

Toward Transparent Reporting of Psychological Science

Etienne P. LeBel
Montclair State University

Leslie K. John
Harvard University

This article to appear in S. O. Lilienfeld & I.D. Waldman (Eds.), *Psychological science under scrutiny: Recent challenges and proposed solutions*. NY, NY: John Wiley and Sons.

Corresponding Author: Etienne P. LeBel, Department of Psychology, Dickson Hall, Montclair State University, Montclair, NJ, USA, 07043; **Email:** etienne.lebel@gmail.com

Toward Transparent Reporting of Psychological Science

In this chapter we make a case for increased transparency of the methods used to obtain research findings. Although comprehensive reporting facilitates accurate assessment of a paper's claims, the current reporting norm is secrecy, not openness. We begin by putting this situation into historical context, comparing reporting norms from a bygone era to those of today. Next, we explain why transparency is desirable, even if full compliance is not achieved. We then outline the obstacles – both psychological and institutional – to comprehensive reporting. We go on to discuss possible remedies and end by drawing connections between the disclosure problem and other ongoing challenges within psychological science and allied fields.

Historical Context

In 1959, Festinger and Carlsmith reported the results of an experiment that became highly influential, spawning a body of research on cognitive dissonance. A little known fact about this study, however, is that only one of the three relevant outcome measures was statistically significant. Subjects who were paid \$1 reported the boring task to be more enjoyable on average than those paid \$20 or \$0. However, no statistically significant differences emerged on two other measures that had also been hypothesized to show results consistent with a cognitive dissonance account (i.e., the desire to participate in a similar experiment and the perceived scientific importance of that experiment).

In another highly influential paper, Word, Zanna, and Cooper (1974) documented the self-fulfilling prophecies of racial stereotypes. In a first experiment, white subject interviewers were found to behave in less friendly ways toward trained black (compared with white) applicants. In a follow-up study, white subject applicants treated in a less friendly way by trained

white interviewers (as blacks had been treated in the first experiment) performed worse than white applicants who had been treated in a friendlier way (as whites had been treated in the first experiment). A curious aspect of the first study, however, is that white subject interviewers behaved in a less friendly way toward the trained black applicant on only three of six non-verbal behaviors measured to assess friendliness (i.e., distance, interview length, and speech error rate, but not forward lean, eye contact, or shoulder orientation; see Table 1, Word et al., 1974).

These two examples provide an historical context for understanding disclosure problems currently faced in psychological science. The examples aim to demonstrate that it was more common 50 years ago to report methods and results in their entirety. But as pressure and competition to publish intensified over time, researchers began to disclose fewer methodological details, yielding “cleaner” looking results which appear more compelling to editors and reviewers.

Disclosure Problem in Psychology

Consensus has emerged that psychology’s current reporting practices are problematic because insufficient details are provided to allow for accurate interpretation and evaluation of findings (Miguel et al., 2014; Simmons, Nelson, & Simonsohn, 2011; Simmons, Nelson, & Simonsohn, 2012). What constitutes adequate disclosure? We think a reasonable standard is to disclose the basic four categories of methodological details proposed by Simmons et al.’s 2012 study: disclose all excluded observations, tested experimental conditions, analyzed measures, and sample size determination rule (hereafter referred to as the Basic 4).¹

¹ While these new disclosure standards were originally designed for experimental research, disclosure standards for non-experimental observational studies have more recently been proposed (e.g., Campbell, Loving, & LeBel, in press; Miguel et al., 2014).

In a large scale survey (John, Loewenstein, & Prelec, 2012) academic psychologists indicated whether they had engaged in a series of questionable research practices, many of which entailed failures to disclose important methodological details (hereafter referred to as questionable reporting practices, or QRePs). A non-trivial percent of respondents admitted to, on at least one occasion, failing to report all of a study's independent variable conditions (28% of respondents) and dependent measures (65% of respondents). Of course, administering many variables does not in and of itself make research questionable; it is the failure to disclose them that can be problematic. When readers are not aware of all study variables that were assessed in relation to a target research question, they cannot be sure of the correct alpha level by which to judge whether results are statistically significant or fluke (Simmons et al., 2011; Wagenmakers, Wetzels, Borsboom, & Van der Maas, 2011).²

Further evidence of problematic reporting practices comes from PsychDisclosure.org, a public platform for authors of recently published psychology articles to disclose the Basic 4. Among a random sample of authors invited to disclose such information, a near-majority (i.e., 49% as of May 18, 2014) did so (LeBel et al., 2013). Moreover in some cases, respondents disclosed details that should significantly alter the interpretation of their reported findings. For example, 45% of respondents indicated that they did not report all dependent measures, 12% indicated that they did not report all experimental conditions, and 11% indicated that they did not report all excluded participants (as of March, 2013). Given the sensitive nature of publicly admitting such practices, the observed disclosure rates in LeBel et al. (2013) are likely dramatic underestimates of the true prevalence of adequate reporting.

