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School of Education

INFORMATIONAL LITERACY IN THE DIGITAL AGE: A PRIMER FOR SCHOOL PSYCHOLOGISTS

Ryan J. McGill
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About Me

- Professional background.
- Academic background.
- Theoretical orientation.

#SP4EBP
Evidence Based School Psychology
@EBSPsych · Community

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Presentation Outline

- Introduction.
- Challenges to the EBP movement in school psychology.
- The relevance of traditional sources in today's age.
- Social networks and how (mis)information spreads at scale.
- Navigating the new ecosystem and implications for choosing to engage online.
- **Q&A.**

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EVIDENCE-BASED PRACTICE (EBP)

Overview and Impact in School Psychology

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EBP Movement

- Evidence-based medicine.
- Managed care movement.
- Special education reform (i.e., IDEIA 2004).
- Professional organizations
  - NASP.
  - APA (Division 16).

Evidence-based practice in psychology (EBPP) is the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences

- APA, 2005

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Challenges to EBP in School Psychology

- Consensus guidelines have been illusive (Shaw & D'Intino, 2017).
- Training gaps (Aiken et al., 2008; McGill & Wilson, 2018).
- Allegiance effects and clinical inertia (McGill et al., 2018).
- Commercial and entrepreneurial interests (Farmer et al., 2021).
- Informational ecosystem that is democratizing "knowledge" (Allgaer, 2019).
- Replication crisis (Proctor, 2004).

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Validation and Replication Issues Relating to School Psychology

- Multiple intelligence theory.
- Learning styles.
- Multisensory learning strategies.
- Balanced literacy.
- Aptitude by treatment interactions (ATI).
- Response to intervention (at scale).
- Suggested interpretive structures for commercial ability measures.
- Methods for identifying specific learning disabilities.
- D.A.R.E.
- Cognitive profile analysis.

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Dombrowski et al. (2020)

Table 1. Monte Carlo Simulation of Posited Models for Prominent Commercial Ability Measures (Average Fit Statistics Across 1,000 Replications).

Model	χ^2	*df*	CFI	TLI	SRMR	RMSEA	BIC	AIC	Replications
WISC-V									
BF (Canivez & Watkins, 2016)	**401.8**	**88**	**0.980**	**0.973**	**0.024**	**0.040**	**84982**	**84617**	**987**
HO (Reynolds & Keith, 2017)	437.7	97	0.978	0.973	0.026	0.040	84948	84635	1000
HO (publisher theory)	1095.4	98	0.936	0.922	0.108	0.068	85598	85290	1000
BF (Dombrowski et al., 2015)	697.3	93	0.961	0.95	0.038	0.054	85238	84902	1000
WJ IV Cognitive									
BF (Dombrowski, McGill, Canivez, 2017, 2018)	**1669.3**	**118**	**0.867**	**0.827**	**0.047**	**0.091**	**70657**	**70277**	**1000**
HO publisher theory[a]	2046.4	128	0.835	0.803	0.056	0.098	70961	70634	1000
KABC-II									
HO (Reynolds et al., 2007)	**530.0**	**95**	**0.971**	**0.964**	**0.029**	**0.047**	**77515**	**77195**	**1000**
BF (McGill & Dombrowski, 2018)	661.4	88	0.962	0.949	0.036	0.057	77667	77307	1000
HO (publisher theory)	1437.6	97	0.912	0.891	0.046	0.083	78406	78097	1000
DAS-II									
HO (Keith et al., 2010)	**522.5**	**161**	**0.949**	**0.940**	**0.035**	**0.053**	**38320**	**37998**	**1000**
BF (Dombrowski, McGill, Canivez, & Peterson, 2018)	509.9	155	0.951	0.939	0.036	0.054	38348	37998	982
HO (publisher theory)	616.0	164	0.936	0.926	0.040	0.059	38394	38085	1000

Note. *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; SRMR = standardized root mean square; RMSEA = root mean square error of approximation; BIC = Bayesian information criterion; AIC = Akaike's information criterion; BF = bifactor; HO = higher order; WISC-V = Wechsler Intelligence Scale for Children–Fifth edition; WJ IV Cognitive = Woodcock-Johnson IV Tests of Cognitive Abilities; KABC-II = Kaufman Assessment Battery for Children–Second edition; DAS-II = Differential Abilities Scales–Second edition. Bold text illustrates best fitting model.
[a]WJ IV Cognitive publisher theory reported negative residual variance of −2.29 and −0.043 on Ga and a standardized parameter estimate of *g* on Ga of 1.13.

