Do scholars follow Betteridge's Law? The use of questions in journal article titles

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Abstract In journalistic publication, Betteridge's Law of Headlines stipulates that "Any headline that ends in a question mark can be answered by the word no." When applied to the titles of academic publication, the assertion is referred to as Hinchcliffe's Rule and denigrates the use of the question mark in titles as a "click-bait" marketing strategy. We examine the titles of all published articles in the year 2014 from five top-ranked and five mid-range journals in each of six academic fields ($n = 7845$). We describe the form of questions when they occur, and where a title poses a question that can be answered with a "yes" or "no" we note the article's substantive answer. We do not find support for the criticism lodged by Betteridge's Law and Hinchcliffe's Rule. Although patterns vary by discipline, titles with questions are posed infrequently overall. Further, most titles with questions do not pose yes/no questions. Finally, the few questions that are posed in yes/no terms are actually more often answered with a "yes" than with a "no." Concerns regarding click-bait questions in academic publications may, therefore, be unwarranted.

Introduction

In the field of journalism, Betteridge's Law strongly asserts that "any headline which ends in a question mark can be answered by the word 'no.'" According to Ian Betteridge, "The reason why journalists use that style of headline is that they know the story is probably

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bullshit, and don't actually have the sources and facts to back it up, but still want to run it" (Betteridge 2009). Online titles and images are similarly disparaged as "clickbait" when they make misleading promises about an article's content (Blom and Hansen 2015).

Similar claims and concerns have been aired about scholarly publications, stimulated by the increased use of question marks in titles in recent years (Ball 2009). Anecdotally, some journal editors advise academic writers to adopt a "clickbait" strategy including "clever titles and titles in the form of questions [that] can help draw the eye" (Hamby 2015: 106–107). Recent scholarship also asserts that marketing is likely to be a primary motivation for the use of questions in academic titles. According to this line of reasoning, readers will be tempted to read an article by the possibility that the question's answer might be yes, while the title's question mark simultaneously protects the author from backlash at readers' subsequent disappointment when they find the article's answer is negative—or, more subtly, inconclusive (Ball 2009; Haggan 2004; Sisó 2009). An analysis of six prominent *Plos* journals indicates such a strategy, if it is followed, may have an immediate but limited payoff; while articles with questions in their titles enjoyed 53 % more downloads than other articles, they received 38 % fewer citations (Jamali and Nikzad 2011). An analysis of over a half-million titles in Web of Science database concludes that articles with question marks in titles receive significantly more citations than articles with no unusual punctuation (Buter and van Raan 2011). Effective or not, the use of a question in a title is seen in this tradition as a rhetorical prop against an ultimately disappointing answer. It follows that where questions appear in academic titles, the answer "no" (or the frustrating "depends" answer) should be expected, while an affirmative "yes" answer would be a surprise. This prediction has been expressed in academics as Hinchcliffe's Rule: "If the title of a scholarly article is a yes–no question, the answer is 'no'" (Shieber 2015).

Although Hinchcliffe's Rule is stated definitively, the tendency it describes may itself be variable, not constant. The overall percentage share of journal articles with questions as titles is low in studies of biological science (Soler 2007), human movement research (Krajnović and Omrčen 2013), and in research publications overall (Buter and van Raan 2011). However, in the social sciences and humanities that share appears to be higher (Haggan 2004; Soler 2007), perhaps reflecting distinctive cultures of discourse (Hyland 2002). Some differences may also be expected according to the citation-based ranking of a journal. Because rankings are based on citation patterns, articles submitted to top-ranked journals are more likely to be cited frequently. Articles published in lower-ranked journals cannot rely on strong readership and tend to be downloaded less often (Guerrero-Bote and Moya-Anegón 2014; Maflahi and Thelwall 2015). To buck the trend, will authors submitting articles to lower-ranked journals pose more eye-catching questions that inappropriately inflate readers' expectations?

