which data were either shared or not, and to check for errors in the reporting of  $p$ -values in both types of papers.

## Methods

In the summer of 2005, Wicherts and colleagues [12] contacted the corresponding authors of 111 papers that were published in the second half of 2004 in one of four high-ranked journals published by the APA: *Journal of Personality and Social Psychology* (*JPSP*), *Developmental Psychology* (*DP*), *Journal of Consulting and Clinical Psychology* (*JCCP*), and *Journal of Experimental Psychology: Learning, Memory, and Cognition* (*JEP:LMC*). The data were requested to determine the effects of authors on statistical outcomes (see Text S1 for details). Although all corresponding authors had signed a statement that they would share their data for such verification

Wicherts JM, Bakker M, Molenaar D (2011)

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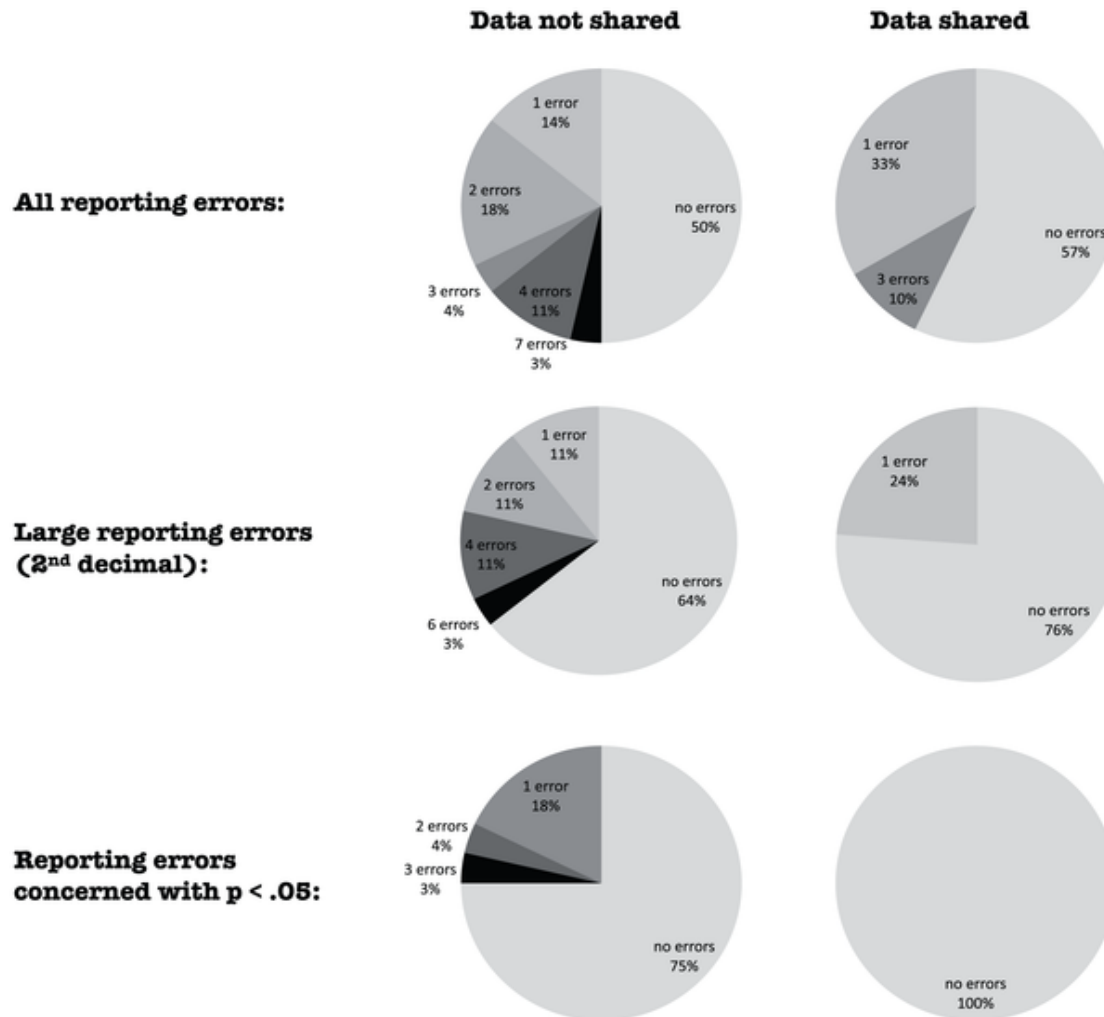
doi:10.1371/journal.pone.0026828

Psychology - 73% authors reluctant to share data

Studied: 49 papers in 2 journals containing 1148 statistical tests

Compared quality of tests from shared vs not shared data

**Figure 1. Distribution of reporting errors per paper for papers from which data were shared and from which no data were shared.**



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<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0026828>

# Conclusions

Open research and data sharing have a major role to play in improving research integrity

Policies to encourage and enhance data sharing should be part of institutional response to tackle misconduct

There may be a role for funder mandates that require data sharing



# Thank you for listening

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