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# Psychologists Are Open to Change, yet Wary of Rules

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## Abstract

Psychologists must change the way they conduct and report their research—this notion has been the topic of much debate in recent years. One article recently published in *Psychological Science* proposing six requirements for researchers concerning data collection and reporting practices as well as four guidelines for reviewers aimed at improving the publication process has recently received much attention (Simmons, Nelson, & Simonsohn, 2011). We surveyed 1,292 psychologists to address two questions: Do psychologists support these concrete changes to data collection, reporting, and publication practices, and if not, what are their reasons? Respondents also indicated the percentage of print and online journal space that should be dedicated to novel studies and direct replications as well as the percentage of published psychological research that they believed would be confirmed if direct replications were conducted. We found that psychologists are generally open to change. Five requirements for researchers and three guidelines for reviewers were supported as standards of good practice, whereas one requirement was even supported as a publication condition. Psychologists appear to be less in favor of mandatory conditions of publication than standards of good practice. We conclude that the proposal made by Simmons, Nelson & Simonsohn (2011) is a starting point for such standards.

## Keywords

replication, publication bias, publication practices

The way psychologists conduct and report their research must change. This idea has been the topic of much research and debate in recent years (cf., Fanelli, 2011; Fiedler, 2011), but few far-reaching changes to standard practices have actually been made. Recently, psychologists have addressed the problem directly in special issues (cf., Glöckner & Hilbig, 2011; Spellman, 2012) and online professional communities (cf., Association of Psychological Science, [openscienceframework.org](http://openscienceframework.org)). Discussions have focused on aspects such as incentives in psychological research (e.g., Fanelli, 2010; John, Loewenstein, & Prelec, 2012), the review process (e.g., Wicherts, Kievit, Bakker, & Borsboom, 2012), replicability (e.g., Hartshorne & Schachner, 2012; Yong, 2012), publication bias (e.g., Fanelli, 2011; Francis, 2012; Renkewitz, Fuchs, & Fiedler, 2011), statistical methods and standards (e.g., Matthews, 2011; Wetzels et al., 2011), and scientific communication (e.g., Nosek & Bar-Anan, in press). One article published in *Psychological Science* proposing a “. . . solution that substantially mitigates the problem but imposes only a minimal burden on authors, reviewers, and readers” (Simmons, Nelson, & Simonsohn, 2011, p. 1362) has received much attention. The proposed solution encompasses six requirements for researchers concerning data collection and reporting practices, as well as four guidelines for reviewers aimed at improving

the publication process (see Table 1 for wording). A successful implementation of this solution is contingent on a positive attitude of the community towards change.

Do psychologists support these concrete changes to data collection, reporting, and publication practices? If not, what are their reasons? To investigate these questions, we surveyed 1,292 psychologists from 42 countries online (48% female,  $M_{\text{age}} = 38.3$  years,  $SD_{\text{age}} = 12.4$ ; see Table 2 and the online supplemental materials at <http://pps.sagepub.com/supplemental> for more information on the sample and procedure). We asked whether each of Simmons et al.’s (2011) requirements and guidelines should be followed as standards of good practice as well as whether the requirements should be implemented as mandatory conditions for publication in psychological journals (see Table 1 for wording).

Psychologists are open to change—98% (highest density interval [HDI] [97%, 98%]) agreed that at least one of the requirements should be followed and 90% (HDI [89%, 92%])

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**Table 1.** Mean Percentages of Agreement Based on Posterior Distributions With 95% Highest Density Intervals.

