Metascience Network Launch

3rd March 2021

Tom Stafford, t.stafford@sheffield.ac.uk
http://tomstafford.staff.shef.ac.uk
@tomstafford

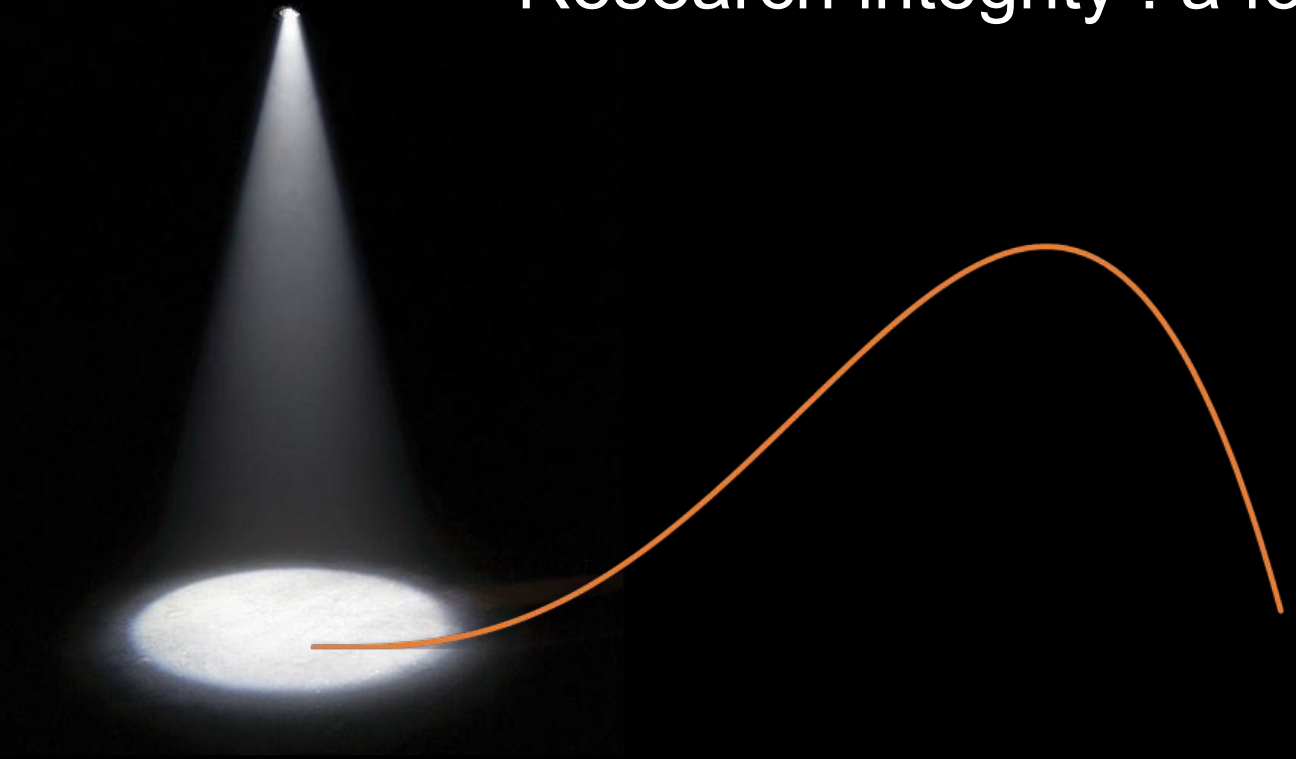
What does a Research Practice Lead do?

… Sheffield is a UKRN founder member

“Ensuring the UK remains a centre for world-leading research.”

