RATIONALITY & COMPETITION
CRC TRR 190

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Discussion Paper No. 530

April 18, 2025

Collaborative Research Center Transregio 190 | www.rationality-and-competition.de
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Abstract

The open science movement has gained significant momentum over the past decade, with pre-registration and the use of pre-analysis plans being central to ongoing debates. Combining observational evidence on trends in adoption with survey data from 519 researchers, this study examines the adoption of pre-registration (potentially but not necessarily including pre-analysis plans) in experimental economics. Pooling statistics from 19 leading journals published between 2017 and 2023, we observe that the number of papers containing a pre-registration grew from seven per year to 190 per year. Our findings indicate that pre-registration has now become mainstream in experimental economics, with two-thirds of respondents expressing favorable views and 86% having pre-registered at least one study. However, opinions are divided on the scope and comprehensiveness of pre-registration, highlighting the need for clearer guidelines. Researchers assign a credibility premium to pre-registered tests, although the exact channels remain to be understood. Our results suggest growing support for open science practices among experimental economists, with demand for professional associations to guide researchers and reviewers on best practices for pre-registration and other open science initiatives.

JEL Classification codes: A14, C12, C18, C80, C90, I23
Keywords: pre-registration, pre-analysis plans, experimental economics, open science

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1 Introduction

The open science movement has substantially expanded over the last 10-15 years. Within it, one growing practice that remains debated is pre-registration and the use of pre-analysis plans. Although the exact definition of this practice varies across disciplines— and even among researchers within the same field— the central idea is to publicly register a research plan (including hypotheses, experimental design, and statistical analyses) before the outcomes are known (Hardwicke and Wagenmakers, 2023). It is intended to reduce the risk of questionable research practices (QRPs; John, Loewenstein and Prelec, 2012) by clearly distinguishing between confirmatory and exploratory analyses.

This practice is particularly common in certain disciplines, such as clinical trials in medical research and psychology, where a certain level of standardization seems to have taken place (De Angelis et al., 2004; Dickersin and Rennie, 2012; Hardwicke and Vazire, 2024). Pre-registration was introduced to economics with the launch of the American Economic Association's registry for randomized controlled trials (AEA RCT Registry) in 2013, aiming to create a central registry that tracks ongoing, completed, and even withdrawn trials (Katz et al., 2013). Initially focused on RCTs and field experiments— where replication is challenging or unfeasible— it expanded to experimental economics as a whole. Since then, pre-registration has gained traction and continues to grow (Figure 1; Christensen, Freese and Miguel, 2019). However, its adoption within economics remains diverse, with ongoing debates about its costs and benefits, as well as its applicability beyond experimental studies (Coffman and Niederle, 2015; Olken, 2015; Christensen and Miguel, 2018; Camerer, Dreber and Johannesson, 2019; Banerjee et al., 2020; Miguel, 2021; Dreber and Johannesson, 2025).[1,2]

We aim to document and understand the diversity of practices and perspectives within the economics profession, with a specific focus on experimental economics. This focus is driven by the particularly dynamic discussions in this field, where experimental researchers have the advantage of generating their own data by controlling the data-generating process. To achieve this, we take a two-step approach. First, we analyze the adoption trends of pre-registration in experimental economics by examining papers published between 2017 and 2023 in 19 leading economics journals. Second, we complement this observational dataset with survey data from a sample of 519 researchers in experimental economics, exploring their experiences with pre-

[1]Even in psychology, where pre-registration has become a common practice, researchers have questioned its effectiveness (Kupferschmidt, 2018). For example, critics argue that while pre-registration was introduced to curb QRPs, it is not well-suited to strengthening the theoretical foundation of studies (Muthukrishna and Henrich, 2019; Oberauer and Lewandowsky, 2019; Szollosi et al., 2020). Beyond this, common concerns include the difficulty of developing contingent plans and the additional time costs involved (van't Veer and Giner-Sorolla, 2016). Similar debates have emerged in other disciplines, including political science (Monogan III, 2015) and consumer psychology (Simmons, Nelson and Simonsohn, 2021; Pham and Oh, 2021).

[2]The applicability of pre-registration to other research designs, such as observational studies, has been discussed in medical research, but no consensus has been reached (Loder, Groves and MacAuley, 2010; Dal-Ré et al., 2014). A major challenge in pre-registering studies that use pre-existing data is the difficulty in verifying that researchers pre-registered their studies before analyzing the data (Christensen and Miguel, 2018).

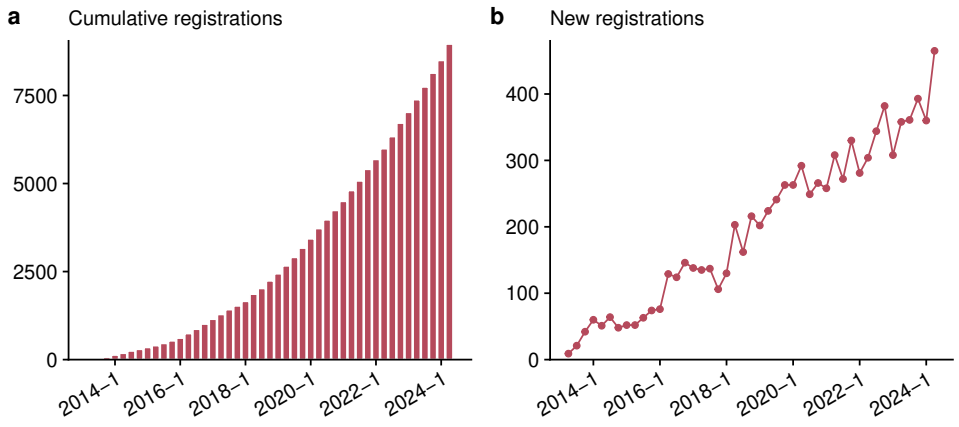

Figure 1: Registrations in the AEA RCT Registry, May 2013 to June 2024. *Notes*: This is a reproduction and extension of Figure 5 in Christensen and Miguel (2018), incorporating updated data from the AEA RCT Registry (AEA RCT Registry, 2024). Different from the original, the data is aggregated at the quarterly level rather than the monthly level.

registration, their beliefs about prevailing norms, and their views on the practice.[3]

Echoing previous work, we document that the number of published papers containing a pre-registered experimental study significantly grew over the period, going from seven in 2017 to 190 in 2023. Most of this increase comes from studies pre-registered on the AEA RCT Registry and the Open Science Framework, and the upward trend is particularly pronounced for papers published in *American Economic Journal: Applied Economics*, *Experimental Economics*, *Journal of Development Economics*, *Journal of Economic Behavior & Organization*, and *Journal of Public Economics*.

The above trends are largely reflected in our survey data, suggesting that pre-registration has now become a mainstream practice. About two-thirds of respondents expressed favorable views toward pre-registration, and 86% had at least one pre-registered research project at the time of taking the survey. Signaling credibility and meeting journal requirements emerged as the primary motives for pre-registering a study, while the need to explore the data and the time costs of pre-registration were among the main reasons against pre-registration.

Researchers could agree on the broad idea of pre-registration but disagree on its scope and implementation details, which we explore next. Regarding scope, a majority of respondents considered that all types of experiments should be pre-registered. Specifically, two-thirds mentioned the need to pre-register lab/online studies, and three-quarters mentioned field/RCT studies. There was also general agreement that the pre-registration should contain clear hypotheses and provide transparency about the amount of data collected and analyzed. However, views were far more split on how comprehensive a pre-registration should be and on the way pre-registration platforms should be designed, including the level of standardiza-

[3]While our focus is on experimental economics, similar discussions would also benefit other areas of economics using pre-existing data (Burlig, 2018; Miguel, 2021), in particular since the evidence suggests that experimental economics and the experimental methods in general exhibit less evidence of p-hacking than other subfields and methods used in economics (Brodeur et al., 2016; Brodeur, Cook and Heyes, 2020).

tion and transparency they should offer.

A broad consensus also emerged regarding the implementation and reporting of pre-registered analyses. A majority of respondents considered that researchers should be allowed to deviate from their pre-registration as much as they want as long as deviations are clearly documented and motivated, and 80% of respondents would like clear reporting in papers of which studies and treatments were pre-registered. This would suggest that the experimental community perceives *transparent* deviations from pre-registration as generally acceptable.

Although properly labeled deviations are judged acceptable, respondents assign a credibility premium to statistically significant results coming from pre-registered hypothesis tests. This perceived credibility premium is associated with beliefs that pre-registration enhances the transparency and replicability of research. On the other hand, a significant proportion of respondents anticipate a negative impact of pre-registration on research creativity and research volume.

The credibility of pre-registration as a vector of transparency, however, hinges on whether any monitoring occurs. On that front, 70% of respondents reported checking pre-registration documents at least some of the time when conducting a review, suggesting that the amount of monitoring is non-trivial. At the same time, views appeared somewhat split on whose responsibility it is to check pre-registration documents, suggesting the need for a more structured discussion on how the monitoring should be organized at the community level.

Showing demand for norm clarification, over three-quarters of respondents would like professional associations such as the Economic Science Association (ESA) to provide guidelines to authors and reviewers on pre-registration, and a slightly smaller majority would like the practice to be encouraged. However, less than one-quarter would be in favor of a mandate. Beyond pre-registration, views on other open science practices appear even more favorable. Among them, respondents were almost unanimously favorable to replications and open data. Most respondents were also favorable to pre-results review and Registered Reports, i.e., review and "in-principle" acceptance of papers before the data are collected (Chambers and Tzavella, 2022; Arpinon and Espinosa, 2023). Taken together, these findings suggest that professional associations such as the ESA could play a key role in guiding the community toward more open science as there is a clear demand for it.

Our study is clearly not the first one to document the diversity of practices and views on the use of pre-registration within the scientific community. Recent survey efforts (Bakker et al., 2021; Logg and Dorison, 2021; Toribio-Flórez et al., 2021; Sarafoglou et al., 2022; Ferguson et al., 2023; Spitzer and Mueller, 2023) examine the attitudes, behaviors, and perceptions of social science researchers in a range of disciplines. Within economics, most of the data on pre-registration practices makes use of the AEA RCT Registry and essentially focuses on RCTs/field studies (Abrams, Libgober and List, 2023; Ofosu and Posner, 2023; Brodeur et al., 2024*b*). Instead, our study covers all types of experiments, including lab and online studies, and offers a broad examination of pre-registration practices and their different modes of ex-

pression. We also offer a comprehensive overview of the existing theoretical and empirical literature on the topic, current registration platforms, and journal policies.

The rest of this article proceeds as follows. Section 2 describes the construction of our observational dataset and main findings. Section 3 describes our survey design and sample, while Section 4 presents the main results from this survey. Section 5 discusses the trade-offs surrounding pre-registration, views on other open science practices, and the next directions. A detailed review of the literature is provided in Online Appendix C. It surveys empirical, theoretical, and methodological work focusing on how pre-registrations are written, adhered to, and communicated. It highlights findings on reviewer scrutiny, the role of journals, researcher motivations, and the impact of pre-registration on transparency, creativity, and overall research quality across disciplines.

The survey presented in this paper (Sections 3 and 4) was pre-registered on the Open Science Framework (`https://osf.io/e5yz4/`), while the observational study (Section 2) was not. Like many authors of pre-registered studies, we face the challenge of handling deviations from the pre-registration— specifically, deciding whether, where, and how to report both pre-registered and unregistered analyses. Our guiding principle in addressing these questions is transparency. Within this constraint, we also try to maximize readability. To achieve this, we adopt the following approach:

1. The results of all pre-registered hypotheses are mentioned in the paper. Some results are reported more succinctly than others, and the order of hypotheses differs from the pre-registration. We structured hypotheses in the pre-analysis plan (PAP) by importance (primary, secondary, and exploratory). However, organizing the results by topics (pre-registration, implementation, other open science practices) improved readability by reducing repetition. To ensure full transparency and facilitate comparison with the PAP, we reference the pre-registered hypotheses in bold within braces (e.g., **Primary Hypothesis 1** or **Exploratory Hypothesis 2**). Table A.3 in the Online Appendix indicates where the results of pre-registered hypotheses can be found. The full populated PAP is provided in Online Appendix D for reference.
2. All tests that were not pre-registered are labeled **unregistered exploratory**. We remind readers here that these exploratory analyses carry limited weight and should primarily be viewed as hypothesis-generating for future studies. If an entire section or subsection reports unregistered hypotheses, we indicate this only once in the heading.
3. Purely descriptive results (those not involving statistical tests) are not labeled.

