



Business and management research: Low instances of replication studies and a lack of author independence in replications

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ABSTRACT

Increasing awareness of the credibility crisis and related replication crisis in business research drives calls for greater understanding of the state of replication studies. This research addresses these calls by analyzing the 10-year publication history of 121 leading journals (Academic Journal Guide (AJG 2018)). Examination of 83,682 articles reveals 4,412 potential replications. Detailed analysis of 500 randomly selected articles offers further insights. Results indicate most replications are conceptual in nature, support prior findings and represent only 1.47% of published research in leading journals. Significantly, most replications occur as part of within-study or intrastudy designs. Replications by independent researchers are very rare, raising credibility concerns due to author overlap and associated researcher and measurement biases. Recommendations for the improvement of replication efforts are made.

1. Introduction

The past decade sees increasing discussion on replication crises across many fields of science (Aguinis and Solarino, 2019). These crises manifest through both the reported failures of independent replications to validate prior findings and the overall lack of replications (Ritchie, 2020). Psychology presents the most public replication crises, with worryingly few instances of replications, and documented failures to validate influential prior research (Makel et al., 2012; Open Science Collaboration, 2015; Ritchie, 2020). Given the large scholarly and methodological overlaps, it is unlikely that business and management research is immune to such replication crises.

This paper seeks to aid our understanding of this issue by quantifying and describing replication studies in our leading business and management journals, guided by the following research question. What is the incidence and nature of replication studies in business and management research?

2. Literature review

2.1. Replication research in context: the credibility of business and management research

Broadly, this credibility crisis relates to the trustworthiness of findings as a basis for future research and practice (Byington and Felps, 2017; Ritchie, 2020). While not singlehandedly addressing credibility issues, replications are vital for validating or refuting positivist research findings, and the consequent building of credible knowledge (Aguinis and Solarino, 2019; Chambers, 2019).

A damaging combination of questionable research practices (QRP's) (Byington and Felps, 2017; Hall and Martin, 2019), coercive citation (Martin, 2013), inadequate researcher training (Mckiernan and Tsui, 2019), illusory theory development (Tourish, 2020), misuse of research metrics (Biagioli et al., 2019), lack of transparency (Christensen and Miguel, 2018), and methodological and analytical weakness (Saylor and Trafimow, 2021; Woodside, 2016) undermines the credibility of business and management research. Additionally, well-documented publication biases drive journals to favor novelty and originality, discarding neutral and negative findings in pursuit of increasing citations and journal impact (van Witteloostuijn, 2016).

Byington and Felps (2017) identify two social dilemmas to explain

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this credibility crisis. Firstly, the perceived career benefits for researchers engaging in QRP's to increase chances of publishing in journals that are central to positive career outcomes such as hiring, promotion, tenure, etc. Secondly, research gatekeepers (journal editors, etc.) face a dilemma to unduly consider novelty and marketability of publications which boost readership, citations and journal prestige. Consequently, if career benefits significantly influence research outputs, and outputs such as replications are less desired by journals, then replications are unlikely to occur.

2.2. Replications in business and management research

Editorials welcoming replications in influential business journals have largely failed to increase the number of replications published (Bamberger, 2019; Eden, 2002).

Evidence of some limited support for publishing replications is seen in Elsevier's curated virtual special issue of business, management and accounting replications published between 1987 and 2011. It contained only 14 papers. A recent special issue of the Journal of Business Research contained 13 replications (Babin et al., 2021) while a 2016 special issue of *Strategic Management Journal* included 11 replications. To its editorial credit, the journal continues to publish some (10) replications in the years following.

Less prestigious journals similarly struggle. The *American Journal of Business* 2013 call for papers yielded only six replications. The editorial highlighted many challenges reflective of the social dilemmas outlined by Byington and Felps (2017), including a reluctance of contributors/authors to conduct and submit replications, and innate reviewer biases against replications. Similarly, a 2010 *Public Finance Review* call for replications yielded only 6, eventually published in 2015 (Burman et al., 2010).

Table 1
Summary of prior research on replication rates in different business fields.

