

How replication studies can improve doctoral student education

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In addition to helping advance theory, replication studies offer rich and complementary learning experiences for doctoral students, enabling them to learn general research skills, through the process of striving to imitate good studies. In addition, students gain replication-specific

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methodological skills and learn about the important roles replications play for making management knowledge trustworthy. We outline best practices for enabling doctoral students and their supervisors to select studies to replicate, execute their replications, and increase the probability of successfully publishing their findings. We also discuss the crucial role of faculty mentors in supporting and guiding replication-based learning of doctoral students. Ultimately, educating doctoral students on how to execute high-quality replication studies helps to answer wider calls for more replication studies in the field of management, an important stepping stone along the journey toward open and responsible research.

Keywords: *Replication Studies; Doctoral Student Education*

“In general, my experiences conducting replications were very good. As I started working on these two [replication] projects at the very beginning of my PhD, this gave me a clear goal and thereby enabled a fast start. Since I did not have to come up with a novel research idea, I quickly learned a lot about the whole process of conducting an academic study: e.g., working with supervisors and co-authors, data analysis, writing, submitting to a journal, making revisions, and so on. The fact that both studies were published was also very motivating. The importance of replication has been proven, but the value placed on it in doctoral education should be improved. . . . In my opinion, it would be good if more graduate students start their PhDs with replications because of the steep learning curve and relatively quick results. The lessons learned will help when creating new research ideas. At the same time, the increase in replications will improve the reliability of results published.”

— Annelot Wismans, Erasmus University¹

We advocate replications not just as a way to advance theory but also as a pedagogical tool. Replication studies have been receiving much renewed attention by management scholars (Aguinis et al., 2017; Bettis et al., 2016b; Goldfarb & King, 2016; Open Science Collaboration, 2015) because it takes sequences of related studies to build confident understanding of empirical patterns (Ioannidis, 2018; Platt, 1964; Starbuck, 2006; Tullett & Vazire, 2018). Moreover, as reflected in the quote above, student-led replication research may have the added benefit of giving early-stage PhD students a “head start” in learning how to design and execute a study and effectively communicate its findings.

All replications imitate earlier, precedent studies, but replications vary in how closely they imitate their precedents. *Exact replications*² aim to imitate their precedents as closely as possible, whereas *constructive replications*³ use their precedents as springboards, by executing a slight variation to the original research design, in order to gather further evidence about the focal phenomenon (Köhler & Cortina, 2021). Replications are being used for doctoral education in many fields, including archeology, chemistry, economics, operations management, political science, psychology, and sociology (Everett & Earp, 2015; Fecher et al., 2016; Frank & Saxe, 2012; Kane, 1984; Marwick et al., 2020; Sodhi & Tang, 2014). However, few doctoral programs in management currently include the use of replications.

In 2022, we conducted an informal “straw poll” about doctoral student replications on the list server of the Academy of Management’s Research Methods Division.⁴ We identified only a handful of management programs that utilized doctoral student replications as a learning instrument: Boston College, Erasmus University, University of Connecticut, University of Hong Kong, and University of Maryland. For reasons articulated in this article, we argue that replications should become widespread in doctoral education in the field of management. To develop and illustrate our thesis, we draw on published replication and education research, as well as conversations with people who have conducted replications while they were doctoral students and faculty who have mentored such students.⁵ Beyond illustrating the feasibility and potential benefits of doctoral student replications, these interviews generated some “cautionary” reactions.

One such reaction was that it would be better for doctoral students to publish innovative research. We agree that doctoral students who are capable of formulating innovative research and carrying it out should do so. However, in our collective experience, very few students have the requisite capabilities for pursuing such work during the initial years of their doctoral studies.

Another cautionary reaction we received was that it would be better for doctoral students to assist professors in research projects that are publishable in prestigious journals. However, when supporting senior faculty in the execution of their research projects, all-too-often, doctoral students play only marginal roles in key research decisions. In practice, faculties’ concerns about the quality of research execution foster the close supervision and micromanagement of their doctoral students. These concerns notwithstanding, we agree that this more traditional form of research apprenticeship enables valuable student learning and plays a key role in doctoral education. However, as will be illustrated shortly, replications can offer additional experiential learning opportunities and benefits. Consequently, our main argument is that replications should supplement and certainly not replace other types of research projects.

The primary focus of this article, therefore, is on the learning benefits of replications for doctoral students. Full benefits, however, require that students successfully complete their replication studies. Thus, we also discuss how doctoral students and their mentors can overcome some of the general publication challenges that all replications currently face in the field of management. The article is organized in four main sections. The first section lays out the core learning benefits of including replications in doctoral education. Whether these benefits actually materialize often depends on the faculty who mentor doctoral students. Accordingly, the second section describes how faculty mentors can help students address the challenges they face when executing replications. The third section describes how students and their mentors can address the challenges associated with publishing their replication studies. The fourth and concluding section discusses the long-term benefits of student replications for the more systematic testing and refinement of theories in the field of management.

Benefits of including replication studies in doctoral education

Empirical studies incorporate the formulation of research questions or hypotheses, research design, data collection, data analysis, and the interpretation and reporting of results. The attendant complexity arising from these combined steps tends to be

overwhelming for students with little research experience. Typically, doctoral education in management entails two years of seminars that teach research skills by discussing published research studies, conducting qualitative and quantitative analyses, and experiential learning involving research collaborations with faculty members. We argue that these learning activities can be accelerated by student replications, which provide distinct experiential learning experiences. Thus, replications represent an additional learning method that complements rather than replaces seminars and other types of faculty–student collaborations.

As noted earlier, the replication literature differentiates between exact replications and constructive replications (Köhler & Cortina, 2021; Tsang & Kwan, 1999). An *exact replication* strives to imitate its precedent study very closely. Exact replications have the potential to instill variously confidence or doubt in the robustness of the results reported in precedent studies. In the field of psychology, for example, Bem’s (2011) statistically significant results supporting the paranormal ability of individuals to “feel the future” was eventually discredited because it did not receive support in subsequent exact replications (Galak et al., 2012; Ritchie, Wiseman, & French, 2012; Wagenmakers et al., 2011). Commenting on an exact-replication project undertaken by undergraduate student teams in psychology, Standing et al. (2014: 101) noted that “Students encountered replication as a requirement for scientific progress, examined issues of power and effect size, and engaged in some critical thinking. They also improved their report writing, computing, and statistical skills, and learned to work collaboratively.”

A *constructive replication* augments its precedent study by changing intentionally either the studied population, data collection, data analysis, or the model tested; Sanchez-Ku and Arthur (2000), for example, investigated a boundary condition of precedent studies that had exclusively studied women by studying men. Alternatively, a replication study may use a more sophisticated measure to probe the robustness and increase the precision of reported effects. Similarly, researchers can apply different analytical approaches (e.g., Bayesian statistics) to probe whether this affects reported findings. Finally, researchers may consider minor changes in the models tested (e.g., adding or replacing a control variable) to probe the robustness of reported findings. Obviously, intentional changes to the precedent study’s research design represent a “slippery slope” because they introduce additional explanations for any differences arising in the results of the replication study. At the same time, as Professors Ed Locke and Gary Latham have demonstrated, constructive replications can play a key role in incremental theory refinements over time (Locke & Latham, 2020). Still, to facilitate comparisons with the precedent study, any intentional changes should be highly focused and narrow (Köhler & Cortina, 2021; Toncar & Munch, 2010).

