*Jussim*

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5. System-Level Causes

 Systems that value productivity in prestigious outlets

 Systems that value novel, unexpected, important findings

 Systems that value statistically significant findings/effects

 Inadequate training in methods/stats/philosophy of science

 Shortage of funding for research

1. Accuracy and Validity Motivations

Desire to publish accurate findings

Desire not to get caught publishing irreplicable results

3. Personal Motivations of Scientists

      Fame

      Employment, job security, tenure

      Promotions

      Paid well

      Respected by peer scientists

      Respected by non-scientists

      Achieve/support political goals

a

6. Perceptions of Practice Norms

suboptimal practices vs

optimal practices

d

e

b

4. Proximal Science-Specific Motivations

 Desire to publish a lot in prestigious outlets

 Get grants

 Desire to produce novel, unexpected, important findings

 Desire to confirm one's own past findings

 Desire to confirm one's own theories

 Desire to disconfirm competing theories or findings

f

2. Competencies

Statistical

Methodological

Philosophy of science

Logic

Theory

g

f

7. Potentially Suboptimal Research Practices

   Non-diagnostic study designs

   Studying small samples of participants

   Studying small samples of stimuli and settings

  P-hacking

   File-drawering

   Publishing findings before self-replicating

   Incomplete or inaccurate reports of research practices and decisions

   Non-systematic sampling of research participants

   Non-systematic sampling of research stimuli

   Misapplication/misinterpretation of statistical tools

   Other QRPs

  HARKing

  Confirmation biases in literature reviewing

   Confirmation biases in data handling

   Poorly specified theories

   Unfalsifiable hypotheses

 Errors and biases in interpretations of results and literatures

i

11. Decreased social value ascribed to social and behavioral scientists

Decreased social value ascribed to social and behavioral science findings

Reduced funding for social and behavioral science research

Less student enrollment in social and behavioral science courses

Less faculty hiring in social and behavioral science departments

10. Failures of interventions to solve problems

9. Inaccurate Media Representation and Public Understanding of Scientific Results

l

j

k

8. Dissemination and Canonization of Erroneous Scientific Conclusions

 Publication of inaccurate findings (e.g., false positives)

 Over-claiming

 Overgeneralizing

h****

Figure 1: Social Psychological Model of Scientific Practices

c

Figure 2: The Research Credibility Pyramid



3. Personal Motivations of Scientists

dWhat is new here is the conceptual integration of ideas being widely discussed and practices being implemented, making explicit what is implicit in many people’s thinking.

eWhat is new here is the conceptual integration of ideas being widely discussed and practices being implemented, making explicit what is implicit in many people’s thinking.

5. System-Level Causes

m

1. Accuracy and Validity Motivations

4. Proximal Science-Specific Motivations

 publications, grants, etc.

b

a

o

2. Competencies

6. Perceptions of Practice Norms

**Science Reform Innovations and Interventions**

**data posting**

**pre-registration**

**registered reports**

**badges**

**improved statistics**

**self-replication**

**larger sample sizes**

**more representative samples**

**stimulus sampling**

**checklists**

**adversarial collaborations**

n

c

h

f

f

g

p

7. Potentially Suboptimal Research Practices

Confirmation biases in literature reviewing and data handling

Other errors and biases in interpretations of results and literatures (logical errors,

 myside biases, preferences biases, blind spots, misunderstanding of statistics)

Poorly specified theories

Unfalsifiable hypotheses

i

8. Dissemination and Canonization of Erroneous Scientific Conclusions

 j

9. Inaccurate Media Representation and Public Understanding of Scientific Results

k

10. Failures of interventions to solve problems

l

11. Decreased social value ascribed to social and behavioral scientists

Figure 4: Social Psychological Model of Scientific Practices, with Reforms

Figure Captions

Figure 1: Social Psychological Model of Scientific Practices

Box 7 focuses on known problematic practices, but it should be obvious that, in each case, there is an opposite better practice (e.g., replace a nondiagnostic study design with a diagnostic one; replace small sample studies with large samples when possible).

Figure 4: SPSPM-R, SPSPM With Reforms

This model is identical to the Social Psychological Model of Scientific Practices, with the following exceptions: The examples under each box header are not shown; a central box for science reforms has been added (in bold), as have several paths indicating how those reforms are predicted to influence scientific practices; Box 7 (Potentially Suboptimal Practices) only shows practices that are ***not*** expected to be affected by these reforms – all others are not shown. The new box and paths are shown with bold text and thicker boxes and arrows. Although there are no compelling reasons to predict that the major proposed reforms will alter the remaining suboptimal practices that are shown in Box 7, path p is included to permit the possibility that they may do so for reasons that are not yet well-understood. This model makes clear that most current reforms target statistics, methods, and practices, but not problems of logic or interpretation, nor the downstream consequences of inaccurate scientific conclusions.

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