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Brief alcohol intervention trials conducted by higher prestige authors and published in higher impact factor journals are cited more frequently

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Abstract

Objective: To examine the relationships between study quality, author prestige, journal impact factors, and citation rates of trials and to examine whether journal impact factors mediated the relationships between study quality and author prestige on citation rates.

Study Design and Setting: We used bibliometric data from 128 controlled trials included in a recent meta-analysis on brief alcohol interventions for adolescents and young adults. We obtained the number of citations from ISI Web of Knowledge and Google Scholar; journal impact factors were obtained from ISI Web of Knowledge. Linear regression models were used to examine the direct and indirect effects of interest.

Results: The results indicated that studies were published in journals with higher impact factors when first authors had higher *h*-indices and studies were funded, but this was largely because those studies were of higher quality. Studies were cited more frequently when first authors had higher *h*-indices and studies were funded, even after adjusting for study quality proxies. The observed associations between study quality and author prestige on citation rates were also partly mediated through journal impact factors.

Conclusion: We conclude that studies conducted by more established authors and reported in more prestigious journal outlets are more likely to be cited by other scholars, even after controlling for various proxies of study quality.

Keywords: Brief alcohol intervention; Citation bias; Meta-analysis; Publication bias; Reporting bias; Systematic review

1. Introduction

Citation rates for journal articles are often used to measure scientific impact, such that widely cited publications presumably have greater influence on the diffusion of ideas than less frequently cited articles. Indeed, tenure and promotion committees often examine publication citation rates as proxies for a scholar's scientific productivity, contributions to the field, and quality of scholarship. The prevailing hypothesis is that methodologically sound publications will be cited more frequently than lower quality publications. This hypothesis is unsubstantiated, however, given that citation rates have been linked to other factors unassociated with study quality, including the direction and statistical significance of effects [1−5]. Two other factors that may contribute to citation rates above and beyond study quality, however, are author prestige and journal impact factors.

Articles published by established scholars may be cited more frequently than those authored by less established scholars of similar quality, particularly if researchers regard established scholars' studies as exemplars given their presumed authority in a field [6]. Thus, part of the association between study quality and citation rates may be confounded with author prestige factors. Journal impact factors, which quantify the frequency that a typical study in a journal is cited in a given year [7], may also partly explain the association between study quality and citation rates. Established authors may also be more likely to publish in higher impact factor journals, and those articles published in higher impact factor journals tend to be cited more frequently [8]. Citation rates are therefore likely a function of both

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What is new?

Key findings

- Articles reporting brief alcohol intervention trials for youth were published in journals with higher impact factors when first authors had higher *h*-indices, but this was largely because those studies were of higher quality.
- Articles were more often cited when first authors had higher *h*-indices, even after adjusting for a range of study quality proxies.
- The associations between author prestige and study citation rates were mediated by journal impact factor, even after adjusting for a range of study quality proxies.

What this adds to what was known?

- This study adds to the empirical evidence on the topic of predictors of study citation rates and indicates that author prestige and journal impact factors are important predictors of citation rates above and beyond study quality.

What is the implication and what should change now?

- Bibliometric analyses predicting article citation rates should consider the role of author prestige and journal impact factors, in addition to study quality.

study quality and author prestige, the effects of which may both be mediated through journal impact factor (see Fig. 1 for a conceptual model).

A large and growing body of empirical research has examined the correlates of article citation rates and journal impact factors. Most prior research suggests that rigorously designed or high-quality-rated studies tend to be published in higher impact factor journals and/or be cited more frequently [9–12]; but see [13]. Impact factors are also highly correlated with citation rates [1,2,8,14–16]. We are unaware of any studies to date, however, that have explicitly examined how author prestige factors are associated with citation rates above and beyond measures of methodological quality, nor any studies that have examined the potential mediating role of journal impact factors in these relationships.

