The Rise, Demise, and Reprise of the Increasingly Protracted APA Journal Article?

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Abstract

Are APA journal articles getting longer or shorter over time? Earlier work that examined changes over time in article length in 24 APA journals (1986–2005) found that pages per article increased over time for the average journal, peaking around 2001, and then plateauing thereafter (Webster, 2007). But have these trends continued during the past 14 years? The current research extends prior work by adding additional years (1986–2019) and four additional journals (28 journals; 34 years; 865 total observations). Multilevel growth curve analyses revealed a cubic effect of time on average article length, showing an increase in the 1980s and 1990s, a plateau or slight decline in the 2000s, and a slight increase again in the 2010s. Journal impact factors (JIFs) moderated linear growth over time; journals with higher JIFs had larger linear increases in article length. Exploratory multilevel interrupted time-series analyses suggested that the average linear change in pages per article over time was more positive following the start of psychology's credibility crisis (2012–2019) than before it (1986–2011), which may relate to an increased emphasis on reporting details and transparency. We discuss implications for article length in the contexts of publishing and psychology's ongoing credibility crisis.

Keywords: Publication trends; article length; multilevel models; growth curve modeling; APA journals; impact factor; credibility crisis

**The Rise, Demise, and Reprise of the
Increasingly Protracted APA Journal Article?**

I much prefer short empirical reports to the bloated carcasses that are common in most other journals.

—Reid Hastie, 2003, then-incoming associate editor at *Psychological Science*¹

Research psychologists often face a dilemma when writing an empirical paper: Should they write a single-study brief report or a protracted multi-study manuscript? This choice poses a dilemma because brief reports are often more appealing to readers as an investment of their time, but brief reports often lack the detail, nuance, and replication present in longer, multi-study manuscripts. In contrast, multi-study manuscripts can cost readers valuable time, but often paint a broader picture, both theoretically and empirically, of the focal phenomenon. To be sure, quantity need not reflect quality in published articles (e.g., see Bem’s [2011] nine-study article purporting experimental evidence of precognition). Brief reports *can* be both boring and rigorous, and multi-study manuscripts *can* be both engaging and opaque. Nevertheless, the choice to write a shorter or longer paper is an important one often influenced by (a) the amount of data or number of studies that the authors have compiled, (b) whether the target journal allows brief reports, (c) editor’s and reviewers’ opinions about a manuscript length, and even (d) publishers’ constraints on physical page allotments. Thus, this dilemma is a dynamic one that is likely influenced by multiple perspectives.

In the present work, we aim to (a) provide some history on the paper-length dilemma in research psychology, (b) discuss the perspectives of multiple stakeholders

¹ As quoted in Jaffe (2003).

(i.e., authors, editors, reviewers), and (c) empirically describe changes in article length in 28 APA journals during the past 34 years (1986–2019), with a keen eye on increasing reporting transparency in the wake of psychology’s credibility crisis.²

A Brief Report on a Long History

Empirical studies of publication trends have a long history in psychology, with one of the first examining change over time in subject categories (e.g., developmental, clinical, educational) using entries in *Psychological Index* and *Psychological Abstracts* from 1894 to 1954 (Louttit, 1957). Another early study showed that the mean article length across the APA’s eight journals in 1953 was 6.3 pages, ranging from 3.7 (*Journal of Applied Psychology*) to 24.6 (*Psychological Monographs*; Girden & Dennis, 1954).

More recent studies focusing exclusively on *Journal of Applied Psychology* have shown increases in mean pages per article (a) from 6.10 (1917–1926) to 12.89 (2007–2016), an increase of 111% (Kozlowski et al., 2017); and (b) from 9.58 (1994) to 15.23 (2013), an increase of 59% (Schmitt, 2017). Further analyses revealed that the relative lengths of Introduction, Method, Results, and Discussion sections were proportionately stable over time (1994–2013); however, reference lists and appendices grew substantially, from 1.39 pages per article (1994) to 4.49 (2013), an increase of 223% (Schmitt, 2017). The joint contribution of expanded references and appendices to increased article length appears to partly reflect APA policy: “The practice of reporting more and larger appendices is consistent with APA’s encouragement of better reporting and greater transparency in publishing these types of articles” (Schmitt, 2017, p. 567).

² We prefer the term credibility crisis to either replication or reproducibility crisis because we believe it reflects a broader concept that encompasses the other two terms.

Supporting the key role that reference lists likely play in increasing article length, one study showed an explosion in both the number of references and in-text citations in two APA journals: *Journal of Experimental Psychology: General (JEP:G)* and *Journal of Social and Personality Psychology (JPSP)* over time (Adair & Vohar, 2003). Specifically, the mean numbers of in-text citations for *JEP:G* and *JPSP* respectively increased from 23 and 29 (1972–1974) to 111 and 116 (2000), reflecting increases of 383% and 300%. Similarly, the mean numbers of references per article for *JEP:G* and *JPSP* respectively increased from 12.4 and 18.0 (1972–1974) to 53.0 and 66.6 (2000), reflecting increases of 327% and 270% (Adair & Vohar, 2003). Going back to 1960, the mean numbers of references per article for *JEP:G* and *JPSP*'s predecessor—*Journal of Abnormal and Social Psychology*—were 9.4 and 11.4, respectively, corresponding to 40-year increases of 464% and 484% (Xhignesse & Osgood, 1967). Thus, ever-expanding reference lists are a strong contributing factor to increasing article length over time.