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Article

Canadian Journal of School Psychology
1–17

DOI: 10.1177/0829573520978111
journals.sagepub.com/home/cjs
SAGE

Why Questionable Assessment Practices Remain Popular in School Psychology: Instructional Materials as Pedagogic Vehicles

Ryan L. Farmer[1], Ryan J. McGill[2], Stefan C. Dombrowski[3], and Gary L. Canivez[4]

Abstract

Surveys reveal that many school psychologists continue to employ cognitive profile analysis despite the long-standing history of negative research results from this class of practice. This begets the question: why do questionable assessment practices persist in school psychology? To provide insight on this dilemma, this article presents the results of a content analyses of available interpretive resources in the clinical assessment literature that may shed insight on this issue. Although previous reviews have evaluated the content of individual assessment courses, this is the first systematic review of pedagogical resources frequently adopted in reading lists by course instructors. The interpretive guidance offered across tests within these texts was largely homogenous emphasizing the primary interpretation of subscale scores, de-emphasizing interpretation of global composites (i.e., FSIQ), and advocating for the use of some variant of profile analysis to interpret scores and score profiles. Implications for advancing evidence-based assessment in school psychology training and guarding against unwarranted unsupported claims in clinical assessment is discussed.

Keywords

standardized assessment, education assessment, assessment, intelligence/cognition, IQ testing, graduate instruction, school psychologists/counsellors, education professionals

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PNAS PNAS PNAS

Science audiences, misinformation, and fake news

Dietram A. Scheufele[a,1] and Nicole M. Krause[a,1]

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Edited by Baruch Fischhoff, Carnegie Mellon University, Pittsburgh, PA, and approved November 9, 2018 (received for review June 18, 2018)

Concerns about public misinformation in the United States—ranging from politics to science—are growing. Here, we provide an overview of how and why citizens become (and sometimes remain) misinformed about science. Our discussion focuses specifically on misinformation among individual citizens. However, it is impossible to understand individual information processing and acceptance without taking into account social networks, information ecologies, and other macro-level variables that provide important social context. Specifically, we show how being misinformed is a function of a person's ability and motivation to spot falsehoods, but also of other group-level and societal factors that increase the chances of citizens to be exposed to correct(ive) information. We conclude by discussing a number of research areas—some of which echo themes of the 2017 National Academies of Sciences, Engineering, and Medicine's *Communicating Science Effectively* report—that will be particularly important for our future understanding of misinformation, specifically a systems approach to the problem of misinformation, the need for more systematic analyses of science communication in new media environments, and a (re)focusing on traditionally underserved audiences.

misinformation | disinformation | fake news | motivated reasoning | science literacy

claims. However, the line between being misinformed or uninformed—that is, simply not knowing—has long been blurry in different literatures.

For example, early empirical observers of the modern US political system equated being misinformed to not being informed in the first place, or to making decisions based on factors other than the best available information. "After examining the detailed data on how individuals misperceive political reality or respond to irrelevant social influences," Berelson et al. (5) wrote over 60 y ago, "one wonders how a democracy ever solves its political problems." Much of the empirical work since then has focused on providing citizens with competencies to absorb relevant facts to "overcome areas of ignorance or … correct mistaken conceptions" (6). Thus, being misinformed has sometimes been understood as both holding inaccurate views and being uninformed about scientific facts and processes.

However, others have argued that believing incorrect information about both scientific topics (e.g., childhood vaccination) and political topics (e.g., weapons of mass destruction in Iraq) can have unique causes and consequences, especially if the person is also politically active. Compared with people who are uninformed or those who are informed but inactive, individuals who are "active" and "misinformed" have "unite[d] their purported knowledge and their political actions, [so] they have little incentive to abandon old beliefs, accept new ones, abandon old

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HOW DOES "EVIDENCE" BECOME EVIDENCE?