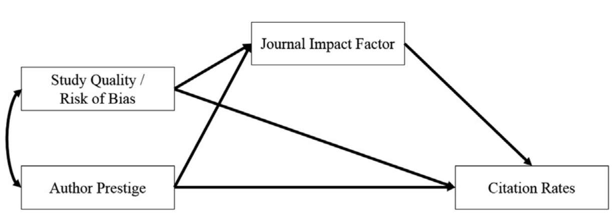

Fig. 1. Conceptual model of associations between study quality and risk of bias, author prestige, journal impact factor, and citation rates.

In this study, we therefore addressed three questions: (1) how do author prestige characteristics correlate with journal impact factors, after adjusting for study quality proxies, (2) how do author prestige characteristics correlate with publication citation rates, after adjusting for study quality proxies, (3) do journal impact factors mediate the relationships between author prestige and study quality with citation rates? We examined these research questions using bibliometric data collected in a systematic review examining the effectiveness of brief alcohol interventions (BAIs) for youth. BAIs have gained prominence as a promising intervention approach for addressing heavy episodic alcohol consumption, which peaks in late adolescence and early adulthood [17,18].

2. Methods

2.1. Reviewed studies

We analyzed data from a recent systematic review and meta-analysis that synthesized findings from 185 studies to examine the effectiveness of BAIs for adolescents and young adults (see [19] for more details). The systematic review included experimental or controlled quasi-experimental trials that examined the effects of a BAI (i.e., no more than 5 hours of total contact time) relative to a comparison condition of no treatment, wait-list control, or treatment as usual. Eligible studies included adolescent (age 18 years and under) and young adult (ages 19–25 years, or collegiate undergraduate students) samples and were required to report at least one postintervention outcome related to alcohol consumption or an alcohol consumption–related problem (e.g., drunk driving). There were no geographic, language, or publication status restrictions on eligibility, but studies must have been conducted in 1980 or later. The present study restricted the sample to the 128 studies that were published in journal article format (this excluded 57 studies that were published solely in non-journal article format, including books, book chapters, theses, conference presentations, technical reports, etc.).

2.2. Citation rates, journal impact factors, and study characteristics

Citation counts were obtained from ISI Web of Knowledge (https://webofknowledge.com/) in August 2013. Because the total number of citations was correlated with publication year (such that older publications had more time to accrue subsequent citations), we used yearly citation rates for all analyses. Yearly citation rates were calculated by dividing the total citation count by the number of years since publication. Citation rates were also obtained from Google Scholar. However, because the correlation between citation rates in Web of Knowledge and Google Scholar was high ($r = 0.98$, $P < 0.001$), and all results were substantively similar across the two sources of citation rates, here we only report the analyses using citation rates obtained from Web of Knowledge.

Journal impact factor data were extracted from the JCR Sciences and Social Sciences Editions in Web of Knowledge. To account for variation in journal ratings over time, journal impact factors were coded separately for each publication year of a given journal.

Study quality and risk of bias was measured using 12 items. Using information provided in the study reports, we collected information on risk of bias using the Cochrane Collaboration's risk of bias tool for randomized trials [20] on sequence generation, allocation sequence concealment, detection bias due to nonblinding of participants/personnel, incomplete outcome data, selective outcome reporting, or other potential threats to validity. Each study was rated as having low, unclear, or high risk of bias on these six domains; for all analyses, we created six binary variables indicating whether the study was rated as having a high risk of bias on each item (vs. low or unclear risk of bias). We also collected information on overall attrition rates, sample sizes, whether the study used a randomized controlled trial (RCT) vs. a controlled quasi-experimental design, whether the study explicitly reported monitoring implementation of the intervention, and whether the study included a CONSORT style participant flow diagram [21].

Author prestige was measured using two items: whether the author acknowledged receipt of funding, and the first author's *h*-index. In August 2013, we collected data on the *h*-index [22] for the first author of each study from Scopus (http://www.scopus.com/search/form/authorFreeLookup.url).