Of course, this is just one way to communicate adherence to and deviations from pre-analysis plans, and we do not claim that our approach is the only or best one. As you will see, experimental economists hold diverse views on this issue, and the author team is no exception.

2 Observational Data (Unregistered Exploratory)

We examine patterns of pre-registration among papers containing an experimental study and published over the period 2017-2023 in 19 leading economics journals listed in Table A.1 in the Online Appendix.

2.1 Dataset Construction

We downloaded all papers from these journals and conducted a full-text keyword search to identify articles that included one or more keywords related to pre-registration and pre-analysis plans (e.g., `analysis plan`, `pap`, `pre-regist`), registry names (e.g., `aea rct`, `osf`, `aspredicted`), and experiment types (e.g., `laboratory`, `online`, `field`, `rct`).[4] See Table A.2 in the Online Appendix for the full list of keywords used. Of the 13,828 PDF files we have, 3,331 (24%) contain at least one keyword related to both pre-registration or pre-analysis plans and experiments. Full-text keyword searches may occasionally flag papers that do not actually include pre-registration or pre-analysis plans. For instance, a paper that theoretically discusses the concept of pre-registration without presenting empirical or experimental data might still trigger a "hit" in our search process. Conversely, we might miss papers that do include pre-registration or pre-analysis plans if the authors describe them in an unconventional way. While addressing the latter issue is difficult, to mitigate the former, our assistants manually reviewed the papers identified through the keyword search. The research team addressed any ambiguities raised by the assistants and reviewed a randomly selected subset of the papers.[5] At the end of the process, we identified 582 experimental (laboratory, online, or field) papers that had at least one corresponding pre-registration and/or pre-analysis plan.[6] See Online Appendix A.1 for details of data construction.

2.2 Trends in Pre-Registration

Result 1. *The number of published papers containing a pre-registered experimental study grew significantly between 2017-2023, with the exception of 2022, likely due to the impact of COVID-19.*

Figure 2, panel (a) illustrates the total number of published papers with at least one pre-registered experiment across all 19 journals in our sample, for each year between 2017 and 2023. We present this trend by both pooling all studies with any form of pre-registration and breaking it down by the platform used for pre-registration. Over this relatively short time

[4] We employed part of the feature extraction and representation (`FEXRep`) framework, which was originally developed to extract features that are potentially useful for reproducibility prediction (Modukuri, 2021; Wu et al., 2021).

[5] Special thanks to Alperen Aydın, Berk Odabaşıoğlu, Defne Demiral, Eda Tarhan, Elif Naz İnan, Fatih Zegerek, Zeynep Nazlı Ok, Sude Acar, Özlem Özmen, and Deniz Hallik.

[6] Data Colada (2023) report that about 43% of all papers published in 2022 in four top journals that publish psychology experiments had at least one pre-registered study.

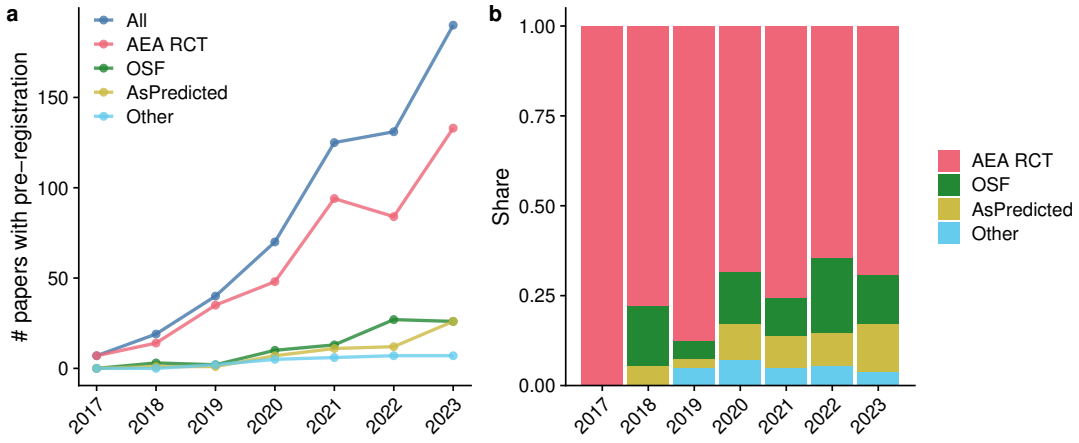

Figure 2: Number of papers with pre-registration/pre-analysis plans published in each year.

frame, the number of papers with pre-registered experimental studies grew from seven per year to 179 per year. Notably, this growth trend temporarily halted between 2021 and 2022. The decline in the number of papers using the AEA RCT Registry is noticeable, but we can see that the use of the Open Science Framework (OSF) has grown enough to offset that decrease. We attribute this to the impact of COVID-19— many researchers were forced to halt field data collection between 2020 and 2021, while laboratory experimentalists were able to continue gathering data through online platforms like Amazon Mechanical Turk and Prolific. The stall in the growth trend appears only temporary, as we observe a strong recovery in 2023, with a 41% increase between 2022 and 2023.

While the practice of pre-registration has clearly gained traction, indicating its mainstream adoption, this rise has been accompanied by a diversification in how pre-registration is implemented. By and large, the AEA RCT Registry remains the predominant platform among economists, with the number of papers registered there closely mirroring the overall trend, though experiencing a steep decline in 2022 (11% decrease between 2021 and 2022). However, examining the distribution of pre-registrations across platforms, we observe an evolution in the composition of pre-registered studies. While 77% of papers with a pre-registration made use of the AEA RCT Registry between 2017 and 2020, this share declined to 70% between 2021 and 2023, with OSF and AsPredicted capturing most of the remaining share (Figure 2b). These platforms differ in their registration requirements and searchability, catering to various needs and constraints. We provide a detailed review of these platforms in Section 5.2 (see Table 3 for a summary).

Figure 3 shows the number of papers with pre-registered studies published across the 19 journals in our sample from 2017 to 2023. A clear upward trend in pre-registered experiments is evident in several journals, particularly in *Experimental Economics* (EXEC), *Journal of Development Economics* (JDE), and *Journal of Public Economics* (JPubE).[7] For most of the top-5

[7]It is important to note that the variation in the number of published papers with pre-registrations across journals is largely driven by differences in the total number of papers each journal publishes annually, as well

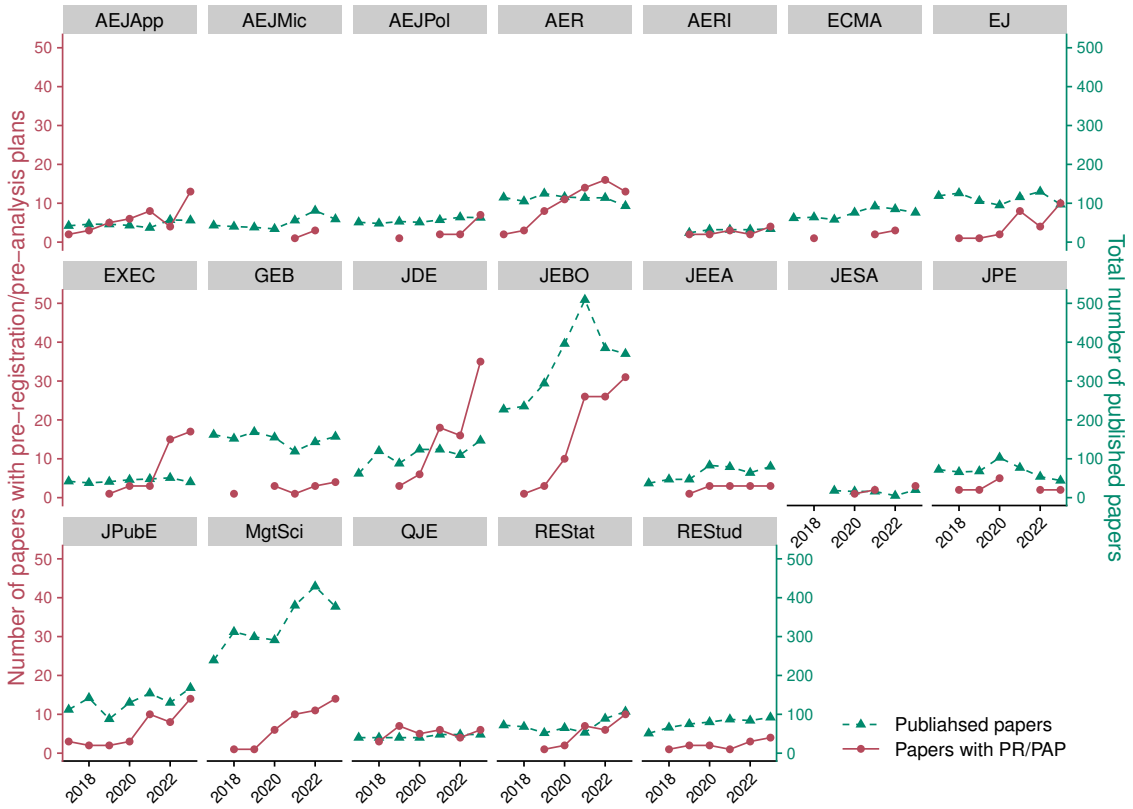

Figure 3: Number of papers with pre-registration/pre-analysis plans (solid line, left y-axis) and the total number of published papers (dashed line, right y-axis) in each year in each journal.

journals, the trend remains relatively flat, with the exception of *American Economic Review* (AER). The dip in the number of papers with pre-registrations during COVID-19 observed in the aggregate is primarily driven by a limited set of journals, including *American Economic Journal: Applied Economics* (AEJApp), *Economic Journal*, JDE, and JPubE.

The upward trend in pre-registration we observe in our data echoes the recent findings of Brodeur et al. (2024*b*), who examine rates of pre-registration from 2018 to 2021 among a set of 314 papers using RCTs published in 15 leading journals.[8] Within this sample and timeframe, they report an overall pre-registration prevalence of 26% (83 pre-registered studies), with an increase from about 13% in 2018 to 40% in 2021.[9]

The increase in pre-registration rates is especially notable among journals outside the top-5, where it has risen from less than 5% to around 35%. In contrast, pre-registration rates within

as the proportion of experimental studies published in each outlet. As such, direct volume comparisons may be misleading.

[8]Their sample of journals contains the top 15 journals ranked by RePEc's Simple Impact Factor in 2018 after removing journals that did not publish a single RCT over the period. Twelve of these journals are included in our analysis. The remaining three journals, which we did not examine, are *Journal of Finance*, *Journal of Human Resources*, and *Journal of Labor Economics*.

[9]Since the interest of Brodeur et al. (2024*b*) is in testing whether papers with pre-registered studies (or more detailed PAPs) display less p-hacking than papers with non pre-registered studies, their definition of registration is stricter than ours and only counts as "pre-registered" the studies that were registered before their trial end date.

Table 1: Journal policies around pre-registration (as of March 2025).

