



Viewpoint

Infusing pre-registration into tourism research

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1. Background

Contemporary science, as we know it, is at a crossroads. From how research is funded to how knowledge is shared, the scientific enterprise is grappling with myriad concerns over the practice, development, and institution of science. The reproducibility crisis—arguably the most visible crack in the edifice of science—is a prime example. Public trust in science partly hinges on the assurance that empirical investigations can be intersubjectively verified and replicated. Yet a *Nature* survey involving 1576 scientists revealed that “More than 70% of researchers have tried and failed to reproduce another scientist’s experiments, and more than half have failed to reproduce their own experiments” (Baker, 2016, p. 452). This crisis has ignited fervent debates across social science domains.

In response to the reproducibility issue and others, the open science movement has recently gained traction as well as widespread academic support. Open science practices aim to foster transparency, rigor, and inclusivity in all scientific endeavors (Bosnjak et al., 2022). To this end, this movement advocates for pre-registration as a valuable tool to mitigate potential biases, such as publication bias and confirmation bias. The movement also promotes data and code sharing to facilitate verification and replication, open access publishing to remove barriers to knowledge dissemination, and independent replication studies to validate original research findings. Additionally, online platforms and tools are emerging to support scholarly collaboration along with efforts to increase peer review transparency (Nosek et al., 2015). This commentary focuses on pre-registration, one of the most popular open science practices.

2. Definition and types

Pre-registration refers to planning and documenting an analysis (or set of analyses) prior to gathering data (Nosek et al., 2018; Simmons et al., 2021). Depending on the research design (e.g., experiment, secondary data analysis, qualitative study), pre-registration typically involves creating a time-stamped document that includes details such as hypotheses, a sampling strategy, interview guides, exclusion criteria, and/or analysis plans. This document can range from an outline to a comprehensive description of a paper’s introduction, literature review, and methods. Although the format might seem novel, pre-registration plans share the same premise as grant or dissertation proposals: they document decisions made before initiating a study.

Pre-registration largely falls under two types: general pre-registration/unreviewed pre-registration and registered reports (including a specialized form, registered replication reports [RRRs]; Chambers & Tzavella, 2022). In the first category, researchers deposit their study plan (e.g., hypotheses and methods) in a public archive before gathering data. This document can be shared with reviewers during submission and with peers after publication. The review process for this type of study is identical to a traditional review, with the added assurance for reviewers of knowing all materials, procedures, and methods were documented beforehand.

Registered reports, also known as peer-reviewed pre-registrations, undergo two-stage peer review. First, researchers submit their detailed research plan (e.g., research question [s], literature review, hypotheses, method, planned analysis) to a journal before conducting the study. Invited review at this stage focuses on the plan’s theoretical and

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methodological rigor rather than anticipated findings. A favorable review results in in-principle acceptance, committing the journal to publish the research, regardless of results. In Stage 2, after completing the study, authors submit a manuscript indicating whether the study adhered to the pre-registered plan and whether conclusions were supported by the evidence. Although modifications are allowed, any deviations must be documented, and unplanned analyses should be explicitly identified. Importantly, the second-stage review does not re-evaluate theoretical foundations or the overall research plan (Chambers & Tzavella, 2022).

RRRs directly replicate influential studies. Similar to registered reports, RRR protocols must be peer reviewed and accepted before data collection. This format uniquely fosters collaboration by enabling multiple research teams to replicate a study using an agreed-upon protocol. Their findings are then presented collectively irrespective of individual outcomes.

Notably, no matter the pre-registration type, authors do not immediately make research plans public on pre-registration platforms to prevent possible information leakage: a plan is only disclosed after article acceptance. Pre-registration offers a potential safeguard against plagiarism—or, at the very least, serves as documentation in case it occurs. Even if not published, a time-stamped pre-registration shows proof of when researchers claimed an idea as their own. Relatedly, all pre-registered papers undergo double-blind peer review; reviewers are aware that a study has been pre-registered but do not know authors' identities.

The growing prevalence of pre-registered studies in disciplines such as psychology and marketing suggests burgeoning recognition of this practice's value. For instance, in 2022, at least 30% of articles published in *Journal of Consumer Research* included pre-registered studies; this proportion reached 58% in social psychology journals like *Journal of Personality and Social Psychology*.¹ More journals have begun urging authors to include at least one pre-registered study in submissions. However, a quick Google Scholar search on keywords such as “preregistered + tourism + travel” in December 2023 returned no more than 10 papers in tourism journals featuring pre-registration.