Variable	Yes	No	Don't know
Requirements			
1. Authors must decide the rule for terminating data collection before data collection begins and report this rule in the article.	GP = 60 [58, 63]; PC = 46 [43, 49]	GP = 28 [26, 31]; PC = 43 [40, 46]	GP = 11 [10, 13]; PC = 11 [9, 13]
2. Authors must collect at least 20 observations per cell or else provide a compelling cost-of-data-collection justification.	GP = 47 [44, 50]; PC = 30 [28, 33]	GP = 41 [38, 43]; PC = 58 [55, 60]	GP = 12 [11, 14]; PC = 12 [10, 14]
3. Authors must list all variables collected in a study.	GP = 58 [55, 60]; PC = 46 [43, 48]	GP = 31 [28, 33]; PC = 42 [39, 44]	GP = 12 [10, 14]; PC = 13 [11, 15]
4. Authors must report all experimental conditions, including failed manipulations.	GP = 80 [78, 82]; PC = 66 [64, 69]	GP = 12 [11, 14]; PC = 22 [20, 24]	GP = 7 [6, 9]; PC = 12 [10, 14]
5. If observations are eliminated, authors must also report what the statistical results are if those observations are included.	GP = 69 [67, 72]; PC = 52 [49, 55]	GP = 20 [18, 22]; PC = 35 [32, 38]	GP = 11 [9, 12]; PC = 13 [11, 15]
6. If an analysis includes a covariate, authors must report the statistical results of the analysis without the covariate.	GP = 67 [65, 70]; PC = 50 [48, 53]	GP = 17 [15, 19]; PC = 33 [31, 36]	GP = 16 [14, 18]; PC = 16 [14, 18]
Guidelines			
1. Reviewers should ensure that authors follow the requirements.	77 [74, 79]	9 [7, 10]	15 [13, 17]
2. Reviewers should be more tolerant of imperfections in results.	84 [82, 86]	8 [7, 10]	7 [6, 9]
3. Reviewers should require authors to demonstrate that their results do not hinge on arbitrary analytic decisions.	75 [73, 77]	12 [10, 14]	13 [11, 15]
4. If justifications of data collection or analysis are not compelling, reviewers should require the authors to conduct an exact replication.	37 [34, 39]	39 [36, 42]	24 [22, 27]

Note: All numbers are percentages. Numbers in brackets indicate 95% highest density intervals. Good practice (GP) indicates responses to question "Should researchers follow this recommendation?", and publication condition (PC) indicates responses to question "Should this recommendation be implemented as a requirement for submissions in psychological journals?". Requirements and guidelines are quoted verbatim from Simmons, Nelson, and Simonsohn (2011).

agreed that at least one should be implemented as a condition for publication.<sup>1</sup>

More specifically, respondents agreed that all requirements except Requirement 2—that authors must collect at least 20 observations per cell or else provide a compelling cost-of-data-collection justification—should be followed as standards of good practice.<sup>2</sup> However, the majority of respondents did not agree that the first three requirements should be implemented as publication conditions. Only Requirement 4—that authors must report all experimental conditions (including failed manipulations)—received support as a publication condition from a majority of respondents (see Table 1 for all agreement rates). The three most often cited reasons for not being in support of a requirement included (in descending order of frequency): "The requirement is not appropriate for all types of studies," "The requirement is too rigid," and "I do not agree with the requirement" (see Table S1 at <http://pps.sagepub.com/supplemental> for all the reasons).

We analyzed whether respondents were more likely to agree with the requirements as standards of good practice as opposed to publication conditions. Using a Bayesian mixed-effects logistic regression, we regressed agreement (yes vs. no) onto agreement type (good practice vs. publication condition) while controlling for research subfield (e.g., social psychology), academic position (e.g., PhD candidate), and editorial experience (i.e., "yes" vs. "no"). Respondents were less likely to agree with a requirement as a publication condition versus a standard of good practice (odds ratio: 0.42, HDI [0.38, 0.45]; see Table S2 at <http://pps.sagepub.com/supplemental> for all regression parameters).

Ninety-eight percent (HDI [97%, 99%]) of respondents agreed with at least one of the guidelines for reviewers. Further, the majority of respondents agreed that reviewers should follow the first three guidelines (see Table 1 for all agreement rates). Only Guideline 4—that reviewers should require the authors to conduct an exact replication, if justifications of data