A study of articles published in *JPSP* in 1968, 1978, and 1988 showed a striking expansion in article length over time—4.35, 7.37, and 10.30 pages per article—a linear increase of 137% in only 20 years (Reis & Stiller, 1992).³ Several other article features also saw significant increases over time, including numbers of authors, studies, tables, references, and participants per study; these increases remained significant even after controlling for numbers of studies per article (Reis & Stiller, 1992). Consequently, these parallel trends are likely also contributing to increased article length over time. For example, each additional study means an additional set of Method and Results sections, each new table occupies a valuable plot of journal-page real estate, and each new author

³ Pages per *JPSP* article grew further, averaging 14.07 in 1996 (Sherman et al., 1999).

may bring unique theoretical and methodological perspectives that must be integrated. The authors speculated that increasingly complex methods and data-analytic procedures likely contributed to the growth in article length and other metrics over time.

This study (Reis & Stiller, 1992) drew enough attention to garner its own special section of six commentaries. In these commentaries, other authors noted that the increase in article length, including studies per article, may relate to multiple factors beyond increasing complexity, including within-laboratory replications and exploration of mediating processes (West et al., 1992). Another contributing factor is the “publication game” of the reviewing process, where editors and reviewers (a) focus on avoiding mistakes instead of supporting novel advancements (Higgins, 1992) and (b) ask authors for additional replication studies and to cite an ever-increasing litany of prior literature (Funder, 1992; Schneider, 1992). Ways to address some of the reviewing-process issues that contribute to longer articles include (a) asking editors to make final decisions after a single round of reviews and (b) limiting the number of reviewers to two (Zanna, 1992). Other factors contributing to increasing article length may include research simply getting better over time (e.g., more interdisciplinary, new methods, new areas of research), or research increasingly based on aging paradigms, where authors are scrapping the bottom of their paradigmatic barrels for additional mediators, moderators, and boundary conditions (Funder, 1992). Still another factor may be the stigma attached to single-study or solo-experiment manuscripts that now pervades many high-impact journals (Wegner, 1992).

A more recent study also focusing on publication trends in *JPSP* showed that the mean article length increased from 6.4 pages (1965) to 15 pages (1998 and 2000), an increase of 134%, though the authors stress that the reformatting of journal pages in

1986, which allowed for more words per page, likely underestimate the true increase (Quiñones et al., 2004). Further, numbers of coauthors per article also grew rapidly: “From 1965 to 1980 there were only 32 articles written by five authors, whereas from 1981 to 2000, 131 articles had the collaboration of five researchers” (Quiñones et al., 2004, p. 441). This increase in collaborations likely contributed to longer articles since each additional author may bring unique perspectives that they wish to add to the paper.

Documented increases in article length are not limited solely to APA journals. For example, average article length in the *Journal of Clinical Child Psychology (JCCP)* grew from 2.36 pages (1972–1974) to 6.14 pages (1987–1989), a 160% increase (Routh et al., 1991). And although *JCCP* lifted a page limit on submissions in 1987, articles length was increasing even before then, averaging 5.70 pages in 1984–1986 (a 142% increase since 1972–1974; Routh et al., 1991). Even less-empirically-oriented journals such as *Journal of Humanistic Psychology* have experienced growth in article length, from averaging 11.10 pages (1961–1970) to 19.81 pages (2001–2010), a 78% increase (Thelen, 2011). Thus, increasingly protracted articles appear to be a pervasive phenomenon throughout many psychology journals, not just those published by the APA.

Emulating the Science and Nature Model: The Rise of Brief Reports

Two of the oldest and most influential empirical research journals are *Science* and *Nature*. Both journals primarily publish brief reports of varying lengths with strict word or page limits. When the Association for Psychological Science (APS) was founded in 1988 as the American Psychological Society—in part as a reaction to what it saw as the overly-clinical orientation of the APA—its leadership created a new journal in 1990, *Psychological Science*, that strove to copy the *Science* and *Nature* publishing model. Specifically, from its inception, *Psychological Science* focused on various types of brief

reports (Estes, 1990), which contrasted sharply with many APA journals at the time. In time, *Psychological Science* largely created and then cornered the niche brief-report market in psychology (Cutting, 2007). As *Psychological Science*'s prestige, influence, and impact factor grew, many established psychology journals began actively soliciting brief reports (including several APA journals), and a few new area-specific journals were established that published only brief reports (e.g., *Social Psychological and Personality Science*). Thus, for a time, psychology appeared to stem the ever-increasing flood of longer journal articles using the temporary diversion channel of brief reports.

This pattern of changes over time in article length was supported by a 20-year sample of 24 APA primary journals (1986–2005), which found that a significant positive linear increase in pages per article over time was qualified by a significant negative quadratic effect (Webster, 2007). Specifically, for the average APA journal, predicted pages per article were 8.03 (1986), 12.15 (1996), and 12.23 (2005), meaning that article length increased 52% during the first decade surveyed, but only 1% during the second—a clear deceleration of growth over time for the average journal. Although speculative, increases in brief report formats across journals around the turn of the century likely contributed to the deceleration in article length over time. Using journal impact factor data, this study also showed that higher-impact journals had significantly more positive linear growth trajectories over time than lower-impact journals, on average.