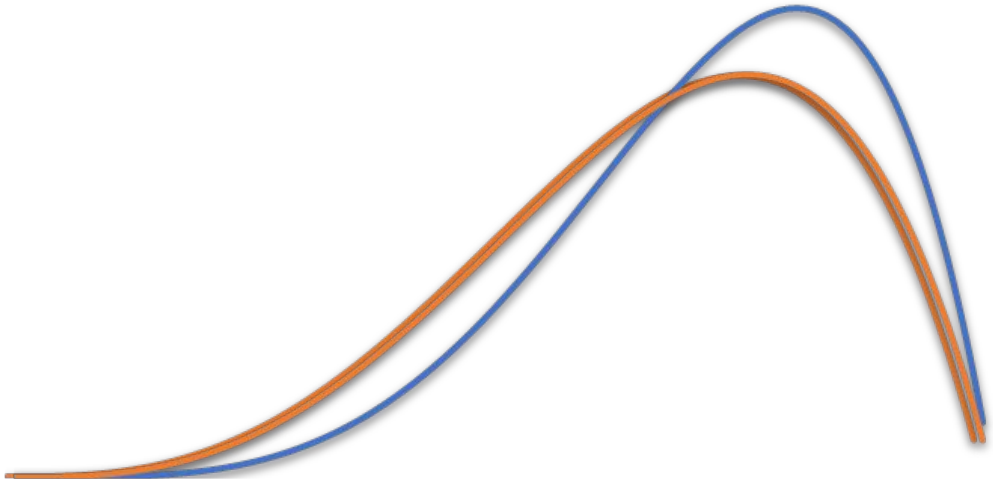
https://www.ukrn.org/

Research integrity : a forensic model?



These two slides stolen from Malcolm MacLeod

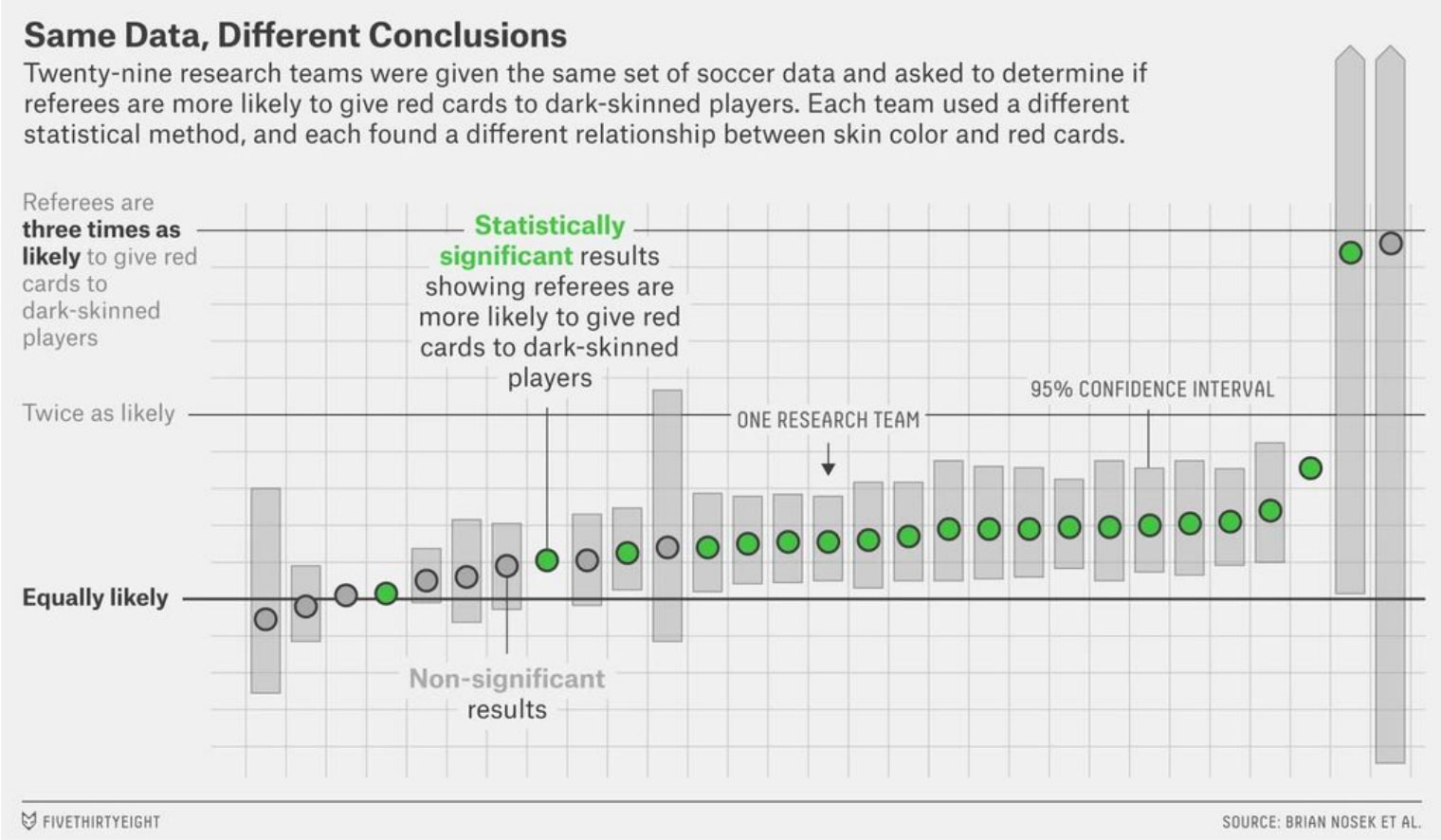
Research Improvement Strategy



These two slides stolen from Malcolm MacLeod

Analyses are more complex

Silberzahn, R. et al (2018). Many analysts, one dataset: Making transparent how variations in analytical choices affect results. *Advances in Methods and Practices in Psychological Science, 1*(3), 337-356



