

1 **If this title is funny, will you cite me?**

2 **Citation impacts of humour and other features of article titles in ecology and evolution**

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17 Running Title: *Citation impacts of funny paper titles*

19 Statement of authorship: SBH designed the study and led writing. CAC compiled literature and
20 citation counts and contributed to the writing. ERW led data analysis and contributed to the
21 writing.

22 This study was reviewed and approved by the Research Ethics Board of the University of New
23 Brunswick (REB #2020041).

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Abstract

25 Titles of scientific papers play a key role in their discovery, and “good” titles engage and
26 recruit readers. A particularly interesting aspect of title construction is the use of humour, but
27 little is known about whether funny titles boost or limit readership and citation of papers. We
28 used a panel of volunteer scorers to assess title humour for 2,439 papers in ecology and
29 evolution, and measured associations between humour scores and subsequent citation (both self-
30 citation and citation by others). Papers with funnier titles were cited less often, but this appears to
31 result from a confound with paper importance. Self-citation data suggest that authors give
32 funnier titles to papers they consider less important. After correction for this confound, papers
33 with funny titles have significantly *higher* citation rates, suggesting that humour recruits readers.
34 We also examined associations between citation rates and several other features of titles.
35 Inclusion of acronyms and taxonomic names was associated with lower citation rates, while
36 assertive-statement phrasing and presence of colons, question marks, and political regions were
37 associated with somewhat higher citation rates. Title length had no effect on citation. Our results
38 suggest that scientists can use creativity with titles without having their work condemned to
39 obscurity.

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Key Words

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44 humour, titles, scientific writing, citation, research impact

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48 **Introduction**

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50 Do titles matter? It's easy to find advice about constructing "good" titles for academic
51 papers (e.g., Thomson and Kamler 2013, Silvia 2014, Saramäki 2018, Belcher 2019, Hofmann
52 2019, Heard 2022). By "good" titles, we generally agree that we mean those that engage readers
53 and thus recruit them to a paper. It seems obvious that titles *should* matter in this way: they're
54 generally the first encounter a potential reader has with a paper, and they're much more widely
55 (and easily) communicated than papers themselves. Belcher (2019), for example, recommends
56 titles that aren't too broad, avoid abstract terms, name specific research subjects (such as species
57 or places), include searchable keywords and verbs, and avoid cleverness or wit – among other
58 things. There isn't strong agreement, though, with advice from other sources sometimes
59 concurring with Belcher's and sometimes contradicting it. Moreover, it's rare for advice of this
60 sort to be supported by data.

61 The availability of large citation-rate datasets has made possible correlative analysis of at
62 least one possible consequence of "good" titles: if a good title attracts readership, it should also
63 make it more likely that the paper is cited. Conversely, papers whose bad titles repel, or at least
64 fail to engage, readers are less likely to be cited. So what, empirically, makes a good title? The
65 literature promises much, but delivers relatively little. For most easily-scored features of article
66 titles, measured effects are weak (e.g., Costello et al. 2019) and inconsistent both among and
67 within disciplines. As an example, consider title length. Most advice favours short titles, but also
68 titles that clearly communicate an article's contents (the fundamental contradiction between
69 those suggestions is hard to miss). While most studies find short titles to have higher citation

70 rates, a few have found the opposite, some find no association at all, and still others find
71 associations that shift across disciplines (review: Heard 2021). In almost every study, though,
72 title length explains only a small fraction of variation in citation rates. The literature for other
73 title features (such as the use of question marks, colons, and hyphens and the inclusion of
74 geographic place names) is similarly mixed. About the only title feature on which the literature is
75 consistent is that titles including scientific names of genera or species are less cited than those
76 that do not (Fox and Burns 2015, Yuret 2018, Murphy et al 2019). The picture that emerges from
77 this work is that many features of titles are indeed associated with differences in citation rate –
78 but that most associations are weak, and many are inconsistent. And yet it's difficult to imagine
79 that titles really don't matter.

80 A major gap in our knowledge involves humour. Do funny titles attract reader attention,
81 and thus increase impact? Or do they suggest that readers shouldn't take the work seriously, and
82 thus decrease impact? Some writing guides explicitly advise against the use of humour in titles
83 (e.g., Thomson and Kamler 2013:85, Mack 2018:47, Belcher 2019:288). However, just three
84 papers to our knowledge have attempted to put evidence behind this advice – likely because
85 humour resists the kind of automated scoring that makes other features of titles easy to study.
86 Sagi and Yechiam (2008) used panels of undergraduates to assess humour in titles of psychology
87 papers, and found that the funniest titles were cited (slightly) less. Perhaps, they reasoned, this is
88 because “scientific publication is considered a serious matter, and humor seems antithetical to
89 it”. Subotic and Mukherjee (2014) attempted to replicate Sagi and Yechiam's result (again for
90 psychology papers), but instead found a positive effect of humour on downloads but no effect on
91 citations. Finally, Murphy et al. (2019) found no significant effect of title humour on citation rate
92 for ecology and entomology papers. Three other studies have examined related attributes of

93 titles: Haslam et al. (2008) found no effect on citation of “catchiness” (a title could be catchy
94 because it was funny, or for many other reasons) Keating et al. (2019) found a negative effect of
95 title sarcasm, and Mammola et al. (2022) found no effect of title “pleasantness”). Together this
96 work provides little evidence that humour helps, and yet funny titles (and the papers that bear
97 them) are widely shared on social media and stick in memory. This incongruity suggests that
98 humour in scientific titles deserves further study, including of the possibility that humour in titles
99 may be correlated with other aspects of papers that influence their later citation.

100 We used citation rate data for 2,439 papers in ecology and evolution, taken from nine
101 well-known journals, to ask whether humour in titles influences subsequent impact. We used
102 self-citation data to control for possible effects of underlying differences in paper importance.
103 We also considered two features of titles that are closely related to humour: cultural references
104 and titles that could be considered offensive. Finally, we consider possible effects of a variety of
105 other title features, including length, use of colons and questions, and inclusion of taxonomic and
106 geographic names. Effects on citation rates were mostly subtle, but we present evidence that,
107 after controlling for paper importance, funny titles increase impact. We regret, therefore, being
108 unable to think of a funnier title for this paper.