Finally, to adjust for other potential confounding study characteristics associated with citation rates (e.g., as noted in [23,24]), we used the following study characteristics as covariate controls in all multivariable models: whether the study reported a positive effect of the intervention, the total number of follow-up waves after the intervention, publication year, the number of pages in the article, and number of authors.

2.3. Statistical analyses

We used bivariate and multivariable linear regression models to examine the relationships between study quality, author prestige, journal impact factor, and citation rates. The linear regression models assume independence and normality of residuals, homoskedasticity, and relationship linearity. Diagnostics indicated that none of the models violated these assumptions; results from linear regression models predicting the natural logarithm of yearly citation rates provided substantively similar results, so results from the models predicting yearly citation rates are presented for ease of interpretation. Although there was no evidence of heteroscedasticity, we used robust standard errors [25] in all models to provide conservative estimates in the event of heteroscedasticity.

The hypothesized mediation model (Fig. 1) was tested using a series of multivariable linear regression models that examined (1) the associations between study quality and author prestige with journal impact factor, (2) the associations between study quality and author prestige with citation rates, and (3) the associations between study quality and author prestige with citation rates, after adjusting for journal impact factor. The indirect effects of each study quality and author prestige measure on citation rates (through journal impact factors) were estimated as the product of coefficients from the models in (2) and (3). We used a bias-corrected bootstrap estimation method [26–28] to assess the statistical significance of the indirect effects. All analyses were conducted in Stata, version 14.0 [29].

3. Results

The 128 articles were published in 51 different journals. Eight journals published five or more studies, and these eight journals accounted for 54% of the included studies (69 of 128; Table 1). According to Web of Knowledge, six journals (8 studies; 6% of 128) did not have impact factors. For the studies published in journals with impact factors, those impact factors ranged from 0.1 to 30.0 (25th, 50th, and 75th percentiles: 1.5, 2.1, and 4.0, respectively). The studies were cited a median of 2.6 times per year (25th and 75th percentiles: 1.0 and 5.8, respectively); 20 studies (16% of 128) had not been cited.

Almost all of the studies (92%) used a RCT design, were conducted in the United States (77%), reported receipt of funding for the conduct of the trial (75%), or reported a positive postintervention effect size (70%). Few studies included a CONSORT flow diagram in the report (38%), explicitly reported conducting intention-to-treat analysis (41%), or explicitly noted monitoring implementation of the intervention (41%).

3.1. Predictors of journal impact factors

Studies with high risks of bias due to inadequate allocation concealment, sequence generation, blinding, incomplete outcome data, and other threats to validity were published in journals with smaller impact factors (Table 2). Journal impact factors were also larger among studies with lower attrition, larger sample sizes, RCTs, those reporting CONSORT diagrams, conducting intention-to-treat analyses, and monitoring implementation fidelity. Studies were also published in higher impact factor journals when first authors had higher scientific