Field	Literature Reviewed	Estimated Replication Rate	Source
Marketing	3 journals from 1974 to 1989	2.4%	Hubbard and Armstrong (1994)
	3 journals from 1990 to 2004	1.2%	Evanschitzky et al. (2007)
	5 marketing journals	1980's- 3% 1990's- 4% 2000's- 8%	Kwon Eun et al. (2017)
Advertising	5 journals from 1980 to 2012	6.4% dropping to 2.9% after excluding intrastudy replications.	Park et al. (2015)
Forecasting	2 journals, from 1996 to 2008	8.4%	Evanschitzky and Armstrong (2010)
Management	9 journals from 1976 to 1995	5.3%	Hubbard et al. (1998)
Applied Psychology	Top 100 journals	1–2%	Makel et al. (2012)
Accounting, economics, finance, management, and marketing	8 journals from 1970 to 1991	< 10% in accounting, finance, and economics < 5% in management and marketing.	Hubbard and Vetter (1996)
Finance	4 journals from 1969 to 1989	5.3%	Hubbard and Vetter (1991)
Economics	3 journals from 1965 to 1989	5.4%	Hubbard and Vetter (1992)
Economics	Top 50 journals from 1974 to 2014.	0.10%	Mueller-Langer et al. (2019)

Table 1 offers a summary of the few previous efforts to estimate replication rates in various fields of business and management.

This study offers a more comprehensive perspective through analyzing replications in 121 leading journals across the range of business and management sub-disciplines (from 2008 to 2017, inclusive). Examining this recent period flows from the view that our contemporary awareness of the suggested credibility crises will benefit most from an examination of contemporary research publications.

This study's broad objective is understanding 'What is the incidence and nature of replication studies in business and management Research?' We explore this objective through several sub-questions. *Relative to our larger body of published research how many replications are we publishing over the period under examination? Across the diverse sub specializations of business journals, where are these replications being published? Is the publication rate of replication research stable or changing? Within a sample of replications what are the rates of replication type, success, and independent authorship?*

In addressing these questions, we draw implications about the current state of replications in leading business and management journals.

3. Method

Where applicable this study follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), a practical guide to reporting on systematic review processes (Moher et al., 2009).

3.1. The categorization of replication studies

Various typologies of replications exist (Köhler and Cortina, 2021). This study employs the replication categorizations of Schmidt (2009), previously used to examine replications in psychology (Makel et al., 2012), criminology (Pridemore et al., 2018) and education science (Makel and Plucker, 2014). This facilitates comparisons between current findings and these prior studies.

Three primary replication categories are used. These are (a) *direct* replication, a 'repetition of an experimental procedure' from a prior study, (b) *conceptual* replication, a 'repetition of a test of a hypothesis or a result of earlier research work with different methods' (Schmidt, 2009, p. p. 91), and (c) 'both'. This third category is recommended by Makel et al. (2012) to categorize replications that include a direct and conceptual replication as parts of a multi-phase research design.

Research highlights the importance of replications being undertaken by authors independent of the original study (Eden, 2002). Consequently, all replications were additionally categorized regarding (a) no author overlap, (b) author overlap with the original research study, or (c) author overlap due to the replication taking place within the same study (known as *intrastudy* (Easley et al., 2000) or *within-article* (Makel and Plucker, 2014) replications).

Finally, we categorize replications results. These categorizations are based on statistical significance and direction of effect in reported findings. Where replications report significant findings in the same direction as original studies they are categorized as having (a) *successfully* confirmed prior findings. Alternatively, replications are categorized as having (b) *failed* to confirm prior findings, or (c) showed *mixed* support for prior findings (some significant and some non-significant results across effects). In a very few cases where significance testing was not the main analytical method, the evaluators relied on the replication authors self-reported validation or refutation of prior results.

3.2. The selection of leading business and management journals

This study adopts a similar article selection process used to study replications in different fields (Makel and Plucker, 2014; Makel et al., 2012). However, rather than employing strictly bibliometric indicators of leading journals we employed the 2018 Academic Journal Guide (AJG 2018) of the Chartered Association of Business Schools which ranks

journals in categories from 4*, 4,3,2 and 1. We define leading business and management journals as those ranked as 4* and 4 in the 2018 AJG (Chartered Association of Business Schools, 2018), resulting in a list of 121 journals, with at least one journal in each of the 22 categories of the 2018 AJG (see Table 2).

3.3. Sampling of articles

In November–December 2018, the Scopus database was used to search the 10-year publication history (2008–2017 inclusive) of the 121 journals, identifying their total number of published articles, and the total number of articles containing the term *replicat** in their text.

Table 2
Summary of journals and articles across different journal categories.