Next, we discuss four ways through which replication studies can offer distinct experiential learning opportunities for doctoral–student education. First, imitation of precedent studies enables students to gain a comprehensive understanding of a specific precedent study’s research design and learn fundamental methodological skills. Second, students engaging in such research may glean valuable insights regarding how to interpret and effectively report their findings. Third, conducting constructive replications teaches students how slightly modifying the precedent study can generate new insights into phenomena and the impact of research design on results. Lastly, by conducting such research, students discover how replications contribute to scientific progress and thus better appreciate the contributions of replications to theory and practice.

Learning to design and execute empirical research

A first key benefit of conducting replications is that students become familiar with the details of fundamental decisions about research design, data collection, and data analysis that were made by the authors of the precedent studies. The methods sections of the precedent studies provide direct and explicit guidelines for conducting replications. Indeed, precedent studies should be models of good research so that execution of a replication will leave students with a far deeper understanding of the methods used to collect, analyze, and interpret data in a good study. However, authors of precedent studies can never provide complete descriptions of their decisions; indeed, decisions that are seemingly obvious to experienced researchers are often omitted (Aguinis et al., 2018). Unfortunately, such omissions frequently extend to the details of crucial, but also less obvious decisions (Schwab & Starbuck, 2017). Bergh et al. (2017) and Crawford et al. (2022), for example, could not reproduce the results of about 70% of the published articles they sampled, because of crucial missing information. Thus, replications, which demand fresh data collection, likely face even higher missing information challenges.

For doctoral student education, however, these challenges present valuable learning opportunities. Replications, for example, force students to recognize and learn about ubiquitous standards and to supplement judiciously the information stated explicitly in the precedent studies. To fill these gaps, students must search the literature and consult fellow researchers, possibly including the authors of the precedent studies.

Student learning also extends to apparently mundane research execution tasks such as recruiting research participants, interviewing, coding data, and applying for Institutional Review Board approval. Related experiential learning clearly goes beyond what students can learn from reading research reports or discussing them in seminars. In the process, these experiences help students recognize the wide range of research design decisions that researchers have to make. Finally, the experience of conducting replications teaches students what information to include in their own future research reports to enable replications.

Analyzing and interpreting replication results

Another important lesson for doctoral students is about best practices for comparing and integrating empirical findings across related empirical studies (Platt, 1964). In our opinion, investigations focusing narrowly on whether replications confirm or reject earlier studies miss the most important contributions that replications can make (Amrhein et al. 2019; Hubbard, 2016). At the best of times, undertaking exact replications is extremely difficult, and often impossible. Thus, differences between precedents and replicates should be expected, and interpreted carefully (Hubbard, 2016; Schwab et al., 2011; Stroebe & Strack, 2014).

In addition, all studies, including replications, have weaknesses, and researchers can almost always see, on reflection and with the benefit of hindsight, how they could have conducted their research better. The total stock of scientific knowledge grows through the accumulation of incremental studies undertaken by many researchers, and each constituent study has its own particular strengths, limitations, and idiosyncrasies. Replications help identify and make explicit each of these characteristic features, and in so doing, enable the discovery of

robust result patterns across studies. Thus, replication benefits from an accumulation-focused mindset. As Bettis et al. (2016b: 2194) observed, “The aim of replication is to provide additional evidence, not to overturn prior studies.” This mindset of course does not preclude the eventual discovery of fatal flaws in the evidence provided by precedent studies. Even in these cases, precedent studies offer valuable lessons by pointing out “honest mistakes” and “dead ends” to avoid in the future. At times, failures are an essential input for progress and replications can help facilitate learning from such failures. Thus, replicators’ central puzzle should be how to combine the findings of precedent studies and their replicates to reach a deeper understanding of phenomena and the impact of particular research methods. Such learning requires careful analyses and interpretation of observed differences and similarities to identify possible explanations for the results obtained.

In the current replication literature, however, too much discussion has been devoted to simple binary judgments and finger-pointing about the (in)correctness of precedent studies, which all-too-frequently employ only statistical significance tests (Asendorpf et al., 2013; Anderson & Maxwell, 2016). To address this concern, replicators should focus more on effect sizes and the accuracy of effect size estimates, as well as consider applying Bayesian and/or meta-analytic techniques (Bonett, 2012, 2021; Bonett & Price, 2015; Eden, 2002; Gronau et al., 2021; Lebel et al., 2019). These approaches tend to offer more effective ways to compare and integrate findings from precedent and replication studies (Cumming & Finch, 2005; Gelman & Stern, 2006; Hubbard, 2016).

The interpretation of empirical results of replications, however, requires more than just the selection of statistical estimation techniques because replicators need to also consider the impact of differences in measures, samples, and other research design, research execution, and research context factors. Undertaking these more comprehensive analyses and interpretations of results will require more time and effort, but doing so promises to generate deeper evidence-based insights with stronger implications for theory development, refinement, and testing. Hence, replications teach students that a mismatch between the findings of a replication and its precedent study is a good reason to search for possible explanations, which in turn can lead to the discovery of inherent uncertainties associated with specific effects. Such knowledge of systematic uncertainties associated with observed effects represents another important input for theory development and refinement. In the end, any such careful comparative and cumulative analyses of replication results provide deep experiential learning experiences for doctoral students.

Gaining deeper insights through constructive replications

A very insightful development in the history of management research involved constructive replications by a (then) doctoral student: John Child. His initial replication of the highly influential Aston studies (Child, 1972a) produced only partial support for their findings on how environments and technologies predicted specific organizational structures including specialization, standardization, formalization, and centralization (cf. Pugh et al., 1968). Child then drew on his own work experience at Rolls Royce, as well as on scholarly research, to argue that the models of the Aston studies were incomplete because they ignored that managers can choose and influence their organizations’ environments and technologies (Child, 1972b, 1997). Using his replication as an initial platform, he developed novel theories and

convinced researchers that they should consider the critical role of intraorganizational decision making and strategic management (Child, 1973). What started as a replication, ushered in new research topics and led eventually to the development of new theories.

The development of goal setting theory is another example of the value of constructive replications. As mentioned earlier, Professors Ed Locke and Gary Latham engaged in a stream of replications, which they labeled “replications with variations,” to develop a fine-grained theory with high predictive power (Locke & Latham, 2020). Other studies illustrating the value of constructive replications are the follow-up studies to Milgram’s classic body of work examining obedience to authority figures. Replicators asked hospital nurses to inject patients with drugs that exceeded the upper limits posted on warning notices (Hofling et al., 1966; Rank & Jacobson, 1977). Replications of Solomon Asch’s similarly well-known social conformity studies revealed temporal boundary conditions, identified because the initial results that were obtained at the end of the McCarthy era in North America differed substantially from results in the United Kingdom obtained during the 1980s (Nicholson et al., 1985; Perrin & Spencer, 1981). These examples highlight that constructive replications present learning opportunities for doctoral students to understand the impact of focused changes in the research design, execution, and context of the precedent study. Students can formulate related hypotheses to test generalizability, and examine the effects of model changes and methodological choices.

Finally, constructive replications create learning flexibility. Intentional changes in the design of the replication study can address the specific learning objectives of each doctoral student. Research methodology is a core object of doctoral student education. Methods are constantly advancing, and replicators know more about the phenomenon because of the precedent study. This implies opportunities not only to address precedent-study limitations, but also to go beyond learning from merely imitating the research methods of the precedent study. Replicators have the opportunity to supplement and extend the methods of precedent studies to obtain a more nuanced understanding of empirical patterns. In the process, students learn state-of-the-art methodological approaches and gain experience in their application, including approaches in which they are personally interested. More experienced students can benefit from more challenging deviations from precedent studies; for example, students interested in Bayesian statistics can apply both frequentist and Bayesian analysis in their replications. Other students might extend passive observation designs to the use of quasi-experimental and experimental research designs. Thus, doctoral students can learn a great deal about methods they are interested in from constructive replications that make corresponding focused changes.