The Credibility Crisis and Increased Reporting Transparency

Autumn 2011 proved to be a pivotal season for psychology. First, a report in *Science* revealed that eminent social psychologist Diederik Stapel had been dismissed by his university over allegations of faked data (Enserink, 2011). Shortly thereafter, a widely circulated investigative report (Levelt Committee, 2011) detailed that Stapel had

manipulated or outright fabricated multiple data sets, ultimately culminating in 58 retracted journal articles, including 14 in *JPSP* and one in *Science*. Second, *Psychological Science* published the now-classic article “False-Positive Psychology” (Simmons, Nelson, & Simonsohn, 2011), which highlighted ways in which data analysts can use flexibility or “researcher degrees of freedom” to make their findings reflect whatever outcome they desire. For example, a creative tongue-in-cheek experiment showed that, with the aid of an unreported covariate, participants impossibly became significantly older after listening to The Beatles song “When I’m Sixty-Four” versus a children’s song. This influential work has been cited over 5,000 times (Google Scholar, October 2020).

These two watershed events in autumn 2011 arguably kick-started the credibility crisis in psychology, where many research psychologists became increasingly concerned over the transparency of their data and the veracity of their findings. Subsequent research found that, of nearly 100 social and cognitive psychology studies selected from articles published in leading journals in 2008 (including *JPSP* and *JEP: Learning, Memory, and Cognition [JEP:LMC]*), fewer than 40% successfully replicated (Open Science Collaboration, 2015), leading some to label the credibility crisis a replication or reproducibility crisis. In contrast, subsequent research suggested that these sobering replication results were not as dire as first believed, showing that nearly 80% of the observed replication effect sizes fell within the 95% confidence intervals of the effect sizes from their respective original studies (Patil et al., 2016).

Reaction to these events and revelations likely influenced updates and revisions to editorial policy and reporting transparency in scientific publishing, often mandated by editorial prescription or by decree from the APS (Publications Committee, 2018) or

APA (Appelbaum et al. 2018; Levitt et al., 2018). Some of these reforms include: (a) listing all variables collected, (b) reporting all conditions in an experiment, (c) describing novel manipulations or materials in enough detail to allow replication, (d) reporting any excluded cases or observations (and reasons why), (e) reporting results with and without covariates, (f) reporting descriptive statistics and correlations among all variables, and (g) posting data and data-analytic code in an online repository (e.g., Open Science Framework [OSF]). These additional but necessary requirements mean that authors must now report more information—to readers, reviewers, and editors—and this contributes to longer articles. Specifically, the credibility crisis and its consequent reforms have likely contributed to both a flourishing of more-detailed Method and Results sections and an increase in protracted journal articles overall.

In addition, editors are increasingly asking authors to include detailed descriptions of their methods, copies of their surveys, stimuli, or other materials in an appendix, online supplement, or online repository. If the preferred choice is providing more detailed Method and Results sections—or an appendix published at the end of the paper—then these factors clearly contribute to increased article length. Thus, in contrast to earlier results suggesting that the reign of the increasingly protracted journal article may have ended (Webster, 2007), the more-recent credibility crisis has likely spurred renewed growth in article length over time.

The Present Study

The purpose of the present study was to examine more recent trends in APA journal article length to see if it has continued to plateau over time (Webster, 2007) or if it has continued to grow, perhaps as a consequence of increased reporting transparency. To this end, we sought to replicate and extend prior research (Webster, 2007) with 14

additional years of data (1986–2019) and four additional APA journals ($N = 28$) to see whether earlier trends have continued or changed. Specifically, because of psychology’s recent emphasis on reporting transparency along with its ever-expanding citation base (Adair & Vohra, 2003), we expected that change-over-time in article length for the average APA journal would reverse again, resuming its upward trajectory (i.e., a cubic trend over time; Hypothesis 1 [H_1]). Like prior research (Webster, 2007), we expected that journal impact factors would moderate linear change-over-time slopes in article length, with high-impact journal showing more positive increases (H_2).

We also made multiple exploratory—and admittedly post-hoc—predictions after viewing the overall trend. First, we examined whether a journal’s choice to limit article length or solicit and publish brief reports of any sort moderated any of the temporal trends in article length (Exploratory Hypothesis 1 [E_1]). Second, we conducted interrupted time-series regressions (Shadish et al., 2002) in a multilevel context (Webster et al., 2012) to see whether the dawn of the credibility crisis in 2011–2012 corresponded with a significant shift in either the average intercept or change-over-time slope in article length (E_2). Third, we examined the extent to which journal impact factor moderated any of the possible interrupted time series effects (E_3).

Method

Sample and Procedure

Following prior research (Webster, 2007), we obtained data from *American Psychologist*’s annual “Summary Reports of Journal Operations.”⁴ Data from 1986 to

⁴ We chose these reports because they offered an efficient and convenient way to collect decades of data on article length versus pouring over pages of individual journals. Our choice of APA journals (vs. APS or other journals) was one of efficiency, not preference.