² This is the case even if thousands of variables were measured to test a particular research question (e.g., large epidemiological studies). Of course, sometimes a study will measure variables for several research questions, in which case only the variables assessed to test the target research question reported in an article need to be fully disclosed.

In some cases, authors provided rationale for the information's apparent irrelevance to assessing the paper's validity (e.g., unreported measures were merely "exploratory"). But such information should be disclosed nonetheless because, as we outline later, authors are biased judges of the soundness of their own research. Apparently sound reasons may not be so sound. It is possible, for example, that the categorization of an outcome variable as "exploratory" is dependent on its results. Outcomes that fail to support one's hypothesis are easily dismissed as having been "exploratory measures," whereas if they had "worked," they would not have been marginalized.³

Additional evidence for the current lack of transparency comes from a sample of manuscript submissions to *Psychological Science* (N = 145), for which editor-in-chief Eric Eich invited submitting authors to disclose the Basic 4. Strikingly, Eich (2013) found that only 42% of respondents had fully disclosed all excluded observations, all tested experimental conditions, and all analyzed dependent variables in their submitted manuscript. This was shocking to Eich (and to us) given that these methodological details speak to basic elements of the scientific method rather than "abstruse bits of methodological arcana" (p. 9). Furthermore, only 10% of respondents had fully disclosed all four pieces of information.

Why We Seek Transparent Reporting

We view transparent reporting as good academic 'hygiene.' At a minimum, if reporting is done honestly, it will enable readers to more accurately gauge the veracity of a paper's claims. We think it could also improve the integrity of the research itself: if researchers know in advance that they must disclose all critical methodological details, they may think twice before writing up

³ This is why transparency coupled with study pre-registration (Chambers, 2013; Wagenmakers et al., 2012) is even more helpful to maximize methodological rigor.

tenuous results. They may opt instead to first conduct follow-up studies to ensure that their effect is robust. For example, if researchers know that they will be required to report all administered outcome measures, they may take pause before submitting manuscripts wherein the hypothesized effects emerge only in a small subset of administered outcome measures. They may also be more careful in designing their experiments and crafting their measures *prior* to data collection.⁴

Conveniently, the benefits of transparency are independent from the reasons why researchers engage in QRePs. Although interesting from a philosophy of science standpoint, we have found that debating the causal antecedents to QRePs devolves into unproductive and inflammatory discussions. But a benefit of transparency – facilitating accurate interpretation of results – *is* dependent on authors' compliance with requests to disclose critical methodological details. How can we be sure that authors will comply? As we discuss in the next section, despite some (inevitable) non-compliance, transparency is unlikely to degrade the quality of psychological science and is likely to improve it.

Predicted Effects of (Non)compliance

In this section, we discuss two anticipated types of non-compliance. We argue that despite inevitable non-compliance, transparency is still a worthwhile initiative.

Primary non-compliance refers to non-disclosure of methodological details in the face of requests to do so. Since the current norm is secrecy, however, one could argue that *any* increase in compliance is an improvement from the status quo. Moreover, substantial primary non-compliance is unlikely given that many authors comply with mere requests for disclosure of

⁴ In informal conversation, we have heard some researchers argue that such care may result in increased false negatives (i.e., Type II errors). However, given the research on the prevalence of practices that dramatically increase false positives, along with the incentive to produce positive results, we believe this objection is unwarranted.

methodological details (as manifested at PsychDisclosure.org); even more would be expected to comply if transparency were required. As full disclosure becomes more common, those who abstain may be perceived as increasingly suspect, in turn motivating them, too, to comply (John, Barasz, & Norton, working paper). However, curbing primary non-compliance, whether through changing norms or submission requirements, might paradoxically increase secondary non-compliance – making inaccurate methodological claims, even if unintentional. We think such deception would be rare and, to the extent it occurred, would be unlikely to leave the scientific community worse off.