Discovering how replications improve scientific progress

From a philosophy of science perspective, a learning objective of conducting replications is to teach doctoral students how replications contribute to the accumulation of scientific knowledge. Even Ronald Fisher (1966: 13) pointed out that “no isolated experiment, however significant in itself, can suffice for the experimental demonstration of any natural phenomenon.” In the natural and medical sciences, replication is considered the “gold standard” and institutional research norms support replications (see, e.g., Cochrane Foundation for medical research; www.cochrane.org). Building on this foundation, there have been

growing calls within the management research community to embrace, more systematically, evidence-based approaches to knowledge accumulation (Hodgkinson & Rousseau, 2009; Rousseau et al., 2008; www.rrbm.network). Developing the field's capacity to undertake replication studies of the requisite quality is a vital step toward the attainment of this important goal. Conducting replications as an integral part of doctoral training will accelerate its achievement, and in so doing, provide a much-needed way of establishing replication research norms in the field of management and ensuring that they are internalized by present day and future scholars alike.

Roles of faculty mentors

High-quality doctoral-student education depends critically on guidance by faculty mentors—and this is just as true for student learning through replication studies. Annelot Wisman's positive experiences with replication studies at Erasmus University in Rotterdam, for example, were facilitated by her mentor, Roy Thurik, who has guided several doctoral students to successfully conduct and publish replications. At the University of Maryland, doctoral student Marta Villamor Martin conducted a replication as part of her first-year paper assignment in collaboration with Professors Brent Goldfarb and David Kirsch.⁶ Our conversations with doctoral students highlighted the important role faculty mentors play in guiding student replications and enabling related student learning. Thus, next we provide some specific recommendations for faculty mentors interested in using replications as a pedagogical tool.

Advancing students' education

Successful faculty mentors are able to balance competing goals. First, their personal development and career goals may overlap only partially with the educational goals of their research students. For many business school faculty, the evaluation of their performance is based largely on articles published in a short list of prestigious journals (Aguinis, et al., 2020), which rarely publish replications. Doctoral students, however, can still benefit from targeting a wider variety of journals. One reason is that editors and reviewers of many journals provide similar comments and ask for similar revisions, which enables doctoral students to acquire the requisite skills for successfully developing subsequent top-journal submissions. In addition, well-designed replication studies have been published recently in top journals such as *Academy of Management Journal* (Wolfson et al., 2021), *Administrative Science Quarterly* (Patil et al., 2019), *Journal of Management* (König et al., 2021), *Leadership Quarterly* (Hammond et al., 2021), *Personnel Psychology* (Dreher et al., 2019), and *Strategic Management Journal* (Minefee et al., 2021). Thus, suitably crafted manuscripts reporting replications can still benefit from targeting what are considered to be the very best outlets, especially when the precedent studies were also published in those same journals.

Successful mentors also have to make good decisions about when to intervene and when to let students proceed on their own. Students can experience deeper learning when they discover problems themselves, evaluate alternative courses of action on their own, and then experiment with different solutions (Kolb, 1984). Through undertaking replication studies,

students are afforded the opportunity to embark on such independent learning, an approach known to boost self-efficacy, with the proviso that the students possess the pre-requisite baseline knowledge and receive suitable guidance (Kirschner et al., 2006). In the case of replications, students receive guidance from the details reported in the study they are seeking to replicate. Collaborating students can also debate with each other how to implement the replication, what inferences to draw, and how to write their reports. Students with more relevant training and experience can help those with less training and experience. Students can also replicate studies that used methods they understand, or studies that force them to try out methods they have just learned about.

Nevertheless, a lot can go wrong during replication projects; accordingly, faculty mentors are needed to mitigate students' frustrations and suggest potential solutions. In essence, independent problem solving during replications needs faculty guidance to ensure high-quality learning outcomes. Mentors should ensure that replications are done well, that appropriate methodologies are being used, that inferences are reasonable, and that arguments are presented convincingly.

Hawkins et al. (2018), Janz (2016), Standing (2016), Standing et al. (2014), and Stojmenovska et al. (2019) have published helpful recommendations for enabling doctoral supervisors to teach their students to conduct replications. In addition, faculty mentors can draw on emerging internet resources. The Institute of Replication (I4R), Open Science Foundation (OSF), Center of Open Science (COS), and the Replication Wiki, for example, represent notable platforms on which to coordinate and support systematic reproduction and replication in the social sciences. Table 1 lists these and other emerging internet resources that faculty mentors can share with their students. Considering the limited history of replication studies in the field of management, and the concomitant dearth of established best practices pertaining to the all-important question of how to conduct such studies, the design and execution of doctoral student replications presents important learning opportunities for faculty mentors, as well as their research students.

Identifying good targets for replications

Because of their experience and knowledge of the research literature, faculty mentors are especially important for helping students identify good precedent studies for replications. As noted earlier, Crawford et al. (2022) found that over two-thirds of published research studies pose difficult challenges for replicators, due to incomplete information about how the precedent study was conducted. Thus, faculty mentors should guide their students away from studies that appear likely to pose obvious replication challenges and guide them toward studies that seem feasible for replication.

One way faculty mentors can increase feasibility, is by pointing students toward replicating studies that have been registered on platforms such as the Open Science Framework (<http://openscienceframework.org/>) because such platforms provide replication-relevant information beyond what is provided in the relevant published paper, including sampling details, original data, computer code, and other desirable information to enhance both the feasibility and the quality of the replication. In addition, some journals have enabled authors to provide such more detailed methodological information in online supplemental materials. Finally, as outlined in Table 1, internet platforms such as the Replication Wiki (<http://replication.uni-goettingen.de>)

Table 1
Internet sources for training replications

Name	Focus area	Mission	URL
Institute for Replication (I4R)	Economics	The Institute for Replication (I4R) works to improve the credibility of science by systematically reproducing and replicating research findings in leading academic journals	https://i4replication.org/
Open Science Foundation (OSF)	General	OSF is a free, open source web application that connects and supports the research workflow, enabling scientists to increase the efficiency and effectiveness of their research. The Collaborative Replication Education Project (CREP) of OSF supports collaborative student replications and their publication	https://osf.io/
Project Teaching Integrity in Empirical Research (TIER)	Social Science	Project TIER promotes the integration of principles and practices related to transparency and replicability in the research training of social scientists. We develop methods and tools for enhancing research transparency that are specially designed to serve the needs of undergraduate and graduate students, and disseminate them to faculty who teach courses on quantitative methods or supervise student research, as well as to students interested in adopting them independently	https://www.projecttier.org/
Center for Open Science	General	Our mission is to increase openness, integrity, and reproducibility of research	https://www.cos.io/
Open Science MOOC	General	Community organization for the development of an Massive Open Online Community for Open Science	https://opensciencemooc.eu/
Replication Wiki	Economics	This wiki serves as a database of empirical studies, the availability of replication material for them and of replication studies. It can help teaching replication to students (University of Göttingen)	http://replication.uni-goettingen.de/wiki/index.php/Main_Page

(continued)

Table 1 (continued)