The tendency for scholars to pose questions in their titles has been empirically studied, but the relationship between questions and answers has not been assessed. Most stringently expressed, Betteridge's Law supposes that every question posed in an article's title will be followed by an answer of "no" in the body of that article. Hinchcliffe's Rule imposes a less stringent standard, recognizing that some questions cannot be answered with a simple yes or no. We might further loosen Hinchcliffe's Rule to recognize the possibility that academics might answer a yes–no question with a contingent answer that depends on context. Other questions—How? Why? Which?—cannot even possibly be answered with a yes or no and reflect legitimate aims of research rather than marketing choices (Ball 2009). How often do these questions occur in academic titles compared to yes–no questions? Are there differences by discipline or rank in the relative frequency of questions, the variety of

questions asked, and the tendency for the substantive answer to be "no?" We seek to address these questions about questions below.

Method

This study begins by identifying the 1st–5th and 50th–54th ranked journals with publications in 2013, as listed on February 1, 2015 (http://www.scimagojr.com) in each of six disciplinary areas (Literature and Literary Theory, Philosophy, Psychology, Sociology and Political Science, Computer Science, and Physics and Astronomy), two each from within the three broad academic traditions of the Humanities, Social Sciences and Natural Sciences. Categorizations of disciplinary areas and rankings within disciplinary areas are drawn from SCImago Journal Rank, which in turn draws from Elsevier's Scopus database of publications (http://www.scopus.com) to generate size-independent rankings of citations weighted by the prestige and thematic closeness of citing journals (Guerrero-Bote and Moya-Anegón 2012). The 1st–5th ranked journals for each disciplines generate high attention, while the 50th–54th ranked journals for disciplines less strongly command peers' attention, making marketing choices in titles more important.

Articles from all published issues of the 60 sampled journals in the year 2014 were obtained, excluding administrative items, errata and book reviews, generating a dataset of 7845 titles in all. The names, disciplines and number of articles for sampled journals are described in "Appendix" section. Although equal numbers of journals were selected for each discipline, journals published widely varying numbers of articles. Natural science journals account for 75.6 % of all articles published in 2014, while social science journals comprise 18.4 % of all articles and humanities journals account for just 6.0 % of articles. Due to differences the volume of publication between disciplines, results below are reported as shares within disciplines.

Articles without questions appearing in their titles were counted and not read. Articles with questions in their titles, on the other hand, were more closely attended to. As we encountered questions in titles, we first determined whether the question could be answered with a "yes" or "no." Questions that could not be answered "yes" or "no" were placed into categories, beginning with the predetermined "what is…", "why" and "how" categories and adding seven additional categories during the process to accommodate questions of varieties we did not anticipate. These categories are listed in Table 1. When journal articles asked a question that could be answered with a "yes" or "no," we read the text of the article to determine the answer. Some journal articles did not answer their questions with a "yes" or "no" but rather indicated a more complicated and contingent answer; these answers we classified in the "depends" category. To strengthen inter-coder reliability in the coding process, the authors both coded a share of these journal articles, compared coding decisions and revised rubrics for coding accordingly. After coding, the first author reviewed the second author's coding, with remaining discrepancies resolved in consultation.

The statistical significance of differences between means is not reported because a non-representative systematic sample of journals was collected, making a calculation of standardized residuals and Chi-square statistics inappropriate. Regardless of statistical significance, the substantive differences in the proportions of those of asking and answering questions in this descriptive study have substantive implications.

Table 1 Frequency of questions and question types in journal article titles, by discipline