2019 were recorded because, beginning in 1986, most APA primary journals standardized their page sizes and layouts (e.g., two-column text for articles) that are still in use today, except for *History of Psychology* and *Psychology, Public Policy, and Law*, which were only recently reformatted. Consequently, both journals were excluded from analyses, and the final sample included pages-per-article data from 28 journals, generating 865 data points across 34 years. Compared to prior research (Webster, 2007) we added four journals to the sample—three newer journals that now have sufficient data for analysis (i.e., *Emotion*, *Psychology of Addictive Behaviors*, and *Rehabilitation Psychology*) and one that now more closely mirrors other APA primary journals (*American Psychologist*; Kazak, 2016). Some journals began publishing after 1986 or became APA primary journals after 1986; these journals have fewer sampled years than others (see Table 1). There is also some sporadic missing data reflected in the original “Summary Reports of Journal Operations.” The median year sampled was 2004.0 ($M = 2003.7$, $SD = 9.4$), and the median number of years sampled per journal was 34 ($M = 30.9$, $SD = 4.6$; range: 19–34). All data are available here: <https://osf.io/s9jrp>

Using the “Summary Reports of Journal Operations,” we recorded annual data on the number of items published and the total number of pages published. Dividing journal pages by the number of items published yielded the pages-per-article (PPA) metric used for analyses as an estimate of average article length. Because PPA were positively skewed ($Mdn = 10.92$, $M = 11.87$, $SD = 4.21$, skewness = 1.17, kurtosis = 1.84), we normalized them using a natural-log transformation prior to analysis ($Mdn = 2.39$, $M = 2.42$, $SD = 0.34$, skewness = 0.13, kurtosis = 0.04).⁵ Though the coefficients

⁵ Following Webster (2007), we originally planned to use a square-root transformation, but preliminary analyses showed that it violated level-1 homogeneity of variance, $\chi^2(27)$

reported in the results are based on log PPA data, the predicted scores (Figures 1, S1, and 2) appear in the original PPA metric (by back-transforming predicted scores).

Also following Webster (2007), we examined journal impact factors (JIFs) as a moderator of change over time in pages per article. In contrast to Webster (2007), which averaged across multiple two-year JIFs, the present research used the most recent (i.e., 2019) and more stable five-year JIFs obtained from 28 APA journal websites (see Table 1). Because the raw JIFs were extremely positively skewed ($Mdn = 4.22$, $M = 5.25$, $SD = 4.44$, skewness = 3.29, kurtosis = 13.60), we normalized them using a natural-log transformation prior to analysis ($Mdn = 1.44$, $M = 1.45$, $SD = 0.60$; skewness = 0.87, kurtosis = 1.01).

Using the websites for the 28 sampled journals, we also collected data on whether journals (a) had word or page limits for regular articles or (b) solicited some form of brief report or short communication (other than comments) that differed from their standard-length research papers. As of October 2020, 18 of 28 journals (64%) had word or page limits for regular articles, and 19 of 28 journals (68%) offered some form of brief report format (see Table 1).

Data Analyses

Echoing prior research (Webster, 2007), we used multilevel models to examine these data, with years hierarchically nested within each journal. Specifically, we tested a series of linear, quadratic, and cubic polynomial regressions (e.g., Jonason et al., 2015) in a multilevel framework at level 1 (see Raudenbush & Bryk, 2002, pp. 169–176). Also

= 44.6, $p = .018$, which the natural-log transformation did not, $\chi^2(27) = 18.4$, $p = .892$. For transparency, we present results for raw PPA in our online supplemental materials.

Table 1. *Change-over-Time Statistics and Five-Year Impact Factors for 28 APA Primary Journals*