Understanding the Journal Publication Process and its Relevance in the present age.

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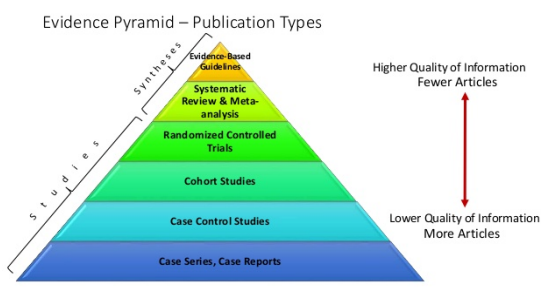
Hierarchy of Evidence



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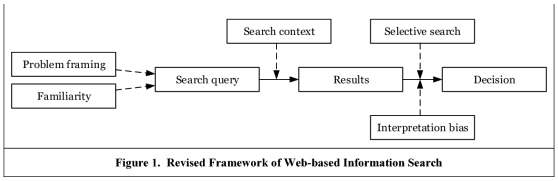

Figure 1. Revised Framework of Web-based Information Search

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Steps in the Publication Process

- Pre-publication.
- Article submitted for review.
- Review decision:
  - Reject.
  - Revise and Resubmit (how many rounds?).
  - Acceptance with minor revisions.
  - Accept.
- Editorial review and formatting.
- Publication:
  - Access lag.
  - Copyright and open access.
    - Royalties.

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Article Versions

- Manuscript.
- Pre-print.
- Post-print.
- Version of record.
- Implications for copyright and open access.

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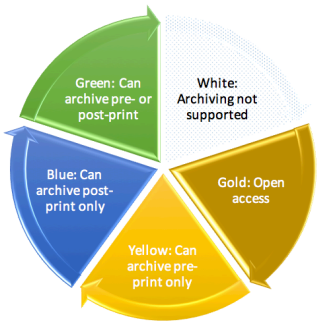

Figure 1. Open access typologies in academic publishing.

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Indicators of Journal Article Quality

- Reputation of journal.
- Impact factor for journal.
  - > 1is generally considered decent quality in psychology and education.
- Citations.
  - Ways in which you can generate citations and interest.
  - Provocative topic or title.
  - Promote on social media or news conferences.
    - How are experts selected in the media now?
- Word of mouth.
- Does retraction work?
  - Wakefield affair.

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Congratulatory Self-Promotion: Cautionary Tale

- Not all attention is good attention!

- OPERA: Faster than light neutrinos.
- Wansink food science retractions.
- Bem and Psi.
  - Harbinger of the replication crisis in scientific psychology.

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Major Journals in SP and Related Fields

Tier 1

- School Psychology Review.
- School Psychology.
- Journal of School Psychology.
- Psychological Assessment.
- Journal of Psychoeducational Assessment.
- Assessment.

Tier 2 and Beyond

- Contemporary School Psychology.
- Journal of Applied School Psychology.
- IJESP.
- School Psychology International.

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Appraising Article Quality

- On the merits.
  - Research design.
    - Sample.
    - Reliability.
    - Valid conclusions.
- Time consuming and requires appropriate training and experience.
  - ~25% of Ed.S. training programs limit foundation to a single catch-all methods course (McGill & Wilson, 2017).
- As a result, we often default to outsourcing.

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Peer Review: Inside the Black Box

- Reviewer selection and editorial discretion.
  - Allegiance effects (Dragioti et al., 2015).
- Reviewing on the merits.
- Does the editor fully integrate reviewer comments?
- How do we deal with this as consumers?

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Are we Just Lucky?