To support the claim that secondary non-compliance (i.e. lying) would be rare, we discuss the effects of different types of secondary non-compliers. The naïve but well-intended, who engage in QRePs simply because they do not know better, are likely to comply with disclosure mandates, faithfully reporting their methodological details (because they are naïve, they are unlikely to understand that strategic lying can, at least in the short run, bolster results' credibility. We would also expect some truthful reporting from a second category of researchers, the self-deceived but well-intended – those who engage in QRePs because they have rationalized them to be acceptable. To the extent that disclosure requests are clear and pertain to concrete behaviors, non-compliance in these individuals should be reduced. Finally, transparency mandates should also induce disclosure among those who *knowingly* engage in QRePs because they turn a sin of omission into one of commission. A wealth of research has shown that it is psychologically more difficult, and hence, rarer, to lie by commission (to overtly lie, say, by making a knowingly false statement) than by omission (to covertly lie, say, by omitting the truth) (Ritov & Baron, 1990, 1995).

Psychological and Institutional Obstacles to Transparent Reporting

As manifested in the generally positive response to LeBel et al.'s (2013) PsychDisclosure.org initiative (49% response rate, with 10% of respondents explicitly praising the initiative), many psychologists realize that transparency is good practice. But there are potent psychological and institutional forces thwarting it.

Psychological obstacles. A variety of biases in human judgment pose psychological obstacles to transparent reporting. One such culprit is confirmation bias, which refers to the tendency to seek and interpret evidence so as to support one's pre-existing intuitions (Nickerson, 1998; see also MacCoun, 2014, this volume, Chapter XX). A second, closely related obstacle is motivated reasoning – the tendency to access, construct, and evaluate beliefs so as to maximize the likelihood of arriving at desired conclusions (Kunda, 1990). Together, in much the same way as researchers' political beliefs can unintentionally bias their interpretation of evidence—a propensity dubbed questionable interpretive practice (Jussim, Crawford, Stevens, Anglin, in press)—these factors tempt researchers away from reporting methods and results in their entirety, 'warts' and all.

Other psychological phenomena are also likely to create obstacles for transparent reporting throughout the research cycle. Goal gradients, for example, refer to the tendency to become more motivated as one approaches a goal, even if this progress is illusory (Kivetz, Urminsky, & Zheng, 2006). In a related vein, recent work has found that people are more likely to cheat as they approach a goal (Schweitzer, Ordonez, & Douma, 2004). Together, these factors suggest that the temptation, and sometimes even the rewards, to engage in QRePs increase with progression through the publication process.

Institutional obstacles. Strong institutional barriers interfere with transparency, including insufficient journal reporting standards, misaligned incentives, questionable editorial practices (QEPs), and a hypercompetitive publish-or-perish academic research culture.

Insufficient journal reporting standards that do not require authors to disclose sufficient methodological details are a powerful force impeding more open and rigorous research practices in psychological science. Though some researchers may voluntarily disclose sufficient methodological details, given the incentive structure in academia and the publish-or-perish culture, even the most well-intentioned researchers might be tempted to withhold such information if it gives them an edge in securing a publication. In one of our frequent informal conversations about this issue, one researcher exclaimed: “Why would anyone disclose information that is going to shoot them in the foot during the review process?”

In other words, the individual desire to accumulate academic currency (i.e. published papers) is imperfectly aligned with an overarching goal of science (at least from an empiricist’s perspective) – to understand the true relationship between variables of interest (Nosek et al., 2012). This creates a difficult intra-psychic conflict of interest (Maurissen et al., 2005), in which the incentive to ‘get it right’ is at odds with ‘getting it published.’ Conflicts of interest have been shown to distort judgments in many domains, even among highly educated and well-intentioned people (Bazerman, Loewenstein, & Moore, 2002; Cain & Detsky, 2008; Dana & Loewenstein, 2004); there is no reason to believe that psychologists are immune to them. Consequently, even for researchers who honestly try incredibly hard to avoid unintentional biases, such as confirmation bias and motivated reasoning, such conflict of interest is a potent barrier to transparency. Psychological and institutional forces can interact in powerful ways to obstruct adequate reporting of methods and results.

Moreover, it has been argued that climates of extreme competitiveness, such as academia induce “hypermotivation,” a heightened desire to succeed, even at the expense of one’s moral standards (Rick & Loewenstein, 2008).⁵ Furthermore, some well-intentioned researchers may even use the fact that journals do not *require* these methodological details as a legitimate justification for not having to disclose those details.