Journal	No. years	Impact factor		Lim	BR	Change-over-time coefficients			Percent change last x years			
		Raw	Log			Linear	Quadratic	Cubic	33	20	10	5
<i>American Psychologist</i>	33	8.58	2.15	1	0	-0.0174	0.00016	0.000125*	48	8	15	13
<i>Behavioral Neuroscience</i>	34	2.54	0.93	0	1	-0.0140	-0.00036	0.000088*	34	7	18	16
<i>Developmental Psychology</i>	34	4.37	1.47	1	1	0.0038	-0.00092	0.000043 [†]	86	27	27	19
<i>Educational Psychology</i>	34	6.13	1.81	1	0	0.0124	-0.00075	0.000069*	178	60	41	26
<i>Emotion</i>	19	4.07	1.40	1	1	-0.0997*	0.00690	-0.000058			-14	-2
<i>Experimental and Clinical Psychopharmacology</i>	27	2.65	0.97	1	1	-0.0103	0.00191*	-0.000057		-7	10	12
<i>Health Psychology</i>	27	4.42	1.49	1	1	-0.0101	-0.00027	0.000102 [†]		12	19	16
<i>JEP: Animal Learning and Cognition</i>	34	1.94	0.66	0	1	-0.0169	-0.00019	0.000099*	29	6	19	16
<i>JEP: Applied</i>	25	2.97	1.09	0	0	-0.0322*	0.00280*	-0.000019		-27	-2	5
<i>JEP: General</i>	34	5.24	1.66	0	1	-0.0049	-0.00149*	0.000061*	57	14	20	16
<i>JEP: Human Perception and Performance</i>	34	2.67	0.98	0	0	-0.0183	-0.00094	0.000100*	25	3	16	14
<i>JEP: Learning, Memory, and Cognition</i>	34	3.11	1.14	0	0	-0.0186	-0.00059	0.000129*	45	11	20	16
<i>Journal of Abnormal Psychology</i>	34	6.46	1.86	1	1	0.0087	-0.00051	0.000041 [†]	114	36	30	20
<i>Journal of Applied Psychology</i>	34	8.07	2.09	0	1	0.0102	-0.00022	0.000071*	162	52	37	23
<i>Journal of Comparative Psychology</i>	34	1.85	0.62	0	1	-0.0036	-0.00022	0.000059*	58	20	27	20
<i>Journal of Consulting and Clinical Psychology</i>	34	5.88	1.77	1	1	0.0092	-0.00061	0.000056*	137	45	35	23
<i>Journal of Counseling Psychology</i>	34	4.66	1.54	1	1	0.0104	-0.00084	0.000037	121	41	34	22
<i>Journal of Family Psychology</i>	28	2.73	1.00	1	1	-0.0354*	-0.00237*	0.000254*		-9	9	11
<i>Journal of Personality and Social Psychology</i>	34	7.78	2.05	0	0	0.0125	-0.00015	0.000028	121	38	30	20
<i>Neuropsychology</i>	27	3.06	1.12	0	1	-0.0065	-0.00054	0.000089 [†]		19	24	19
<i>Professional Psychology: Research and Practice</i>	34	2.08	0.73	1	1	0.0194	0.00004	-0.000023	109	42	37	25
<i>Psychological Assessment</i>	31	4.37	1.47	1	1	0.0066	-0.00085	0.000084*		53	39	25
<i>Psychological Bulletin</i>	34	24.61	3.20	0	0	0.0054	-0.00011	0.000091*	148	40	27	18
<i>Psychological Methods</i>	24	9.68	2.27	1	0	0.0014	-0.00164	0.000118		25	23	17
<i>Psychological Review</i>	34	8.70	2.16	1	0	0.0008	-0.00028	0.000051*	73	18	20	15
<i>Psychology and Aging</i>	34	3.24	1.18	1	1	-0.0088	-0.00086	0.000114*	84	28	29	21
<i>Psychology of Addictive Behaviors</i>	23	3.20	1.16	1	1	-0.0164	0.00462*	-0.000163*		-10	8	10
<i>Rehabilitation Psychology</i>	23	2.02	0.70	0	1	-0.0539*	-0.00183	0.000280*		-43	-13	-1
Average Journal	30.9	5.25	1.45	.64	.68	-0.0075*	-0.00025[†]	0.000074*	53	13	20	16

Note. JEP = Journal of Experimental Psychology. Change-over-time coefficients from simple effects tests for each journal. Lim = page or word limit, BR = brief report (1 = yes, 0 = no). [†] $p \leq .10$. * $p \leq .05$.

following earlier research (Webster, 2017), we examined JIF as a moderator of change over time in pages per article at level 2. See online supplemental materials (OSM) for model details and equations: <https://osf.io/s9jrp>

Results

Polynomial Change over Time

We first tested a purely linear model (without the quadratic or cubic effects), which showed that log PPA increased significantly over time for the average journal ($\beta_{10} = 0.0061, t(27) = 2.80, p = .010$). This linear trend explained 49% of the residual variance compared to the null model ($R^2_{\text{pseudo}} = .49$; see Kreft & de Leeuw, 1998, p. 119). Recall that Webster’s (2007) study of mean article length found significant linear and quadratic effects of time on PPA, suggesting an overall pattern of growth from 1986 to 2005 that slowed and plateaued over time. Re-running this model with 14 additional years of data and four more journals yielded a non-significant local linear effect at 2002.5 ($\beta_{10} = 0.0019, t(27) = 0.51, p = .614$) and a non-significant quadratic effect ($\beta_{20} = 0.000086, t(27) = 0.41, p = .688$).⁶ Thus, the ensuing 14 years have changed the overall quadratic change-over-time pattern in PPA that once existed between 1986 and 2005.

To see if the overall trend had swung positive again during the last 14 years, which would likely result in a cubic trend over the 34 years surveyed, we added a cubic term to the multilevel model. In this cubic model (OSM Equation 1), the local (2002.5) linear trend was significantly negative, the local quadratic trend was marginally negative ($p = .083$), and the overall cubic trend was significantly positive (see Table 2, Model 1;

⁶ Recall that in the context of a quadratic effect, the linear effect is the local or simple effect of x on y when $x = 0$. Thus, when x is mean-centered, the linear effect is the simple effect of x on y at the mean value of x (i.e., the line tangent to the curve where $x = 0$).

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H₁).⁷ This cubic trend explained 18% of the residual level-1 variance compared to the quadratic model ($R^2_{\text{pseudo}} = .18$). Crucially, this positive cubic effect suggests that average APA article length may again be increasing.