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111 **Methods**

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113 *Compiling papers*

114 We compiled the titles for every paper published in 2000 and 2001 in nine well-known
115 ecology and evolution journals: *The American Naturalist*, *Ecology*, *Evolution*, *Evolutionary*

116 *Ecology, Journal of Animal Ecology, Journal of Ecology, Journal of Evolutionary Biology,*
117 *Oikos, and Trends in Ecology and Evolution.* Our choice of journals was somewhat arbitrary (in
118 particular, we did not consider impact factor), but these journals are well represented in
119 university libraries, familiar to scientists in the field, and as a set capture both North American
120 and European publication. Our compilation included 2,439 papers. We categorized papers as
121 primary research articles, review articles, and “other”, with that last category including less
122 standard forms such as “forum review” articles (*Oikos*) and “journal club” articles (*Trends in*
123 *Ecology and Evolution*).

124

125 *Scoring titles*

126 We recorded whether each paper’s title was a question or an assertive sentence (a
127 declarative statement of a main result), and whether it was a two-part title (using a colon, dash,
128 etc.). We also scored titles (yes/no) for the presence of acronyms or initialisms, for the inclusion
129 of the scientific (Latin) name of a genus or species, and for the mention of a political region
130 (country, state/province, etc.). We then assembled a group of 10 “humour scorers”, who received
131 a spreadsheet of titles and were asked to score them for humour, offensiveness, and the presence
132 of cultural references (allusions to books, movies, music, memes, and other non-scientific
133 cultural knowledge). Journal names and author lists were redacted from the spreadsheets sent to
134 humour scorers, and they were instructed not to look up any information about a paper beyond
135 its title. Each scorer received the full set of 2,439 titles, but in a different random order. We
136 instructed scorers to work in 20 minute sessions to avoid task fatigue, not to score more than 8
137 20-minute sessions in a day, and to score each title with their screen adjusted so that only that
138 title was visible. Scorers were students or employees of the University of New Brunswick,

139 Fredericton, New Brunswick, Canada. We had (multiple) male and female scorers and scorers
140 originating in North America and in the Global South; their ages ranged approximately from 20
141 to 40. All scorers gave informed consent before their involvement, and the study was reviewed
142 and approved by the Research Ethics Board of the University of New Brunswick (REB
143 #2020041).

144 We had scorers assess humour on a 7-point scale, from zero (completely serious) to 6
145 (extremely funny). We did not attempt to calibrate scales across scorers. Scorers were asked to
146 infer the author's attempt at humour, rather than their own assessment of how funny the title was,
147 and they were asked to ignore the subject of the article in assessing humour.

148 We asked scorers to identify any titles they found offensive. In contrast to the humour
149 scoring, here we asked scorers to report their own feelings rather than their inference about the
150 authors' intent. Also in contrast to humour scoring, we allowed for a title to be found offensive
151 as a result of the article's subject (for example, a scorer might be offended by the use of humour
152 in the title of an article addressing a very serious subject).

153 We asked scorers to identify titles that included cultural references of any sort (books,
154 movies, music, memes, etc.). In a few cases, scorers reported that they suspected a cultural
155 reference but could not identify its origin; we instructed them to include these instances. We did
156 not restrict the age of a "cultural reference". Thus, allusions to Vivaldi and Lil Nas X are both
157 cultural references and are treated equally in our analyses. We acknowledge, however, that
158 scorers might sometimes miss less current examples.

159

160 *Tracking citations*

161 Because a minority of titles included humour or cultural references, we subset the titles
162 database before gathering citation data. We first identified all titles for which at least one scorer
163 recorded either a non-zero humour score or a cultural reference. There were 414 such titles, and
164 all underwent citation tracking. From the remaining 2,025 titles, we randomly selected 650 for
165 tracking, giving us a citation-tracked dataset of 1,064 titles. We randomized the order of titles
166 before counting citations, because citations accumulate through time. We used ScopusTM to
167 count citations, recording the total number of citations from publication until the date of
168 checking. We divided total citations into self- and other-citation. Self-citations were citations of
169 the focal paper by any paper that shared at least one author; other-citations were citations of the
170 focal paper by any paper with a non-overlapping set of authors. We use self-citations as an
171 indicator of a paper's intrinsic importance, reasoning that the authors' likelihood of later citing
172 their own paper depends on its content, not on its title.

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174 *Data analysis*

175 Our full data set will be available in the Supplementary Materials with the published
176 version of this preprint. We used generalized linear models with Poisson (citation counts) or
177 Gaussian (title attributes) error terms to explore relationships between titles and citation impact.
178 Our primary research question was whether title humour influenced citation rate; because
179 offensiveness and cultural references are intertwined with humour, their influences on citation
180 was a secondary research question. We separated review articles from primary ones in these
181 analyses, because we found authors have different practices for use of humour between article
182 types. Finally, to complement previous studies we also examined effects on citation of several

183 other title features, including length, use of colons and questions, and inclusion of taxonomic and
184 geographic names. This also let us control for these variables in our analysis of title humour.

185 We measured agreement among humour scorers by calculating pairwise Pearson
186 correlation coefficients among scorers and calculating Light's (1971) kappa as an overall
187 measure of concordance. Light's kappa is the mean of all possible pairwise combinations of
188 kappa scores between raters, where each $\kappa = (P(a) - P(e)) / (1 - P(e))$. In this expression, $P(a)$ is the
189 observed fraction of agreement and $P(e)$ is the expected fraction of agreement due to chance.

190 Kappa is often referred to as “interrater reliability”, although this implies scorers are succeeding
191 or failing at measuring an objective underlying measurement. In our case, since humour is
192 subjective, we are using kappa to measure agreement, not reliability, and so we avoid the latter
193 term.