Journal category	Number (and %) of 4* & 4 journals AJG2018	Total # of articles (and %) published in each category	Total # of replicat* articles (and %) in each category	# of actual replications (and %) in random 500 sample
Accounting	6 (4.96)	2490 (2.98)	51 (2.05)	1 (0.2)
Business and Economic History	2 (1.65)	480 (0.57)	1 (0.21)	0
Economics, Econometrics and Statistics	23 (19.01)	14,547 (17.38)	317 (2.18)	4 (0.8)
Entrepreneurship and Small Business Management	3 (2.48)	1089 (1.30)	92 (8.45)	0 (0.0)
General Management, Ethics, Gender and Social Responsibility	8 (6.61)	2856 (3.41)	371 (12.99)	6 (1.2)
Finance	8 (6.61)	5496 (6.57)	55 (1.00)	4 (0.8)
HRM and Employment Studies	5 (4.13)	1817 (2.17)	85 (4.68)	1 (0.2)
International Business and Area Studies	2 (1.65)	1069 (1.28)	132 (12.35)	0 (0.0)
Information Management	5 (4.13)	2581 (3.08)	126 (4.88)	3 (0.6)
Innovation	2 (1.65)	1855 (2.22)	163 (8.79)	2 (0.4)
Management Development and Education	1 (0.83)	241 (0.29)	20 (8.30)	0 (0.0)
Marketing	8 (6.61)	4147 (4.96)	270 (6.51)	15 (3.0)
Operations and Technology Management	3 (2.48)	1794 (2.14)	156 (8.70)	2 (0.4)
Operations Research and Management Science	4 (3.31)	9350 (11.17)	143 (1.53)	3 (0.6)
Organizational Studies	5 (4.13)	3148 (3.76)	341 (10.83)	11 (2.2)
Psychology (General)	9 (7.44)	8358 (9.99)	935 (11.19)	61 (12.2)
Psychology (Organizational)	7 (5.79)	4012 (4.79)	533 (13.29)	20 (4.0)
Public Sector and Health Care	3 (2.48)	1855 (2.22)	46 (2.48)	0 (0.0)
Regional Studies, Planning and Environment	2 (1.65)	2219 (2.65)	18 (0.81)	0 (0.0)
Sector Studies	5 (4.13)	4365 (5.22)	121 (2.77)	0 (0.0)
Social Sciences	9 (7.44)	9020 (10.78)	279 (3.09)	6 (1.2)
Strategy	1 (0.83)	893 (1.07)	157 (17.58)	1 (0.2)
Totals	121 (100%)	83,682 (100.00%)	4412 (5.27%)	140 (28%)

Researchers have previously employed this method when searching for replications in large databases (Makel et al., 2012; Pridemore et al., 2018). Table 2 offers a quantitative summary of data across the AJG journal categories.

Following the methodology of previous researchers (Makel et al., 2012; Pridemore et al., 2018), we estimate the frequency of actual replications in the 4412 articles containing the term *replicat** by examining a random sample of 500 articles. This method previously identified actual replications in 68.4% (psychology) (Makel et al., 2012), 47.9% (education science) (Makel and Plucker, 2014), and 62.3% (criminology) (Pridemore et al., 2018) of cases.

Firstly, all identified replications were recorded as either (a) direct (b) conceptual, or (c) both. Secondly, authorship was categorized as either (a) no author overlap, (b) author overlap in a study separate from the original research, or (c) author overlap due to replication occurring intrastudy. Finally, the results of the replication were recorded as (a) success, (b) failure or (c) mixed.

100 papers were independently categorized by each author, then cross-checked. Agreement occurred in more than 95% of cases. In a few contentious cases, results were discussed, and the appropriate categorization was agreed. The remaining 400 cases were then divided and categorized by one of the co-authors.

4. Results

Results firstly offer an overview of key findings, then address the specific research questions posed previously.

Across the 10-year publication history of the 121 journals with 83,682 articles, we identified 4412 articles (5.27%) containing the term *replicat**. An examination of 500 articles randomly selected from this 4412 revealed only 28% (140 articles) contain an element of purposeful replication. The remaining 360 papers either discuss or cite replications or used the term in a way unrelated to the concept of scientific replications. Similar findings are reported by Makel et al. (2012).

Of the 140 replications, 12 were direct, 123 were conceptual and 5 were both (i.e., including direct and conceptual replications). Most replications reported successful (111) or mixed results (23), with only 6 reporting failure.

4.1. Relative to our larger body of published research how many replications are we publishing over the period under examination?

From 83,682 total publications, 4412 *replicat** articles were identified. Of the 500 articles sampled, only 140 actual replications were found (28%). Consequently, we estimate that as few as 1.47% of published research articles over the 10-year period are overt replications ($(4412/83,682) \times 28 = 1.47\%$).