Table 2. *Log Pages per Article as Functions of Time and Journal-Level Differences*

Model or predictor	Coefficient	<i>t</i>	<i>df</i>	<i>p</i> ≤
Model 1: Cubic polynomial				
Intercept	2.45	43.52	27	.001
Linear time	-0.0075	-2.20	27	.037
Quadratic time	-0.00024	-1.80	27	.083
Cubic time	0.000074	8.97	861	.001
Model 2: Journal impact				
Intercept	2.45	46.06	26	.001
× Journal impact factor (log)	0.20	2.10	26	.045
Linear time	-0.0074	-2.43	26	.023
× Journal impact factor (log)	0.013	2.67	26	.013
Quadratic time	-0.00025	-1.83	26	.078
× Journal impact factor (log)	-0.00020	-1.21	26	.239
Cubic time	0.000075	8.46	857	.001
× Journal impact factor (log)	-0.000004	-0.30	857	.763

Note. Ns: 865 years, 28 journals; *dfs* are years for cubic effects because they were fixed (vs. random). Linear time centered at 2002.5.

⁷ This pattern of temporal trends remained even after excluding *Psychological Bulletin*, which as a review journal, has historically had the longest articles (see OSM Table S2).

Table 1 shows descriptive statistics and simple effects tests (change-over-time coefficients) for all 28 journals in the sample as well as the average journal.⁸ Table 1 also displays the simple percent change in PPA over the last 33, 20, 10, and 5 years. For example, the predicted PPA for the average APA primary journal was 8.74 in 1986 and 13.41 in 2019, an increase of 53% over 33 years. Predicted PPAs for the average APA journal increased 13%, 20%, and 16% during the past 20, 10, and 5 years, respectively.

Moderation by Journal Impact Factor

Next, following Webster (2007), we added the grand-mean-centered log five-year JIFs to our multilevel model as a journal-level moderator (OSM Equation 2). The JIFs significantly moderated both the intercept and the linear effect time, but neither the quadratic nor cubic effects of time (see Table 2, Model 2; H₂). Thus, around 2002.5, more impactful journals had higher log PPA overall and experienced more positive linear growth in PPA over time.⁹ To unpack the moderating role of journal impact, we tested simple effects at ± 1 SD from the mean log JIF (Figure 1; see also OSM Figure S1 for predicted curves for each journal weighted by JIFs). Lower-impact journals (-1 SD) saw a significant linear decrease over time in log PPA around 2002.5 ($\beta_{10} = -0.015$, $t(26) = -3.04$, $p = .006$). In contrast, higher-impact journals ($+1$ SD) bucked this trend, showing virtually no linear change over time in log PPA around 2002.5 ($\beta_{10} = 0.00049$, $t(26) = 0.15$, $p = .883$).

⁸ We conducted simple effects using dummy codes associated with each journal (e.g., *American Psychologist* = 0, other journals = 1; Cohen et al., 2003; Webster et al., 2007).
⁹ To be thorough, we also examined if log JIF moderated change over time in a model including only the linear effect; it did ($\beta_{11} = 0.011$, $t(26) = 3.62$, $p = .001$; $R^2_{\text{pseudo}} = .31$).

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Figure 1. Predicted mean pages per article (PPA) as functions of time and APA journal impact factor (JIF): Simple effects of time on PPA at the mean JIF and ± 1 SD from the mean JIF, with darker curves reflecting higher impact.

Moderation by Length Limits and Brief Reports

On an exploratory basis, we also examined the possible moderating roles of between-journal differences in article length limits and brief reports. We expected that journals that have either length limits or solicit and publish brief reports should show less of an increase in PPA over time (linear, quadratic, or cubic). Whether or not

journals had article length limits significantly moderated only the overall intercept ($\beta_{01} = -0.23, t(26) = -2.44, p = .022$); unsurprisingly, those with length limits had shorter articles on average. Similarly, whether or not journals had brief reports significantly moderated only the overall intercept ($\beta_{01} = -0.33, t(26) = -2.75, p = .011$), such that those publishing brief reports had shorter articles on average. Neither length limits nor brief reports significant moderated any of the temporal trends ($ps \geq .224$; no support for E_1).

Interrupted Time Series: Credibility Crisis and Reporting Transparency

After viewing these trends, we noticed that the recent increase in article length appeared to correspond to the ongoing creditability crisis in psychology and other sciences. To this end, on a purely post-hoc basis, we tested interrupted time-series (ITS) regressions (Shadish et al., 2002) in the context of a multilevel model (Webster et al., 2012). Although there is no official start date to the credibility crisis, we used 2011–2012 as our pivotal interruption time point because of the two key events that occurred in late 2011 (see Introduction). We thus set an admittedly arbitrary ITS cut point between 2011 and 2012. We coded years 1986–2011 as -0.5 and years 2012–2019 as 0.5. Following ITS methods (Shadish et al., 2002), we also centered the time (publication year) variable at 2011.5. We then cross-multiplied these two variables to create an interaction term to test whether the average journal change-over-time slopes differed between 1986–2011 and 2012–2019 (i.e., before vs. during the ongoing credibility crisis). Because we tested these ITS effects in a multilevel context, we essentially ran an ITS model for each journal and then examined the average of these effects across journals (see Webster et al., 2012).