Name	Focus area	Mission	URL
Berkeley Initiative for Transparency in the Social Sciences	Social Science	The Berkeley Initiative for Transparency in the Social Sciences works to improve the credibility of science by advancing transparency, reproducibility, rigor, and ethics in research	https://www.bitsss.org/
Society for the Improvement of Psychological Science (SIPS)	Psychological Science	The SIPS brings together scholars working to improve methods and practices in psychological science. SIPS is a service organization aiming to make psychological science higher quality and more cumulative	https://improvingpsych.org/sipsinaction/sips-products/
The Replication Network	Economics	This website serves as a channel of communication to (i) update scholars about the state of replications in economics and (ii) establish a network for the sharing of information and ideas. The goal is to encourage economists and their journals to publish replications	https://replicationnetwork.com/
Collaboratory Replication Lab	General	The Collaboratory Replication Lab is an interdisciplinary team of faculty, staff, and students at University of Virginia and University of Maryland working towards replication science solutions	https://www.edreplication.org/
Framework for Open and Reproducible Research Training (FORRT)	General	The FORRT is advancing research transparency, reproducibility, rigor, and ethics through pedagogical reform and meta-scientific research	https://forrt.org/
OpenAIRE	General	Shift scholarly communication toward openness and transparency and facilitate innovative ways to communicate and monitor research	https://www.openaire.eu/guides
UK Reproducibility Network (UKRN)	General	The UKRN is a national peer-led consortium that aims to ensure the UK retains its place as a center for world-leading research. We do this by investigating the factors that contribute to robust research, promoting training activities, and disseminating best practice	https://www.ukrn.org/

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Table 1 (continued)

Name	Focus area	Mission	URL
Ludwig-Maximilians-Universität München (LMU) Open Science Center (OSC)	General	The interdisciplinary LMU OSC has the mission to promote and to foster open science practices at LMU Munich and beyond	https://www.osc.uni-muenchen.de/contact/index.html
Center for Reproducible Science (CRS)	General	The objective of the CRS is to train the next generation of researchers in good research practices, to develop novel methodology related to reproducibility and replicability, and to improve the quality of scientific investigation using meta-science (University of Zurich)	https://www.crs.uzh.ch/en.html
Cochrane Foundation	Medicine	We are an independent, diverse, global organization that collaborates to produce trusted synthesized evidence, make it accessible to all, and advocate for its use. Our work is internationally recognized as the benchmark for high-quality information about the effectiveness of health care	https://methods.cochrane.org/equity/projects/systematic-review-replication
Enhancing the Quality and Transparency of Health Research (Equator) Network	Health	The EQUATOR Network is an international initiative that seeks to improve the reliability and value of published health research literature by promoting transparent and accurate reporting and wider use of robust reporting guidelines	https://www.equator-network.org/

are emerging that offer searchable databases for researchers to post, propose, and vote on studies for replication as well as share replication results and advice.

Faculty mentors should also consider what their doctoral students already know. The replication process should teach students research skills and concepts that complement and expand their knowledge in directions relevant for their future research. Related discussions between faculty mentors and students regarding the focal research interests of the latter are vital for ensuring that students are able to express their personal learning objectives and incorporate them when choosing a precedent study to replicate. In contrast with more traditional faculty–student research collaborations, which tend to be more focused on faculty members’ personal research interests than on students’ research interests, the integration of students’ particular interests in the development and execution of replication studies promises to substantially enhance their motivation and ultimately support their dissertation research. These considerations also make replications a very flexible teaching tool.

Finally, faculty mentors, with their deeper understanding of the management literature and research process, can play a crucial role in guiding students toward replications that promise

more meaningful contributions. Obviously, any contribution depends to a substantial degree on the results of the replication, which, of course, at the outset are unknown. The impact of the precedent study, however, is known and can offer relevant information to aid the selection process. For example, replicating old studies with very few citations is unlikely to be very fruitful. On the other hand, a highly cited and award-winning study indicates that both the phenomenon studied and the study's findings have been of keen interest to researchers. Recent studies with increasing citation rates are indicative of phenomena and topics that are currently being debated within the scholarly research community. Overall, the contribution of a given precedent study constitutes a baseline for assessing the potential additional contribution of the proposed replication. Holding everything equal, the replication of a more impactful and salient precedent study promises a stronger contribution by the replication.

The contributions of replications, however, tend to be gradual in nature. As discussed earlier, the notion of replications providing final answers about "true" effects is misleading. Nevertheless, in deciding which study or studies to replicate, replicators should carefully evaluate the anticipated value-added contribution of the proposed replication. Thus, doubts about reported findings in precedent studies can motivate replications because results that deviate markedly from the precedent study imply significantly larger corrections to the established stock of knowledge. In contrast, fresh replications of already well-replicated studies promise only rather minor additional contributions—with the potential exception of well-thought-out constructive replications. Thus, opportunities for substantive methodological improvements, and probing for key contingencies and boundary conditions are always important considerations when selecting precedent studies for replication.

In sum, faculty mentors are crucial for guiding students in their quest to identify exact and constructive replications that are both feasible and of potential interest to editors, reviewers, and the wider research community. If replications do indeed provide valuable contributions, the process of undertaking such work affords opportunities for doctoral students to learn about the research publication process, another major learning objective that we consider in more detail in the next section.

Publishing replications

Literature searches, corroborated by our own informal conversations with established scholars, indicate that replications face substantial publication challenges (Block et al. 2022). These challenges represent a serious obstacle to career progression, as one of the interviewed faculty mentors, who promotes the use of replications, colorfully explained: "For better or worse, I do not have my students conducting pure replication studies unless they plan to build a program of research off of that foundation ... [replication] alone is not publishable in outlets that would benefit Ph.D. students. ... I am sure as heck not going to have students spending their time replicating previous results when the field doesn't value them."

Despite these challenges, we maintain that replications present doctoral students with valuable opportunities both to learn about the publication process and to successfully build their resumes. Although leading management journals typically favor the publication of papers that introduce and test new theories (Cucina & McDaniel, 2016; Hambrick, 2007), a growing number of them have started to explicitly invite the submission of manuscripts reporting replications (Bettis et al., 2016a; Miller & Bamberger, 2016). This trend is complemented by the

development of new outlets such as the *Journal of Management Scientific Reports*, which are devoted to the publication of replications. These nascent developments, however, have so far not fundamentally altered the challenges for publishing replications in the top journals that often matter most for doctoral students' job-market prospects. Thus, we offer the following strategies to increase the odds of students not only learning valuable skills about the publication process but also succeeding in publishing their replications.

As indicated earlier, students' progress toward publishing should start with picking precedent studies and designing replications that promise valuable contributions. Editors and reviewers try to select papers that make valuable contributions to theory. Replications tend to make incremental contributions to knowledge, but incremental contributions usually have subtle value, so replicators need to explain convincingly how their work advances theory (Aguinis & Cronin, 2022). The field of international management illustrates the potential of replication studies to advance theory beyond incremental levels. Scholars in this field typically recognize strong differences between national cultures, and their journals often publish replications that reveal such differences (Dau et al., 2021). Merely reporting that a replication in a different country produced different findings is not very informative in itself. However, describing the results in terms of evidence about a theory's boundary conditions, and its attendant implications for practice, considerably enhances the perceived value-added contributions of the reported replication study. Aspiring authors should also carefully link the results of their replication back to the arguments in the introduction of their article concerning why a replication of the precedent study was needed.

Another potentially helpful strategy to enable publication in the better regarded journals is to not just perform a single replication, but instead to undertake a series of related replication studies. Student teams, for example, can combine an exact replication with various types of constructive replications, applying additional measures and alternative analytical techniques to the newly gathered data. The comparison of results from constructive replications not only with the results of the precedent study but also with results of an exact replication of the precedent study represents another way to enable more fine-grained interpretations of observed effects. Shanks et al. (2013), for example, combined the findings of nine replications, based on an overall total sample of 475 participants, all of which failed to replicate the intelligence priming effects reported in precedent studies. The combination of multiple replications allowed the authors to satisfy what they labeled the "overwhelming evidence" expectations of editors. The Collaborative Replication Education Project (CREP; <https://osf.io/wfc6u/>) of the Open Science Foundation (OSF), included in Table 1, provides a platform on which to coordinate multiple independent student replications of specific highly cited and feasible precedent studies, thus enabling the subsequent publication of the resulting meta-analytic findings (Wagge et al., 2019).⁷ Such broader replication initiatives also provide opportunities to engage in and learn about abductive (Bamberger, 2019) and inductive (Locke, 2015; Locke & Latham, 2020) reasoning. Combining the incremental contribution of each individual replication promises a far deeper and more convincing joint contribution to the literature.