Discipline	Natural Sciences		Humanities		Social Sciences	
	Computer Science	Physics and Astronomy	Literature and Literary Theory	Philosophy	Psychology	Sociology and Political Science
% of all Titles with Questions	0.9 % (10/1153)	0.3 % (15/4779)	4.2 % (9/216)	4.3 % (11/253)	6.0 % (57/947)	15.1 % (75/497)
What is…?	10.0 % (n = 1)	6.7 % (n = 1)	22.2 % (n = 2)	9.1 % (n = 1)	1.8 % (n = 1)	1.3 % (n = 1)
Why?	10.0 % (n = 1)	6.7 % (n = 1)			1.8 % (n = 1)	4.0 % (n = 3)
How?	10.0 % (n = 1)		11.1 % (n = 1)	18.2 % (n = 2)	12.3 % (n = 7)	12.0 % (n = 9)
How much?					3.5 % (n = 2)	1.3 % (n = 1)
Under what conditions?		6.7 % (n = 1)		9.1 % (n = 1)	7.0 % (n = 4)	6.7 % (n = 5)
Which alternative?	40.0 % (n = 4)	20.0 % (n = 3)			21.1 % (n = 12)	10.7 % (n = 8)
Who benefits?			11.1 % (n = 1)			
What comes next?		6.7 % (n = 1)				
Rhetorical question					3.5 % (n = 2)	2.7 % (n = 2)
Subject's question, quoted			11.1 % (n = 1)		1.8 % (n = 1)	
Yes/no question	30.0 % (n = 3)	53.3 % (n = 8)	44.4 % (n = 4)	63.6 % (n = 7)	47.4 % (n = 27)	61.3 % (n = 46)

Results

How many questions are asked in the journal articles of this sample? Table 1 reports the absolute and relative frequency of questions and question types by discipline. The overall frequency of questions in titles across disciplines is small, with just 2.3 % of titles featuring questions. Questioning titles are particularly rare in the natural sciences, especially in the division of physics and astronomy, from which Hinchcliffe's Rule originates. If we took a hundred random article titles from the 1st–5th and 50th–54th ranked journals in the Humanities, we would expect to obtain fewer than five titles with questions. However, questions are noticeably more frequent in the sociology and political science journals sampled for this study; nearly one in six titles in this disciplinary area comes in the form of a question. Even though natural science journal titles occur more than ten times as often as sociology and political science titles in our data, the number of sociology and political science question titles is three times as large as the number of natural science question titles. These findings are consistent with other research regarding the relative frequency of questions in titles, where across multiple disciplines the relative frequency of questions in titles typically varies between 2 and 3 %, but also where for particular disciplines, notably medicine and the social sciences, the frequency of questions in titles can run higher (Ball 2009; Buter and van Raan 2011; Jamali and Nikzad 2011; Soler 2007).

When questions are asked in journal article titles, what kind of questions are asked? In all disciplines, a substantial portion of questions cannot be answered with a "yes" or "no." A small number of questions in titles do not reflect the posing of questions by authors at all, but rather are rhetorical devices for making a statement. "Where is urban politics?" in the International Journal of Urban and Regional Research is a declaration that an old emphasis on spatial analysis in urban political research should be renewed. Some questions in article titles merely quote the questions posed by research subjects. "'Who's he?' Event-related brain potentials and unbound pronouns" in the Journal of Memory and Language quotes a subject who was confronted by a statement with a mismatched gender pronoun. More frequent are questions that do not imply an answer but rather suggest a subject of inquiry. What is? Why? How? How much? Under what conditions? Which alternative? Who benefits? What comes next? Such questions describe legitimate research questions, the posing of which is a widely-accepted task of academic writing. With the exception of punctuation choice, they do not differ much in meaning from non-questioning titles that state the subject of research. Such questions do not satisfy Betteridge's Law.

About half (53.7 %) of the 177 titles with questions can be answered with a "yes" or "no." The disciplines that deviate most strongly from this overall share (computer science, literature/literary theory and philosophy) have so few questions in titles overall that their distinctiveness might simply be the product of small numbers. The area of sociology and political science, on the other hand, is more robustly distinctive. This disciplinary area which features the greatest number and share of questions in its journal article titles accounts for nearly one out of every two titles with a yes/no question format. Sociologists and political scientists appear to be fond of asking yes/no questions.