Table 1. Outcomes of Tests of Significance for Four Psychology and Three Medical Research Journals

Journals	No. of articles reviewed in 1986–87	% articles reviewed that use tests in 1986–87	% articles using tests that reject H_0 in 1986–1987	No. of articles reviewed that used tests in 1958	% articles using tests that reject H_0 in 1958
Experimental Psychology (four journals)	165	92.73	93.46	106	99.06
Comparative & Physiological Psychology (two journals)	119	88.24	97.14	94	96.81
Consulting & Clinical Psychology	83	96.39	97.50	62	95.16
Personality & Social Psychology	230	97.83	95.56	32	96.88
Psychology Journals Total	**597**	**94.30**	**95.56**	**294**	**97.28**
American Journal of Epidemiology	141	81.56	80.87	N/A	N/A
American Journal of Public Health	97	43.30	88.10	N/A	N/A
New England Journal of Medicine	218	75.69	87.88	N/A	N/A
Medical Journals Total	**456**	**69.25**	**85.40**	N/A	**N/A**

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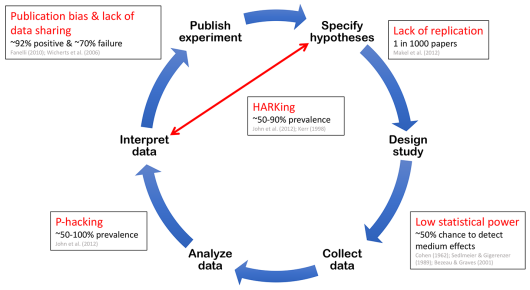

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Things to Keep in Mind

- Outright data fabrication is rare.
- We still have much work to do in SP.
- The replication crisis is actually a good thing.
- Our standards for publication are much higher than in the past.
- We can still have faith in science as long as we understand that it is an imperfect process.

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Open Science to the Rescue?

- Open science framework (https://osf.io/).
- Pre-registration.
- Un-blinded review.
- Pre-print repositories.
- Impact?

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Open Access and Predatory Publishing

- In 2015, ~200 psychology journals currently listed in Directory of Open Access Journals.
- Illusion of quality control:
  - Fake peer review.
  - Predatory fee structures.
  - Promotion of junk science (Beall, 2018).
- How can you tell the difference?

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Pre-Print Repositories

- What are they?
  - Goals.
- How are they being used?
- Example (https://psyarxiv.com/dxr2g/)
- Quality control and unanticipated blowback (Viskontis, 2018).
  - Popular media and COVID.

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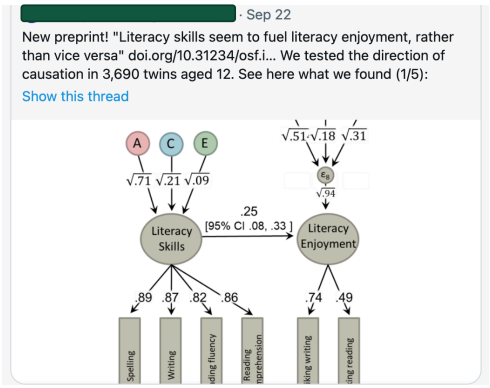

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Relevance of Journal Articles?

- Online first has undercut the importance of print issues.
- Publication lag, access, and lack of alignment with *in situ* priorities remain a problem.
- Studies are used mostly by academics to make arguments in academia (i.e., journals).
- Outsourcing of review places an immense amount of trust on external parties with more freedom to vary.
- Journal publishers and academics have had difficulty transitioning to the digital age.

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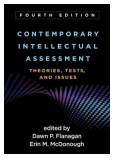
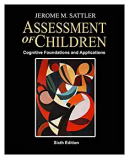
Outsourcing: Books, Clinical Guidebooks, and Book Chapters

- Good initial source to get the lay of the land.
- Authors rarely, if ever, disclose COI.
- Editorial control rests largely with authors.
- Framing the search and presentation of information.
  - Quality varies.





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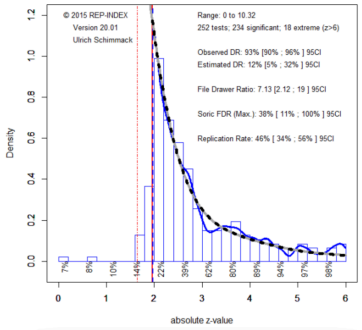
Test Drive: Estimating the Replicability of *Thinking Fast and Slow* (Schimmack, 2015)



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Outsourcing: CPD Workshops and Conference Proceedings

- Most popular influence beyond graduate school and clinical lore (Farmer et al., 2021).
- Most are peer reviewed to some degree.
- While appearing independent, many proceedings are sponsored by commercial interests.
  - Stipends and fees.
- Quality can vary depending on venue.
  - Need to develop standards (Washburn et al., 2019).