Journal editors may also be subject to this conflict of interest, although they are likely to feel it less acutely than authors (whose careers hinge upon publications). Sometimes editors ask authors to suppress methodological details to make results seem more compelling, enhance readability, and presumably increase a journal’s impact factor (Giner-Sorella, 2012). In addition, in LeBel et al. (2013), researchers occasionally indicated that by editorial request, they had suppressed experimental conditions (5% of respondents) and/or that they had suppressed outcome measures that failed to reveal statistically significant differences (also 5% of respondents). Thankfully, these values are not terribly high, but they are nonetheless worrisome given that QEPs clearly mis-characterize evidence. Moreover, virtually all authors will comply with such editorial requests if it means getting published in a prominent journal.

At this point we should note that this is not a chapter about dramatically overhauling the standards for publication. It is also not a chapter about changing the incentive structure of academia. We need *some* way of assessing the merits of scientific contributions; the publication system is designed to accomplish this, albeit imperfectly. Our goal is to highlight that in an environment where individual and community incentives diverge, individual incentives often

⁵ Although beyond the scope of this paper, we note that this hyper-competitiveness – the fact that authors compete for sparse space in journals – is largely unnecessary given the prospect of online publication. To that end, we see promise in the basic philosophy of *PLoS One*, whereby all scientifically sound work should be published, which thanks to e-publication, is unencumbered by page limits. Once published, page views and downloads provide proxies of the importance of the research. In other words, the academic community, rather than the idiosyncratic tastes of a few reviewers, assesses the importance of the contribution.

prevail in guiding people's behavior. Although transparency does not address this root cause of the exploitation of researcher degrees of freedom, it is relatively easy to implement, and likely to be beneficial. We therefore readily acknowledge that transparency has the capacity to curb, but not prevent, questionable practices.

Potential Remedies

We will now briefly describe four developments aimed at increasing transparency. First, as noted earlier, PsychDisclosure.org has shown promise in encouraging authors to disclose critical methodological details. The public nature of the platform gives researchers credit for voluntarily choosing to be more transparent about their methods even though some of the disclosed information may reduce the evidentiary value of the reported findings (Simonsohn, Simmons, & Nelson, 2014). We hope that disclosure continues to grow, reaching a turning point at which disclosing such methodological details is as standard as reporting sample size and demographics.

Another promising development is a reviewer statement initiative spearheaded by Simonsohn, LeBel, Simmons, Nelson, and Moore (2013). The rationale of this initiative is that to be able to do our jobs as reviewers, we need to have access to basic methodological information (such as the Basic 4) to be able to accurately evaluate the empirical claims reported in an article. The initiative is for reviewers to include the following standardized statement in their reviews:

I request that the authors add a statement to the paper confirming whether, for all experiments, they have reported all measures, conditions, data exclusions, and how they determined their sample sizes. The authors should, of course, add any additional text to

ensure the statement is accurate. This is the standard reviewer disclosure request endorsed by the Center for Open Science [see <http://osf.io/hadz3>]. I include it in every review.

One limitation of this initiative, however, is that if the action editor decides to accept a manuscript without sending it back out for review, a reviewer will not be able to see the additional methodological information disclosed by the authors. Given this limitation, some of the contributors to this initiative were arguing for a reviewer statement with much more teeth, for instance, demanding that the information be provided within the manuscript *before* agreeing to even review a paper. Ultimately, the group decided that a softer statement would facilitate broader adoption and increase the probability that the initiative will have a positive impact in the long run.

Another development in this vein are open science initiatives such as Nosek & Spies' Open Science Framework (<https://osf.io/>) and LeBel's [CurateScience.org](https://curatescience.org) which organize fundamental scientific information of published findings, including independent replications, links to publicly available data files, independent verification of analyses information, pre-registration of studies, and methods disclosure information (for example, see <https://curatescience.org/schnalletal.html>). In terms of methods disclosure, the CurateScience.org platform enables authors to add methodological information for each study that went unreported in the published report. Even better, these platforms facilitate a priori disclosure through study pre-registration. Disclosures made a priori are likely to be more valid than those made post-hoc, as they are unadulterated by confirmation bias (incentivizing authors to pre-register their studies; however, is another issue altogether). [CurateScience.org](https://curatescience.org) will use a custom-made icon system to

indicate whether a published article has disclosed all basic methods information. Ultimately, the integration of methods disclosure on these types of platforms will serve to further encourage transparency.