In addition, students can learn other strategies that replicators have used to enhance the general contributions of their replications. One such strategy has been to provide high-quality reviews of the research leading up to precedent studies. These reviews can identify dominant themes, long-term trends, biases in data, and overlooked causal influences. Such reviews might, for example, reveal a persistent bias that a constructive replication could then

Table 2
Journals that have recently published replication studies

Journal	Recent replication publication	5-year impact factor	First Author	Title
Academy of Management Discoveries	2020	7.95	Ertug	Do coaches in the National Basketball Association actually display racial bias? A replication and extension
Academy of Management Journal	2021	16.18	Wolfson	Deploying human capital resources: Accentuating effects of situational alignment and social capital resources
Administrative Science Quarterly	2019	14.69	Patil	“The Public Doesn’t Understand”: The self-reinforcing interplay of image discrepancies and political ideologies in law enforcement
AIS Transactions on Replication Research	2020	na	Adams	A replication of beyond the turk: Alternative platforms for crowdsourcing behavioral research
Applied Psychology: An International Review	2020	5.68	Wismans	Attention-deficit hyperactivity disorder symptoms and entrepreneurial orientation: A replication note
Basic and Applied Social Psychology	2018	2.68	Hamstra	Regulatory focus and individual sales performance of field marketers: A constructive replication
Behavior Modification	2019	3.32	Silbaugh	Failure to replicate the effects of the high-probability instructional sequence on feeding in children with autism and food selectivity
Behaviour Research and Therapy	2018	6.68	Mulkens	To deliver or not to deliver cognitive behavioral therapy for eating disorders: Replication and extension ...
Business Research Quarterly	2021	5.93	Peyton	Employee perceptions of their work environment, work passion, and work intentions: A replication study using three samples
Current Psychology	2020	2.64	Shahzadi	Reinforcement sensitivity theory and adult attachment: A replication study
Empirical Economics	2019	2.38	Runst	A replication of ‘Entry Regulation and Entrepreneurship: A Natural Experiment in German Craftsmanship’
Entrepreneurship Theory and Practice	2022	3.51	Fossen	2D:4D and self-employment: A preregistered replication study in a large general population sample
European Journal of Personality	2020	7.02	Tackman	Personality in its Natural Habitat’ Revisited: A pooled, multi-sample examination of the relationships between the Big Five personality traits ...

(continued)

Table 2 (continued)

Journal	Recent replication publication	5-year impact factor	First Author	Title
European Management Review	2021	3.20	D'Amato	Testing the homogeneity hypothesis of personality: Replication and extension across European countries, industry sectors and organizations
Human Relations	2021	6.62	Ho	Home computer user security behavioral intention: A replication study from Guam
Human Resource Development International	2020	na	Hamlin	Toward an emergent Asian behavioural model of perceived managerial and leadership effectiveness: A cross-nation comparative analysis ...
International J of Organizational Analysis	2021	na	Ateia	Suitability of the high performance organization framework for Egyptian ICT companies: A replication study
International J of Selection and Assessment	2018	2.25	Butucescu	Patterns of change in fairness perceptions during the hiring process: A conceptual replication in a controlled context
J of Applied Behavior Analysis	2022	2.95	Myers	The effects of pedestrian gestures on driver yielding at crosswalks: A systematic replication
J of Applied Psychology	2020	13.72	Roulin	Faking to fit in: Applicants' response strategies to match organizational culture
J of Business and Psychology	2021	6.84	Rosseel	When reflection hinders creative problem-solving: A test of alternative reflection strategies
J of Business Research	2022	1.66	Khan	Team faultlines and upward voice in India: The effects of communication and psychological safety
J of Business Venturing Insights	2021	na	Schneck	A replication study on growth paths of young firms: Evidence from German administrative data
J of Competitiveness	2019	0.44	Babikova	A model replication with an extension of students' perception of prospective employer attractiveness
J of Contextual Behavioral Science	2020	4.75	Pendrous	Appetitive augmental functions and common physical properties in a pain-tolerance metaphor: An extended replication
J of Counseling Psychology	2022	7.58	Seidman	The effects of group counseling and self-affirmation on stigma and group relationship development: A replication and extension
J of Economic Psychology	2021	3.59	Hoang	Replication: Emotional well-being and unemployment—evidence from the American time-use survey

(continued)

Table 2 (continued)

Journal	Recent replication publication	5-year impact factor	First Author	Title
J of Enterprising Communities	2021	na	Chatterjee	Entrepreneurial behavior of family firms in the Indian community: Adoption of a technology platform as a moderator
J of Experimental Psychology: General	2023	6.02	Keith	Failure to learn from failure is mitigated by loss-framing and corrective feedback: A replication and test of the boundary conditions ...
J of Experimental Social Psychology	2023	5.70	Cruz	Do individuation instructions reduce the cross-race effect? A registered replication of Hugenberg, Miller, and Claypool (2007)
J of Family Business Strategy	2022	1.22	Markin	Lone-founder firms in China: Replicating Miller et al. (2007) in a different context
J of International Education in Business	2021	na	Cater	Re-exploring entrepreneurial intentions and personality attributes during a pandemic
J of Management	2021	6.43	König	Opportunity/threat perception and inertia in response to discontinuous change: Replicating and extending Gilbert (2005)
J of Managerial Psychology	2020	4.35	Jordan	Supervisor narcissistic rage: Political support as an antidote
J of Organizational Behavior	2020	11.98	Nielsen	The moderating role of calling in the work–family interface: Buffering and substitution effects on employee satisfaction
J of Organizational Behavior Management	2020	1.79	Melendez	Utilizing the performance diagnostic checklist–human services to assess and improve employee performance on Mand training: A replication
J of Pacific Rim Psychology	2020	1.79	Hu	Living wages across the Pacific rim: A localised replication study from China
J of Personality and Social Psychology	2021	10.50	Genschow	Does social psychology persist over half a century? A direct replication of Cialdini et al.'s (1975) classic door-in-the-face technique
J of Personnel Psychology	2022	2.08	Krause	Career adaptability and career success: A constructive replication study
J of Gender Studies	2022	2.36	Swank	I'll take the check!: A longitudinal replication analysis of gender biases in bill placement from restaurant servers
Leadership Quarterly	2021	12.63	Hammond	The romance of leadership: Rekindling the fire through replication of Meindl and Ehrlich
Management and Organization Review	2020	4.11	Judge	Institutional systems for equitable wealth creation: Replication and an update of Judge et al. (2014)

(continued)

Table 2 (continued)

Journal	Recent replication publication	5-year impact factor	First Author	Title
Management International Review	2020	5.15	Blagoeva	Services in international business studies: A replication and extension of Merchant and Gaur (2008)
Management Review Quarterly	2022	na	Dettori	Improving continuity by simplifying the structure of family firms: A replication study
Org. Behavior and Hum. Decision Processes	2022	6.74	Teigen	What is a “likely” amount? Representative (modal) values are considered likely even when their probabilities are low
Personality and Individual Differences	2022	4.28	Jensen	How dark personalities gain workplace influence: A replication and extension
Personnel Psychology	2019	11.31	Dreher	The pay premium for high-potential women: A constructive replication and refinement
PloS one	2019	4.07	Zendle	Loot boxes are again linked to problem gambling: Results of a replication study
Psychological Bulletin	2022	31.55	Sobkow	Conceptual replication study of fifteen JDM effects: Insights from the Polish sample
Psychological Reports	2022	2.02	Skowronski	Does the fading affect bias vary by memory type and a parent’s risk of physically abusing a child? A replication and extension
Public Management Review	2021	7.07	Cepiku	Leadership behaviours in local government networks: An empirical replication study
Social Influence	2020	1.81	Peng	Gratitude, indebtedness, and reciprocity: An extended replication of Bartlett & Desteno (2006)
Social Psychology	2021	3.42	Briker	(How much) do temporal social comparisons matter? A replication of study 1a of Reh, Tröster, and van Quaquebeke (2018)
Strategic Management Journal	2021	12.25	Minefee	Reexamining investor reaction to covert corporate political activity: A replication and extension of Werner (2017)

Note: 5-year impact factor data from Clarivate Analytics/Web of Science for 2021.

address. The in-depth survey of the history of the focal topic should also enable replicators to integrate their findings more meaningfully and highlight their contributions more extensively in the discussion section.