194 We assessed the effect of various title attributes on both total citation count and self-
195 citation count using a series of generalized linear models, each with a Poisson error structure.
196 Specifically, we examined the effect of the average humour, offensiveness, and cultural-
197 reference scores for each title (Avg_humour, Avg_offense, Avg_culture), as well as article type
198 (PrimaryReviewOther), whether the title was phrased as a question (Question), whether the title
199 was assertive (Assertive), the presence of a colon or dash in the title (Colon), the presence of any
200 acronyms or initialisms (Acronyms), whether the political region was noted in the title
201 (Location), and the presence of a taxonomic name (Taxonomic_name). For humour, we also
202 calculated an importance-corrected citation rate as total citations divided by self citations, and
203 tested a similar generalized linear model. We use this test primarily as a way of illustrating the
204 importance effect, recognizing that it is not independent of the separate total- and self-citation
205 tests. We assessed each combination of these predictor variables and ranked models according

206 to AIC criteria – once for an analysis including all article types, and then again considering only
207 primary research articles. We present only the best fitting model for each response variable.
208 Because there was some multicollinearity among title characteristics, we did not include highly-
209 correlated (>0.7) predictor variables in the same model. We did not include offensiveness or
210 cultural-reference scores in the multivariate models as these are conceptually related to, and
211 correlated with, humour. We examined residual plots to verify that model assumptions were met.
212 Unless otherwise specified, for all reported results $P < 0.01$.

213

214 **Results**

215

216 Citation counts for the papers we tracked were extremely variable, ranging from zero to
217 just over 2,300 (median 64; mean 111). Unsurprisingly, review papers were cited more heavily,
218 on average, than primary research papers; “other” papers had the lowest citation rates (Figure
219 1A). The citation advantage of review papers was far smaller, but still significant, for self-
220 citation (Figure 1B). Among article types, titles from “other” papers were rated significantly
221 more humorous than those from review and primary articles (Figure 1C). Humour did not vary
222 significantly among journals, except that *Trends in Ecology and Evolution* (where all papers
223 belonged to the review or “other” types) had significantly funnier titles than the rest (a higher
224 average score and many more non-zero scores; Figure 1D). Our best fitting models and
225 parameter estimates were similar whether we analyzed all articles or just primary research papers
226 (compare Tables 1 and 2, for all articles, with Supplementary Materials, Tables S2 and S3, for
227 primary research papers only). In what follows, we present only the more comprehensive
228 analysis.

229 Few titles were funny: only 414 of 2,439 papers were assigned a non-zero humour score
230 by even one scorer, and only 60 had at least 11 humour points (as they would if all scorers gave
231 them the minimum non-zero humour score, or two scorers gave them the maximum score). The
232 median humour score was zero (mean 0.096). We saw fairly low, but non-zero, agreement among
233 scorers in their assessment of title humour. The overall concordance score (Light's kappa) was
234 just 0.34; most pairwise (Pearson) correlations had $r < 0.5$, and over a third had $r < 0.35$ (Figure
235 2, and precise correlations in Supplemental Materials, Table S4). The title with the highest
236 humour score was “Nice snake, shame about the legs”; this title also tied for the highest
237 offensiveness score. Other titles with relatively high humour scores included “Some Like it Hot:
238 Intra-Population Variation in behavioral Thermoregulation in Color-Polymorphic pygmy
239 Grasshoppers”, “Is it Time to Bury the Ecosystem Concept? (With Full Military Honors, of
240 Course!)”, and “The Competition□Colonization Trade□off is Dead; Long Live the
241 Competition□Colonization Trade□off”. Only the first title received a non-zero humour score
242 from every scorer.

243 Our best-performing models (Tables 1 and 2) suggested contributions to citation rate
244 from title humour but also from phrasing titles as questions, including colons, acronyms,
245 locations, and taxonomic names, and (for all article types but not for primary research papers
246 alone) phrasing titles as assertive statements. However, some of these effects were weak (see
247 below).

248 After we controlled for other predictors, total citations declined with average title humour
249 (Figure 3A). The effect was relatively small, with a decrease of 4% in total citations for each 1
250 point increase in average humour score, but this equates to a difference of 20.4% between the
251 least and most humorous titles. There is, however, an important qualification: the pattern was

252 similar, but much stronger, for self citations, with an 82% decrease for the most humorous titles
253 (Figure 3B). Thus, after correcting for underlying paper importance, funny titles are cited more,
254 not less (Figure 3C), with a 23% increase for each 1 point increase in humour score.

255 While we did not include offensiveness or cultural references in our AIC modeling, we
256 examined their association with citation rates in isolation. Offensive titles were rare, with only 19
257 of 2,439 titles scored as offensive by even a single scorer (median 0, mean 0.06). Citation rates
258 declined with average offense score (Figure 4A). However, as for humour, there was an even
259 stronger decline for self-citations (Figure 4B), suggesting that less important papers are given
260 titles that our scorers judged offensive. Titles including cultural references show a pattern of
261 increasing citation (Figure 4C), despite fewer self-citations (Figure 4D, again suggesting lower
262 underlying paper importance). Interestingly, the detection of cultural references by our scorers
263 was quite imperfect. 75 titles were recorded as including a cultural reference by at least one
264 scorer, but only 5 were so recorded by a majority of scorers and none by all scorers..

265 Several other characteristics of paper titles were significant predictors of citation counts
266 in the AIC model, but most of these effects were relatively weak. Titles with colons or question
267 marks, those phrased as assertive statements, and those including names of political regions were
268 more highly cited (Table 1 and Supplementary Material Figure S1, upper row), although only the
269 colon effect was strong and the “assertive statement” effect disappeared when we analyzed only
270 primary research articles; Supplementary Material Table S2). Effects on self-citation were
271 mostly very weak (Supplementary Material Figure S1, lower row), except that titles mentioning
272 political regions had moderately more self-citations. Finally, title length was excluded from all
273 AIC models (Tables 1, 2) and made little difference to either total or self citation rates viewed in
274 isolation (Supplementary Materials Figure S2).