4.2. Across the diverse sub specializations of business journals, where are these replication studies being published?

Given the small number of actual replications in some journal categories, inferences or conclusions drawn are severely limited. However, patterns in the data are of interest and might prompt future research. For example, the two rightmost columns in Table 2, identify journals in the category Psychology (General) publishing a relatively high percentage of articles with the term *replicat** (11.19%, respectively). Additionally, the number of actual replications from this journal category within the random sample of 500 articles were 61 (12.2%). In contrast, the journal category Entrepreneurship and Small Business shows 8.45% of articles containing the term *replicat**, though the number of actual replications from this journal category within the random sample of 500 articles was 0.

Allowing for the limitations in estimating the actual number of replications across categories from only a sub-sample of *replicat** articles, Table 2 offers insights for fields such as Accounting, Finance and

Operations Research, among others, where instances of replicat* articles are few, and where the number of actual replications found are also low.

4.3. Is the publication rate of replication research stable or changing?

Year on year comparisons between overall total publications and publications containing replicat* from 2008 to 2017 show little change. The rate of replicat* articles published in the 121 journals examined, rises slightly from 4.9% to 5.7% over the period.

4.4. Within a sample of replications what are the rates of types of replication, success, and independent authorship?

For the sample of 500 papers a summary of findings on the nature of the replications (direct/conceptual/both), outcomes from the replications (success/failure/mixed), and degree of independent authorship is presented in Table 3.

Only 23 of the 140 replications had no overlapping authors with the original research. These replications report a failure to replicate 4 times (17.39% of the 23 replications identified). Of the 117 replications with author overlap, failure to replicate occurs only twice (1.71% of the 117 replications). Despite difficulties in direct comparison due to differences in group sizes the observed difference in failure rates seems stark, and worthy of future investigation.

A most significance finding is the identification of the prevalence of replication efforts published in the same article as part of a multiphase study. Makel et al. (2012) report this phenomena as representing 40.8% of replications in the field of psychology. This type of intrastudy replication represents 72.86% (102) of our 140 replication papers, and of those papers only 2 report a failure to replicate prior findings. Livingston et al. (2014) offers a typical example of this type of intrastudy replication.

5. Discussion

The volume of published business and management research is considerable. Over 470,000 papers were published in the SCOPUS category of Business, Management and Accounting in the 10 years examined here. Yet despite the vastness of our scholarship, credibility concerns continue. Solutions to this credibility crisis may be successfully advanced through a variety of avenues including greater emphasis on responsible research, shifts in our dominant methodological paradigms, greater openness in research and publication practices, disruptions to the nature of research evaluation and dissemination, greater rigor in researcher training and education, and as is the focus of the current study, an increased emphasis on replications.

Table 3
Analysis of 140 replications (type and authorship).

Replication type (# and %)	# of papers (% success)	# of papers (% failure)	# of papers (% mixed)
Direct (12) (8.6%)	8 (66.66%)	4 (33.33%)	0 (0%)
Conceptual (123) (87.9%)	101 (82.22%)	2 (1.62%)	20 (16.2%)
Mixed (5) (3.6%)	2 (40%)	0 (0%)	3 (60%)
Total (140) (100%)	111 (79.3%)	6 (4.3%)	23 (16.4%)
Replication authorship (# and %)	# of papers (% success)	# of papers (% failure)	# of papers (% mixed)
Intrastudy (Same paper/ authors) (102) (72.9%)	86 (84.31%)	2 (1.96%)	14 (13.72%)
Author overlap different paper (15) (10.7%)	11 (73.33%)	0 (0%)	4 (26.66%)
Author overlap (Above 2 Rows Combined) (117) (83.6%)	97 (82.91%)	2 (1.71%)	18 (15.38%)
No author overlap (23) (16.4%)	14 (60.87%)	4 (17.39%)	5 (21.74%)

Previous calls for more replications in business and management research have largely been made without a quantitative understanding of the existing state of replication research. Current findings can now act as a benchmark for instances of replication. Results suggest that the frequency of published replications is low. We estimate as little as 1.47% of published research contains an element of overt replication. Though higher than estimates in psychology (1.07%) (Makel et al., 2012) criminology (0.45%) (Pridemore et al., 2018), or educational science (0.13%) (Makel and Plucker, 2014), it is certainly insufficient to ameliorate ongoing credibility issues and is lower than many prior estimates summarized in Table 1.