Table 1. Journals that published trials of brief alcohol interventions for youth

Journal title	Number of trials	Impact factor (mean)
Academic Emergency Medicine	1	1.78
Acta Colombiana de Psicología	1	0.16
Addiction	5	4.31
Addiction Biology	1	4.83
Addiction Research & Theory	1	1.03
Addiction Science & Clinical Practice	1	1.00
Addictive Behaviors	9	2.09
Alcohol & Alcoholism	2	2.95
Alcoholism Treatment Quarterly	1	0.51
Alcoholism: Clinical and Experimental Research	3	3.11
American Journal of Health Education	1	0.23
American Journal of Preventive Medicine	1	4.04
American Journal on Addictions	1	1.74
Annals of Behavioral Medicine	1	4.2
Annals of Emergency Medicine	2	4.13
Archive of Pediatrics & Adolescent Medicine	1	4.14
Archives of Family Medicine	1	na
Archives of Internal Medicine	1	11.46
British Dental Journal	1	0.92
British Journal of Health Psychology	1	2.70
Drug and Alcohol Dependence	1	3.38
Drug and Alcohol Review	1	1.55
Evaluation & the Health Professions	1	1.23
Experimental and Clinical Psychopharmacology	1	2.58
Group Processes & Intergroup Relations	1	1.24
Health Psychology	1	3.87
International Journal of Behavioral Med	1	2.63
International Journal of Drug Policy	2	2.47
International Journal of the Addictions	1	na
Journal of Alcohol and Drug Education	7	0.08
Journal of American College Health	8	1.45
Journal of Cognitive Psychotherapy	2	1.65
Journal of College Counseling	2	0.28
Journal of Consulting and Clinical Psychology	12	4.85
Journal of Medical Internet Research	8	1.83
Journal of Studies on Alcohol	4	2.25
Journal of Studies on Alcohol and Drugs	7	2.25
Journal of Substance Abuse Treatment	4	3.14
Journal of the American Medical Association	1	30.03
Journal of the First Year Experience & Students in Transition	1	na
NASPA Journal	1	na
PLOS One	1	4.09
Pediatrics	2	5.44
Professional Psychology: Research and Practice	1	1.34
Psychology of Addictive Behaviors	13	2.09
Revista Mexicana de Análisis de la Conducta	2	na
Substance Abuse	1	1.33
Substance Use & Misuse	2	1.10
TIPICA: Boletín Electrónico de Salud Escolar	1	na
The Journal of Primary Prevention	1	1.54
Violence Against Women	1	1.33
Total	128	

Abbreviation: na, impact factor not available for this journal.

productivity, as measured by their *h*-index ($b = 0.08$, $P < 0.001$), and receipt of funding ($b = 1.98$, $P < 0.001$).

After adjusting for all study characteristics in a multivariable regression model, all of the bivariate associations between study quality, author prestige, and journal impact factors were attenuated to nonsignificance (Table 2). Thus, after adjusting for various study quality proxies, there was no evidence that author prestige was associated with higher journal impact factors.

3.2. Predictors of yearly citation rates

Journal impact factor was positively associated with yearly citation rates, such that studies reported in higher impact factor journals were cited significantly more than those in lower impact factor journals ($b = 0.51$, $P = 0.01$). Studies with high risks of bias due to inadequate allocation concealment, sequence, generation, and other threats to validity were cited less frequently. Yearly citation rates were also larger among studies with lower attrition, RCTs, and those monitoring implementation fidelity. Studies were also cited more frequently when the first author had a higher *h*-index ($b = 0.24$, $P < 0.001$) and when the study reported receipt of funding ($b = 2.74$, $P = 0.003$) (Table 3).

After adjusting for all study characteristics in a multivariable regression model (Table 3, model I), yearly citation rates were significantly higher among studies with higher risk of detection/blinding bias ($b = 5.88$, $P = 0.04$). Studies that included CONSORT flow charts had significantly lower yearly citations. This association, however, was driven entirely by five outliers with high citations rates (>20) that did not include a CONSORT flow chart; excluding these five outliers attenuated the regression coefficient to nonsignificance ($b = -1.18$, 95% CI [−2.70, 0.34]). Citation rates were higher among studies that used intention-to-treat analyses and that monitored implementation fidelity, and also for authors with a higher *h*-index and funded studies. Thus, even after adjusting for various study quality proxies, author prestige characteristics were associated with higher yearly citation rates.