	Pre-registration		Guidelines			
Journal	Encouraged	Mandatory	Repository	Content	Reference	Deviation
AEA journals	✓	✓	✓	✓	✓	✗
ECMA	✓	✗	✓	✗	✓	✗
EJ	✗	✗	✗	✗	✗	✗
EXEC	✗	✗	✗	✗	✗	✗
GEB	✗	✗	✗	✗	✗	✗
JDE	✗	✗	✗	✗	✗	✗
JEBO	✗	✗	✗	✗	✗	✗
JEEA	✓	✗	✗	✗	✓	✗
JESA	✗	✗	✗	✗	✗	✗
JPE	✗	✗	✗	✗	✗	✗
JPEMicro	✓	✓	✓	✓	✗	✓
JPubE	✗	✗	✗	✗	✗	✗
MgtSci	✓	✗	✗	✗	✗	✗
NHB	✓	✗	✗	✗	✓	✓
QJE	✗	✗	✗	✗	✗	✗
REStat	✗	✗	✗	✗	✗	✗
REStud	✗	✗	✗	✗	✓	✗

Notes: See Online Appendix A.2 for details. Columns in the "Pre-registration" section indicate whether each journal encourages or mandates pre-registration. Meanwhile, columns in the "Guidelines" section indicate whether a journal provides policies on key aspects, including where to upload the pre-registration, what to include in it, how to reference it in the manuscript, and how to report deviations within the manuscript.

the top-5 journals have consistently remained higher, increasing from approximately 33% in 2018 to 53% in 2021. However, even within this group, there is considerable variation in pre-registration rates, going from 63% for *American Economic Review* (AER) and *Journal of Political Economy* (JPE), and 53% for *Quarterly Journal of Economics* (QJE), to less than 5% for *Econometrica* (ECMA) and *Review of Economic Studies* (REStud). While differences in the type of papers published in these journals likely account for much of the observed variation, another potential factor is the influence of editorial policies. A significant policy shift occurred in January 2018, when the American Economic Association (AEA) journals introduced a requirement that all field experiments submitted for publication be registered in the AEA RCT Registry (Rousseau, 2018).[10] Since then, several journals have issued editorial statements encouraging the use of pre-registration, with *Journal of Political Economy Microeconomics* (JPEMicro) making it mandatory in May 2024. Table 1 presents an overview of the current policies for the journals in our sample as well as *Nature Human Behaviour* (NHB) and JPEMicro. We will return to this table in subsequent sections of the paper.

[10]The policy only concerns field experiments, with the possibility of registering the study during any phase of the trial (forthcoming, ongoing, or completed), although early registration is encouraged. For the full policy statement, see: https://www.aeaweb.org/journals/policies/rct-registry. Brodeur et al. (2024*b*) observe that between 2018 and 2021, only 35% of test statistics collected from AEA journal articles originated from studies registered prior to the trial end.

3 ESA Survey: Design and Sample

3.1 Survey Components

The survey was divided into six main parts. The first part introduced a definition of pre-registration and pre-analysis plans, after which respondents were asked about their knowledge of and general opinion on the practice. The second part of the survey covered their experience with pre-registration and reasons for (not) adopting this practice, as well as their knowledge of existing platforms and preferred format. The third part asked respondents for their opinion on (i) the breadth of application of pre-registration practices (types of studies and elements to pre-register) and (ii) the implementation and reporting of pre-registered (vs. non pre-registered) analyses. The fourth part collected data on respondents' interpretation and evaluation of pre-registered studies as well as their beliefs on current practices and views. The fifth part examined knowledge and views on other "open science" practices and sought feedback on the role that the ESA should play in fostering open and transparent research. The final part collected data on respondents' characteristics (ESA membership, conference attendance, gender, career stage, location, primary discipline, and research topics).

Most questions were presented in a multiple-choice or Likert scale format. Virtually all questions could be skipped, but respondents received an alert message to confirm their decision to skip one. For question items without a natural progression, we randomized the order of presentation. The full survey instrument, including response frequencies, is available in Online Appendix E, and the corresponding Qualtrics file is available on the Open Science Framework (`https://osf.io/e5yz4/`). The study was reviewed and approved by the Ethics Committee of Koç University (protocol no. 2023.142.IRB3.062).

3.2 Sample Selection and Characteristics

Recruitment. An anonymous survey link was shared with members of the Economic Science Association over the month of June 2023, both via email and via an announcement posted on the ESA mailing list by Marie Claire Villeval (then ESA President). The first announcement was made on June 6, 2023, and one reminder was sent two weeks later. See Online Appendix A.3 for the invitation message. Our sample includes all responses received before the start of the 2023 ESA World Meeting in Lyon, which began on June 26, 2023 and during which a panel on pre-registration and pre-analysis plans took place.

Final sample. A total of 637 participants started the survey (i.e., provided consent and confirmed they conduct empirical research), with 519 (81.5%) completing it between June 5 and June 26, 2023, 12:00 CEST. Additionally, 16 more participants started the survey after the cutoff, of whom 15 completed it. As pre-registered, our analyses below include all 519 respondents who completed the survey. However, since some questions were optional, the

sample size in the descriptive results can vary across questions.

Sample characteristics. We perform two benchmark exercises to assess the representativeness of our survey sample. First, we compare survey respondents to the population of all 1,197 researchers who purchased an ESA membership in 2023 on characteristics recorded by the ESA (gender, position, and ESA region). Second, we assess how respondents differ relative to the 2023 ESA World Meeting attendees on the same set of characteristics. We initially planned to conduct selection tests based on a broader set of characteristics, including gender, academic position, ESA region, experience with pre-registration, and the use of field experiments and/or RCTs in research (Section 4 in the pre-analysis plan, copied in Online Appendix D.4). The last two characteristics were intended to allow comparisons between respondents and attendees, but we found them imprecise and difficult to code using publicly available information. Similarly, ESA membership data does not accurately reflect members' career stages. Due to these challenges, we are deviating from our original plan and focusing only on gender, position, and ESA region.

Table 2 highlights that our sample of survey respondents differs from both the conference attendees and the overall ESA membership. Compared to these benchmarks, our sample includes a lower proportion of females and Ph.D. students but a higher proportion of researchers based in Europe. This regional skew is largely due to conference location, which influences over 70% of annual membership and, consequently, its geographic distribution. We need to interpret the results from the survey presented below with a caveat that the respondents might be more positive about pre-registration and PAPs compared to the general population of experimental economists.

4 ESA Survey: Experience, Attitudes, and Beliefs

This section is structured as follows. We begin by examining current practices related to pre-registration and pre-analysis plans, including knowledge, general opinions, experiences, heterogeneity in adoption, and reasons for or against pre-registration (Section 4.1). We then explore normative questions regarding how respondents believe these practices should be employed (Section 4.2). Finally, we address the evaluation of pre-registered studies (Section 4.3). All tests are pre-registered unless otherwise noted (`https://osf.io/e5yz4/`). In testing these hypotheses, we interpret a two-sided p-value below 0.005 as "statistically significant evidence" and a two-sided p-value below 0.05 as "suggestive evidence" based on the recommendations of Benjamin et al. (2018).

Table 2: Demographic characteristics of the survey respondents, ESA World Meeting participants, and ESA members.

	Respondents		Participants		Members	
	Prop.	N	Prop.	N	Prop.	N
Female	0.321	433	0.405	457	0.387	1,197
Ph.D. student	0.145	433	0.258	457	–	–
ESA region: Asia-Pacific	0.102	432	0.096	459	0.180	1,197
ESA region: Europe	0.620	432	0.773	459	0.513	1,197
ESA region: North America	0.257	432	0.120	459	0.284	1,197
ESA region: Other	0.021	432	0.011	459	0.023	1,197
Respondents vs. Participants						
Female	$\chi^2(1) = 6.39, p = 0.012$					
Ph.D. student	$\chi^2(1) = 6.39, p < 0.001$					
ESA region	$\chi^2(3) = 31.39, p < 0.001$					
Respondents vs. Members						
Female	$\chi^2(1) = 5.63, p = 0.018$					
ESA region	$\chi^2(3) = 19.94, p < 0.001$					

Notes: We restrict the "Respondents" sample to 437 participants who indicated being ESA members. See Supplementary Information A for details of the data construction.

4.1 Current Practices

Knowledge and overall opinion. There is no universally agreed-upon definition of pre-registration and pre-analysis plans (PAPs). To establish a common understanding in our survey, we defined them jointly as:

> 1. Writing down a subset of the study design, outcome variables of interest, hypotheses or planned statistical analyses **in advance** of analyzing the outcome data; AND
> 2. Posting the document on a **public registry** where it will be **time-stamped**.

Note that we did not attempt to make a distinction between the two concepts for simplicity and because there is heterogeneity in views as to what separates a simple pre-registration from a PAP.[11] To be as inclusive as possible, we further indicated that "*this may also include writing down hypotheses or planned statistical analyses for a previously collected experimental or observational dataset in advance of examining the data*". Overall, 99% indicated that they

[11] Brodeur et al. (2024*b*) emphasize the ambiguity of definitions: "It is worth underlining here that we proceed with notions of pre-registration and PAPs as practiced in economics, or at least as operationalized by the largest and most influential professional association in the discipline, the American Economic Association (AEA). In their discussion relating to psychology, Nosek et al. (2018) contend that: "An effective solution is to define the research questions and analysis plan before observing the research outcomes— a process called preregistration," which implies that pre-registration and the existence of a PAP are one and the same thing (see also Simmons, Nelson and Simonsohn (2021) for a similar contention)."

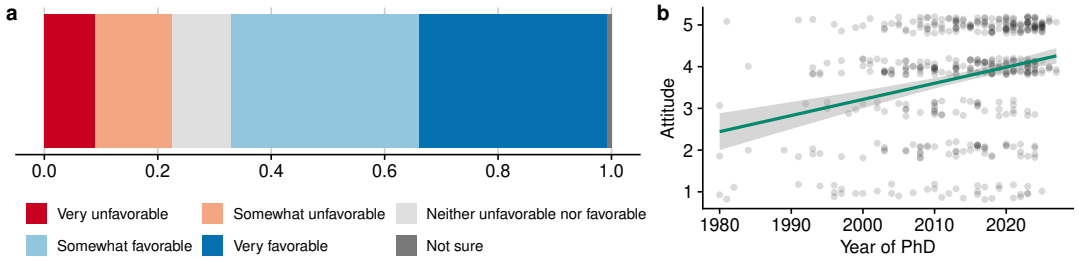

Figure 4: Attitude toward pre-registration. (a) Overall attitude. (b) Heterogeneity by year of Ph.D. completion. *Notes*: Panel (b) presents a linear regression where the dependent variable is attitude (1: Very unfavorable, 2: Somewhat unfavorable, 3: Neither favorable nor unfavorable, 4: Somewhat favorable, 5: Very favorable). Four respondents who selected "Not sure" are removed from the analysis in accordance with the PAP.

had heard of the practice and thus were able to express an opinion. However, respondents underestimated others' familiarity with the practice (**Secondary Hypothesis 6**; 88% vs. 99%; Welch's t-test: $t(885.65) = -13.801$, 95% CI $[-0.124, -0.093]$, $p < 0.001$). See Figure B.1 in the Online Appendix. We now turn to respondents' overall attitude toward pre-registration.

Result 2. *Despite some heterogeneity, the majority of respondents expressed being favorable to the practice of pre-registering hypotheses or analysis plans in advance of a project.*

Figure 4, panel (a) shows that 66% of respondents reported being either somewhat or very favorable to the practice, with about 23% who expressed being somewhat or very unfavorable. Panel (b) shows that more junior researchers, as measured by the (expected) year of completion of their Ph.D. studies, tend to be more favorable toward pre-registration (**Primary Hypothesis 1**; $\beta = 0.039$, $SE = 0.006$, $t(462) = 6.209$, $p < 0.001$). Moreover, attitudes toward pre-registration differ significantly by position (**Exploratory Hypothesis 1**; Figure 23, panel (1); Table B.2, column (1), $F(6, 505) = 7.766$, $p < 0.001$). These findings are in contrast with Ferguson et al. (2023), who find no clear evidence of differences in stated support between early-career and more experienced researchers, but in line with the work of Logg and Dorison (2021) and Spitzer and Mueller (2023).