Who is conducting our replications is concerning. Of 140 replications, 83.6% (117) have some author overlap with the original research being replicated. Köhler and Cortina (2021) report similar findings across three leading management journals. It is argued that non-author overlap adds value to replications by decreasing the likelihood of researcher and measurement biases (Eden, 2002; Pridemore et al., 2018), as well as confirmatory bias (Ritchie, 2020). It is unsurprising then that only 2% of replications with author overlap fail to replicate findings.

It is of particular interest that 102 of the 140 replications (72.9%) in this study are intrastudy replications. While these replications may appear to enhance the validity of the single study they are part of Easley et al. (2000), they do not address the many questionable and even fraudulent research practices that researchers suggest are prevalent across the social sciences (Chambers, 2019; Ritchie, 2020). Intrastudy replications fail to address concerns for greater openness across science (Nosek et al., 2015; Ritchie, 2020). A large proportion of published research is irreplicable without further methodological clarification and guidance from original authors (Aguinis and Solarino, 2019). Insufficient detailing of methodological and analytical processes will not be overcome through intrastudy replications. We must also look cautiously at the overwhelming levels of success in replications with author overlap.

While Eden (2002) suggests conceptual replications establish the validity of theories beyond a specific context, Chambers (2019) is highly critical, suggesting they only devalue direct replications and exacerbate confirmation bias. This is certainly a valid criticism of many of the conceptual replications in the current study with increased likelihood of confirmation bias due to author overlap.

Since our low levels of replications appear consistent over the 10 years examined here, the authors support van Witteloostuijn (2016) call for greater publication space for replications. We encourage scholarly associations and their journals to pursue an affirmative action plan for replication research, enforcing policies committing to publishing a percentage of replications annually. Doing so may redirect research efforts away from the production of meaningless research (Saylor and Trafimow, 2021; Tourish, 2020) and towards the essential scientific activity of refuting or validating influential findings through replication. We call for systematic change in editorial policies and practices, research valuation, publication biases and the training of business and management researchers in order to increase replication efforts.

One radical advance may be for leading business schools to require graduate students to undertake replication as part of their dissertation. Everett and Earp (2015) make a similar suggestion for psychology, while sociologists are also supporting graduate research training through replications (Stojmenovska et al., 2019). Such initiatives support the type of revolutionary generational change called for by the movement for responsible research in business and management (Mckiernan and Tsui, 2019).

This study also notes the reliance on statistical significance testing within our broader literature. The weaknesses of this approach are well documented and several researchers advocate for alternatives such as significant sameness testing (Hubbard and Lindsay, 2013), qualitative comparative analysis (Woodside, 2016) or Bayesian analysis (Lohrke et al., 2018). It seems desirable to incorporate such alternative methods

in our replication efforts to more rigorously validate or refute our existing knowledge base.

5.1. Limitations and opportunities for future research

Ideally, future researchers might examine the entire population of replicat* articles, rather than a sample (500) in this case. Additionally, despite prior use of the term *replicat** as a search parameter (Köhler and Cortina, 2021; Makel and Plucker, 2014; Makel et al., 2012; Pridemore et al., 2018), the authors are conscious of the methods coarseness. Arguably, a portion of published research contains elements of hidden replication (Schmidt, 2017) that are not identifiable using the replicat* search term.

We encourage future researchers to replicate this study using different replication categorizations (Köhler and Cortina, 2021), and different category journals. While evidence suggests that publishing replications in both higher and lower ranked journals is challenging (Reed, 2014), further research is needed.

Given its prevalence, the issue of author overlap also warrants further study. Understanding the mechanisms and motives of authors working together on replications would help shed light on the robustness, validity and relative value of this replication type.

6. Summary and conclusions

In summary, the authors suggest that the state of replication research in the field of business and management is not healthy. The estimated 1.47% of replications in our literature is insufficient to validate or refute much of our knowledge base. The prevalence of intrastudy replications is a significant issue. This type of within-study replication will not address concerns over research errors, QRP's, or researcher and measurement biases. We must recognize replications as a fundamental pillar of good scientific practice and promote replications as valued contributions through our scholarly training and our willingness to grant replications a forum for discussion/publication.

CRedit authorship contribution statement

James C. Ryan: Conceptualization, Methodology, Software, Data curation, Writing – original draft, Visualization, Investigation, Supervision, Validation. **Syed A. A Tipu:** Methodology, Software, Data curation, Writing – review & editing, Investigation, Supervision, Validation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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