3. Advantages of pre-registration

The benefits of pre-registration are manifold (Krypotos et al., 2022). First and foremost, it can greatly diminish researchers' engagement in questionable research practices (QRPs; Simmons et al., 2021). These practices include HARKing (hypothesizing after results known, also known as P-hacking), flexibly using data analyses to confirm an otherwise unsupported hypothesis, and collecting data until the null hypothesis has been rejected in null hypothesis significance testing. The alarming frequency of QRPs demands that research practices be overhauled and that robust preventative measures be implemented. Several methods have been proposed to put a stop to QRPs, such as revamped incentives, ethics training, an emphasis on quality, and open data/-replication. Given the challenges posed by a rapidly evolving research reward culture and obstacles in sharing data and performing replicability studies, pre-registration appears a particularly feasible solution. Pre-registration curbs QRPs by forcing upfront planning and shifting the review focus. Instead of cherry-picking significant results, researchers commit to specifics (hypotheses, samples, analyses) before obtaining data. Especially for registered reports, reviewers assess a study's merits and methods—not just statistical significance (Chambers & Tzavella, 2022).

Beyond amplifying transparency and reducing bias, pre-registration encourages meticulous pre-planning. Making research documentation publicly available enhances accountability (van't Veer & Giner-Sorolla, 2016) and signals researchers' confidence in their methods.

Pre-registered studies can even earn a “pre-registration” badge. This symbol is a hallmark of trust among reviewers, peers, and the public, highlighting researchers' dedication to upfront decision making. Choosing a registered report also allows for early feedback and possible in-principle acceptance before data collection. A more rigorous research process then follows.

4. Pre-registration platforms and usage examples

Two popular pre-registration platforms are *aspredicted* (aspredicted.org) and *osf* (osf.io). [Aspredicted.org](https://aspredicted.org) allows scholars to pre-register a study by answering eleven straightforward questions about their research design and analyses. *Osf.io* offers more detailed templates that contain wide-ranging questions. Taking aspredicted.org as an example, a researcher starts the process by signing in at <https://aspredicted.org> and then clicking on “Create a new pre-registration.” A list of questions is compiled upon entering one's email address (and those of co-researchers, if applicable). [Table 1](#) lists sample answers to these

Table 1
Sample answers to pre-registration questions at [Aspredicted.org](https://aspredicted.org).

Items	Sample answers
1) <i>Data Collection</i> . Have any data been collected for this study already?	Select “No” by default to continue.
2) <i>Hypothesis</i> . What's the main question being asked or hypothesis being tested in this study?	We are investigating whether happiness increases tourists' preferences for leisure destinations.
3) <i>Dependent Variable</i> . Describe the key dependent variable(s), specifying how they will be measured.	Participants will rate their preferences for leisure destinations, adventure destinations, wellness destinations, and cultural destinations on 7-point scales (1 = <i>not at all</i> ; 7 = <i>extremely</i>). Preference for leisure destinations will be defined as the difference between a participant's rating of leisure destinations and their average rating of the three non-leisure destination options.
4) <i>Conditions</i> . How many and which conditions will participants be assigned to?	Before rating their destination preferences, participants will be randomly assigned to one of three conditions in which they will watch a clip from either a sad film (<i>My Dog Skip</i>), a happy film (<i>Pitch Perfect</i>), or a neutral film (<i>Gone With the Wind</i>).
5) <i>Analyses</i> . Specify exactly which analyses you will conduct to examine the main question/hypothesis.	We will run an ordinary least squares regression to predict participants' preference for the leisure destination by condition (1 = sad film; 0 = happy or neutral film). We will control for gender (1 = male; 0 = female) in our analysis.
6) <i>Outliers and Exclusions</i> . Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.	We will exclude participants who fail at least two of the three attention checks provided at the start of our study (before the experimental manipulation).
7) <i>Sample Size</i> . How many observations will be collected or what will determine sample size? (No need to justify decision, but be precise about exactly how the number will be determined).	Data collection will cease once 150 participants have responded on MTurk. Deviations from this goal would be entirely due to MTurk software and outside of our control.
8) <i>Other</i> . Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned)	Fill in as appropriate
9) <i>Name</i> . Give a title for this <i>Aspredicted</i> pre-registration	Fill in as appropriate
10) <i>Type of Study</i>	Class project or assignment/ Experiment/Survey/Observational/ archival study/Other:
11) <i>Data Source</i>	Prolific/MTurk/University lab/Field experiment/Randomized controlled trial/Other

Note: Sample answers were mostly adapted from [Simmons et al. \(2021\)](#) to suit a tourism context.

¹ <https://datacolada.org/115>.

questions to guide users through the pre-registration process.

5. Debunking myths

Pre-registration faces criticism in four respects: 1) excessive rigidity; 2) limited applicability to exploratory or qualitative research; 3) failure to eliminate QRPs; and 4) accompanying increases in workload and complexity. Despite claims that the practice hinders flexibility and creativity (Krypotos et al., 2022), pre-registration does not restrict research as feared; it instead inspires transparency by outlining questions, methods, and analyses in advance. Contrary to misconceptions, it also does not prevent exploratory or additional analyses beyond the initial plan. It rather promotes full disclosure of analyses and differentiates planned from unplanned ones (Simmons et al., 2021). This clarity reinforces integrity, allows for preliminary analyses without concerns about P-hacking, and aids in hypothesis generation for subsequent studies.