https://fivethirtyeight.com/features/science-isnt-broken/#part1

Research integrity is not researcher integrity

Honest, diligent researchers can still produce unreliable research

You get errors for free, no deliberate effort is required

You don’t even need to know you are walking in the garden of forking paths to distort outcomes

The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or "p-hacking" and the research hypothesis was posited ahead of time*

Andrew Gelman† and Eric Loken‡

14 Nov 2013

"I thought of a labyrinth of labyrinths, of one sinuous spreading labyrinth that would encompass the past and the future . . . I felt myself to be, for an unknown period of time, an abstract perceiver of the world." — Borges (1941)

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological science*, *22*(11), 1359-1366.

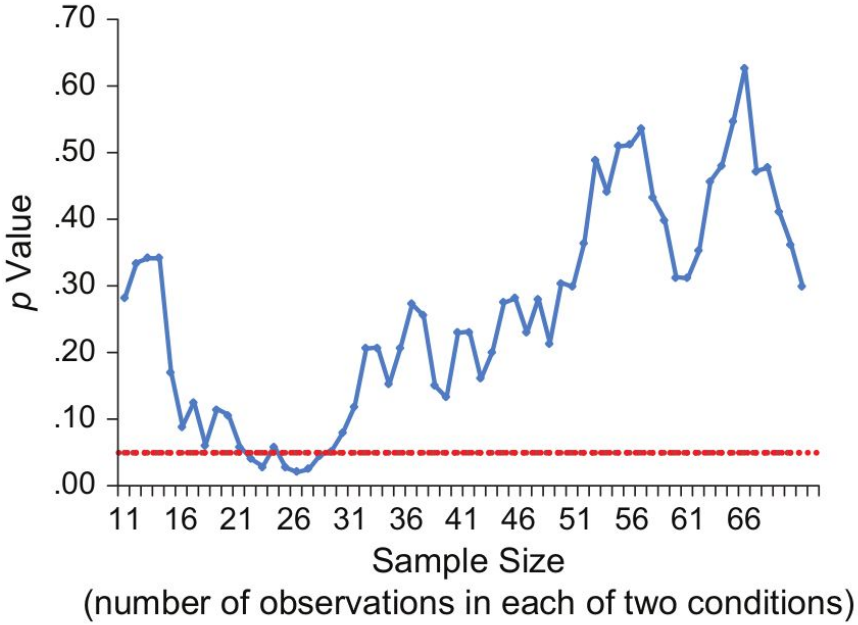
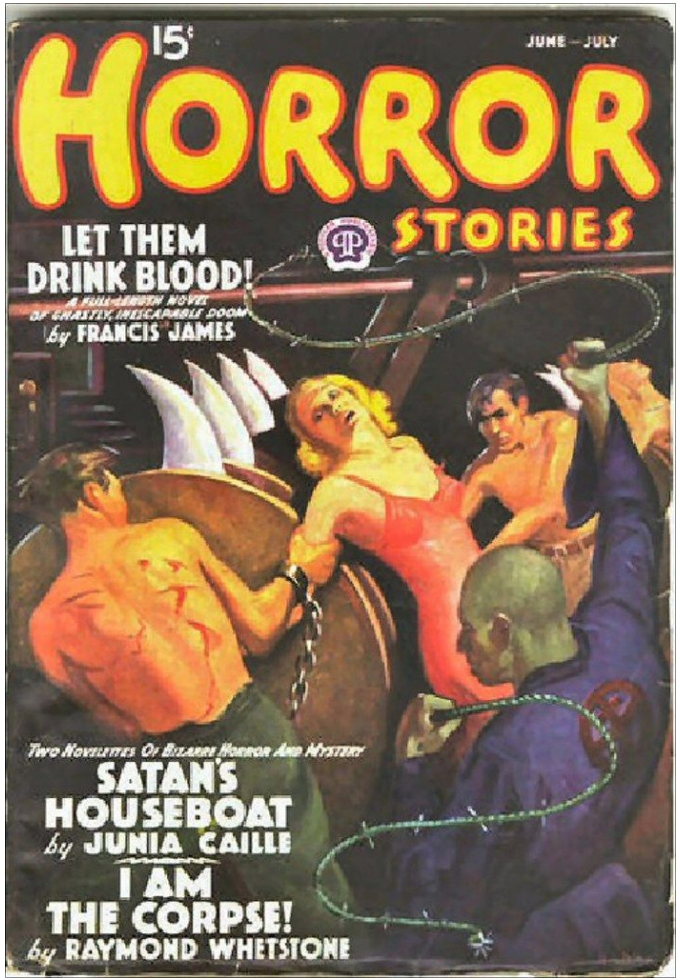