3.3. Mediating role of journal impact factors

After adjusting for journal impact factor in the mediation model, the effects of high risk of detection/blinding bias and implementation monitoring on citation rates were attenuated to nonsignificance (Table 3, model II). Author prestige characteristics were still significantly correlated with citation rates, such that studies with a first author with a higher *h*-index and funded studies were cited more frequently. The estimated indirect effects indicated that the effects of several study quality and risk of bias characteristics on citation rates were significantly mediated by journal impact factor (Table 3, indirect effects). The effects of author prestige characteristics on citation rates were also

Table 2. Linear regression models predicting journal impact factors

b [95% CI][a]	Bivariate associations		Model I: direct effects	
High risk of bias				
Allocation concealment	−1.31*	[−2.16, −0.46]	−1.00	[−2.59, 0.59]
Sequence generation	−1.53*	[−2.34, −0.73]	−0.15	[−1.33, 1.04]
Detection/blinding	−1.91*	[−2.58, −1.23]	0.70	[−0.97, 2.37]
Incomplete outcome data	−1.42*	[−2.34, −0.51]	0.26	[−0.56, 1.08]
Selective reporting	0.50	[−1.06, 2.06]	0.78	[−1.41, 2.96]
Other risk of bias	−1.00*	[−1.87, −0.13]	−1.02	[−2.44, 0.39]
Other study quality				
Attrition at first follow-up	−2.21*	[−4.18, −0.24]	−1.32	[−3.15, 0.50]
Sample size	0.00*	[0.00, 0.00]	0.00	[−0.00, 0.00]
Randomized controlled trial	1.23*	[0.33, 2.14]	0.76	[−1.35, 2.86]
CONSORT flow chart	2.27*	[1.04, 3.50]	0.76	[−0.08, 1.59]
Intention-to-treat analysis	2.08*	[0.88, 3.29]	1.13	[−0.29, 2.55]
Monitored implementation	1.58*	[0.33, 2.84]	1.13	[−0.45, 2.71]
Author prestige				
First author *h*-index	0.08*	[0.04, 0.12]	0.02	[−0.01, 0.06]
Funded	1.98*	[1.20, 2.76]	0.58	[−0.28, 1.44]
Other study characteristics				
Positive effect size	0.27	[−0.74, 1.28]	0.02	[−1.06, 1.09]
Total number of follow-ups	0.08	[−0.05, 0.22]	−0.01	[−0.09, 0.07]
Publication year	0.11*	[0.03, 0.18]	0.04	[−0.04, 0.12]
Total pages	−0.08*	[−0.16, −0.00]	−0.13*	[−0.26, −0.01]
Number of authors	0.39*	[0.13, 0.66]	−0.03	[−0.20, 0.14]
n	112–120		112	
R^2	0.00–0.14		0.29	

*$P < 0.05$.

[a] All values shown are unstandardized regression coefficients and 95% confidence intervals estimated with robust standard errors.

significantly mediated by journal impact factor. Namely, studies conducted by higher prestige authors were cited more frequently than those conducted by lower prestige authors, which is partly due to their appearance in journals with higher impact factors.

4. Discussion

Citation rates for journal articles are often used as proxies for scientific impact and quality of scholarship based on the assumption that higher quality studies will be cited more frequently than lower quality studies. A burgeoning body of bibliometric research indicates, however, that citation rates may be biased in favor of studies reporting confirmatory and/or statistically significant findings [4,11,13]. Thus, citation rates may not accurately reflect study quality or rigor. We sought to explore this phenomenon using data from a recently completed systematic review of BAIs for youth, with the goals of examining whether and how author prestige and journal impact factors were correlated with article citation rates, after adjusting for study quality proxies. The key strengths of this study were the large sample of articles included in the review ($n = 128$), the inclusion of a diverse set of study characteristics (including quality proxies, author prestige, and a range of other potential confounders), and the examination of journal impact factor as a potential mediator explaining publication citation rates.

Trials examining the effectiveness of BAIs for youth were distributed over 51 different journals, ranging from specialized addiction journals (e.g., *Addiction*, *Addictive Behaviors*), to general behavioral science journals (e.g., *Annals of Behavioral Medicine*, *Journal of Consulting and Clinical Psychology*), to more specialized local journals (e.g., *NASPA Journal*, *Revista Mexicana de Análisis de la Conducta*). The publication of BAI trials in such diverse publication outlets presumably reflects the multidisciplinary background of researchers studying alcohol interventions among youth.