Finally, replicators, whether students or faculty, need to be conscious that they are venturing into disputed territory. Editors, for example, are likely to recruit the authors of precedent studies as reviewers. Differences between precedent studies and their replications often lead readers to consider which studies are “right” and which studies are “wrong.” However, as

outlined earlier, in most cases, each of the studies in question provide relevant and, often, complementary information. Thus, authors of replications should strive to frame their findings in ways that reduce the likelihood of defensive responses because such constructive framing is better scientific practice.

As a complementary resource, Table 2 lists management journals that have published at least one replication since 2016. A further 16 journals published replications between 2000 and 2016 but have not done so recently. In addition, as noted above, new journals such as the *Journal of Management Scientific Reports* (<https://journals.sagepub.com/home/MSR>) and *Journal of Business Venturing Insights* (<https://www.journals.elsevier.com/journal-of-business-venturing-insights>) are emerging, which have made the publication of high-quality replications an explicit focus of their mission. These new journals and the replication-promoting initiatives of established journals suggest expanding opportunities for the publication of replications.

In spite of efforts to encourage replications, the small number of published replications substantially reduces the motivation of doctoral students and their mentors to conduct them. In today's academic job market doctoral students need top-journal publications. In our conversations with methods scholars, they frequently echoed a concern voiced by one such scholar who said: "while replication studies are good for the field, they currently are not good for individual careers. I don't believe faculty can currently reasonably advise PhD students to invest in replication studies when it is clear that the career payoff on 'regular' studies is much higher." These widely held beliefs represent a severe obstacle for the proposed use of replications studies for doctoral student education. Negative short-term career prospects may prevent long-term beneficial changes.

It is, however, important to note that framing replication and novel research as a mutually exclusive choice makes it difficult for the scholarly research community to recognize and leverage their potential synergies. At many business schools, for example, first-year students are expected to start and later complete a top-journal caliber novel research project. After only two semesters of doctoral training, this is an ambitious task that only rarely succeeds or does so only with high levels of faculty involvement. Alternatively, conducting a replication during their first year can serve as a learning accelerator that enables students to design and execute subsequent original studies of much higher quality, as a result of transferable skill and insights acquired during the replication process. A successful replication also empowers students to be more valuable contributors to subsequent research collaborations with faculty members. For dissertation-stage students their empirical studies focused on novel theory extensions might directly benefit from an empirical integration with the prior research via an exact or constructive replication. A resulting carefully crafted paper reporting both replication-oriented and extension-oriented empirical studies surely has a higher publication probability than one reporting either study alone. Thus, in spite of their publication challenges, replications can strengthen doctoral students' overall publication record, while simultaneously providing more comprehensive and deeper learning experiences.

Conclusions

Replications represent a currently underutilized pedagogical tool for training doctoral students. As an experiential learning tool, it promotes not only the development of general empirical study

execution skills, but also helps students to see the value of replications and gain the skills needed to execute high-quality empirical work. Additionally, designing and conducting replication studies has the potential to strengthen students' skills in theorizing since such studies typically result from questioning why previously reported findings might recur in some situations and not in others.

One of the unique features of replications is that the replicated study provides doctoral students with substantial guidance for the design and execution of their replications. This feature enables more independent learning by students, with potential positive effects on their research self-efficacy and on targeting their learning to meet their personal research interests and developmental goals. The guidance afforded by the replicated study, however, is inherently incomplete. Consequently, faculty mentors must play a key role in enabling student learning by assisting in the choice of studies to replicate, in the execution of the replication, and in helping their students publish their replication findings in highly respected journals.

Along with greater general recognition of the usefulness of replication studies by management scholars, it is important to educate doctoral students in how to conduct high-quality replications, and show them how these replications support scientific progress. Over time, faculty-mentored student replications of the sort we have outlined in this article, promise not only to advance knowledge and best practices regarding how to conduct student replications, but also to help address the dearth of high-quality replications in the field of management. When done well, exact and constructive replications enable both knowledge accumulation and theory development in ways that expand science and practice, to their mutual benefit. For these reasons, learning and teaching how to design and execute high-quality replications should be an important component of all future-oriented doctoral programs.


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Notes

1. As a doctoral student, Wismans published two first-authored papers reporting replication studies (Wismans et al., 2020, 2021).

2. Exact replications have also been referred to as direct replications (Simons, 2014; Zwaan et al., 2018) and as literal replications (Lykken, 1968). No replication, however, can exactly repeat a prior study (Stroebe & Strack,

2014). For exact replications, deviations must be considered minor or not relevant (Bonett, 2021). Replications require the collection of new data, whereas reproductions focus narrowly on the statistical recreation of the results reported in the precedent study using the dataset gathered by the precedent study's originators (Bergh et al., 2017; Stojmenovska et al., 2019).

3. Constructive replications have also been referred to as conceptual replications (Stroebe & Strack, 2014; Tsang & Kwan, 1999), instrumental replications (Kelly et al., 1979), and extended replications (Bonett, 2012).

4. The original straw poll was posted on January 15, 2022. We followed up responses with more detailed questions primarily using email communication. However, in response to the recommendations by an anonymous JOMSR reviewer, we contacted identified doctoral students and their mentors again in December 2022.

5. We interviewed six individuals who completed replications during their doctoral education and also communicated with dozens of research-methods scholars engaged in doctoral student education.

6. Tim Simcoe (Boston University) and Gilad Chen (University of Maryland) offer methods seminars that teach students how to conduct and learn from replications.