We also asked researchers to estimate the percentage of their peer respondents who declared being either somewhat or very favorable to pre-registration. Figure 5, panel (a) illustrates the distribution of responses. Overall, respondents slightly underestimated the favorability of others toward pre-registration (**Secondary Hypothesis 5**; 60% vs. 66%; Welch's t-test: $t(651.34) = -3.056$, 95% CI $[-11.260, -2.450]$, $p = 0.0023$). Panel (b) shows that beliefs about others' opinions vary by the respondents' own views: the average belief of those who are favorable to pre-registration ($N = 339$) is 66%, i.e., exactly on the target, while the average of those who are not favorable ($N = 162$) is only 49% (**unregistered exploratory**; Welch's t-test: $t(284.13) = 10.321$, 95% CI $[13.552, 19.940]$, $p < 0.001$). The observed underestimation of other researchers' support for the practice is in line with the findings of Ferguson et al. (2023), who document consistent misperceptions of norms of behavior and attitudes toward

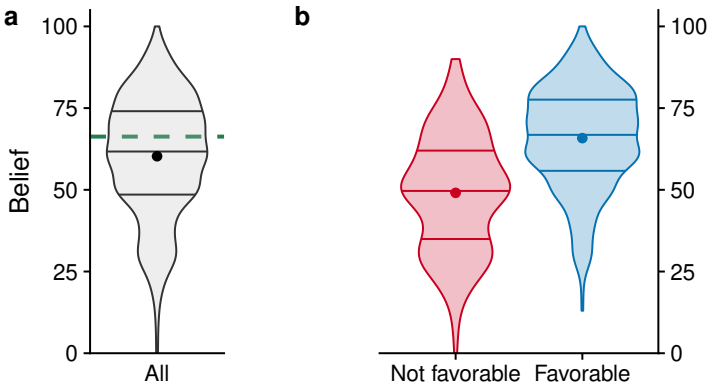

Figure 5: Beliefs about other respondents' attitude toward pre-registration. (a) All (N = 505). (b) Beliefs by respondents' own views (not favorable, N = 162; favorable, N = 339). *Notes*: The horizontal lines within violin plots correspond to the 25th, 50th, and 75th percentiles, and the points indicate means. The dashed line in panel (a) indicates the actual proportion of respondents who are either somewhat or very favorable to pre-registration (66%).

open science practices, including pre-registration.

Experience with pre-registration. We next examine how knowledge of the practice and favorability relate to personal experience with pre-registration.

Result 3. *Overall, 86% of respondents pre-registered at least one of their research projects (personally or with collaborators).*

In line with the observational data presented earlier (see Figure 2, panel (a)), Figure 6, panel (a), shows that the practice gained traction between 2018 and 2020. By 2020, more than half of the respondents who had completed their Ph.D. before that year had pre-registered at least one study. Panel (b) shows that the practice is not merely punctual: among those who have pre-registered (individually or in collaboration) at least one of their studies, most have done so for most or all of them. In particular, overall, 71% reported having done so systematically since their first pre-registration.

The prevalence rate of 86% measured in our 2023 survey is well above the adoption rate of around 50% documented in Ferguson et al. (2023) among experimental social science researchers surveyed between 2018 and 2020 (see their Figure 2(c)). However, as indicated in Figure 6, panel (a), the prevalence rates we document are comparable once we account for the relevant time periods. This suggests that the observed differences between the two studies are due to a general upward trend in adoption, and not to the specificities of our respective samples.

Survey studies on open science practices, such as those by Ferguson et al. (2023) and Spitzer and Mueller (2023), have documented a positive association between support for pre-registration and adoption of the practice. Building on these findings, we conduct an unregistered, exploratory analysis to examine the relationship between respondents' attitudes and

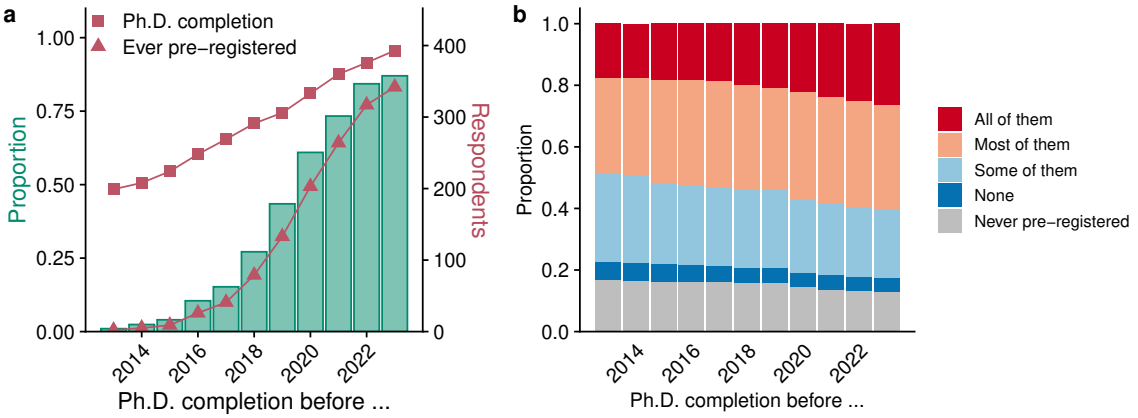

Figure 6: Research experience and adoption of pre-registration. (a) Red squares (■) represent the number of respondents who completed their Ph.D. by year Y. Red triangles (▲) denote those who had completed their Ph.D. before year Y and had pre-registered at least one study by that year.Green bars indicate the proportion (▲/■). (b) Frequency of pre-registration. Each bar only keeps respondents who had completed their Ph.D. by year Y.

behaviors. Unlike existing studies, however, we observe only weak evidence of a positive association between support for pre-registration and adoption of the practice. In fact, as panel (a) of Figure 7 shows, over 80% of researchers who expressed a very unfavorable view of the practice had at least one pre-registered project by 2023, a rate that is only slightly lower than those who reported being somewhat favorable (85%).[12] Figure 7, panel (b), shows no clear monotone relationship between favorability and the intensity of the practice. The fact that many researchers seem to have accepted the practice despite their negative views may be explained by a combination of factors, including having co-authors who are themselves favorable and/or feeling compelled to do so. We will revisit the reasons behind pre-registration decisions later in this section.

Heterogeneity in the adoption of the practice.

Result 4. *Among the main sources of heterogeneity, researchers conducting field experiments are more likely to pre-register their studies. However, the relationship with academic seniority is ambiguous.*

As shown in Figure 8, panel (a), most pre-registered studies were lab or online studies. This is unsurprising given that most respondents collect their data through lab/online experiments (Figure B.2 in the Online Appendix). Adoption of pre-registration is associated with experience in conducting field experiments (panel (b)). Specifically, those who have run field experiments are more likely to have experience with pre-registration (**unregistered exploratory**; 95% vs. 81%; Welch's t-test: $t(513.08) = 5.247$, 95% CI [8.870.19.487], $p < 0.001$).[13]

[12] A linear probability model regressing a binary indicator of experience with pre-registration on attitude towards pre-registration provides suggestive evidence of a positive association (**unregistered exploratory**; $\beta = 0.030$, $SE = 0.012$, $t(515) = 2.428$, $p = 0.016$).

[13] Related to this, we explore researchers' adoption of pre-registration based on the research area(s) they

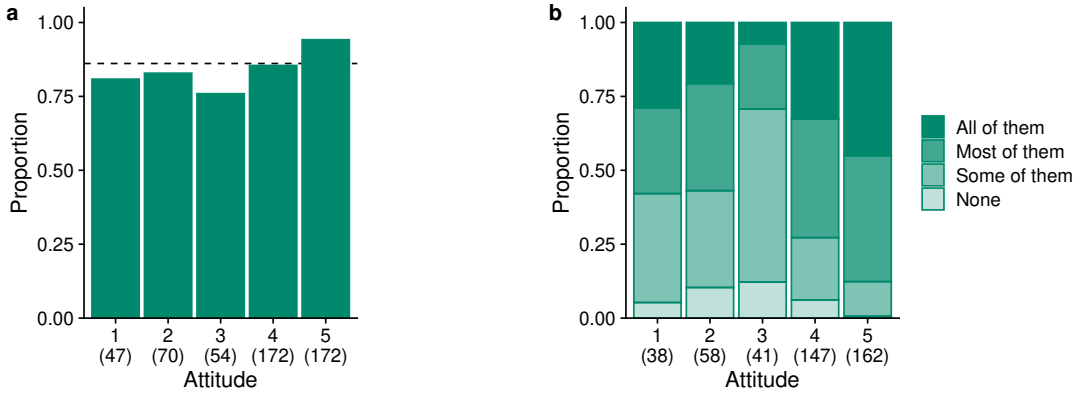

Figure 7: Adoption of pre-registration by favorability rating. (a) Proportion of participants who have ever pre-registered (N = 515). (b) Frequency of pre-registration (N = 446). *Notes*: The dashed line indicates the overall adoption rate. Numbers in parentheses represent the number of participants who are: very unfavorable (1), somewhat unfavorable (2), neither unfavorable nor favorable (3), somewhat favorable (4), and very favorable (5). Four respondents who selected "Not sure" are removed from the analysis.

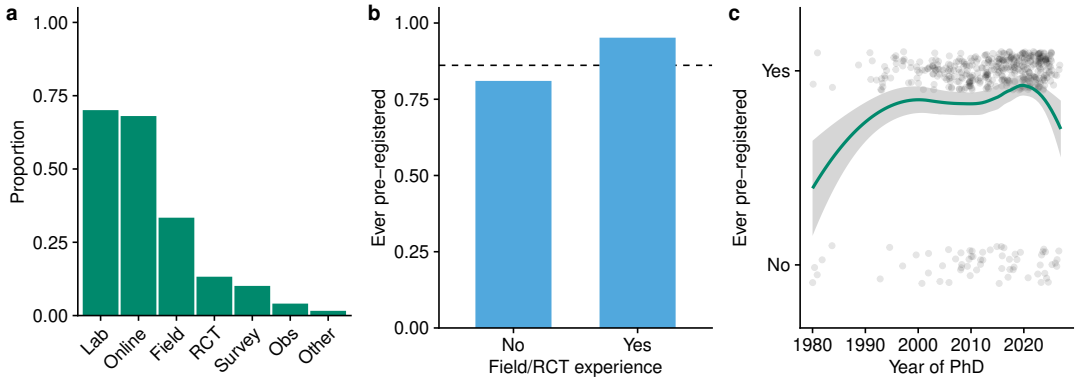

Figure 8: (a) Type of pre-registered studies (N = 447). (b) Experience with field/RCT studies and pre-registration. (c) Year of Ph.D. completion and pre-registration. *Notes*: (a) Multiple selection is allowed. (b) The dashed line represents the overall rate of pre-registration (86%). (c) The green line represents the LOESS curve, with the gray band indicating the 95% confidence band.

Unlike attitudes, academic age is not a clear predictor of the adoption of the practice. On the extensive margin of adoption, panel (c) of Figure 8 shows that while respondents who obtained their Ph.D. before 2000 appear less likely to have ever pre-registered a project than later cohorts, the relationship is mostly flat for researchers who graduated between 2000 and 2020 (the dip after 2020 possibly reflecting a combination of the effect of COVID-19 on research productivity and the fact that the youngest cohorts had fewer opportunities to complete any experimental projects). On the intensive margin of adoption, younger cohorts are slightly

indicated working in. Although there is some variation (see Figure B.3 in the Online Appendix), the differences are relatively minor. For instance, we compare two non-overlapping groups: 98 participants who selected "Field Experiments", "Psychology and Biology" or "RCTs/Impact evaluation" as one of their research areas, and 178 participants working in more theory-based fields such as "Games", "Decision Theory", "Markets" or "Public Choice". The difference in pre-registration adoption rates between these groups is not statistically significant (**unregistered exploratory**; $\chi^2(1) = 0.1582$, $p = 0.6909$).