Studies conducted by prominent and/or prestigious authors (i.e., those with higher *h*-indices and who had received funding for their research) were cited more frequently than those conducted by less prestigious authors, which was partly due to their publication in higher impact factor journals (even after statistically adjusting for study quality proxies).

The BAI trials published in higher impact factor journals tended to be less likely to have high risks of bias and were higher in quality ratings in terms of larger sample sizes, more rigorous research designs (i.e., RCTs), reporting of study procedures via CONSORT flow diagrams, lower attrition, use of intention-to-treat analyses, and monitoring of implementation fidelity. Thus, citation rates of BAI trials reflect a range of factors above and beyond study quality, such as author prestige characteristics and journal impact factors. Bibliometric analyses predicting article citation rates should therefore consider the role of author prestige

Table 3. Linear regression models predicting the number of times articles were cited per year

b [95% CI][a]	Bivariate associations		Model I: direct effects		Model II: mediation model		Indirect effects through journal impact factor	
Journal impact factor	0.51*	[0.12, 0.90]	-		0.43*	[0.07, 0.79]		
High risk of bias								
Allocation concealment	−2.65*	[−4.98, −0.31]	−2.61	[−6.50, 1.28]	−2.40	[−5.84, 1.03]	−0.43*	[−0.78, −0.02]
Sequence generation	−2.86*	[−5.24, −0.50]	3.49	[−0.71, 7.69]	3.58	[−0.034, 7.50]	−0.06	[−0.59, 0.46]
Detection/blinding	0.56	[−5.18, 6.30]	5.88*	[0.18, 11.58]	2.76	[−0.64, 6.17]	0.30*	[0.02, 0.55]
Incomplete outcome data	−1.48	[−3.54, 0.57]	0.62	[−1.84, 3.08]	0.37	[−1.93, 2.67]	0.11	[−0.12, 0.31]
Selective reporting	−0.92	[−3.14, 1.30]	−0.98	[−3.19, 1.24]	−1.00	[−2.96, 0.97]	0.33*	[0.20, 0.54]
Other risk of bias	−1.97*	[−3.81, −0.13]	−1.87	[−3.98, 0.24]	−1.73	[−3.70, 0.25]	−0.44*	[−0.64, −0.19]
Other study quality								
Attrition at first follow-up	−3.87*	[−7.38, −0.36]	−1.70	[−7.26, 3.85]	−1.20	[−6.74, 4.34]	−0.57	[−1.18, 0.09]
Sample size	−0.00	[−0.00, 0.00]	0.00	[−0.00, 0.00]	−0.00	[−0.15, 0.24]	0.00*	[0.00, 0.00]
Randomized controlled trial	4.52*	[3.39, 5.65]	3.73	[−1.17, 8.63]	2.93	[−0.00, 0.00]	0.33	[−0.20, 0.82]
CONSORT flow chart	−1.81	[−3.82, 0.19]	−3.68*	[−6.96, −0.40]	−4.16*	[−0.23, 0.32]	0.33*	[0.11, 0.56]
Intention-to-treat analysis	1.90	[−0.32, 4.12]	3.65*	[0.62, 6.67]	3.18*	[−7.35, −0.96]	0.49*	[0.28, 0.76]
Monitored implementation	2.61*	[0.37, 4.84]	2.16*	[0.07, 4.26]	1.62	[−0.37, 3.61]	0.49*	[0.26, 0.68]
Author prestige								
First author *h*-index	0.24*	[0.11, 0.36]	0.18*	[0.08, 0.28]	0.15*	[0.06, 0.24]	0.01*	[0.00, 0.03]
Funded	2.75*	[0.98, 4.52]	2.27*	[0.16, 4.37]	2.49*	[−0.45, 0.65]	0.25*	[0.01, 0.47]
Other study characteristics								
Positive effect size	1.22	[−0.59, 3.04]	1.10	[−1.02, 3.22]	1.25	[−0.81, 3.32]	-	
Total number of follow-ups	−0.01	[−0.32, 0.30]	0.03	[−0.19, 0.25]	0.04	[−0.15, 0.24]	-	
Publication year	−0.43*	[−0.78, −0.09]	−0.36*	[−0.72, −0.00]	−0.51*	[−0.90, 0.12]	-	
Total pages	−0.02	[−0.23, 0.19]	−0.06	[−0.35, 0.24]	0.05	[−0.23, 0.32]	-	
Number of authors	0.26	[−0.35, 0.88]	0.01	[−0.55, 0.57]	0.10	[−0.45, 0.65]	-	
n	103−107		103		101		-	
R^2	0.00−0.18		0.47		0.56		-	