As Table 2 demonstrates, however, Betteridge's Law and Hinchcliffe's Rule do not apply to any discipline, at least not for the journals sampled in 2014. Both the Law and the Rule assert that yes/no questions will be uniformly answered with a "no." Overall, however, only 35.8 % of journal articles with yes/no questions in titles answered those questions with a "no," and only an additional 9.5 % of articles answered the yes/no question of the title with a contingent "depends." The only disciplines in which answers of

Table 2 Frequency of answers to yes/no questions by discipline

All	Natural Sciences		Humanities		Social Sciences	
	Computer Science	Physics and Astronomy	Literature and Literary Theory	Philosophy	Psychology	Sociology and Political Science
Yes						
54.7 %	33.3 %	87.5 %	50.0 %	–	66.7 %	52.2 %
($n = 52$)	($n = 1$)	($n = 7$)	($n = 2$)		($n = 18$)	($n = 24$)
No						
35.8 %	66.7 %	12.5 %	25.0 %	71.4 %	33.3 %	34.8 %
($n = 34$)	($n = 2$)	($n = 1$)	($n = 1$)	($n = 5$)	($n = 9$)	($n = 16$)
Depends						
9.5 %	–	–	25.0 %	28.6 %	–	13.0 %
($n = 9$)			($n = 1$)	($n = 2$)		($n = 6$)

"no" and "depends" are more common than answers of "yes" are computer science and philosophy, each of which has fewer than ten article titles posing yes/no questions, making those patterns quite possibly a matter of chance. In no discipline were answers to these questions uniformly in the negative.

Finally, we might expect that Betteridge's Law and Hinchcliffe's Rule would better apply to articles in lower-ranked journals that are not guaranteed attention, with authors in such journals resorting to marketing to elicit readership. Table 3 reports the frequency of questions, of yes/no questions, and of yes/no questions with "no" or "depends" answers on the basis of SCImago journal ranking according to average article citation count. In this table, each column deals with a progressively slimmer share of all articles. Results provide little support at best. Articles in top-ranked journals were actually more likely to feature questions in titles (4.2 %) than articles in lower-ranked journals (1.8 %), although neither set of journals featured a high share of titles with questions. The titles with questions in articles from higher-ranked journals were no less likely to pose yes/no questions (54.0 %) than question-titles from lower-ranked journals (53.5 %). A moderately higher share of yes/no questions were answered "no" among lower-ranked journals (39.3 %) than among higher-ranked journals (29.4 %), the sole mild indicator of the sort of behavior that Betteridge and Hinchcliffe imagine. However, in both groups of ranked-journals a majority of articles' yes/no question titles were answered in the affirmative (61.7 % for top-ranked

Table 3 Frequency of questions, yes/no questions and answers to yes/no questions by ranking level of journal

	All journal article titles	Titles with questions	Question titles with yes/no questions	Yes/no questions answered "yes"	Yes/no questions answered "no"	Yes/no questions answered "depends"
Ranked 1st–5th	$n = 1499$	4.2 % ($n = 63$)	54.0 % ($n = 34$)	61.7 % ($n = 21$)	29.4 % ($n = 10$)	8.8 % ($n = 3$)
Ranked 50th–54th	$n = 6346$	1.8 % ($n = 114$)	53.5 % ($n = 61$)	50.8 % ($n = 31$)	39.3 % ($n = 24$)	9.8 % ($n = 6$)

journals; 50.8 % for lower-ranked journals). Such a result flatly contradicts both Betteridge and Hinchcliffe.

Conclusion

Betteridge's Law and Hinchcliffe's Rule assert that when an article's title poses a yes/no question, the answer to the question is "no." This article follows Betteridge's Law and Hinchcliffe's Rule with its own title, but in that regard it is unusual. With the notable exception of titles in sociology and political science, titles from 60 journals in the year 2014 rarely ask questions at all. Where questions are asked, a large share of questions do not fall into the yes/no type susceptible to marketing manipulations. In the few articles in which yes/no questions are posed in titles, articles tend to provide an affirmative answer more often than not. This pattern holds across disparate disciplines and for both top-ranked and middling-ranked journals.

We do not analyze the content of all articles for all journals in all academic disciplines in 2014, a limitation imposed by our choice to read articles with yes/no questions and determine answers through a substantive understanding of those articles. It is possible that non-sampled articles in non-sampled disciplines more closely follow Betteridge's Law, a question that a larger effort in replication may settle. Future research may wish to delve further down journal rankings within disciplines, to examine articles in different disciplines, and to assess whether articles answering yes/no questions negatively or contingently are downloaded and cited more than articles answering these questions affirmatively. Future work might also ask whether the posing of a question in a title might provoke downloads or citations even when the answer provided in the text is affirmative; some other form of ambiguity besides the avoidance of a definitive "no" may serve an author's purposes.