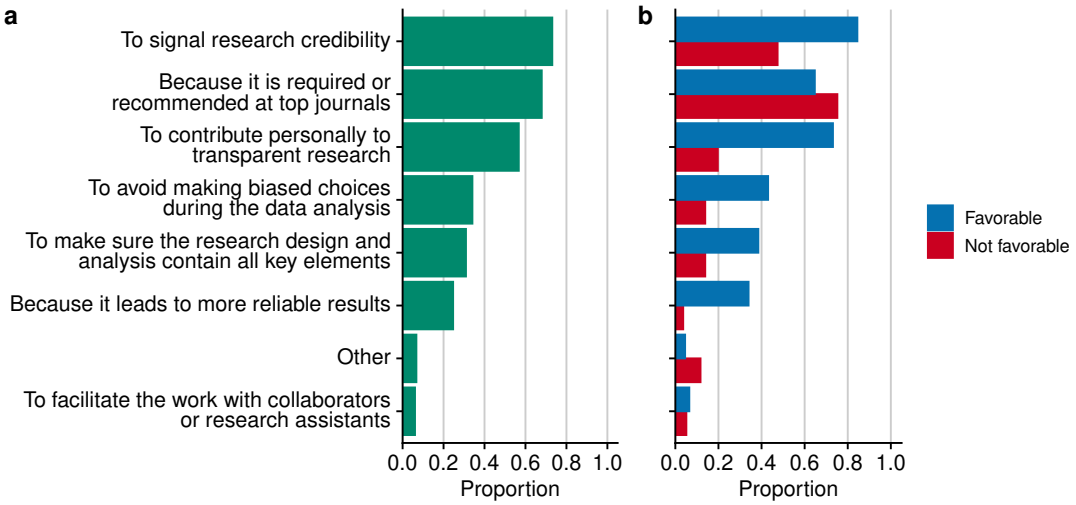

Figure 9: Reasons for pre-registration (among 447 participants who pre-registered at least one of their research projects). (a) All ($N = 446$). (b) Selection of reasons by respondents' attitude toward pre-registration (not favorable, $N = 136$; favorable, $N = 309$).

more likely to report having pre-registered either all or most of their projects since the first project they pre-registered (Figure 6, panel (b)). While this could partly reflect a shift in norms, the interpretation is not straightforward since younger cohorts likely had fewer projects they could have pre-registered. We note that the evidence presented in the literature is itself ambiguous. Ferguson et al. (2023) document that experienced authors practice open science more than early-career researchers, but they cannot exclude career-length effects; Logg and Dorison (2021) find the opposite pattern using different data and Spitzer and Mueller (2023) also document a stronger motivation from early-career researchers to use pre-registration.

Reasons for/against pre-registration. Respondents were asked why they chose to pre-register all or some of their projects and why they did not.

Result 5. *Among researchers who pre-registered studies, the main reasons given were to signal credibility and because it is required by journals.*

Figure 9 shows the distribution of reasons for pre-registering overall (panel (a)) and broken down by the respondent's personal views of pre-registration (panel (b)). Signaling research credibility was the reason most cited by favorable respondents (84% of responses), closely followed by contributing to transparent research (73%) and because of journal requirements (65%). The latter reason is cited slightly more frequently by those not favorable to pre-registration (75%), with nearly half of them also citing the desire to signal credibility. Thus, the perceived reputational benefits and requirements imposed by journals appear to play a key role in pre-registration decisions, followed to a smaller extent by public good contributions to research transparency. By contrast, reasons related to the possibility of improving one's own research quality appear to be, at best, secondary factors.

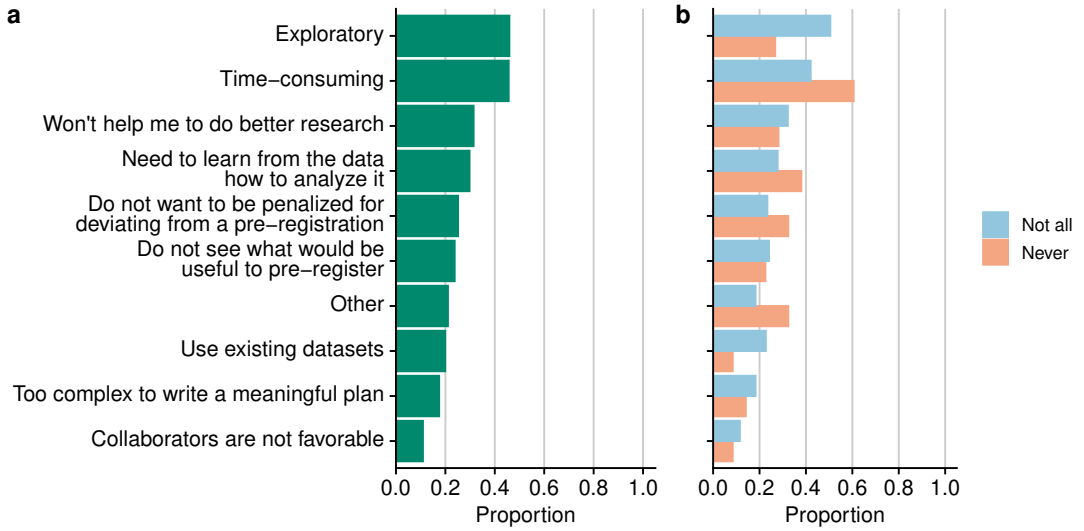

Figure 10: Reasons for not pre-registering some or all of the research projects. (a) All ($N = 366$). (b) Selection of reasons by frequency of pre-registration (not all, $N = 295$; never, $N = 71$).

Result 6. *Among the reasons given for not pre-registering a study, researchers selected exploratory research and the need to learn from data as well as the time-consuming nature of the practice and its lack of usefulness.*

Compared to the reasons for pre-registering a study, the reasons for not pre-registering, as shown in Figure 10, panel (a), are more diverse, with no reason being cited by a majority of respondents. Nevertheless, the demands of pre-registration on the researcher's time stand out as the primary concern among those who have never pre-registered a study, as illustrated in panel (b). Additionally, the need to explore the data emerges as a key factor, regardless of the respondent's frequency of pre-registration.

Our findings complement the work of Sarafoglou et al. (2022), Ofosu and Posner (2023), and Spitzer and Mueller (2023) documenting researchers' perceived benefits and challenges of pre-registration in psychology and political science. In particular, Spitzer and Mueller (2023) identify perceived effort and time costs as the most voiced obstacle against pre-registration, followed by low flexibility, inadequate dealing with deviations, and lack of knowledge about the process. Sarafoglou et al. (2022) and Ofosu and Posner (2023) provide similar evidence on perceived time pressures, counterbalanced by perceived benefits among users of pre-registration on research planning, quality, and transparency. We return to a discussion of the perceived effects of pre-registration on various research outcomes in Sections 4.3 and 5.

4.2 Application, Implementation, and Reporting

We now move away from the positive question of documenting what researchers actually do (and why) to normative questions pertaining to how they think the practice of pre-registration should be used. In particular, we look at three issues: (i) what studies or study elements should

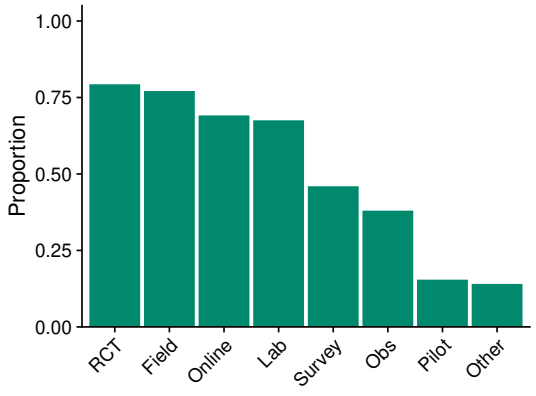

Figure 11: Types of studies participants think should be pre-registered ($N = 501$). *Notes*: Multiple selection was allowed.

be pre-registered; (ii) the extent to which researchers should be allowed to deviate from pre-registered decisions; (iii) how researchers should communicate about potential deviations.

Breadth of application. We first examine researchers' views on the type of studies that should be pre-registered and, within those studies, the type of elements that should be covered by the pre-registration.

Result 7. *In total, 77%, 61%, and 63% of respondents consider that field/RCT, lab, and online studies should be pre-registered, respectively.*

In other words, a majority of respondents agree that all types of experiments should be pre-registered, while about 19% of respondents consider that pre-registration should only be required for field/RCT studies but not for lab and online studies. Compared to the 40% pre-registration rate of RCTs measured in 2021 by Brodeur et al. (2024*b*, Figure 1), Figure 11 suggests that there might still be a gap between the descriptive and prescriptive norms, although future work should measure this more carefully.[14] Beyond experiments, we note that 43% of respondents expressed the view that simple surveys like ours should be pre-registered, and 35% considered that pre-registration should apply to observational studies as well.

Result 8. *The majority of researchers consider that a pre-registration should contain clear hypotheses and provide clarity on the amount of data collected and analyzed.*

As shown in panel (a) of Figure 12, over 90% of respondents considered that researchers should pre-register clear hypotheses to be tested. About 63% considered that the pre-registration should contain a justification of the sample size, and a similar percentage (66%) indicated that criteria for excluding observations should be stated. Notably, 60% of the respondents considered that the pre-registration should disclose whether any prior (pilot) data was collected.

[14] As stressed in Section 3.2, our sample of respondents might not be fully representative of the entire population of researchers who conduct experiments; furthermore, given the upward trends in adoption noted earlier, it is likely that the prevalence rate of pre-registration grew even further between 2021 and 2023.

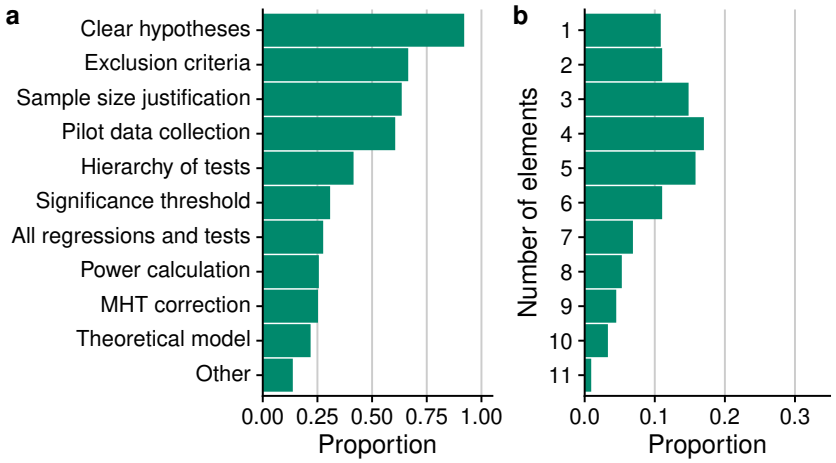

Figure 12: (a) What elements a pre-registration should contain ($N = 504$). (b) The number of elements participants think should be contained in a pre-registration.

However, only a minority of respondents (27%) considered that a pre-registration should specify all regressions and tests. Figure 12, panel (b), shows considerable variation in views regarding how comprehensive a pre-registration should be. The modal number of selected components is four with a standard deviation of 2.4, and their composition varies (see Figure B.4 in the Online Appendix for which elements researchers typically listed together). Regressing attitude toward pre-registration on the number of elements in the pre-registration, we find that researchers who prefer more detailed analysis plans in pre-registrations are more favorable toward pre-registration (**Secondary Hypothesis 7**; $\beta = 0.261$, $SE = 0.019$, $t(517) = 13.717$, $p < 0.001$).