*$P < 0.05$.

[a] All values shown are unstandardized regression coefficients and 95% confidence intervals estimated with robust standard errors (unless otherwise noted).

and journal impact factors, given that they may be correlated with larger sample sizes and better methodological quality.

4.1. Limitations

There are several limitations of the present study that should be noted. First, some of the journals included in the sample did not have impact factors listed in the JCR Sciences and Social Sciences Editions in ISI Web of Knowledge, and as such, we excluded studies published in these journals from the analytic models. Second, although we included several proxy measures for study quality and rigor, these were only proxies for true methodological quality. For instance, other factors such as the presence of a statistician or epidemiologist in the author list, or the *h*-index of the last author, could be important variables to explore. Future replication studies should therefore also examine the role of other important quality proxies that were not examined here. Finally, our study focused on one specific body of literature: brief alcohol intervention effectiveness for adolescents and young adults. As such, we can only speculate on the generalizability of these findings to other literature or other types of study designs. Despite this limitation, the present study nonetheless maximized information from a comprehensive data source. Our analysis included information on a large number of trials, incorporated a wide range of study characteristics and potential confounding variables, and spanned more than 50 journals.

4.2. Conclusion

This study adds to the growing body of research using bibliometric data to predict citation rates. The results indicated that citations to BAI trials were higher when the cited articles were conducted by higher prestige authors and published in higher impact factor journals. Although BAI trials published in higher impact factor journals tended to use more rigorous research designs and have better reporting of study procedures, the associations between author prestige, journal impact factor, and citation rates persisted even after adjusting for study quality proxies. Citation rates of BAI trials thus likely reflect a range of factors above and beyond study quality, including author prestige characteristics and journal impact factors.

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References

[1] Jannot AS, Agoritsas T, Gayet-Ageron A, Perneger TV. Citation bias favoring statistically significant studies was present in medical research. J Clin Epidemiol 2013;66:296−301.

[2] Kimimäki M, Batty GD, Kawachi I, Virtanen M, Singh-Manoux A, Brunner EJ. Don't let the truth get in the way of a good story: an illustration of citation bias in epidemiologic research. Am J Epidemiol 2014;180:446−8.

[3] Kjaergard LL, Gluud C. Citation bias of hepato-biliary randomized clinical trials. J Clin Epidemiol 2002;55:407−10.

[4] Nieminen P, Rucker G, Miettunen J, Carpenter J, Schumacher M. Statistically significant papers in psychiatry were cited more often than others. J Clin Epidemiol 2007;60:939−46.

[5] Tanner-Smith EE, Polanin JR. A retrospective analysis of dissemination biases in the brief alcohol intervention literature. Psychol Addict Behav 2015;29:49−62.

[6] Shadish WR, Tolliver D, Gray M, Gupta SKS. Author judgements about works they cite: three studies from psychology journals. Social Stud Sci 1995;25:477−98.