A final constructive remedy for addressing the disclosure problem in psychology is what we are calling *persuade-a-journal-editor*. As the name implies, the remedy entails persuading editors to change their journals' editorial policy to require higher reporting standards. Whether attempted at conferences or via email, the goal is to convince editors that the time is now for all journals to require reporting of basic methodological details. For one's persuasion attempt, one could cite evidence that 60% of authors involved in Eich's (2013) pilot study with *Psychological Science* voluntarily disclosed the information, and a near-majority of PsychDisclosure.org authors voluntarily and publicly disclosed the information. Most compellingly, one could simply cite that a growing number of journals now require the Basic 4 to be disclosed for a manuscript to even be considered for review and that *not* requiring such transparency could eventually tarnish their journal's credibility. The following twelve journals now require disclosure of such information for a manuscript to even be considered for review: PLoS One, Psychological Science, Psychonomic Bulletin & Review (PBR), Personality and Social Psychology Bulletin (PSPB), Archives of Scientific Psychology, Behavior Research Methods (BRM), Attention, Perception, & Psychophysics (APP), Cognitive, Affective, & Behavioral Neuroscience (CABN), Learning & Behavior, Memory & Cognition, and Management Science.

In sum, we see these four emerging initiatives as positive developments toward increased transparency of research in psychological science.

Relation to Other Extant Challenges

Though the disclosure problem is a distinct issue that needs focused attention and effort, it also relates to other current challenges in psychological science. First, more transparent reporting helps rule out the use of questionable research practices (John et al., 2012) or researcher-degrees-of-freedom (Simmons et al., 2011) as alternative explanations for a reported set of findings. Regardless of whether flexibility in design or analysis was unintentionally or intentionally exploited, more transparent reporting helps us better quantify the quality of the evidence reported in an article (e.g., by adjusting p-values to account for multiplicity of significance tests).

Furthermore, transparency helps alleviate the file-drawer problem, which can lead to dramatic overstatements of evidence (see Fergusson, this volume, Chapter XX). A concrete example in this respect is the growing (though still uncommon) practice of disclosing file-drawer negative studies *after* a set of findings has been published. For instance, Jostmann, Lakens, and Schubert (2009) voluntarily disclosed (and posted on PsychFileDrawer.org) that they ‘file-drawer’ a study that failed to produce the expected effect of weight as an embodiment of importance (Jostmann, 2013; for another example, see Galak & Meyvis, 2012).

Moreover, the disclosure problem relates to the ‘replicability crisis’ (Pashler & Harris, 2012; Pashler & Wagenmakers, 2012) in that transparency can facilitate the execution of independent direct replications which are crucial to corroborating original findings and ensuring cumulative knowledge development (see Nosek, this volume, Chapter XX). This is the case because published articles typically lack sufficient methodological detail to attempt a fair and diagnostic independent direct replication (Kashy, Donnellan, & Ackerman, 2009). Hence, transparency can facilitate the self-corrective, cumulative, aspect of science by making available

the information necessary for the scientific community to conduct falsifiable independent direct replications (Open Science Collaboration, 2012, 2013).

Finally, we emphasize that transparency should be seen as a necessary but insufficient remedy in our path to becoming a more reliable and cumulative scientific discipline. It is not a panacea and consequently will never replace the crucial role that independent direct replications play in corroborating the veracity of published findings (Bacon, 1267/1859; Feynman, 1974; Popper, 1934/1992). The ability of independent researchers to consistently replicate a finding under the conditions specified by the original researchers is the only way – and will remain the only way – to assess the robustness of empirical findings. That said, for published findings in which independent direct replication may not be as feasible, for example, studies involving time-consuming data collection (e.g., longitudinal studies, experience sampling studies), special samples (e.g., cross-culture studies) or expensive equipment (e.g., fMRI studies), transparency can bolster (or weaken) our confidence in a set of reported findings. In a similar way, pre-registration of studies and analyses, where researchers pre-specify their design and analysis plans *prior* to data collection (Chambers, 2013; Wagenmakers et al., 2012), is another way to increase our confidence in a set of reported findings that may not be as feasible to independently corroborate.