Regardless of these possibilities worthy of exploration, the pattern in the 7845 journal articles we studied so starkly contradicts the predictions of Betteridge's Law and Hinchcliffe's Rule that we see little reason to continue to subscribe to them in the absence of evidence to the contrary. For observers concerned that academic writing has been overtaken by this most extreme form of marketing, these results should be reassuring and yet provocative. If all questions (and indeed, all titles) serve some rhetorical purpose, satisfying some imperatives of the academic and scientific enterprises, how might imperatives apart from mere volume of readership shape the titles of journal articles? As these imperatives shift, do titles shift in response, and if so, how? Given the complexity of scientific publication, observable patterns of title use within those publications may be better explained as the mutable outcome of institutional structure than as unvarying obedience to a simple law.

Appendix

See Table 4.

Table 4 Sampled academic journals by discipline

Humanities			Social Sciences			Natural Sciences		
Publication	Rank	Articles	Publication	Rank	Articles	Publication	Rank	Articles
Literature and Literary Theory			*Psychology*			*Computer Science*		
Poetics	1	36	Trends in Cognitive Sciences	1	121	Foundations and Trends in Machine Learning	1	4
Written Communication	2	15	Annual Review of Psychology	2	27	Foundations and Trends in Computer Graphics and Vision	2	3
Men and Masculinities	3	26	Psychological Bulletin	3	63	IEEE Transactions on Pattern Analysis and Machine Intelligence	3	192
College Composition and Communication	4	15	Personality and Social Psychology Review	4	20	Foundations and Trends in Communications and Information Theory	4	2
English in Education	5	18	Annual Review of Clinical Psychology	5	28	Archives of Computational Methods in Engineering	5	14
Huntington Library Quarterly	50	19	Journal of Memory and Language	50	68	Journal of Chemical Theory and Computation	50	552
Exemplaria	51	19	Journal of Occupational and Organizational Psychology	51	39	SIAM Journal on Computing	51	71
Archipel	52	17	Neuropsychologia	52	355	IEEE Transactions on Robotics	52	132
Journal of English and Germanic Philology	53	16	Journal of Experimental Psychology: Human Perception and Performance	53	185	SIAM Journal on Optimization	53	82
Word and Image	54	35	Psychotherapy and Psychosomatics	54	41	Information Sciences	54	101
Philosophy			*Sociology and Political Science*			*Physics and Astronomy*		
Natural Language Semantics	1	10	American Political Science Review	1	48	Reviews of Modern Physics	1	37
Ethics	2	19	Administrative Science Quarterly	2	23	Advances in Physics	2	4
The Philosophical Review	3	10	American Journal of Political Science	4[a]	63	Nature Materials	3	286
Business Ethics Quarterly	4	35	Political Analysis	5	28	Annual Review of Astronomy and Astrophysics	4	14

Table 4 continued

Humanities			Social Sciences			Natural Sciences		
Publication	Rank	Articles	Publication	Rank	Articles	Publication	Rank	Articles
Nous	5	38	Annual Review of Sociology	6	31	Nature Nanotechnology	5	269
Foucault Studies	50	22	International Journal of Urban and Regional Research	50	126	Journal of the Mechanics and Physics of Solids	50	195
Politics, Philosophy and Economics	51	21	Journal of European Public Policy	51	86	Astronomical Journal	51	300
Economics and Philosophy	52	19	European Journal of International Relations	52	45	Scripta Materialia	52	337
Dialectica	53	26	Law and Society Review	53	31	New Astronomy Reviews	53	5
Logic Journal of the IGPL	54	53	Work and Occupations	54	16	Optics Express	54	3332

[a] The third-ranked Handbook of Social Economics did not publish articles in 2013. The sixth-ranked Annual Review of Sociology was therefore included so five top journals would be observed for the social sciences

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