275 We found stronger effects for the inclusion in titles of acronyms and taxonomic names.

276 Each was associated with a sharp decrease in citation rates (acronyms 41%, Figure 5A; and

277 taxonomic names 32%, Figure 5C). These effects cannot be explained by paper importance, as

278 the inclusion of acronyms was not associated with self-citation (Figure 5B) and the inclusion of

279 taxonomic names was associated with slightly higher self-citation (Figure 5D).

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281

282 **Discussion**

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284 Despite the widespread availability of clear and firm advice on constructing “good” titles,

285 the most striking pattern we document is simply that few easily measured attributes of titles seem

286 to have strong associations with citation rates. This is broadly consistent with the literature (e.g.,

287 Costello et al. 2019, Murphy et al. 2019, Mammola et al. 2022; review: Heard 2021).

288 There were some differences in humour scores among the three article types we

289 distinguished. In particular, “other” articles (forum review and journal club papers) had both the

290 highest humour scores and the lowest citation rates. This can account for the higher average

291 humour scores for one journal (*Trends in Ecology and Evolution*), where the bulk of “other”

292 papers were published. Otherwise, though, article type didn’t drive the patterns in citation rate

293 we observed, as analyses restricted to primary research articles had very similar results to those

294 including all three article types.

295 Our analysis suggests that humour in the title can increase a paper’s impact. It is true that

296 the simplest analysis, correlating total citations with humour score, finds a (weak) negative

297 relationship. However, such an analysis fails to account for the possibility that authors are less

298 likely to use humour in titling their more important papers. Our self-citation data strongly
299 suggest that this is true: papers with funnier titles are subsequently cited less *by their own*
300 *authors*. Since authors don't need titles to alert them to their own papers, self-citation provides a
301 title-independent estimator of importance – unlike other-citations, for which effects of title and
302 underlying importance on citation are inextricably confounded. Because the decline in self-
303 citation with humour score is much steeper for self-citations than for other-citations, funny titles
304 are actually over-cited, not under-cited, after correction for paper importance (Figure 3C).

305 Earlier literature has not considered the possibility of confounding between title humour
306 and paper importance. An analysis for psychology papers by Sagi and Yechiam (2008), which
307 found a negative association between total citations and title humour, did not attempt any
308 correction for paper importance, via self-citation or otherwise. As a result, that analysis may well
309 have drawn precisely the wrong conclusion. The same issue applies to analyses by Subotic and
310 Mukherjee (2014) and Murphy et al. (2019), both of which found no effect of humour on total
311 citation but, again, did not correct for paper importance. Advice to avoid humour in paper titles
312 (e.g., Thomson and Kamler 2013:85, Mack 2018:47, Belcher 2019:288) is thus not well founded
313 in evidence – at least, not if the concern is citation impact.

314 Scientists sometimes express two related worries about the use of humour: that funny
315 titles might be seen as offensive, and that funny titles will be misunderstood by those who don't
316 share the author's cultural background. Our data suggest three things about this. First, if these
317 things happen, they don't affect citation much. Papers with titles identified as offensive were
318 indeed cited less, but as for humour, analysis of self citations suggests that this can be more than
319 explained by the use of such titles for less important papers. Second, the low concordance among
320 our scorers suggest that even with a group of scorers of relatively homogeneous cultural

321 background, opinions about humour and offense vary widely. The simultaneous existence of
322 *South Park* and *The Satanic Verses* should make it obvious that both humour and offense are
323 deeply personal, and both will sometimes be perceived even when neither is intended. Third,
324 even though some readers will miss cultural references in titles (it was commonplace for our
325 scorers to differ in their detection), this does not interfere with discovery or impact of the papers:
326 the use of cultural references was strongly associated with increased citation rates.

327 Other features of titles are significantly associated with citation rates, but most of the
328 effect sizes are small – as has generally been true in previous studies. Citation rates are higher for
329 two-part titles (those with colons, dashes, etc.) and a little higher for question and assertive
330 sentence titles. Inclusion of a geographic region name increases citation a little, consistent with
331 some other studies (Rostami et al. 2013, Nair and Gibbert 2015, Murphy et al. 2019) but
332 contrasting with others (Jacques and Sebire 2010, Paiva et al. 2012, Abramo et al. 2016,
333 Alimoradi et al. 2016, Yuret 2018, Costello et al. 2019). However, analysis of self citation
334 suggests that this is likely explained by a tendency for authors to use geographic names in their
335 more important papers. We do not have an explanation for this tendency, which surprised us.
336 Title length, which is one of the most frequent targets of well-meaning advice, had virtually no
337 effect on citation. This is broadly consistent with the literature (review: Heard 2021): shorter
338 titles are sometimes found to be cited more, and sometimes found to be cited less, but the effects
339 vary from weak to very weak. Keeping titles short may help typesetters, but seems to have no
340 implication for authors or readers.

341 There were larger effects for taxonomic names: their inclusion is associated with a steep
342 (32%) reduction in citation. The negative effect of taxonomic names in titles is one of the few
343 citation effects to be consistent across studies (Fox and Burns 2015, Yuret 2018, Murphy et al.

344 2019). Readers appear to behave as if inclusion of a taxonomic name signals narrower scope of,
345 and thus narrower interest in, a paper. This could be a reliable signal (papers including
346 taxonomic names may, on average, genuinely be of narrower scope) or a misperceived one (with
347 readers being deterred from papers that really are relevant to them). Since *self*-citations don't
348 decline with the inclusion of a taxonomic name, we suspect that misperception is often involved.
349 Authors may therefore wish to consider removing scientific names of taxa from titles.