Final Thoughts

In closing, voices calling for more rigorous research practices to improve the validity of published research findings are growing in number and volume across the social and behavioral sciences. In this chapter, we have discussed the benefits of, and barriers toward, transparent reporting of psychological science. We have outlined several initiatives that have potential to

increase the rigor of research practices and hence increase the reliability of our findings and credibility of our discipline.

References

- Bacon, R. (1859). *Fr. Rogeri Bacon Opera quaedam hactenus inedita*. Vol. I. containing I.—Opus tertium. II.—Opus minus. III.—Compendium philosophiæ. Longman, Green, Longman and Roberts. Retrieved from <http://books.google.com/books?id=wMUKAAAAYAAJ> (Original work published 1267).
- Bazerman, M., Loewenstein, G., & Moore, D. (2002). Why Good Accountants do Bad Audits. *Harvard Business Review*.
- Cain, D., & Detsky, A.S. (2008). Everyone's a Little Bit Biased (Even Physicians). *Journal of American Medical Research*, 299(24), 2893-2895.
- Campbell, L., Loving, T. J., & LeBel, E. P. (in press). Enhancing transparency of the research process to increase accuracy of findings: A guide for relationship researchers. *Personal Relationships*.
- Chambers, C. D. (2013). Registered Reports: A new publishing initiative at Cortex. *Cortex*, 49, 609–610.
- Dana, J., & Loewenstein, G. (2003). A Social Science Perspective on Gifts to Physicians from Industry. *Journal of American Medical Research*, 290(2), 252-255.
- Eich, E. (2013). Business not as usual. *Psychological science*, 0956797613512465.
- Festinger, L. & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *The Journal of Abnormal and Social Psychology*, 58(2), Mar 1959, 203-210. doi: 10.1037/h0041593
- Feynman, R. P. (1974). Cargo cult science. *Engineering and Science*, 37, 10-13.
- Galak, J., & Meyvis, T. (2012). You Could Have Just Asked Reply to Francis (2012). *Perspectives on Psychological Science*, 7(6), 595-596.
- Giner-Sorolla, R. (2012). Science or art? How esthetic standards grease the way through the publication bottleneck but undermine science. *Perspectives on Psychological Science*, 7(6), 562–571. 10.1177/1745691612457576
- John, L. K., Loewenstein, G., & Prelec, D. (2012). Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological science*, 0956797611430953.
- John, L.K., Barasz, K., & Norton, M.I. Kate Barasz and Michael I. Norton (working paper) “What Hiding Reveals: Ironic Effects of Withholding Information.”
- Jostmann, N. (2013). Clipboard weight did not affect cognitive elaboration. (2013, March 22). Retrieved 12:20, July 13, 2014 from <http://www.PsychFileDrawer.org/replication.php?attempt=MTU0>
- Jostmann, N. B., Lakens, D., & Schubert, T. W. (2009). Weight as an embodiment of importance. *Psychological science*, 20(9), 1169-1174.
- Jussim, L., Crawford, J. T., Anglin, S. M., & Stevens, S. T. (In press a). The politics of social psychological science II: Distortions in the social psychology of liberalism and conservatism. To appear in J. Forgas, K. Fiedler, & W. Crano (Eds.), *Sydney Symposium on Social Psychology and Politics*.
- Kashy, D. A., Donnellan, M. B., Ackerman, R. A., & Russell, D. W. (2009). Reporting and interpreting research in PSPB: Practices, principles, and pragmatics. *Personality and Social Psychology Bulletin*, 35(9), 1131-1142.
- Kivetz, R., Urminsky, O., & Zheng, Y. (2006). The Goal-Gradient Hypothesis Resurrected: Purchase Acceleration, Illusionary Goal Progress, and Customer Retention. *Journal of Marketing Research*, 43, 39-58.