**Table 2.** Sample Characteristics.

%	Variable
Country	
35	United States
23	Germany
15	United Kingdom
5	Australia
4	Netherlands
4	Canada
4	Switzerland
< 2	Belgium, Israel, Austria, Italy, Spain, France, Sweden, Afghanistan, Estonia, New Zealand, Norway, Poland, Romania, Turkey, American Samoa, Bulgaria, Finland, Greece, Latvia, Portugal, Singapore, Slovenia, Algeria, Argentina, China, Colombia, Cyprus, Denmark, Hungary, Ireland, Japan, Philippines, Taiwan, United Arab Emirates, Vatican City State
Subfield	
26	Social psychology
21	Cognitive psychology, general psychology
14	I/O psychology, health psychology, judgment and decision making
11	Developmental psychology, educational psychology
9	Neuroscience, biological psychology
8	Personality psychology
8	Clinical psychology
3	Other
Position <sup>a</sup>	
29	PhD candidate
24	Post-doctorate or equivalent
22	Assistant/associate professor or equivalent
19	Full professor
6	Other (e.g., practicing psychologist, data-analyst)
Experience	
85	Published in peer-reviewed journal
71	Worked as reviewer for peer-reviewed journal
58	Teaches/taught college-level research methods and/or statistics classes
29	Are/were member of editorial board of peer-reviewed journal
Acquaintance with Simmons et al. article	
30	Read article prior to participation
28	Heard of article prior to participation but did not read
34	Planned to discuss article with colleagues
27	Discussed article with colleagues prior to participation

Note: Numbers are percentages of total sample.

<sup>a</sup>94% of total sample had or were currently working towards a PhD. For PhD holders, mean number of years since receiving PhD = 10.9 (*SD* = 12.2).

collection or analysis are not compelling—was not supported by the majority of respondents (see Table S2 at <http://pps.sagepub.com/supplemental> for regression analysis predicting guideline agreement). The three most frequently cited reasons

for not being in favor of a guideline were the same as for the requirements (see Table S1 at <http://pps.sagepub.com/supplemental> for all reasons).

In addition, respondents indicated that approximately 68% (HDI [67%, 70%]) of print and 63% (HDI [61%, 64%]) of online journal space should be dedicated to novel studies, whereas approximately 20% (HDI [19%, 21%]) of print and 27% (HDI [26%, 28%]) of online journal space should be dedicated to direct replications.

Finally, respondents believed, on average, that 53% (HDI [51%, 54%]) of results in psychology as a whole could be replicated in direct replications. Respondents' perceptions of replicability in their respective subfields were similar (56%, HDI [54%, 57%]).<sup>3</sup>

Overall, psychologists appear to be open to change how they conduct and report their research. Not only are five requirements for researchers and three guidelines for reviewers supported as standards of good practice, one requirement—that researchers must report all experimental conditions run in a study, including failed manipulations—is even supported as a publication condition. Respondents generally agreed with the requirements and guidelines irrespective of their professional position and research subfield.<sup>4</sup>

Still, many respondents expressed concerns regarding the rigidity of the requirements and guidelines as well as their questionable applicability for all types of studies. Respondents were also less likely to agree with the requirements as mandatory publication conditions as opposed to standards of good practice. Perhaps what we need are standards tailored to specific types of research (e.g., large-scale surveys vs. laboratory experiments) rather than strict mandatory rules for psychological research as a whole. The proposal from Simmons and colleagues addresses important issues and thus serves as a starting point for the development of such standards. However, standards must be adapted to diverse types of psychological research before they can be implemented into the publication process. Researchers and editorial staff alike must also ensure that standards are enforceable so as to avoid punishing honest researchers. The psychological community should capitalize on the current openness to change in order to develop and implement appropriate changes and thus improve the quality of published psychological research.

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### Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

## Notes

1. We analyzed the data using Bayesian statistics with vague priors (e.g., Kruschke, 2011) and report mean posteriors and 95% Highest Density Intervals (HDI; i.e., “Bayesian confidence intervals” for which “all values inside the interval have higher credibility than values outside the interval, and the interval contains 95% of the distribution,” p. 302). We assume that all answer options are equally likely a priori.
2. We define agreement as follows: The proportion of “Yes” answers is larger than 50% and the HDI excludes 50%.
3. Due to a program error, missing answers for the questions regarding publication space as well as replicability in general and in the specific research field were coded as zero. Therefore, we excluded respondents with values of zero on all six variables from these analyses ( $N = 100$ ). We also excluded responses greater than 100% ( $N = 3$ ).
4. As respondents in this study represent a self-selected sample, we advise the reader to generalize the results with caution.

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