350 Finally, we were surprised by the strong pattern for acronyms. Despite our deep
351 familiarity with – perhaps even love for – acronyms (Barnett and Doubleday 2020), their
352 appearance in a title is associated with a 41% decrease in citation rates, and this can't be
353 explained by variation in paper importance. There were already good reasons to reduce our use
354 of acronyms in writing; their apparent effect on citation impact may add another.

355 There is, of course, an important assumption behind our choice of citation rate as a
356 variable to correlate with features of titles. Citation rate is only of interest if it says something
357 useful about the reach or impact of a paper. Given that science is a fundamentally cumulative
358 process, and given that modern citation practices involve an ethical responsibility to cite
359 influential work, citation rate really does seem likely to be measuring something useful. In a few
360 cases, of course, a paper may be heavily cited because it's wrong – for example, as an example
361 of how an analysis can go astray – but we doubt that such citations account for a significant
362 fraction of our database.

363 Ultimately, the factors that explain the citation impact of a paper are sure to be numerous,
364 interrelated in complex fashion, and extending far beyond just the title. However, because titles
365 are the first point of contact with a paper for most readers, we suspect interest in their
366 construction will remain strong. In a sense, our results are mostly good news for authors: few

367 title features (barring acronyms and taxonomic names) work against citation. That means
368 scientists can use titles creatively, even inserting touches of humour (Heard 2014), without fear
369 of their work ending up in undeserved obscurity.

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373 **Acknowledgements**

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375 We thank our scorers, who read more paper titles in a couple of weeks than some people
376 do in a career. Lyndsey Burrell grappled bravely and well with searching and summarizing a
377 rather peculiar literature. We are grateful to Joel Dacks, an anonymous reviewer, and members
378 of the PEER Group, Dept. of Biology, University of New Brunswick, for helpful comments on
379 the work and the manuscript. This research was funded by the Natural Sciences and Engineering
380 Research Council of Canada via a Discovery Grant to SBH.

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450

Figure and Table Legends

451

452 Table 1. Best fitting model after AIC model selection for total citations. For each covariate, we
453 present the log effect and (standard error) and significance level, denoted by stars.

454

455 Table 2. Best fitting model after AIC model selection for self-citations. For each covariate, we
456 present the log effect and (standard error) and significance level, denoted by stars.

457

458 Figure 1. Total citations (A) and self citations (B) compared among article types (Other,
459 Primary, or Review); and average humour scores compared among article types (C) and
460 among journals (D). Boxplots show the median (thick horizontal line), interquartile range
461 (25th and 75th percentile) for the box, and 1.5 x interquartile range for the box whiskers.

462

463 Figure 2: Concordance among scorers for title humour. The matrix shows Pearson correlation
464 coefficient (r) for each pairwise combination of scorers, across all scored titles. The
465 overall concordance, measured by Light's kappa, was 0.34.

466

467 Figure 3: Humour and citation rates. Both total citations (A) and self citations (B) significantly
468 decreased with higher humour scores. However, the effect size is much larger for self
469 citations, and the ratio of total to self (C) citations *increases* with humour score.

470

471 Figure 4: Offensive titles, cultural references, and citation rates. Total citations decreased
472 significantly with higher offensive scores (A), but self citations decreased more strongly

473 (B). The inclusion of cultural references was associated with higher total citations (C) but
474 with *lower* self citations (D).

475

476 Figure 5: Acronyms, taxonomic names, and citation rates. The inclusion of acronyms was
477 associated with a significant decrease in total citations (A), but was not associated with
478 self citations (B). The inclusion of taxonomic names was associated with a strong
479 decrease in total citations (C) but a slight increase in self citations (D). Boxplots show the
480 median (thick horizontal line), interquartile range (25th and 75th percentile) for the box,
481 and 1.5 x interquartile range for the box whiskers.

482

483 Table 1: Best fitting model after AIC model selection for total citations. For each covariate, we
484 present the log effect and (standard error) and significance level, denoted by stars.

<i>Dependent variable:</i>	
Total Citations	
PrimaryReviewOtherPrimary	0.542*** (0.013)
PrimaryReviewOtherReview	1.662*** (0.014)
Question	0.044*** (0.009)
Assertive	0.165*** (0.011)
Colon	0.416*** (0.006)
Acronyms	-0.529*** (0.052)
Location	0.082*** (0.011)
Taxonomic Name	-0.389*** (0.010)
Average Humour	-0.096*** (0.006)
Constant	3.926*** (0.013)
Observations	1,027
Log Likelihood	-61,416.010
Akaike Inf. Crit.	122,852.000