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References

- Aguinis, H., Cascio, W. F., & Ramani, R. S. (2017). Science's reproducibility and replicability crisis: International business is not immune. *Journal of International Business Studies*, *48*(6), 653–663.
- Aguinis, H., & Cronin, M. A. (in press). It's the theory, stupid. *Organizational Psychology Review*, 204138662210806. <https://doi.org/10.1177/20413866221080629>
- Aguinis, H., Cummings, C., Ramani, R. S., & Cummings, T. G. (2020). "An A is an A." The new bottom line for valuing academic research. *Academy of Management Perspectives*, *34*(1), 135–154.
- Aguinis, H., Ramani, R. S., & Alabduljader, N. (2018). What you see is what you get? Enhancing methodological transparency in management research. *Academy of Management Annals*, *12*(1), 83–110.
- Amrhein, V., Trafimow, D., & Greenland, S. (2019). Inferential statistics as descriptive statistics: There is no replication crisis if we don't expect replication. *The American Statistician*, *73*(sup1), 262–270.
- Anderson, S. F., & Maxwell, S. E. (2016). There's more than one way to conduct a replication study: Beyond statistical significance. *Psychological Methods*, *21*(1), 1–12.
- Asendorpf, J. B., Conner, M., De Fruyt, F., De Houwer, J., Denissen, J. J. A., Fiedler, K., Fiedler, S., Funder, D. C., Kliegl, R., Nosek, B. A., Perugini, M., Roberts, B. W., Schmitt, M., Van Aken, M. A. G., Weber, H., & Wicherts, J. M. (2013). Recommendations for increasing replicability in psychology. *European Journal of Personality*, *27*(2), 108–119.
- Bamberger, P. A. (2019). On the replicability of abductive research in management and organizations: Internal replication and its alternatives. *Academy of Management Discoveries*, *5*(2), 103–108.
- Bem, D. J. (2011). Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. *Journal of Personality and Social Psychology*, *100*(3), 407–425.
- Bergh, D. D., Sharp, B. M., Aguinis, H., & Li, M. (2017). Is there a credibility crisis in strategic management research? Evidence on the reproducibility of study findings. *Strategic Organization*, *15*(3), 423–436.
- Bettis, R. A., Ethiraj, S., Gambardella, A., Helfat, C., & Mitchell, W. (2016a). Creating repeatable cumulative knowledge in strategic management: A call for a broad and deep conversation among authors, referees, and editors. *Strategic Management Journal*, *37*(2), 257–261.
- Bettis, R. A., Helfat, C. E., & Shaver, J. M. (2016b). The necessity, logic, and forms of replication. *Strategic Management Journal*, *37*(11), 2193–2203.
- Block, J. H., Fisch, C., Kanwal, N., Lorenzen, S., & Schulze, A. (in press). Replication studies in top management journals: An empirical investigation of prevalence, types, outcomes, and impact. *Management Review Quarterly*. <https://doi.org/10.1007/s11301-022-00269-6>
- Bonett, D. G. (2012). Replication-extension studies. *Current Directions in Psychological Science*, *21*(6), 409–412.
- Bonett, D. G. (2021). Design and analysis of replication studies. *Organizational Research Methods*, *24*(3), 513–529.
- Bonett, D. G., & Price, R. M. (2015). Varying coefficient meta-analysis methods for odds ratios and risk ratios. *Psychological Methods*, *20*(3), 394–406.
- Child, J. (1972a). Organizational structure, environment, and performance. *Sociology*, *6*(1), 1–22.

- Child, J. (1972b). Organization structure and strategies of control: A replication of the Aston study. *Administrative Science Quarterly*, 17(2), 163–177.
- Child, J. (1973). Strategies of control and organizational behavior. *Administrative Science Quarterly*, 18(1), 1–17.
- Child, J. (1997). From the Aston programme to strategic choice: A journey from concepts to theory. In T. Clarke (Ed.), *Advancement in Organizational Behaviour: Essays in Honour of Derek S. Pugh* (pp. 45–71). Farnham, UK: Ashgate.
- Crawford, G. C., Skorodziyevskiy, V., Frid, C. J., Nelson, T. E., Booyavi, Z., Diana, M., Hechavarria, D. M., Li, X., Reynolds, P. D., & Teymourian, E. (2022). Advancing entrepreneurship theory through replication: A case study on contemporary methodological challenges, future best practices, and an entreaty for communality. *Entrepreneurship Theory and Practice*, 46(3), 779–799.
- Cucina, J. M., & McDaniel, M. A. (2016). Pseudosocial theory proliferation is damaging the organizational sciences. *Journal of Organizational Behavior*, 37(8), 1116–1125.
- Cumming, G., & Finch, S. (2005). Inference by eye: Confidence intervals and how to read pictures of data. *American Psychologist*, 60(2), 170–180.
- Dau, L. A., Santangelo, G. D., & van Witteloostuijn, A. (2022). Replications in international business. *Journal of International Business Studies*, 53(2), 215–230.
- Dreher, G. F., Carter, N. M., & Dworkin, T. (2019). The pay premium for high-potential women: A constructive replication and refinement. *Personnel Psychology*, 72(4), 495–511.
- Eden, D. (2002). From the editors: Replication, meta-analysis, scientific progress, and AMJ's publication policy. *Academy of Management Journal*, 45(5), 841–846.
- Everett, J. A. C., & Earp, B. D. (2015). A tragedy of the (academic) commons: Interpreting the replication crisis in psychology as a social dilemma for early-career researchers. *Frontiers in Psychology*, 6(1152), 1–4.
- Fecher, B., Fräßdorf, M., & Wagner, G. G. (2016). Perceptions and practices of replication by social and behavioral scientists: Making replications a mandatory element of curricula would be useful. DIW Berlin Discussion Paper No. 1572. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.2768629>.
- Fisher, R. A. (1966). *The design of experiments*. Edinburgh, UK: Oliver and Boyd.
- Frank, M. C., & Saxe, R. (2012). Teaching replication. *Perspectives on Psychological Science*, 7(6), 600–604.
- Galak, J., LeBoeuf, R. A., Nelson, L. D., & Simmons, J. P. (2012). Correcting the past: Failures to replicate psi. *Journal of Personality and Social Psychology*, 103(6), 933–948.
- Gelman, A., & Stern, H. (2006). The difference between “significant” and “not significant” is not itself statistically significant. *The American Statistician*, 60(4), 328–331.
- Goldfarb, B., & King, A. A. (2016). Scientific apophenia in strategic management research: Significance tests and mistaken inference. *Strategic Management Journal*, 37(1), 167–176.
- Gronau, Q. F., Heck, D. W., Berkhout, S. W., Haaf, J. M., & Wagenmakers, E. J. (2021). A primer on Bayesian model-averaged meta-analysis. *Advances in Methods and Practices in Psychological Science*, 4(3), 1–19.
- Hambrick, D. C. (2007). The field of management's devotion to theory: Too much of a good thing? *Academy of Management Journal*, 50(6), 1346–1352.
- Hammond, M. M., Schyns, B., Lester, G. V., Clapp-Smith, R., & Thomas, J. S. (in press). The romance of leadership: Rekindling the fire through replication of Meindl and Ehrlich. *The Leadership Quarterly*. <https://doi.org/10.1016/j.leafqua.2021.101538>
- Hawkins, R. X., Smith, E. N., Au, C., Arias, J. M., Catapano, R., Hermann, E., & Frank, M. C. (2018). Improving the replicability of psychological science through pedagogy. *Advances in Methods and Practices in Psychological Science*, 1(1), 7–18.
- Hodgkinson, G. P., & Rousseau, D. M. (2009). Bridging the rigour-relevance gap in management research: It's already happening! *Journal of Management Studies*, 46(3), 534–546.
- Hofling, C. K., Brotzman, E., Dalrymple, S., Graves, N., & Pierce, C. M. (1966). An experimental study in nurse-physician relationships. *Journal of Nervous and Mental Disease*, 143(2), 171–180.
- Hubbard, R. (2016). *Corrupt research: The case for reconceptualizing empirical management and social science*. Los Angeles, CA: Sage Publications
- Ioannidis, J. P. A. (2018). Why replication has more scientific value than original discovery. *Behavioral and Brain Sciences*, 41, E137.
- Janz, N. (2016). Bringing the gold standard into the classroom: Replication in university teaching. *International Studies Perspectives*, 17(4), 392–407.