[7] Garfield E. The agony and the ecstasy—The history and meaning of the journal impact factor.'' Presentation at the International Congress on Peer Review and Biomedical Publication. Chicago, IL 2005. Available at http://garfield.library.upenn.edu/papers/jifchicago2005.pdf. Accessed November 4, 2015.

[8] Etter JF, Stapleton J. Citations to trials of nicotine replacement therapy were biased toward positive results and high-impact-factor journals. J Clin Epidemiol 2009;62:831−7.

[9] Bhandari M, Busse J, Devereaux PJ, Montori VM, Swiontkowski M, Tornetta Iii P, et al. Factors associated with citation rates in the orthopedic literature. Can J Surg 2007;50:119−23.

[10] Lee KP, Schotland M, Bacchetti P, Bero LA. Association of journal quality indicators with methodological quality of clinical research articles. JAMA 2002;287:2805−8.

[11] Lokker C, McKibbon KA, McKinlay RJ, Wilczynski NL, Haynes RB. Prediction of citation counts for clinical articles at two years using data available within three weeks of publication: retrospective cohort study. BMJ 2008;336:655−61.

[12] Patsopoulous NA, Analatos AA, Ioannidis JPA. Relative citation impact of various study designs in the health sciences. JAMA 2005;293:2362−6.

[13] West R, McIlwaine A. What do citation counts count for in the field of addiction? an empirical evaluation of citation counts and their link with peer ratings of quality. Addiction 2002;97:501−4.

[14] Callaham M, Wears RL, Weber E. Journal prestige, publication bias, and other characteristics associated with citation of published studies in peer-reviewed journals. JAMA 2002;287:2847−50.

[15] Filion KB, Pless B. Factors related to the frequency of citation of epidemiologic publications. Epidemiol Perspect Innov 2008; 5:3.

[16] Perneger TV. Citation analysis of identical consensus statements revealed journal-related bias. J Clin Epidemiol 2010;63:660−4.

[17] Carey KB, Scott-Sheldon LAJ, Carey MP, DeMartini KS. Individual-level interventions to reduce college student drinking: a meta-analytic review. Addict Behav 2007;32:2469−94.

[18] Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2013 National Survey on Drug Use and Health: Summary of national findings, NSDUH Series H-48, HHS Publication No. (SMA) 14−4863. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.

[19] Tanner-Smith EE, Lipsey MW. Brief alcohol interventions for adolescents and young adults: a systematic review and meta-analysis. J Subst Abuse Treat 2015;51:1−18.

[20] Higgins JPT, Altman DG, Gøtzsche P, Jüni P, Moher D, Oxman AD, et al, Cochrane Statistical Methods Group. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. BMJ 2011; 343:d5928.

[21] Schulz KF, Altman DG, Moher D, for the CONSORT Group. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. BMJ 2010;340:698−702.

[22] Hirsch JE. An index to quantify an individual's scientific research output. Proc Natl Acad Sci U S A 2005;102:16569−72.

[23] Figg WD, Dunn L, Liewehr DJ, Steinberg SM, Thurman PW, Barrett JC, et al. Scientific collaboration results in higher citation rates of published articles. Pharmacotherapy 2006;26: 759−67.

[24] Johnson BT, MacDonald HV, Bruneau ML, Goldsby TU, Brown JC, Huedo-Medina TB, et al. Methodological quality of meta-analyses on the blood pressure response to exercise: a review. J Hypertens 2014; 32:706−23.

[25] White H. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 1980;48: 817−30.

[26] Hayes AF. Introduction to mediation, moderation, and conditional process analysis: a regress-based approach. New York, NY: The Guilford Press; 2013.

[27] Mallinckrodt B, Abraham WT, Wei M, Russell DW. Advances in testing the statistical significance of mediation effects. J Couns Psychol 2006;53:372−8.

[28] Shrout PE, Bolger N. Mediation in experimental and nonexperimental studies: new procedures and recommendations. Psychol Methods 2002;7:422−45.

[29] StataCorp, *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP, 2015.