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Outsourcing: Grey Material Online

- Easily accessible.
- Useful to supplement other sources.
  - Cross-validate.
- Often sponsored by commercial or professional interests.

Pearson

"COVID Slide" Not Evident in Individually Administered Clinical Test Scores Obtained From a Large, Referred Sample

Susan Engi Raiford, PhD
Kristina Breaux, PhD
Siqi Chen, PhD
Tyler Matta, PhD

February 2021

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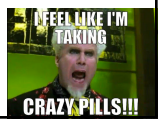
In Sum…

- All prevailing information sources that influence practice have strengths and limitations.
- Reliance on convenience is likely to exacerbate weaknesses.
- Reputable peer reviewed journal articles remain the "gold standard" but they are more difficult to access.
- Predatory and open access journals provide illusion of quality control.



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DIGITAL PLATFORMS AND SOCIAL NETWORKS

Social media to the rescue?

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What is social media?

- "Social media" is based on web 2.0. functionality.
  - Static versus kinetic forms of communication and content generation.
- Social media is composed of a panoply of web platforms that allow you to communicate instead of only informing.
- Use in SP is increasing.
  - Professional listservs.
  - Twitter (personal and professional).
  - Facebook affinity groups.
  - Podcasts*

facebook

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Social media platforms

- Change and ubiquity in platforms.
  - Pareto principle.
- We need to understand:
  - How each one works.
  - Why are people interested in participating.
  - How we can benefit from each one.

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Appraising Social Media

Strengths	Limitations

• Interact and share information at scale.
• Promote awareness and branding.
• Flattens barriers to communication and knowledge production.
• Removes paid content barriers.*
	• Targeted algorithms.
	  • Information silos.
	  • Conduit for advertising.
	• Addictive.
	• Spread of misinformation.
	• Absence of context.
	• Exposure can reify preconceived beliefs.
	• BX norms.

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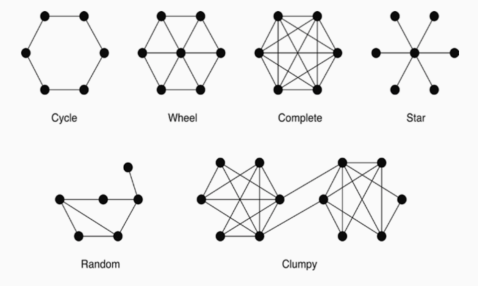
Communication Networks



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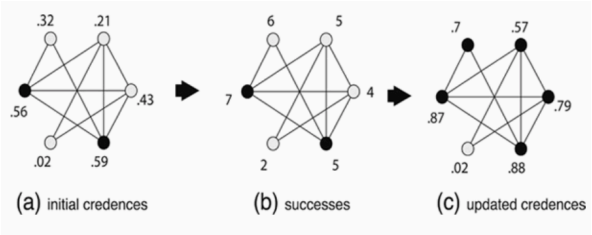
Bayal and Goyal-Style Model



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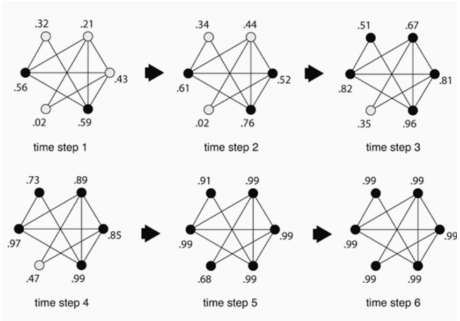
Optimistic Updating of Beliefs



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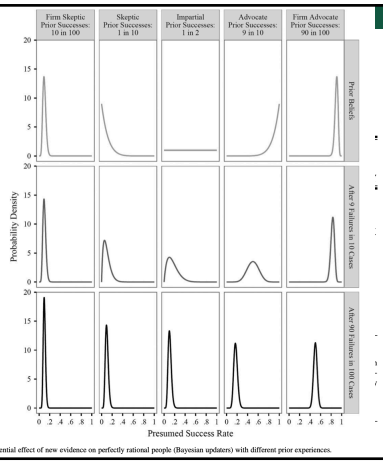

Fig. 1. The differential effect of new evidence on perfectly rational people (Bayesian updaters) with different prior experiences.