We began by regressing log PPA onto the binary credibility crisis variable (i.e., 1986–2011 vs. 2012–2019). For the average journal, articles were longer during the ongoing credibility crisis (12.10 pages) than before it (10.89 pages; $\beta_{10} = 0.11, t(27) =$

3.41, $p = .002$, $R^2_{\text{pseudo}} = .22$), an 11% increase. We then added the linear change-over-time variable and its interaction with the credibility crisis to the model to see whether the change-over-time slopes differed between 1986–2011 and 2012–2019. The focal interaction term was significant (Table 3, Model 3; $R^2_{\text{pseudo}} = .08$; E_2). Specifically, the simple change-over-time slope in log PPA during the credibility crisis ($\beta_{20} = 0.023$, $t(27) = 10.02$, $p < .001$) was more positive than it was before the pivotal events of autumn 2011 ($\beta_{20} = 0.0032$, $t(27) = 0.88$, $p = .388$). Thus, a substantial increase in PPA coincided with the credibility crisis and its journal reporting transparency reforms.

On an exploratory basis, we also examined whether log JIFs moderated the ITS results. Journal impact significantly moderated only the linear effect of time on log PPA at the focal transition point (i.e., 2011.5; Table 3, Model 4; E_3). Figure 2 shows predicted PPA as functions of time (publication year), the ITS interaction effect, and journal impact.

Table 3. *Log Pages per Article as Functions of Crisis, Time, and Journal Impact*

Model or predictor	Coefficient	<i>t</i>	<i>df</i>	<i>p</i> ≤
Model 3: Interrupted time series				
Intercept	2.43	40.37	27	.001
Crisis	-0.058	-2.10	27	.045
Linear time	0.013	6.36	27	.001
Crisis × linear time	0.020	4.37	27	.001
Model 4: ITS × journal impact				
Intercept	2.43	49.22	26	.001
× Journal impact factor (log)	0.31	3.47	26	.002
Crisis	-0.058	-2.10	26	.045
× Journal impact factor (log)	-0.0021	-0.07	26	.946
Linear time	0.013	7.42	26	.001
× Journal impact factor (log)	0.0094	3.55	26	.002
Crisis × linear time	0.020	4.46	26	.001
× Journal impact factor (log)	-0.0084	-1.27	26	.215

Note. *Ns*: 865 years, 28 journals. Crisis coded -0.5 = 1986–2011, 0.5 = 2012–2019. Linear time centered at 2011.5.

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Figure 2. Interrupted time series results: Predicted mean pages per article (PPA) as functions of time, the onset of the credibility crises (i.e., 1986–2011 vs. 2012–2019), their interaction, and the moderating effect of APA journal impact factor (JIF): Simple effects of time on PPA at the mean JIF and ± 1 SD from the mean JIF, with darker lines reflecting higher impact.

Discussion

Overall, our findings suggest that the diminishing growth over time in APA journal article length observed in prior research (Webster, 2007) has indeed reversed—articles are once again getting longer. Our ITS findings suggest that one contributing

factor to increased article length may be the more detailed and transparent reporting standards that journals have imposed in the wake of psychology’s credibility crisis. In addition, journal impact moderated aspects of these temporal effects, whereby more highly-cited journals also saw greater increases in article length over linear time.

Limitations

Although compelling, the present work has multiple shortcomings. First, because we limited our sample to APA primary journals, our findings may not generalize to other psychology journals published by other publishers, including APS. Second, pages per article is a rather crude but convenient measure of article length, especially given the available data from the APA’s “Summary Reports of Journal Operations,” which make no distinctions among types of published items (e.g., reviews, empirical articles, brief reports, comments). Third, JIFs are an imperfect reflection of a journal’s influence or relative prestige because (a) positive outliers can unduly influence averages and (b) they often depend on a journal’s breadth or interdisciplinary focus. Fourth, our examinations of the effects of length limits, brief reports, and the credibility crisis were post-hoc and exploratory; we elected to test these effects only after viewing the overall cubic trend. Another decade or so of data will likely be necessary before we can draw any concrete conclusions about the possible lasting impacts of the credibility crisis on article length.

Fifth, although ITS analyses can show temporal precedence, they cannot show definitive casual processes (Shadish et al., 2002). For example, the credibility crisis in general—and the two abovementioned events of autumn 2011 in particular—likely have delayed and diffused effects over time. Clearly, neither did researchers suddenly change their reporting transparency standards, nor did editors immediately demand more detailed information in submitted manuscripts, beginning promptly on January 1, 2012.

These reforms take time and diffuse through different psychology areas, journals, and editorial teams at different rates over time. Another threat to ITS designs is history—other temporal processes that may be concomitant or confounded with the event of interest. For example, a more parsimonious explanation for the cubic trend over time may be that some psychology journals truly did try to emulate the *Science-and-Nature*, briefer-is-better approach around the turn of the century, but have since simply regressed to their more-familiar mean of ever-expanding article length.