- Klein, R. A., Ratliff, K. A., Vianello, M., Adams Jr, R. B., Bahník, Š., Bernstein, M. J., ... & Woodzicka, J. A. (2014). Investigating Variation in Replicability. *Social Psychology*, 45(3), 142-152.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological bulletin*, 108(3), 480.
- LeBel, E. P., Borsboom, D., Giner-Sorolla, R., Hasselman, F., Peters, K. R., Ratliff, K. A., & Smith, C. T. (2013). PsychDisclosure.org: Grassroots support for reforming reporting standards in psychology. *Perspectives on Psychological Science*, 8(4), 424-432. doi: 10.1177/1745691613491437
- Maurissen, J. P., Gilbert, S. G., Sander, M., Beauchamp, T. L., Johnson, S., Schwetz, B. A., ... & Barrow, C. S. (2005). Workshop proceedings: Managing conflict of interest in science. A little consensus and a lot of controversy. *Toxicological Sciences*, 87(1), 11-14.
- Miguel, E., Camerer, C., Casey, K., Cohen, J., Esterling, K. M., Gerber, A., Glennerster, R., Green, D. P., Humphreys, M., Imbens, G., Laitin, D., Madon, T., Nelson, L., Nosek, B. A., Petersen, M., Sedlmayr, R., Simmons, J. P., Simonsohn, U., & Van der Laan, M. (2014). Promoting transparency in social science research. *Science*, 343, 30-31.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of general psychology*, 2(2), 175.
- Nosek, B. A., Spies, J. R., & Motyl, M. (2012). Scientific utopia: II. Restructuring incentives and practices to promote truth over publishability. *Perspectives on Psychological Science*, 7, 615-631. doi: 10.1177/1745691612459058
- Open Science Collaboration. (2012). An open, large-scale, collaborative effort to estimate the reproducibility of psychological science. *Perspectives on Psychological Science*, 7(6), 657-660.
- Open Science Collaboration. (2013). The Reproducibility Project: A model of large-scale collaboration for empirical research on reproducibility. *Implementing Reproducible Computational Research (A Volume in The R Series)*. New York, NY: Taylor & Francis, 2.
- Pashler, H., & Harris, C. R. (2012). Is the replicability crisis overblown? Three arguments examined. *Perspectives on Psychological Science*, 7(6), 531-536.
- Pashler, H., & Wagenmakers, E. J. (2012). Editors' Introduction to the Special Section on Replicability in Psychological Science A Crisis of Confidence? *Perspectives on Psychological Science*, 7(6), 528-530.
- Popper, K. R. (1934/1992). *The logic of scientific discovery*. New York, NY: Routledge. (Original work published 1934)
- Rick, S., & Loewenstein, G. (2008). Hypermotivation. *Journal of Marketing Research*, 12.
- Ritov, I., & Baron, J. (1990). Reluctance to vaccinate: Omission bias and ambiguity. *Behavioral Decision Making*, 3(4), 263-277.
- Ritov, I., & Baron, J. (1995). Outcome knowledge, regret, and omission bias. *Organizational Behavior and Human Decision Processes*, 64(2), 119-127.
- Schweitzer, M., Ordóñez, L. D., & Douma, B. (2004). The Dark Side of Goal Setting: The Role of Goals in Motivating Unethical Behavior. *The Academy of Management Journal*, 47, 422-432.
- Simmons J., Nelson L. & Simonsohn U. (2011) False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allow Presenting Anything as Significant. *Psychological Science*, 22(11), 1359-1366.

- Simmons J., Nelson L. & Simonsohn U. (2012) A 21 Word Solution Dialogue: The Official Newsletter of the Society for Personality and Social Psychology, 26(2), 4-7.
- Simonsohn, U., LeBel, E. P., Moore, D. A., Nelson, L. D., & Simmons, J. P. (2014). Standard Reviewer Statement for Disclosure of Sample, Conditions, Measures, and Exclusions. Retrieved from Open Science Framework, <http://osf.io/hadz3>
- Simonsohn, U., Nelson, L., and Simmons, J., P-Curve and Effect Size: Correcting for Publication Bias Using Only Significant Results (April 27, 2014). Available at SSRN: <http://ssrn.com/abstract=2377290> or <http://dx.doi.org/10.2139/ssrn.2377290>
- Wagenmakers, E. J., Wetzels, R., Borsboom, D., & Van Der Maas, H. L. (2011). Why psychologists must change the way they analyze their data: the case of psi: comment on Bem (2011).
- Wagenmakers, E. J., Wetzels, R., Borsboom, D., van der Maas, H. L., & Kievit, R. A. (2012). An agenda for purely confirmatory research. *Perspectives on Psychological Science*, 7(6), 632-638.
- Word, C. O., Zanna, M. P., & Cooper, J. (1974). The nonverbal mediation of self-fulfilling prophecies in interracial interaction. *Journal of Experimental Social Psychology*, 10(2), 109–120. doi: 10.1016/0022-1031(74)90059-6