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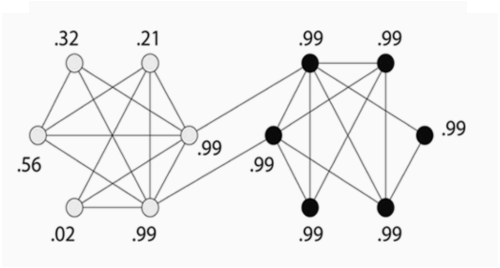
Effect of Polarization



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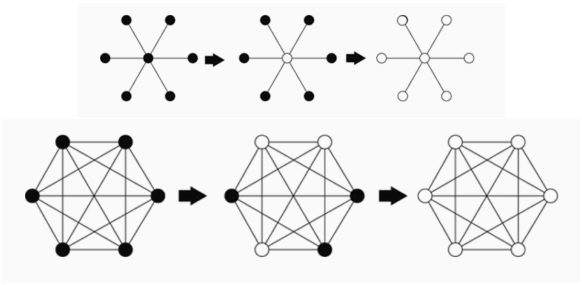
Connectivity and the Spread of Misinformation



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Illusory Truth Effect (Fazio et al., 2015)

Journal of Experimental Psychology: General
2015, Vol. 144, No. 5, 993–1002

0096-3445/15/$12.00 http://dx.doi.org/10.1037/xge0000098

Knowledge Does Not Protect Against Illusory Truth

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Nadia M. Brashier
Duke University

B. Keith Payne
University of North Carolina at Chapel Hill

Elizabeth J. Marsh
Duke University

In daily life, we frequently encounter false claims in the form of consumer advertisements, political propaganda, and rumors. Repetition may be one way that insidious misconceptions, such as the belief that vitamin C prevents the common cold, enter our knowledge base. Research on the illusory truth effect demonstrates that repeated statements are easier to process, and subsequently perceived to be more truthful, than new statements. The prevailing assumption in the literature has been that knowledge constrains this effect (i.e., repeating the statement "The Atlantic Ocean is the largest ocean on Earth" will not make you believe it). We tested this assumption using both normed estimates of knowledge and individuals' demonstrated knowledge on a postexperimental knowledge check (Experiment 1). Contrary to prior suppositions, illusory truth effects occurred even when participants knew better. Multinomial modeling demonstrated that participants sometimes rely on fluency even if knowledge is also available to them (Experiment 2). Thus, participants demonstrated knowledge neglect, or the failure to rely on stored knowledge, in the face of fluent processing experiences.

Keywords: illusory truth, fluency, knowledge neglect

Supplemental materials: http://dx.doi.org/10.1037/xge0000098.supp

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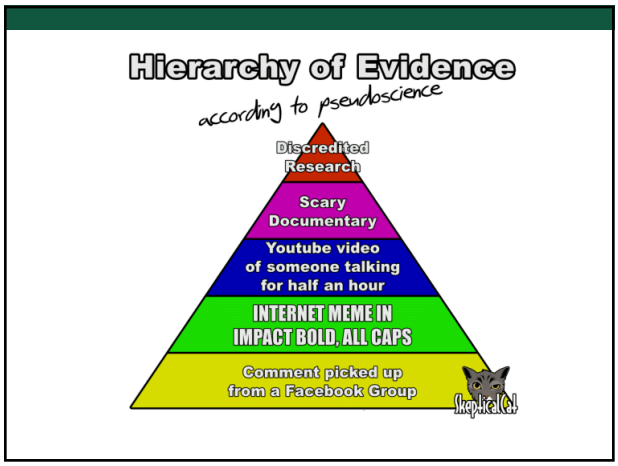
Hierarchy of Evidence
according to pseudoscience
Discredited Research
Scary Documentary
Youtube video of someone talking for half an hour
INTERNET MEME IN IMPACT BOLD, ALL CAPS
Comment picked up from a Facebook Group
Skeptical Cat