Fig. 2. Illustrative simulation of p values obtained by a researcher who continuously adds an observation to each of two conditions, conducting a t test after each addition. The dotted line highlights the conventional significance criterion of $p \leq .05$.



Trials design

Statistical gotchas

Code errors

Measurement & calibration

Image: Will Hart

236a Horror Stories Jun-Jul-1938 Includes Princess of Pain by E. Hoffmann Price

Is my field at risk? Ask yourself ….

Publication pressures

- speed? volume? status?

Focus on novelty / Lack of replication?

Expensive or laborious methods?

Complex/opaque analysis?

Data / materials / platforms hard to access?

Dogmatic peers?

Incomplete training?

Conflict of interest from funders?

- impact? profit?

Lack of standards / consensus on criteria by which research should be assessed?

Also?

Lack of consortia / competitions / common data

Lack of formal theory / support for theoretical work

Bias against (no funding for) exploratory and observational research

Lack of standardised reporting / measures

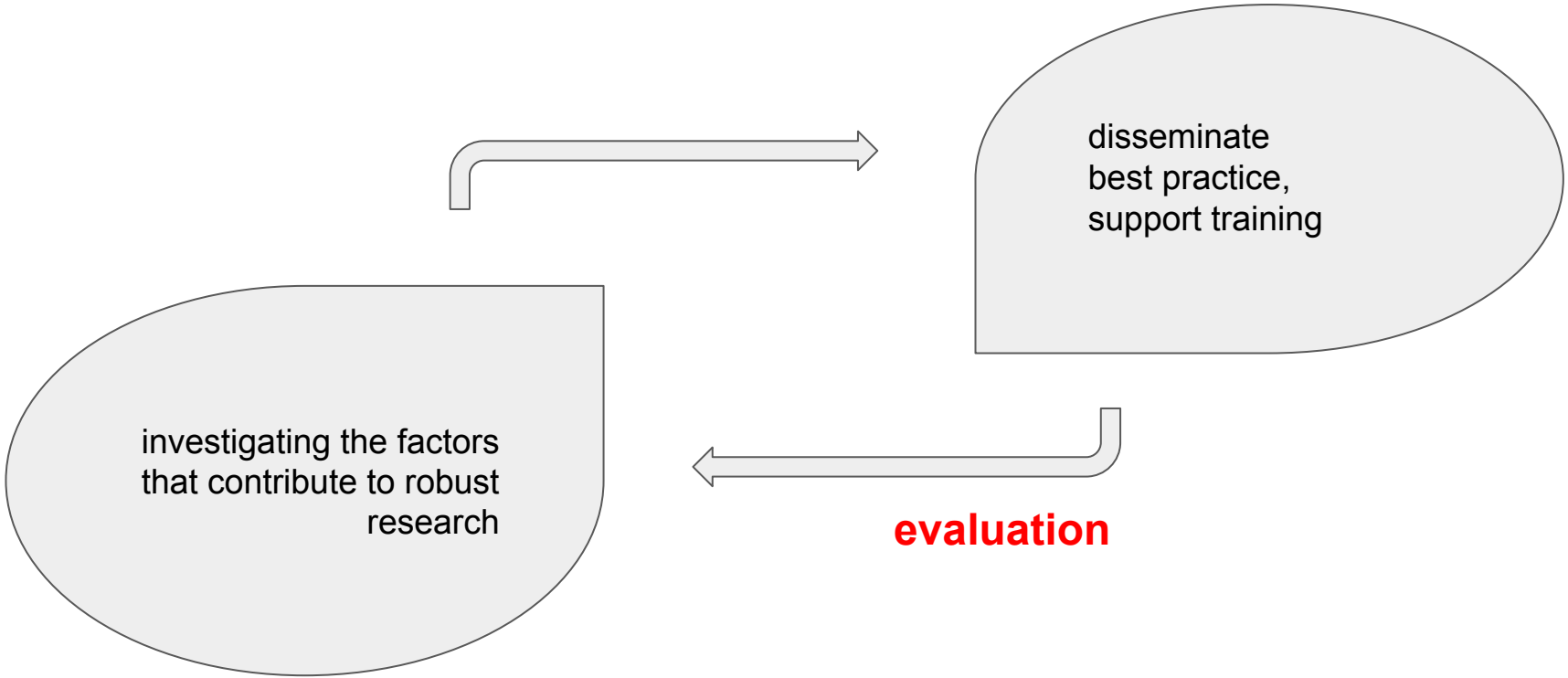
Lack of risk of bias / quality indicator tools