Our survey responses on this issue echo findings from several papers documenting variability in the level of detail in PAPs (Bakker et al., 2020; Abrams, Libgober and List, 2023; Ofosu and Posner, 2023; van den Akker et al., 2023*a*). In a randomly drawn sample of 195 PAPs from political science and economics, Ofosu and Posner (2023) report that nearly 50% of PAPs failed to specify at least one key component, such as clear hypotheses, primary dependent variable(s), treatment, or key explanatory variables, and full statistical models. For instance, 32% of PAPs did not contain a full specification of the statistical models used.

Implementation and reporting. We also asked respondents to consider how much researchers should follow their pre-registration and what information they should disclose in their papers.

Result 9. *A small majority of the respondents consider that researchers should be allowed to deviate from their pre-registration as much as they want as long as it is clear where and why they deviated.*

As shown in Figure 13, the vast majority of respondents (83%; the sum of the top two selections) considered that researchers should be able to deviate, whether parsimoniously

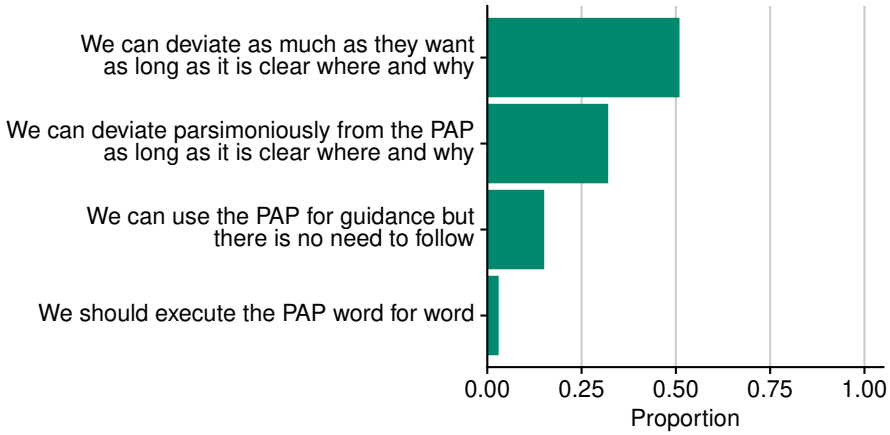

Figure 13: How much should one follow a pre-registration ($N = 513$).

or as much as they want, provided that those deviations are clearly communicated. These views likely reflect the fact that some deviations might be unavoidable due to the difficulty of anticipating future contingencies, and the arrival of new information (including comments from reviewers) might justify such deviations (Miguel, 2021; Lakens, 2024). In practice, several papers (Claesen et al., 2021; Ofosu and Posner, 2023; van den Akker et al., 2023*b*; Willroth and Atherton, 2024) document that deviations occur very frequently. For instance, in a sample of 27 pre-registered studies published in the journal *Psychological Science*, Claesen et al. (2021) find that 89% had at least one deviation, with the most common deviations concerning sample size, exclusion criteria, and statistical analyses. The commonality of deviations brings the question of how they should be communicated and, more generally, what information about pre-registration should be disclosed in papers.

Result 10. *According to 80% of respondents, the paper should clearly state which studies and treatments were pre-registered, and for over 56%, analyses should be clearly labeled in the main text as either pre-registered or exploratory.*

Figure 14 shows that a majority of respondents also agreed that a link to the pre-registration document(s) should be added on the front page of the paper. On the other hand, a much smaller fraction of respondents (25%) judged that the appendix of the paper should contain a clear comparison between the pre-registered analyses and those presented in the main text.

The available evidence suggests that many papers with pre-registrations fail to meet the above transparency requirements, with deviations often left undocumented and a lack of clarity regarding which analyses were actually pre-registered (Claesen et al., 2021; van den Akker et al., 2023*b*; Willroth and Atherton, 2024). One contributing factor to this lack of transparency is that current journal policies, in fact, rarely make these requirements explicit. As shown in Table 1 (and Online Appendix A.2), only two journals (JPEMicro and NHB) in our sample provide guidelines on documenting deviations, and the vast majority provide no instructions on how to reference a pre-registration in a manuscript. In the absence of official journal

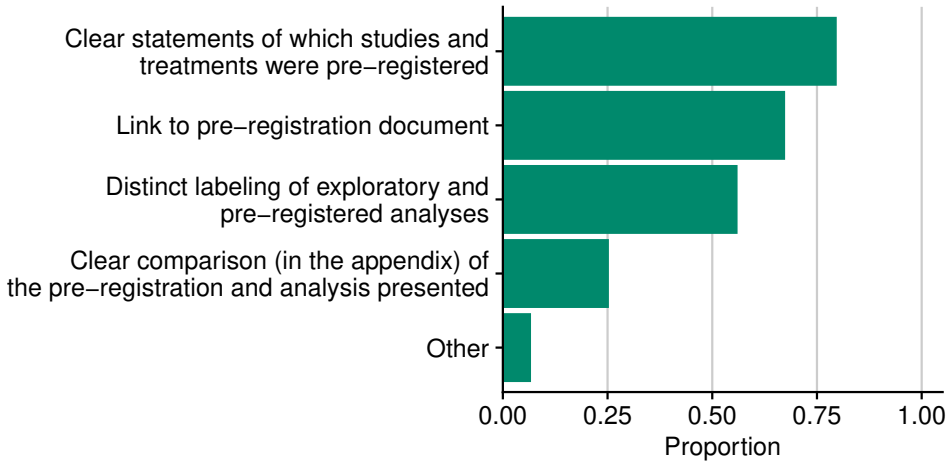

Figure 14: Which information the authors should disclose in the paper ($N = 511$).

guidelines, Lakens (2024) and Willroth and Atherton (2024) offer a framework for classifying, reporting, and justifying deviations.

4.3 Interpretation and Peer Review

We now turn to the issue of the evaluation of pre-registered studies. How do readers, including reviewers, judge studies with and without pre-registration? One theoretical justification for the use of pre-registration often put forward is that it may serve as a commitment device against questionable research practices (QRPs) coming from researchers' degrees of freedom when analyzing data. If the commitment device is anticipated to work, then pre-registered research should be perceived as more credible than unregistered research.

Result 11. *Statistical results with $p < 0.05$ are perceived to be much more credible for pre-registered hypothesis tests than for unregistered tests.*[15]

Figure 15, panel (a) shows that the distribution of credibility ratings (0-10) for statistical results with $p < 0.05$ from pre-registered hypothesis tests first-order stochastically dominates the corresponding distribution for unregistered tests (**unregistered exploratory**; $M = 8.59, 6.99$ $SD = 1.82, 2.02$; Welch's t-test for difference in means, $t(999.53) = 13.21$ $p < 0.001$). Credibility beliefs are somewhat heterogeneous (Figure 15, panel (b)). In particular, researchers who are more favorable toward pre-registration more strongly believe that pre-registration improves the credibility of statistically significant findings (**Secondary Hypothesis 8**; regression of the credibility premium on attitude toward pre-registration; $\beta = 0.764$, $SE = 0.071$, $t(504) = 10.692$, $p < 0.001$).

[15] In the survey, we used the more familiar $p < 0.05$ threshold for statistical significance and framed the question as follows: "On a scale of 0 (not at all) to 10 (extremely), how would you rate the credibility of a statistically significant finding ($p < 0.05$) based on a: (i) Pre-registered hypothesis test, and (ii) Non-pre-registered hypothesis test."

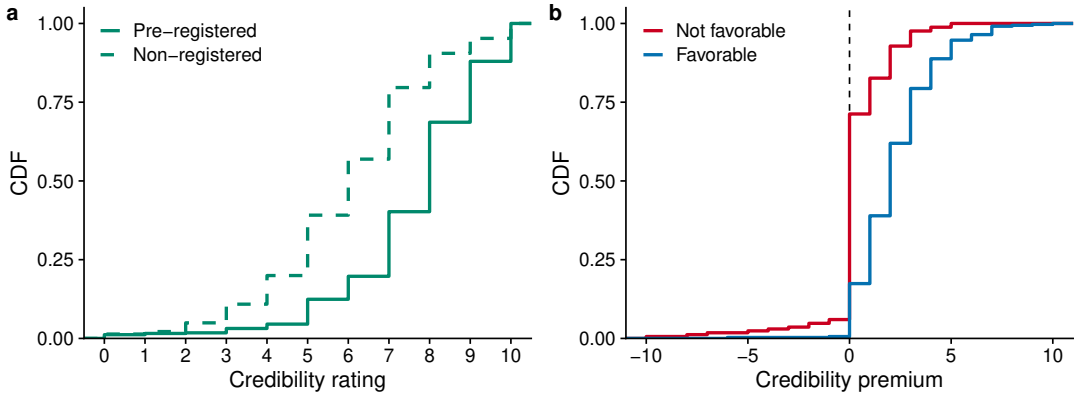

Figure 15: Perceived credibility of a statistically significant ($p < 0.05$) finding. (a) Empirical CDFs of credibility ratings for hypotheses that are pre-registered ($N = 507$) and not pre-registered ($N = 506$). (b) Heterogeneity of credibility premium (difference between credibility rating for pre-registered and unregistered hypotheses) by attitude toward pre-registration.

The enhanced credibility of pre-registered tests has some theoretical foundations. Williams (2023) shows that when the researcher has superior private information about the study's context compared to the evaluator of the study, pre-registration can serve as a credible signal of confidence in a hypothesis or help convey details that cannot be credibly revealed post-study. Relatedly, Kasy and Spiess (2023) show that when the incentives of the analyst and the decision maker (e.g., the journal) are misaligned, valid statistical inference may require the use of a pre-analysis plan.

At an empirical level, this "credibility premium" speaks to the recent work of Brodeur et al. (2024*b*), who find that pre-registered studies with a PAP show less evidence of p-hacking.[16] The higher perceived credibility could also reflect the fact that pre-registered hypotheses might be simply more credible in the first place because they are less risky or speculative than unregistered ones. To understand how these various channels might influence perceptions, we asked respondents to assess the impact of pre-registration on a range of outcomes, including the amount of risky/speculative research, amount of HARKing (i.e., hypothesizing after seeing the results), and amount of p-hacking, among other outcomes examined more in Section 5. Figure 16 shows that some of them contribute to the credibility premium (**unregistered exploratory**).

The efficacy of pre-registration as a commitment mechanism, however, likely depends on the perceived probability of monitoring, i.e., the belief that readers, especially reviewers, will examine pre-registration documents. To assess this, we asked respondents several questions about their interaction with pre-registered studies as reviewers.

Result 12. *Among respondents who have reviewed at least one paper with a pre-registration, about 70% reported checking the pre-registration documents at least some of the time.*

[16]However, the authors also find that simple pre-registrations without a PAP are not associated with reduced p-hacking or publication bias.

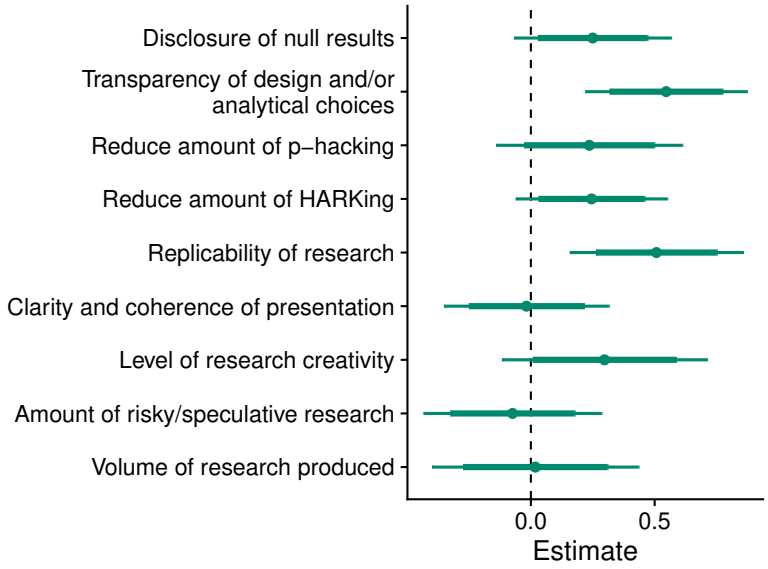

Figure 16: Expected impact of pre-registration and credibility premium. *Notes*: Estimated coefficients from a multiple linear regression model are reported: the dependent variable is credibility rating as defined above, and the independent variables are 1-5 ratings from the question about the potential impact of pre-registration on a range of outcomes. Two outcomes, the amount of p-hacking and HARKing, are reverse-coded so that the higher rating indicates a stronger belief in the reduction of these outcomes. Bars indicate 99.5% (thin lines) and 95% (thick lines) confidence intervals.