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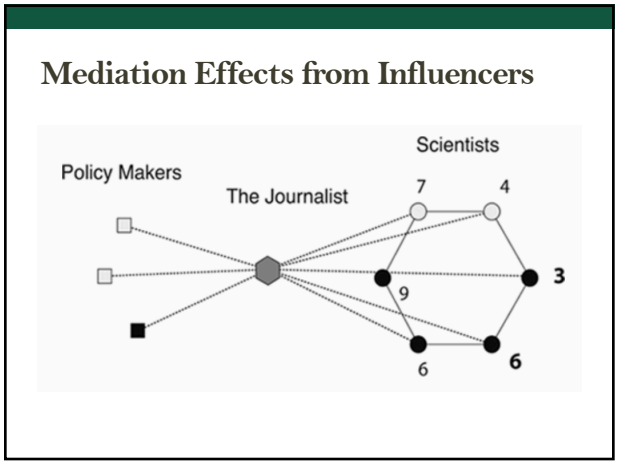
Mediation Effects from Influencers
Policy Makers
The Journalist
Scientists
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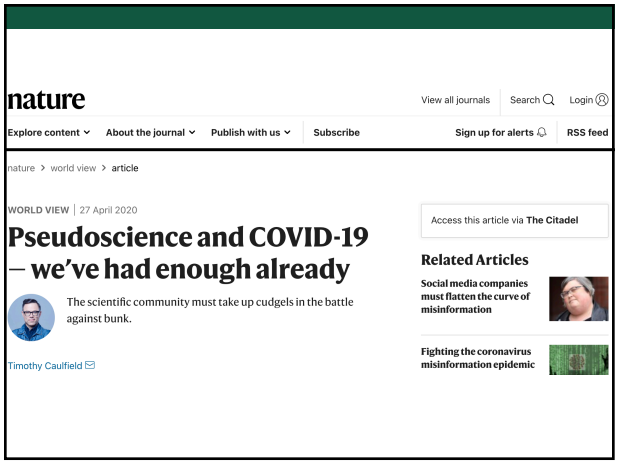
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The scientific community must take up cudgels in the battle against bunk.
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How would you define "misinformation?"

- Any source of info that is not rooted in fact.
- False information create by design that is interpreted as true and spreads rapidly via the internet.
- Misguided interpretations of data on a contentious issue that turn out to be contraindicated after the fact.
- A way to indicate what the phrase's user thinks is negative propaganda towards themselves or *their* beliefs.

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Online Disinhibition Effect (Suler, 2004)

Computers in Human Behavior 28 (2012) 434–443

Contents lists available at SciVerse ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Effects of anonymity, invisibility, and lack of eye-contact on toxic online disinhibition

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University of Haifa, Mount Carmel, Haifa 31905, Israel

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Article history:
Available online 10 November 2011

Keywords:
Online communication
Disinhibition
Anonymity
Invisibility
Eye-contact

ABSTRACT

The present research studied the impact of three typical online communication factors on inducing the toxic online disinhibition effect: anonymity, invisibility, and lack of eye-contact. Using an experimental design with 142 participants, we examined the extent to which these factors lead to flaming behaviors, the typical products of online disinhibition. Random pairs of participants were presented with a dilemma for discussion and a common solution through online chat. The effects were measured using participants' self-reports, expert judges' ratings of chat transcripts, and textual analyses of participants' conversations. A 2 × 2 × 2 (anonymity/non-anonymity × visibility/invisibility × eye-contact/lack of eye-contact) MANOVA was employed to analyze the findings. The results suggested that of the three independent variables, lack of eye-contact was the chief contributor to the negative effects of online disinhibition. Consequently, it appears that previous studies might have defined the concept of anonymity too broadly by not addressing other online communication factors, especially lack of eye-contact, that impact disinhibition. The findings are explained in the context of an *online sense of unidentifiability*, which apparently requires a more refined view of the components that create a personal sense of anonymity.