Note: *p<0.1; **p<0.05; ***p<0.01

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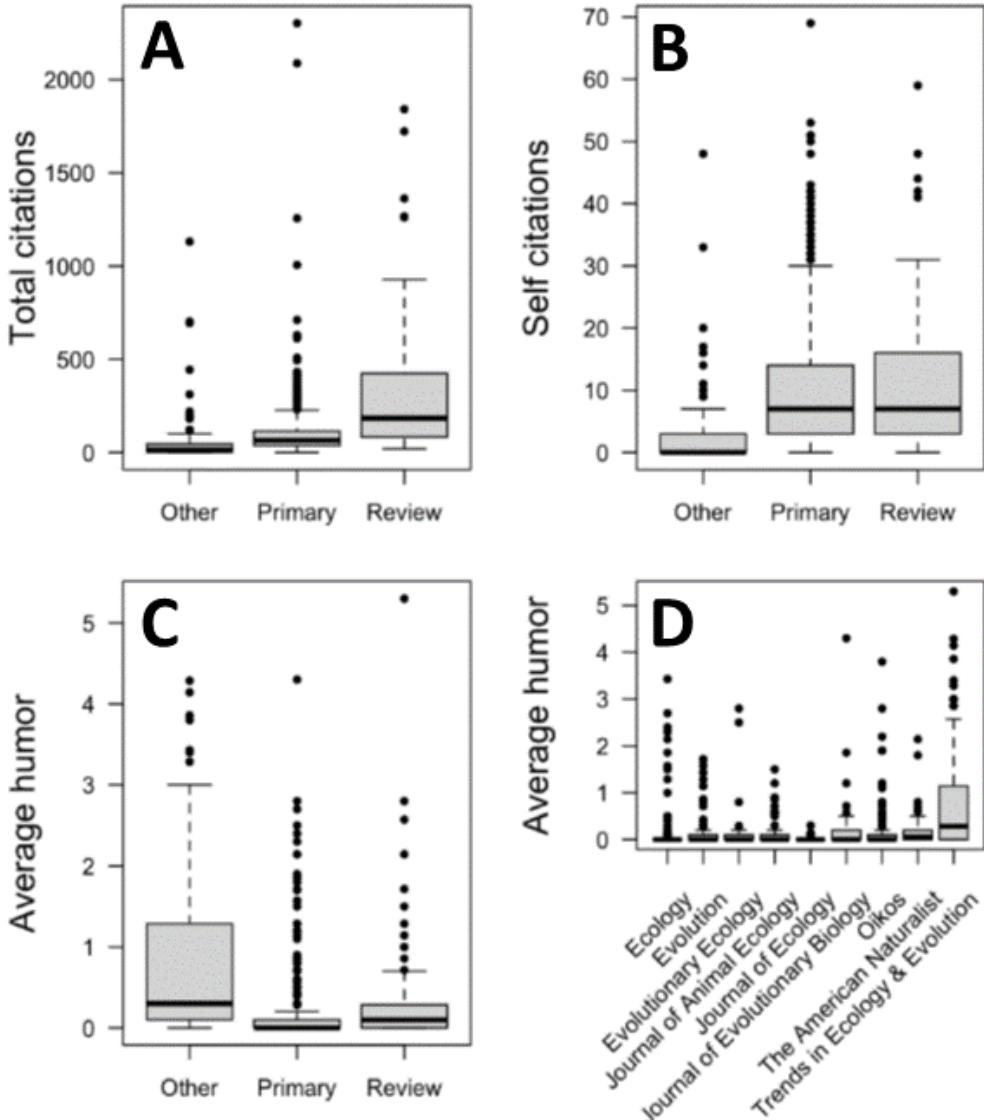
487

488 Table 2: Best fitting model after AIC model selection for self-citations. For each covariate, we
489 present the log effect and (standard error) and significance level, denoted by stars.

<i>Dependent variable:</i>	
	Self Citations
PrimaryReviewOtherPrimary	1.125*** (0.057)
PrimaryReviewOtherReview	1.327*** (0.064)
Question	−0.076** (0.035)
Colon	0.126*** (0.021)
Location	0.248*** (0.034)
Average Humour	−0.152*** (0.027)
Constant	1.109*** (0.057)
Observations	1,027
Log Likelihood	−6,062.415
Akaike Inf. Crit.	12,138.830

Note: *p<0.1; **p<0.05; ***p<0.01

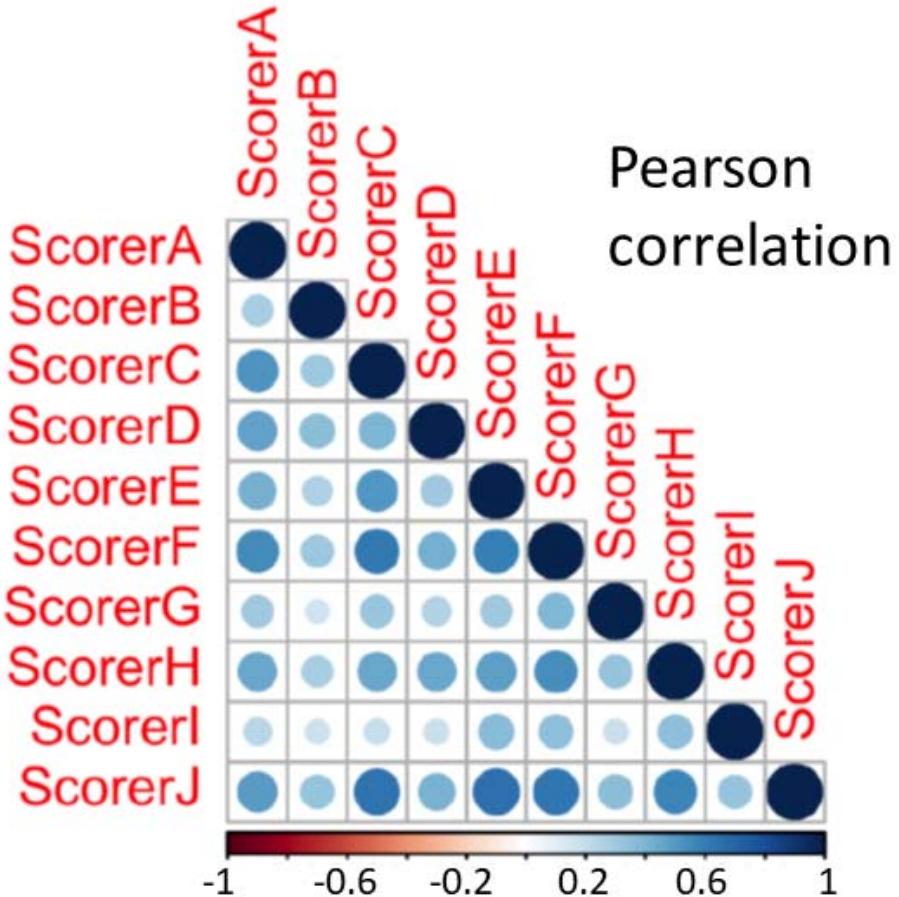
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493 Primary, or Review); and average humour scores compared among article types (C) and among
494 journals (D). Boxplots show the median (thick horizontal line), interquartile range (25th and 75th
495 percentile) for the box, and 1.5 x interquartile range for the box whiskers.