Lack of (enough) expert reviewers/reviews

Reliance on indirect / proxy measures

What to do?

Collectively we already know what to do, but it is under-shared, under-evidenced, not packaged for dissemination and not clearly distinguished from suboptimal practices


disseminate
best practice,
support training
investigating the factors
that contribute to robust
research
evaluation

UKRN Academy

The UKRN Academy connects doctoral students at UKRN member institutions who are working on topics related to reproducibility.

Open to all doctoral students in the UK working on research reliability, transparency, metascience or other meta-research / research-on-research topics.

Founder members:

8 PhD students,

at 5 institutions

Zuzanna Zagrodzka
Evaluating the perceptions of bias, replication and transparency in evolution and climate change science

My questions for you

Are you so sure of what is good practice?

What could your field share with others?

How could we test it?

Feedback

t.stafford@sheffield.ac.uk

Want to get involved in promoting Open Research at Sheffield?

ukrn@sheffield.ac.uk

These slides available at

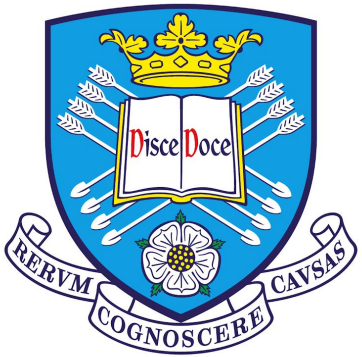
http://tomstafford.staff.shef.ac.uk/talks/

END

Reserve slides follow

My ambition for Sheffield

“Made in Sheffield”



The University Of Sheffield.

Why openness is key

Why Openness is key to quality

audit / replication

dissemination

extension & integration

collaboration

an ethical duty

an honest signal

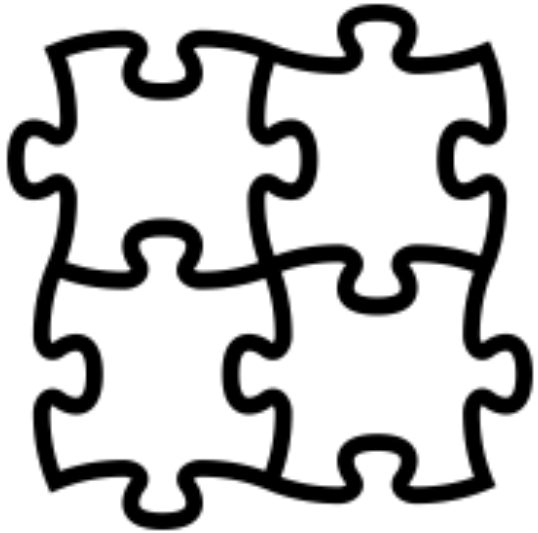


Image: Puzzle Pieces, CC-BY by M Ryan, US

What this means on the ground

Code (sharing, version control)

Data (management, sharing)

Open Access publishing

Research Culture

Policies and responsible metrics

Research training

Practices: replication, pre-registration, version control, collaboration

Common concerns about “open research”

Sharing of code limiting scope for commercialisation

Weaponisation of open data by bad actors (e.g. climategate)

Pre-prints squandering trust in research

Lack of funding model for auxiliary “research services” (e.g. statistical support)

Rising journal costs / extortion by academic publishers

News

Open Research Working Group @ Sheffield

Claudia von Bastian

Jim Uttley

UKRN@sheffield.ac.uk

Training & support gaps?

Licensing: Do we need a research code management plan, like we have research data management plans?

PGR training 1: There is no financial model to incentivise specialist DDP training.

PGR training 2: supporting "Computational literacy" is a core research practice skill

Statistics support/advisory: could be better joined up / sign posted?