- Kane, E. J. (1984). Why journal editors should encourage the replication of applied econometric research. *Quarterly Journal of Business and Economics*, 23(1), 3–8.
- Kelly, C. W., Chase, L. J., & Tucker, R. K. (1979). Replication in experimental communication research: An analysis. *Human Communication Research*, 5(4), 338–342.
- Kirschner, P., Sweller, J., & Clark, R. E. (2006). Why unguided learning does not work: An analysis of the failure of discovery learning, problem-based learning, experiential learning and inquiry-based learning. *Educational Psychologist*, 41(2), 75–86.
- Köhler, T., & Cortina, J. M. (2021). Play it again, Sam! An analysis of constructive replication in the organizational sciences. *Journal of Management*, 47(2), 488–518.
- Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development*. Upper Saddle River, NJ: Prentice Hall.
- König, A., Graf-Vlachy, L., & Schöberl, M. (2021). Opportunity/threat perception and inertia in response to discontinuous change: Replicating and extending Gilbert (2005). *Journal of Management*, 47(3), 771–816.
- LeBel, E. P., Vanpaemel, W., Cheung, I., & Campbell, L. (2019). A brief guide to evaluate replications. *Meta-Psychology*, 3, 1–9. <https://doi.org/10.15626/MP.2019>
- Locke, E. A. (2015). Theory building, replication, and behavioral priming: Where do we need to go from here? *Perspectives on Psychological Science*, 10(3), 408–414.
- Locke, E. A., & Latham, G. P. (2020). Building a theory by induction: The example of goal setting theory. *Organizational Psychology Review*, 10(3–4), 223–239.
- Lykken, D. T. (1968). Statistical significance in psychological research. *Psychological Bulletin*, 70(3), 151–159.
- Marwick, B., Wang, L. Y., Robinson, R., & Loisel, H. (2020). How to use replication assignments for teaching integrity in empirical archaeology. *Advances in Archaeological Practice*, 8(1), 78–86.
- Miller, C. C., & Bamberger, P. (2016). Exploring emergent and poorly understood phenomena in the strangest of places: The footprint of discovery in replications, meta-analyses, and null findings. *Academy of Management Discoveries*, 2(4), 313–319.
- Minifiee, I., McDonnell, M. H., & Werner, T. (2021). Reexamining investor reaction to covert corporate political activity: A replication and extension of Werner (2017). *Strategic Management Journal*, 42(6), 1139–1158.
- Nicholson, N., Cole, S. G., & Rocklin, T. (1985). Conformity in the Asch situation: A comparison between contemporary British and US university students. *British Journal of Social Psychology*, 24(1), 59–63.
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716.
- Patil, S. V. (2019). “The public doesn’t understand”: The self-reinforcing interplay of image discrepancies and political ideologies in law enforcement. *Administrative Science Quarterly*, 64(3), 737–769.
- Perrin, S., & Spencer, C. (1981). Independence or conformity in the Asch experiment as a reflection of cultural and situational factors. *British Journal of Social Psychology*, 20(3), 205–209.
- Platt, J. (1964). Strong inference: Certain systematic methods of scientific thinking may produce much more rapid progress than others. *Science*, 146(3642), 347–353.
- Pugh, D. S., Hickson, D. J., Hinings, C. R., & Turner, C. (1968). Dimensions of organization structure. *Administrative Science Quarterly*, 13(1), 65–105.
- Rank, S. G., & Jacobson, C. K. (1977). Hospital nurses’ compliance with medication overdose orders: A failure to replicate. *Journal of Health and Social Behavior*, 18(2), 188–193.
- Ritchie, S. J., Wiseman, R., & French, C. C. (2012). Failing the future: Three unsuccessful attempts to replicate Bem’s ‘retroactive facilitation of recall’ effect. *PLoS One*, 7(3), e33423.
- Rousseau, D. M., Manning, J., & Denyer, D. (2008). Evidence in management and organizational science: Assembling the field’s full weight of scientific knowledge through syntheses. *Academy of Management Annals*, 2(1), 475–515.
- Sanchez-Ku, M. L., & Arthur, W. (2000). A dyadic protocol for training complex skills: A replication using female participants. *Human Factors*, 42(3), 512–520.
- Schwab, A., Abrahamson, E., Fiedler, F., & Starbuck, W. H. (2011). Researchers should make thoughtful assessments instead of null-hypothesis significance tests. *Organization Science*, 22(4), 1105–1120.
- Schwab, A., & Starbuck, W. H. (2017). A call for openness in research reporting: How to turn covert practices into helpful tools. *Academy of Management Learning and Education*, 16(1), 125–141.

- Shanks, D. R., Newell, B. R., Lee, E. H., Balakrishnan, D., Ekelund, L., Cenac, Z., & Moore, C. (2013). Priming intelligent behavior: An elusive phenomenon. *PLoS One*, *8*(4), e56515.
- Simons, D. J. (2014). The value of direct replication. *Perspectives on Psychological Science*, *9*(1), 76–80.
- Sodhi, M. M. S., & Tang, C. S. (2014). Guiding the next generation of doctoral students in operations management. *International Journal of Production Economics*, *150*, 28–36.
- Standing, L. G. (2016). How to use replication team projects in a research methods course. In W. Altman, L. Stein, & J. Westfall (Eds.), *Essays from Excellence in Teaching* (Vol. 15, pp. 26–31). Washington, DC: Society for the Teaching of Psychology.
- Standing, L. G., Grenier, M., Lane, E. A., Roberts, M. S., & Sykes, S. J. (2014). Using replication projects in teaching research methods. *Psychology Teaching Review*, *20*(1), 96–104.
- Starbuck, W. H. (2006). *The production of knowledge: The challenge of social science research*. Oxford, UK: Oxford University Press.
- Stojmenovska, D., Bol, T., & Leopold, T. (2019). Teaching replication to graduate students. *Teaching Sociology*, *47*(4), 303–313.
- Stroebe, W., & Strack, F. (2014). The alleged crisis and the illusion of exact replication. *Perspectives on Psychological Science*, *9*(1), 59–71.
- Toncar, M. F., & Munch, J. M. (2010). Meaningful replication: When is a replication no longer a replication? A rejoinder to Stella and Adam (2008). *Journal of Marketing Theory and Practice*, *18*(1), 71–80.
- Tsang, E. W., & Kwan, K. M. (1999). Replication and theory development in organizational science: A critical realist perspective. *Academy of Management Review*, *24*(4), 759–780.
- Tullett, A. M., & Vazire, S. (2018). Scientific progress is like doing a puzzle, not building a wall. *Behavioral and Brain Sciences*, *41*, E154.
- Wagenmakers, E.-J., Wetzels, R., Borsboom, D., & van der Maas, H. L. J. (2011). Why psychologists must change the way they analyze their data: The case of psi: Comment on Bem (2011). *Journal of Personality and Social Psychology*, *100*(3), 426–432.
- Wagge, J. R., Brandt, M. J., Lazarevic, L. B., Legate, N., Christopherson, C., Wiggins, B., & Grahe, J. E. (2019). Publishing research with undergraduate students via replication work: The collaborative replications and education project. *Frontiers in Psychology*, *10*(247), 1–4.
- Wismans, A., Kamei, K., Thurik, R., & Torrès, O. (2021). The link between attention-deficit hyperactivity disorder symptoms and entrepreneurial orientation in Japanese business owners. *Management Review Quarterly*, *71*(4), 857–872.
- Wismans, A., Thurik, R., Verheul, I., Torrès, O., & Kamei, K. (2020). Attention-deficit hyperactivity disorder symptoms and entrepreneurial orientation: A replication note. *Applied Psychology*, *69*(3), 1093–1112.
- Wolfson, M. A., & Mathieu, J. E. (2021). Deploying human capital resources: Accentuating effects of situational alignment and social capital resources. *Academy of Management Journal*, *64*(2), 435–457.
- Zwaan, R. A., Etz, A., Lucas, R. E., & Donnellan, M. B. (2018). Making replication mainstream. *Behavioral and Brain Sciences*, *41*, E120.