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Examples…

- Ad hominin attacks on commenters in professional threads.
- De-blinding reviewer reports and openly critiquing journal practices.
- Hyping preliminary research results that evade scrutiny.
- Practitioners @ing commercial entities regarding the validity of their products.
- Crowd sourcing clinical test interpretation.
- Sharing copyright materials or student data online without permission.
- Appeals to pseudoscience and nonsensical practices.
- Doxxing.

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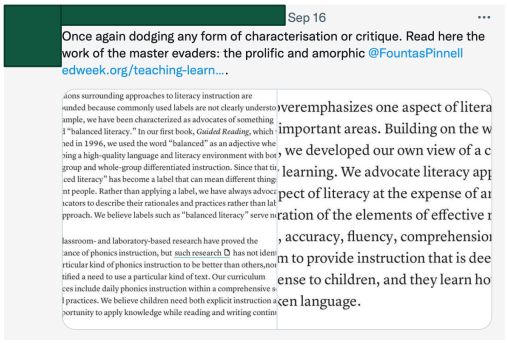

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Becoming a Savvy Information Consumer

- Take advantage of free methodological/EBP resources.
  - Psychological Methods Facebook group.
  - Data Colada (http://datacolada.org/)
  - Replication Index (https://replicationindex.wordpress.com/)
  - Evidence-Based School Psychology Facebook group.
- Trust but verify.
  - Overreliance on single studies related to contentious issues.
  - Use evidential weight/value as a guide to make clinical decisions.
  - Skepticism versus cynicism.
- Social media.
  - Be careful about what you endorse and put out there.
  - Understand the benefits and limitations of various platforms.
    - What network model is operating and who controls the flow of information?
  - Vet to ensure legitimacy.

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Savvy Consumer….Cont.

- Use the information age to your advantage.
  - There is no such thing as a *bad* platform.
  - Be mindful that whatever the source, good and bad information abounds.
  - Relying on one platform or method is likely to exacerbate the downside of that source at the expense of its upside.
- At the end of the day, there is no substitute for content expertise.
- We have to balance between ignorance and oversaturation.
- Breadth and consistency are key inoculators for stable decision-making and informed adoption of clinical practices (Lilienfeld et al. 2012).

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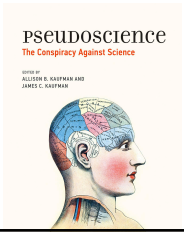
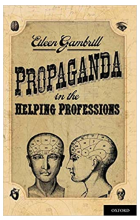
Resources for Being Able to Spot Hype and Pseudoscience

- Baloney detection toolkit (Sagan, 1997).
- Warning signs for hype (Dombrowski et al., 2021).
- Distinguishing science and pseudoscience in SP (Lilienfeld et al. 2012).





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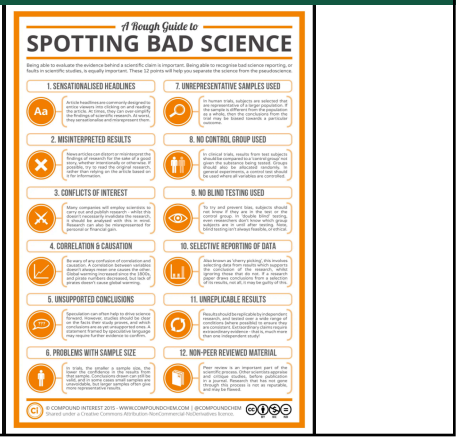

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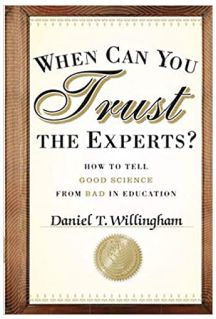
Simple Egalitarian Fallacy



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Venturing Online: Things to Consider

- Is the platform for personal or professional use, or both?
  - Regardless, your content is an extension of your professional life.
- What you post will likely exist in perpetuity in some way.
- Users have no obligation to respond to your content.
- For groups, ensure that you have a content moderation board and clear policies on what can and cannot be posted.
  - Be consistent in your enforcement.
- Understand the ways in which users are likely to communicate with you via the platform(s) you choose.
- Don't be afraid to lurk.

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