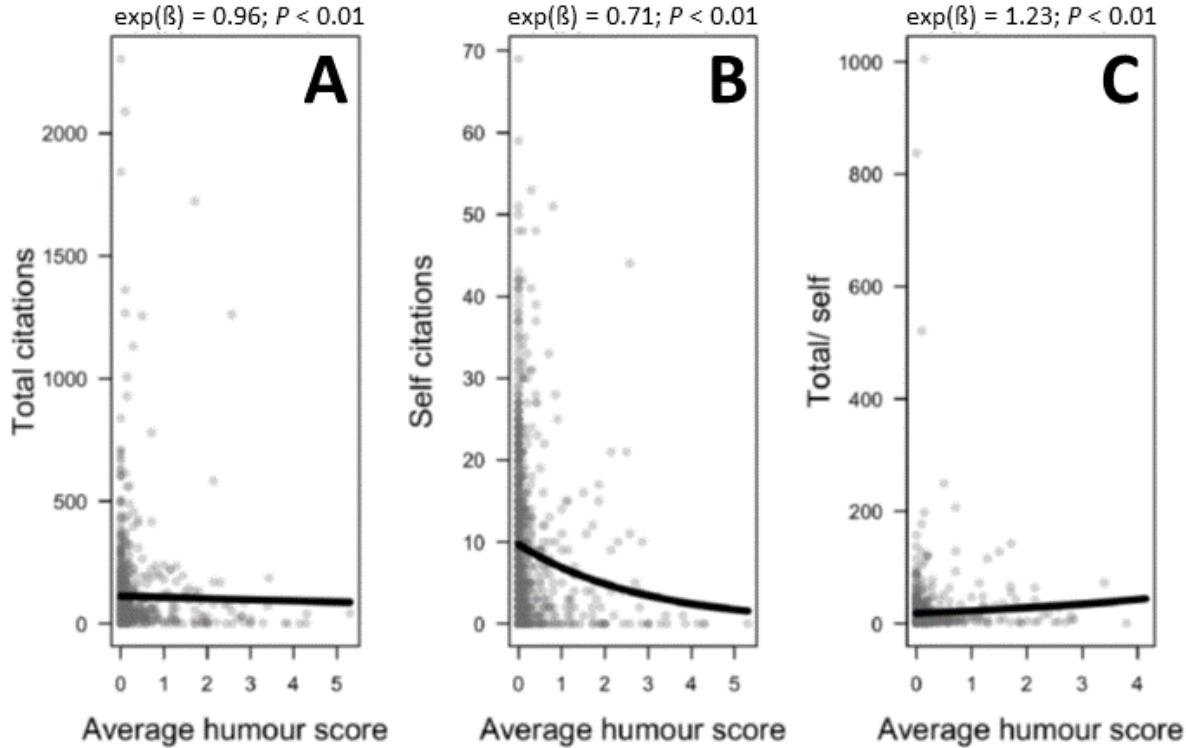
496



497

498 Figure 2: Concordance among scorers for title humour. The matrix shows Pearson correlation
499 coefficient (r) for each pairwise combination of scorers, across all scored titles. The overall
500 concordance, measured by Light's kappa, was 0.34. Exact correlation coefficients can be found
501 in Supplementary Materials, Table S4.