Perspectives: Authors, Editors, Reviewers, and Publishers

We opened this paper with a dilemma that every author faces—write a full-length article or a brief report. On one hand, authors can increase their publication counts and presumably further their careers by focusing on the “least publishable unit” (LPU)—submitting the smallest bit of scholarly information that can surpass a given journal’s acceptability threshold (Sindermann, 2001). Such an approach favors brief reports. But brief reports often lack the details that editors, reviewers, and readers seek, especially if they wish to replicate or thoroughly critique the research in question. But then again, with the advent of online supplementary materials, this criticism of brief reports may now be moot. Indeed, all 28 of the APA journals we surveyed allow authors to submit supplementary materials that will appear online, pending a manuscript’s acceptance.¹⁰

On the other hand, longer articles, which often feature multi-study approaches, offer authors a chance to showcase direct or conceptual replications, to explore

¹⁰ Because of this uniformity, we could not examine variation in supplementary materials across journals, and the APA’s “Summary Reports of Journal Operations” does not contain data on the number or proportion of articles that contain such supplements. Nevertheless, examining variation in supplemental materials within and across journals, and how they contribute to article length, remains a fruitful avenue for future research.

mediators or moderators, or a combination of theses. Importantly, longer articles give authors enough space to provide expansive details in the body of the paper rather than relegating this often-essential information to an online appendix or other supplement. But from the gatekeeper’s perspective, longer, multi-study papers often give editors and reviewers more valuable information to consider before making an evaluative appraisal, even though they take longer to read. Specifically, journal gatekeepers can benefit from longer papers’ thoroughness, internal replications, and expanded theoretical discussion.

For better or worse, publishers and some editors obsess over their JIFs. One way to increase a journal’s citation metrics is to publish a lot of novel, surprising, and newsworthy findings as brief reports, especially given limited physical page allotments from publishers. Another way is to focus on publishing meta-analyses and integrative theoretical reviews, which nearly always feature longer articles (with lots of citations). Indeed, *Psychological Bulletin*, which is arguably the APA’s premier journal for meta-analyses, is also its most highly cited based on its JIF (see Table 1). A third way to increase a journal’s JIF is by including many recent self-citations (e.g., a *JPSP* article that cites several other recent *JPSP* articles; see Anseel et al., 2004). Because of these divergent JIF-increasing strategies, editors may strongly favor either brief reports on hot topics or protracted full-length review articles, including meta-analyses.

It is also important to consider the increasing role that mass media, including online social networks (e.g., academic Twitter), appear to be playing in promoting and influencing the content—and perhaps even length—of psychological research articles. Journal articles featured in and disseminated broadly by social media often garner higher citation counts than those that do not (Eysenbach, 2011), but this may differ by academic discipline (Tonia et al., 2016). This link between social media exposure and

future citations likely reinforces an incentive structure in which journal gatekeepers may be more likely to publish papers on the hot topic du jour (e.g., COVID-19 research) over topics more tepid and demure (e.g., temporal changes in article length). But we also speculate that social media may indirectly promote shorter, bite-sized studies because we increasingly inhabit a digital world where multiple sources compete for our screen time and attention. Specifically, we believe that most researchers—and the lay public—would prefer to read a shorter article than a longer one on the same topic, and that the shorter one is in turn more likely to be shared with others (e.g., retweeted).

Conclusions

Mean article length in the average APA journal increased in the 1980s and 1990s, plateaued or decreased slightly in the 2000s, and have increased slightly in the 2010s. Although change over time in article length varied considerably across journals, linear growth related positively to JIFs, suggesting that highly-cited journals experienced greater growth in article length over time. This pattern may be driven in part the journals with the highest JIFs (e.g., *Psychological Bulletin*) because they serve as the key repositories of record for an expanding body of knowledge (Adair & Vohra, 2003).

Longer article formats give authors more leeway to (a) include detailed methods, (b) distinguish between confirmatory and exploratory results, (c) include a series of direct or conceptual replications, (d) examine the generalizability of findings, and (e) be frank with readers about the work's limitations. Including such information is key to improving the ability of (a) readers, reviewers, and editors to critically assess the research and (b) future researchers to replicate it. Paradoxically, both short-report journals and journals soliciting short-reports have multiplied over the past decade, just as a renewed emphasis on open and reproducible science in psychology has emerged.

Thus, perhaps psychological science—or the way we report it—is at a crossroads: Should we emulate high-impact journals that publish exclusively brief reports (e.g., *Nature*, *Science*), or should we continue to embrace detailed, long-format reporting that has long been a hallmark of our top journals (e.g., *JPSP*, *JEP:G*, *JEP:LMC*)? Or should we blaze our own trail and attempt to do both: provide readers and reviewers access to all necessary information, but do so regardless of article length? Thankfully, the advent of online supplements and registered online repositories (e.g., OSF) may have solved this dilemma for us because even brief reports can direct readers and reviewers to the additional resources they seek. As these changes in technology and reporting norms unfold, we might expect to see them correlate with changes in article length over time.

What are the implications of changes in article length in a world of increasingly digital publishing and an ongoing scientific credibility crisis (or at least the public perception of one; Ferguson, 2015)? One possible outgrowth of psychology’s credibility crisis—which appears to be driven by underpowered original *and* replication studies (Maxwell et al., 2015)—has been journal editors easing word-limit restrictions for Method and Results sections to allow authors more room to provide essential details for transparency and future replication attempts. And an outgrowth of digital publishing has been that many journals now allow authors to post online supplements with additional details. How these countervailing forces will continue to affect article length in psychology journals in the coming years remains to be seen.

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