At the time of taking the survey, 58% of respondents had reviewed at least one paper with a pre-registration for a journal. Among them, Figure 17, panel (a) shows that 40% reported having checked the pre-registration documents for all papers they reviewed, and only 30% declared having never done so, with the remainder having checked documents at least some of the time. Thus, reviewers appear to examine pre-registration documents at a fairly high frequency. Checking the pre-registration documents seems to have rarely affected the reviewer's evaluation of the paper negatively (panel (b)). In other disciplines, Mathieu, Chan and Ravaud (2013) report that 34% of editors and reviewers in medical journals check trial registrations during the review process, while Willroth and Atherton (2024) report a much higher rate of 65% in psychology. Exploiting the recently introduced Open Peer Review system in the *PLOS* journal family, Syed (2023) observes low levels of engagement with pre-registration during the review process.

We now examine how often respondents anticipate that reviewers will check the pre-registration documents. As Figure 17, panel (c) shows, beliefs are heterogeneous, but the median belief of 31% suggests that respondents expect somewhat limited monitoring. We also find that respondents who are not favorable to pre-registration tend to hold lower beliefs regarding peer monitoring, exhibiting a median of 29.5%, compared to a median of 35% for those in favor of pre-registration (**unregistered exploratory**; Kolmogorov-Smirnov test, $p < 0.001$). This may suggest that researchers who are skeptical about the effectiveness of monitoring pre-registrations may be less convinced of its potential to yield credible research,

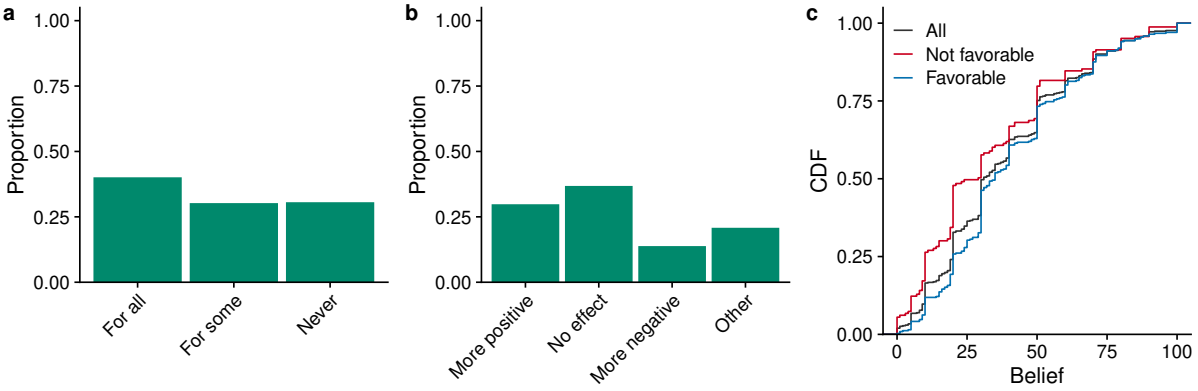

Figure 17: Peer review. (a) Frequency of checking the pre-registration documents as a reviewer (N = 294). (b) Effect of checking the pre-registration documents on evaluation (N = 200). (c) Belief about the frequency with which reviewers check pre-registration documents and heterogeneity by the attitude toward pre-registration.

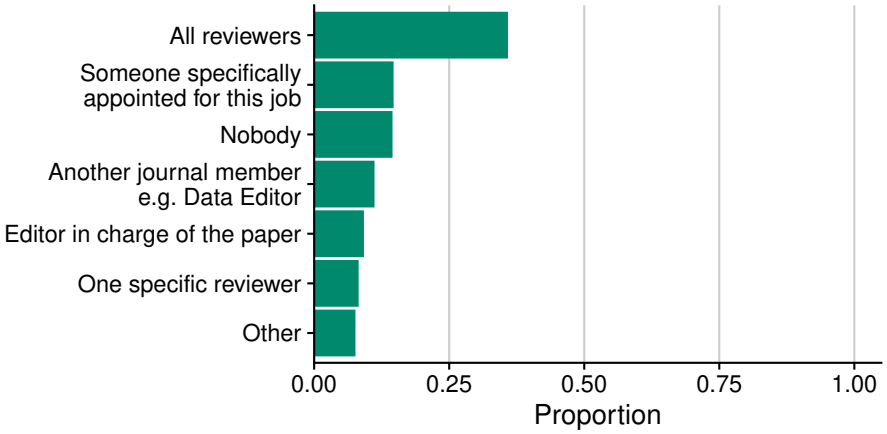

Figure 18: Who should check the pre-registration documents that accompany a submission (N = 510).

contributing to their unfavorable stance.

Finally, on the issue of peer review, we also asked respondents for their views on who should check the pre-registration documents that accompany a submission. While the modal response was that all reviewers should check the documents, Figure 18 indicates substantial disagreement on who should be responsible. This lack of clarity on the distribution of responsibilities might limit the efficacy of pre-registration as a commitment device to conduct open and transparent research.

5 Other Results and Discussion

5.1 The Trade-offs Behind Pre-registration Decisions

Section 4 showed that while most respondents appear favorable toward pre-registration, there is significant heterogeneity in current practices and views on how the practice should be con-

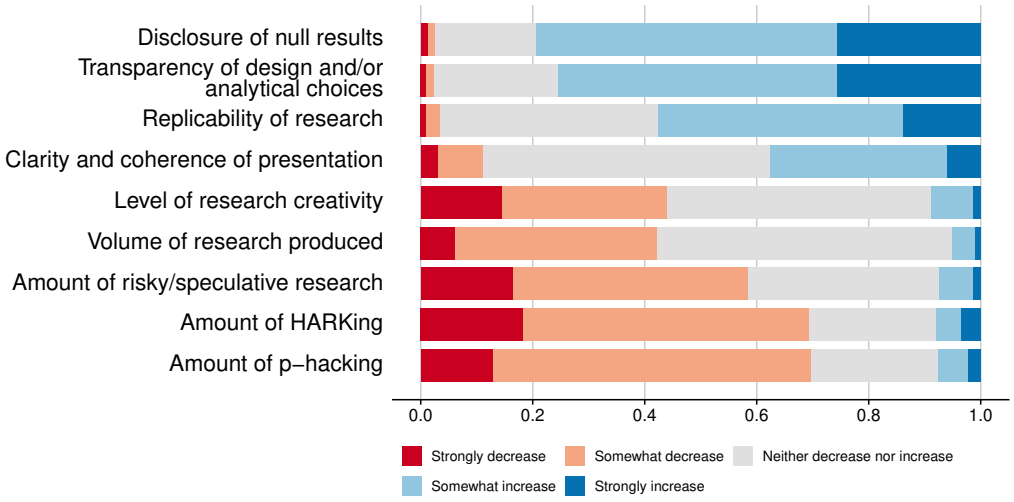

Figure 19: Expected impact of pre-registration. *Notes*: Associations between item ratings are presented in Figure B.5 in the Online Appendix.

ducted. Part of the observed heterogeneity might reflect different hopes regarding the ability of this practice to improve the quality of scientific research and the amount of information shared. At the outset, pre-registration could have a simultaneous effect— whether positive or negative— on a range of outcomes, including:

1. The disclosure of null results
2. The amount of p-hacking and other QRPs (e.g., HARKing)
3. The replicability of research
4. The shape and quality of scientific communication
5. The nature of the research produced (e.g., riskiness, creativity)

To better understand potential trade-offs, we asked respondents to evaluate the likely impact of pre-registration on nine outcomes. As shown in Figure 19, while respondents generally expect pre-registration to increase information disclosure and the replicability of research and to decrease QRPs, they also expect that pre-registration may reduce the amount of risky/speculative research, the level of research creativity, and the volume of research produced, the latter echoing concerns around the time-consuming nature of the practice.

While not all of these effects may be negative, recent research by Andre and Falk (2023) suggests that most economists view current research as insufficiently risky and disruptive. Simultaneously, most also consider that greater emphasis should be put on quality rather than quantity, suggesting that a reduction in the volume of research produced might not be a bad outcome. Regardless, it is worth noting that the available evidence for assessing the validity of these conjectures (summarized in Table C.1) remains limited, often ambiguous, and relies on observational data. For example, studies using statistical analyses of the distributional patterns of a large collection of p-values or z/t-statistics present mixed evidence on the impact

of pre-registration on p-hacking (Adda, Decker and Ottaviani, 2020; Abrams, Libgober and List, 2023; Decker and Ottaviani, 2023; Brodeur et al., 2024*b*). Studies have shown that pre-analysis plans registered on the Evidence in Governance and Politics (EGAP) and AEA RCT Registry often lack clarity in specifying control variables in regressions (Ofosu and Posner, 2023). Additionally, pre-registered studies do not necessarily contain a higher proportion of null results in psychology (van den Akker et al., 2024).

Furthermore, accounting for the equilibrium responses of researchers to the incentive system they face (Bergemann and Ottaviani, 2021; Libgober, 2022) might produce results that seem counter-intuitive at first, e.g., pre-registration may not significantly increase the disclosure of null results. Indeed, while the authors of pre-registered studies might feel more compelled to disclose their null results if they choose to write a paper, they could be less likely to write one in the first place if they anticipate a bias against null results at the review stage.[17]

5.2 Optimal Design of Pre-registration Platforms

The impact of pre-registration on transparency, information disclosure, p-hacking, and other outcomes also depends on the precise design of the platforms that support this practice. Table 3 summarizes the main characteristics of existing platforms together with information on the knowledge and use of these platforms among our respondents.

More than 75% of participants are familiar with the AEA RCT Registry and OSF. AsPredicted is slightly less well-known but is still used by over half of the participants, with a usage rate comparable to the other two platforms. The majority of researchers (55%) have used only one platform, while 35% have used two platforms (depending on their needs). Researchers cited several reasons and the pros of each platform (Figure B.6 in the Online Appendix). Researchers use the AEA RCT Registry due to its widespread recognition, standardization, focus on RCTs, support from the American Economic Association (AEA), and necessity for publication in AEA journals. The primary reasons for using AsPredicted include its simplicity, speed, and flexibility as a platform for concise registration, making it widely accepted for both lab and online studies. Lastly, OSF is regarded as a comprehensive, flexible, and user-friendly platform that integrates pre-registration and data repository functions, making it suitable for general science with extensive features for document uploading and collaboration.

At a high level, these platforms differ in the extent to which (i) pre-registrations are made publicly available and searchable and (ii) impose constraints on registration format and reporting. We asked respondents to express their preferences on these two dimensions. Figure 20, panel (a) shows that respondents' preferences over disclosure policies are quite split.

[17] Although Chopra et al. (2024) finds evidence for a "null results penalty", the findings of Brodeur et al. (2023*b*) suggest that authors might underestimate their chances of publishing null results. In fact, Franco, Malhotra and Simonovits (2014) find that most of the publication bias seems to come from authors not writing their papers rather than from journals being biased against null results.

Table 3: Design of current platforms.