502



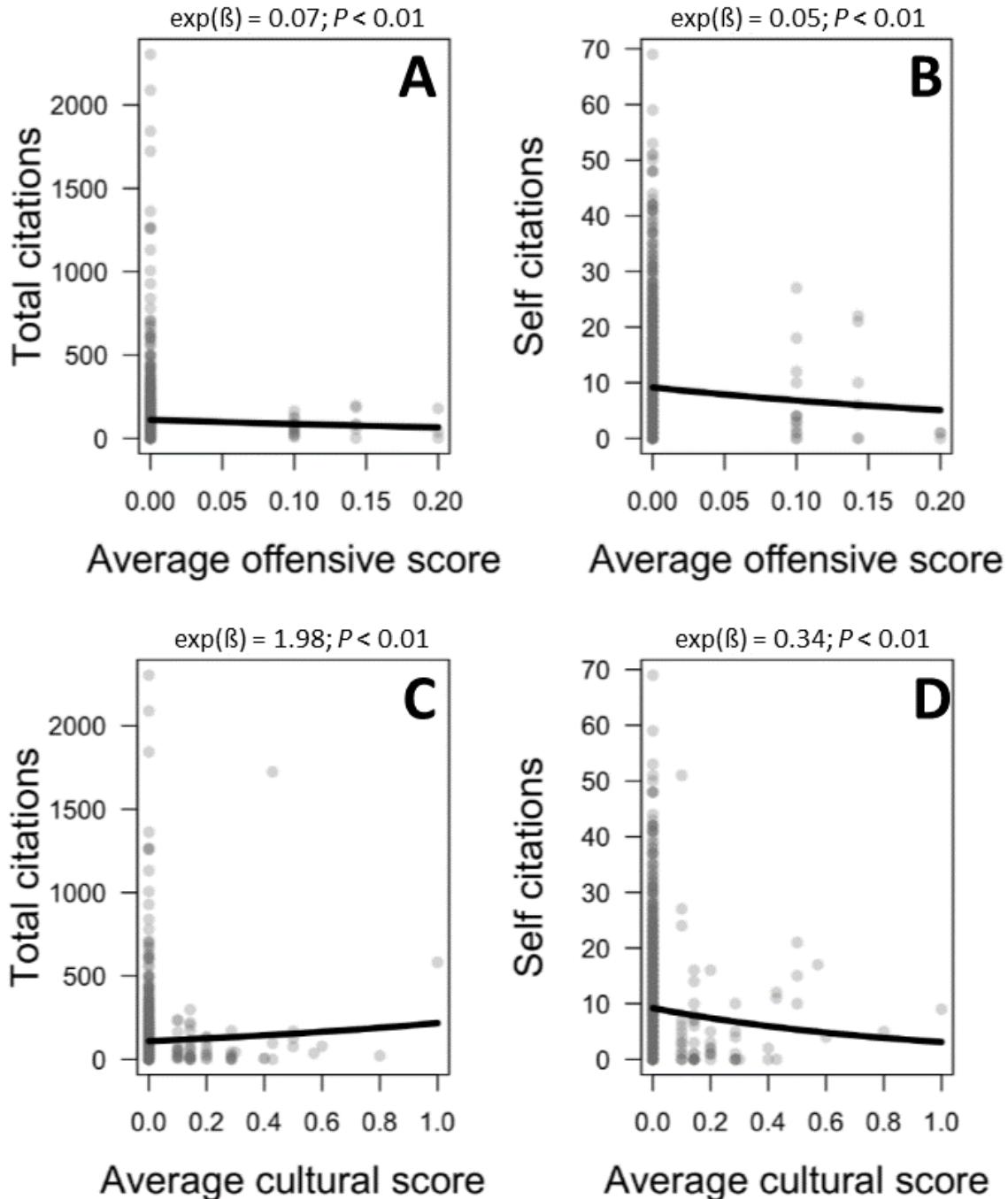
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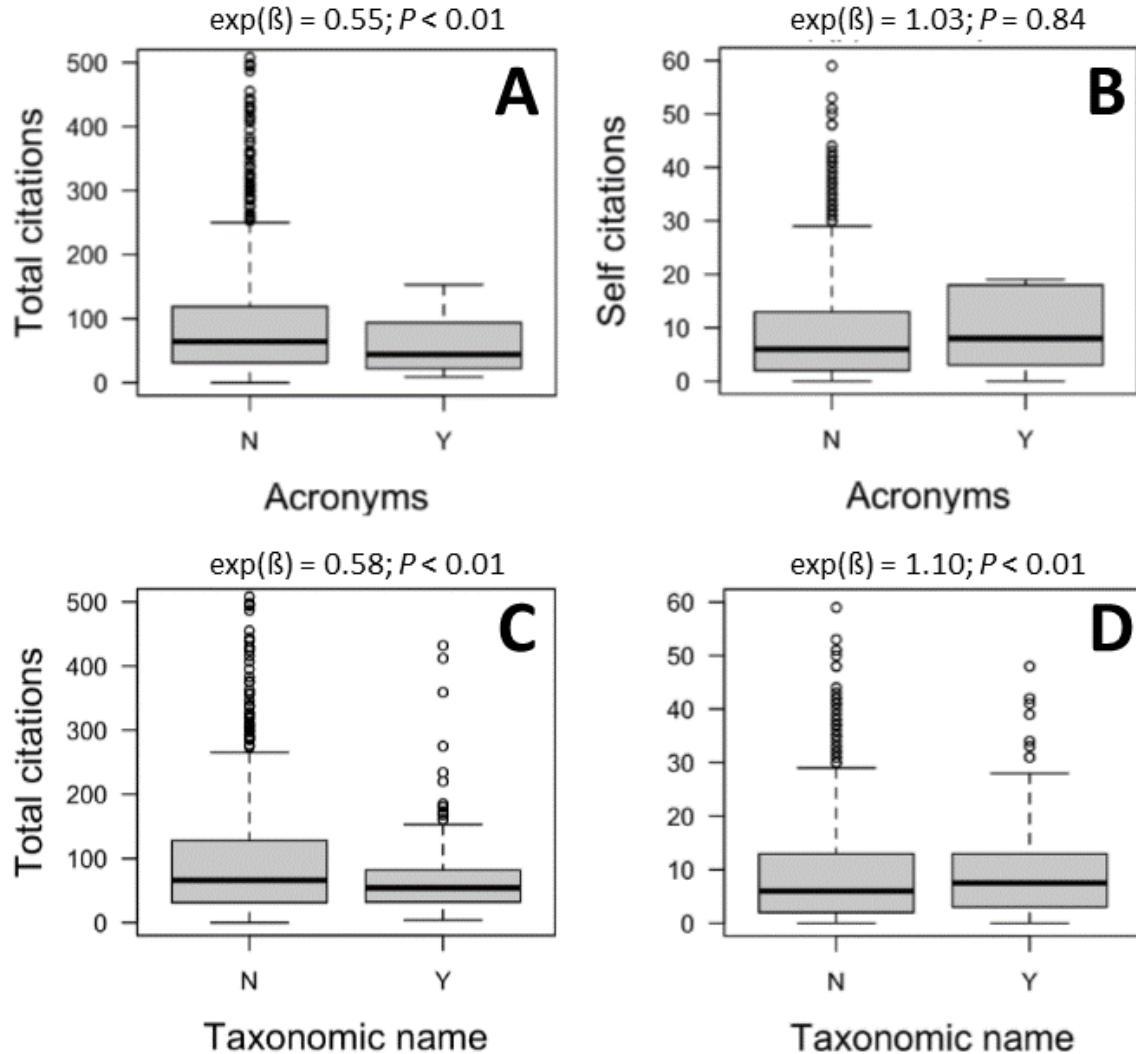
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510
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513 inclusion of cultural references was associated with higher total citations (C) but with *lower* self
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515

516 Figure 5: Acronyms, taxonomic names, and citation rates. The inclusion of acronyms was
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518 citations (B). The inclusion of taxonomic names was associated with a strong decrease in total
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520 horizontal line), interquartile range (25th and 75th percentile) for the box, and 1.5 x interquartile
521 range for the box whiskers.

522

Supplementary Material

523

524 *Supplemental Tables and Figures:*

525 *Table S1. Full dataset used in analyses (to be provided with the published version).*

526 *Table S2. AIC-selected model for total citations, primary research papers only.*

527 *Table S3. AIC-selected model for self citations, primary research papers only.*

528 *Table S4. Pearson correlations among scorers for title humour.*

529 *Figure S1. Associations with total citation rates (top row) and self citation (bottom row) for two-*

530 *part titles (“colon”), question titles, assertive-sentence titles, and titles including names*

531 *of political regions.*

532 *Figure S2. Title length and rates of total (A) and self (B) citation.*