Skeptics argue pre-registration only benefits confirmatory quantitative studies. Yet its advantages for exploratory or qualitative research are increasingly apparent (Haven et al., 2020). Even though exploratory studies inherently investigate data without specific hypotheses, pre-registering this process (e.g., outlining initial research questions, methods, criteria for data exploration, and analytic techniques) helps distinguish hypothesis-driven and exploratory findings. A template for qualitative research has in fact been devised (see <https://osf.io/j7ghv/>) to facilitate pre-registration.

Pre-registration may not necessarily eradicate QRPs, but it places a spotlight on them. Requiring upfront plans (hypotheses, methods, analyses) makes deviations stand out. Pre-registered protocols can potentially be manipulated, but the openness of the process acts as a deterrent. The research community's push for more stringent standards further reduces this risk. Pre-registration ultimately contributes to a more reproducible and honest research culture.

Finally, in spite of apprehensions about added complexity (particularly for pre-registered reports), the pre-registration process is straightforward (see Table 1). It involves thinking about design and analysis before data collection, with no additional burden. Even pre-registered reports, which are subject to early peer review, come with more benefits than drawbacks: they help refine studies and boost acceptance chances. Platforms such as aspredicted.org have witnessed substantial growth in the number of pre-registered studies since 2015 (Simmons et al., 2021). With 300+ journals in various disciplines accepting articles with pre-registered reports (Chambers & Tzavella, 2022), pre-registration's popularity implies that workload-related concerns are unfounded.

6. Conclusions

The scientific landscape is undergoing a metamorphosis, driven by a desire to democratize knowledge and enhance rigor. By tackling bias,

ensuring transparency, and setting ground rules, pre-registration can bolster replicability, collaboration, and inclusivity in the scientific community. It is an integral component of the broader movement toward open science practices, which intend to strengthen the reliability and credibility of scientific research. Numerous tourism-adjacent disciplines, such as economics, psychology, management, sociology, and geography, have already adopted pre-registration and other open science practices.

We acknowledge pre-registration's limitations and do not consider it a panacea. However, its prospective benefits coupled with the ongoing scientific shift make pre-registration a compelling option. As a first step, we would urge tourism scholars to have well-informed conversations about pre-registration's merits and drawbacks. Introductory training and trial runs should be completed. Leading tourism journals are recommended to develop comprehensive guidance for studies employing pre-registrations, specifically addressing policies and procedures on the publication of and adherence to registered protocols. This commentary is meant to spark such discussion. Even though the tourism field may be a latecomer to pre-registration, we approach this transition optimistically: there may indeed be a "late mover advantage" in that tourism academics can learn from and address concerns about pre-registration practices, putting us on track for smoother and more effective implementation. The pre-registration initiative holds promise for solidifying tourism studies' transparency, replicability, and precision. Ultimately, infusing pre-registration into tourism research has the potential to elevate the field's academic standing. The tide of pre-registration is rising in social science, with tourism research poised to catch the wave.

References

- Baker, M. (2016). Reproducibility crisis. *Nature*, 533(26), 353–366.
- Bosnjak, M., Fiebach, C. J., Mellor, D., Mueller, S., O'Connor, D. B., Oswald, F. L., & Sokol, R. I. (2022). A template for preregistration of quantitative research in psychology: Report of the joint psychological societies preregistration task force. *American Psychologist*, 77(4), 602–615.
- Chambers, C. D., & Tzavella, L. (2022). The past, present and future of registered reports. *Nature Human Behaviour*, 6(1), 29–42.
- Haven, T. L., Errington, T. M., Gleditsch, K. S., van Grootel, L., Jacobs, A. M., Kern, F. G., Piñeiro, R., Rosenblatt, F., & Mokkink, L. B. (2020). Preregistering qualitative research: A delphi study. *International Journal of Qualitative Methods*, 19, 1–13.
- Krypotos, A. M., Mertens, G., Klugkist, I., & Engelhard, I. M. (2022). Preregistration: Definition, advantages, disadvantages, and how it can help against questionable research practices. In *Avoiding questionable research practices in applied psychology* (pp. 343–357). Cham: Springer International Publishing.
- Nosek, B. A., Alter, G., Banks, G. C., Borsboom, D., Bowman, S. D., Breckler, S. J., & Yarkoni. (2015). Promoting an open research culture. *Science*, 348(6242), 1422–1425.
- Nosek, B. A., Ebersole, C. R., DeHaven, A. C., & Mellor, D. T. (2018). The preregistration revolution. *Proceedings of the National Academy of Sciences*, 115(11), 2600–2606.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2021). Pre-registration: Why and how. *Journal of Consumer Psychology*, 31(1), 151–162.
- Van't Veer, A. E., & Giner-Sorolla, R. (2016). Pre-registration in social psychology—a discussion and suggested template. *Journal of Experimental Social Psychology*, 67, 2–12.