Platform	AEA RCT Registry	AsPredicted	OSF	ClinicalTrials.gov	EGAP[a]	RIDIE
Year of creation	2013	2015	2012	2000	2011	2013
Searchable database	✓	✗	✓	✓	✓	✓
Indexing (DOI)	✓	✗	✓	✗	✓	✗
Timestamp	✓	✓	✓	✓	✓	✓
Version history	✓	Limited[b]	✓	✓	✓	✗
Disclosure policy	Default public[c]	Can remain private[d]	Embargoed[e]	Regulated[f]	Public	Partial privacy[g]
Template	✓	✓	✓	✓	✓	✓
Page/word limits	No	3,200 char/field[h]	5GB[i]	Unlimited	5GB[i]	20k char + files[j]
# of registration fields[k]	18 (M), 59 (O)	11 (M)	13 (M), 22 (O)[l]	~70 (M)[m]	Same as OSF	32 (M), 50 (O)
Registration flexibility	Highly flexible[n]	Limited[o]	Highly flexible[p]	Less flexible[q]	Same as OSF	Highly flexible[n]
Guidelines provided	✓	✓	✓	✓	✓	✓
Heard (%)[r]	84.7	69.2	75.6	19.3	6.1	0.4
Used (%)[s]	56.8	52.7	50.0	1.6	1.1	1.4

Notes: [a]EGAP closed in 2023. [b]Only the title can be changed. Other fields are unchangeable after acceptance. [c]Selected fields can be hidden/embargoed until trial completion. Confidential documents can be uploaded and remain private unless explicitly authorized. [d]Pre-registrations can remain private indefinitely. [e]Registrations can remain private for up to 4 years, and must be public afterward. [f]Regulated by US Code 42 CFR Part 11. Specific protocols and results must be disclosed. [g]Most fields are public, but some can be kept private during the study period. All fields become public at project completion. [h]Recommended response length for Questions 2-8. [i]Larger registrations require contacting support. [j]20,000 characters in text boxes, unlimited files up to 40MB each. [k]M = Mandatory, O = Optional. [l]Varies between registration forms. Numbers shown for the standard OSF form. [m]Varies depending on the trial type and specifics. [n]Researchers can upload their own documents in addition to mandatory fields. [o]Limited to 11 text entry questions. No document uploads are allowed. [p]Researchers can upload their own documents, but attached files cannot be updated post-submission. [q]Relatively regimented by platform design; can upload own documents. [r]509 responses to the question "Which of the following registration platforms have you heard of? Please select all that apply." [s]440 responses to the question "Which of the following registration platforms have you used so far? Please select all that apply."

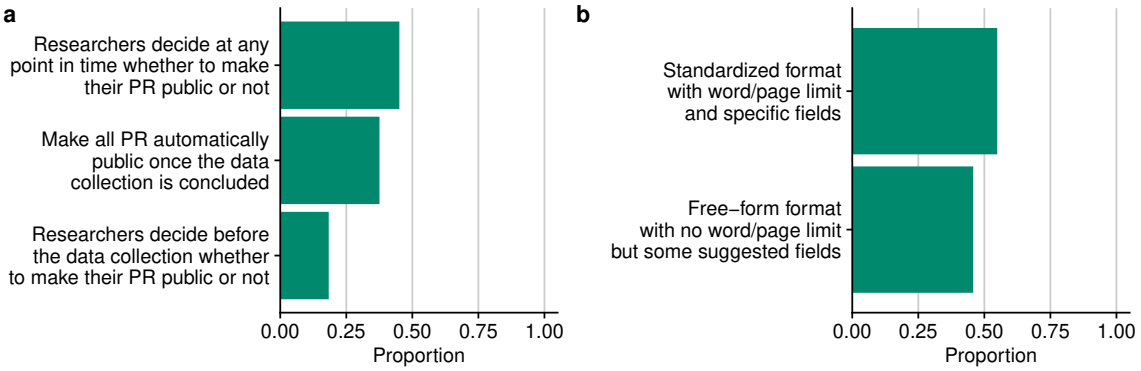

Figure 20: Preferred disclosure policy and formats of pre-registration.

While 45% of respondents would prefer to give researchers maximum flexibility in deciding if/when to make their pre-registration public, 37% would be most favorable to making all pre-registrations automatically available once the data collection is concluded. Figure 20, panel (b) shows that respondents are even more split on the use of templates, with 55% preferring a standardized pre-registration format with word/page limit and specific fields, and 45% preferring instead a less structured and more flexible format.

The lack of consensus on the design of pre-registration platforms reflects a fundamental

tension between ensuring broad participation with fewer requirements vs. maintaining high standards of documentation but at a lower participation. Without a clear and sufficiently detailed reporting procedure, the available evidence suggests that p-hacking and other QRPs might be insufficiently curtailed (Brodeur et al., 2024*b*). At the same time, imposing more stringent institutions could induce researchers to opt out of the practice or produce less ambitious projects for which they can write a detailed analysis.[18] More research needs to be conducted to understand the trade-off between the extensive vs. intensive margin of participation and its impact on the aggregate amount of information disclosure and equilibrium level of knowledge production.

5.3 Other Open Science Institutions

While this paper focused on the practice of pre-registration, other complementary or alternative institutions could help address some of the objectives listed in Section 5.1.

Among the possibilities, we asked respondents to consider Registered Reports and results-blind review, as two alternative peer review mechanisms that could help with combatting publication bias (Dufwenberg and Martinsson, 2014; Findley et al., 2016; Chambers and Tzavella, 2022; Bloomfield, Rennekamp and Steenhoven, 2018; Grand et al., 2018; Arpinon and Espinosa, 2023). Both mechanisms require journals to evaluate manuscripts solely based on the quality of the proposed research and without having knowledge of the findings. In the case of Registered Reports, no prior data collection should occur before the initial review stage while some or all data may have been already collected for pre-results review. Such peer review institutions are novel in economics, with Registered Reports being considered only in a few journals, including *Experimental Economics*, *Journal of Development Economics*, *Journal of the Economic Science Association*, and *Journal of Political Economy Microeconomics*.[19] Over 80% of respondents reported being familiar with Registered Reports, and about half had heard of results-blind reviews.

Next to these two peer-review mechanisms, we also asked respondents to consider open data/protocol and replications as two mechanisms to improve research transparency and assess the robustness of research findings. Over the last 20 years, significant efforts have been made to promote open data and improve the reproducibility or replicability of research (Vilhuber, 2020; Miguel, 2021; Brodeur et al., 2023*a*, 2024*a*).

Figure 21 shows that a large majority of researchers are now very favorable to replications

[18] Mandating detailed pre-analysis plans for experiments could also come at the risk of reducing the influence of the field in economics if researchers decide to reallocate their research efforts toward theory or empirical research with observational data for which pre-registration cannot be credibly performed.

[19] In 2023, *Experimental Economics* published two Registered Reports in its symposium issue "Pre-results review" (Fischbacher and Wolff, 2023). Espinosa et al. (2023) list economics journals that accept Registered Reports as a valid submission format. We are not aware of economics journals that perform results-blind reviews, but this review mode is practiced in other disciplines, such as political science (Findley et al., 2016), and often as a "pilot" program.

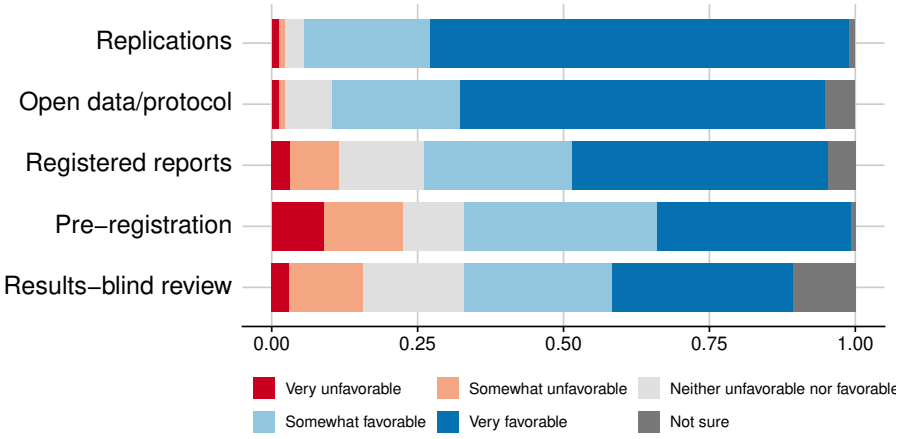

Figure 21: Opinion on open science practices. *Notes*: "Pre-registration" row is copied from Figure 4. Associations between item ratings are presented in Figure B.7 in the Online Appendix.

and open data/protocol, with a distribution of favorability scores that is remarkably in line with the recent findings of Ferguson et al. (2023). Respondents also appear broadly favorable to Registered Reports and results-blind reviews, which seem to bring more consensus than pre-registration.

Heterogeneity analyses show a statistically significant effect of seniority or position for Registered Reports (seniority: **Secondary Hypothesis 3**, $t(439) = 4.102, p < 0.001$; position: **Exploratory Hypothesis 6**, $F(6, 496) = 3.393$, $p = 0.003$) and suggestive evidence for results-blind review (seniority: **Secondary Hypothesis 4**, $t(410) = 3.027, p = 0.003$; position: **Exploratory Hypothesis 7**, $F(6, 496) = 3.003$, $p = 0.007$), but not for replications (seniority: **Secondary Hypothesis 2**, $t(457) = 0.563$, $p = 0.574$; position: **Exploratory Hypothesis 5**, $F(6, 498) = 0.858$, $p = 0.526$) and open data/protocol (seniority: **Secondary Hypothesis 1**, $t(437) = 0.323, p = 0.747$; position: **Exploratory Hypothesis 4**, $F(6, 497) = 0.951, p = 0.458$). The estimated coefficients are displayed in Figures 22 and 23, and the full regression results are reported in Tables B.1 and B.2 in Online Appendix B.

5.4 Role of Professional Associations

Even with large community support, reforms cannot be implemented without the active involvement of professional associations. For this reason, we asked respondents to consider what role the ESA should play in the open science movement (Figure 24). First, looking at pre-registration, 74% of respondents indicated that they would be in favor of providing guidelines to authors and reviewers on how to write and evaluate pre-registrations, respectively. A smaller majority would also be favorable toward strongly encouraging pre-registrations for papers submitted to *Experimental Economics* and *Journal of the Economic Science Association*; however, they were generally against mandating pre-registrations. More junior researchers were again more supportive of encouraging or even mandating pre-registration at the ESA journals (**Primary Hypotheses 2-3**; support pre-registration in EXEC and JESA: $t(465) =$

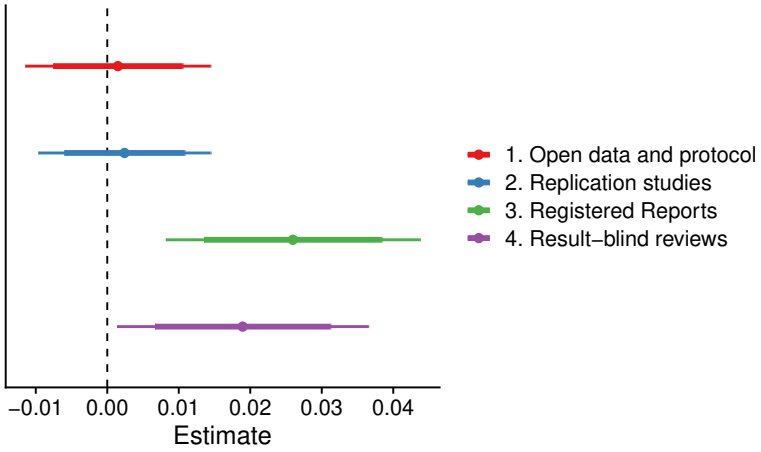

Figure 22: Heterogeneity of support for other open science practices. *Notes*: Estimated coefficients from four linear regression models, where the independent variable is the (expected) Ph.D. completion year. The dependent variable in each model is as follows: (1) support of open data and protocol, (2) support of replication studies, (3) support of Registered Reports, (4) support of Results-blind review. Bars indicate 99.5% (thin lines) and 95% (thick lines) confidence intervals. For full regression results, see Table B.1 in the Online Appendix.

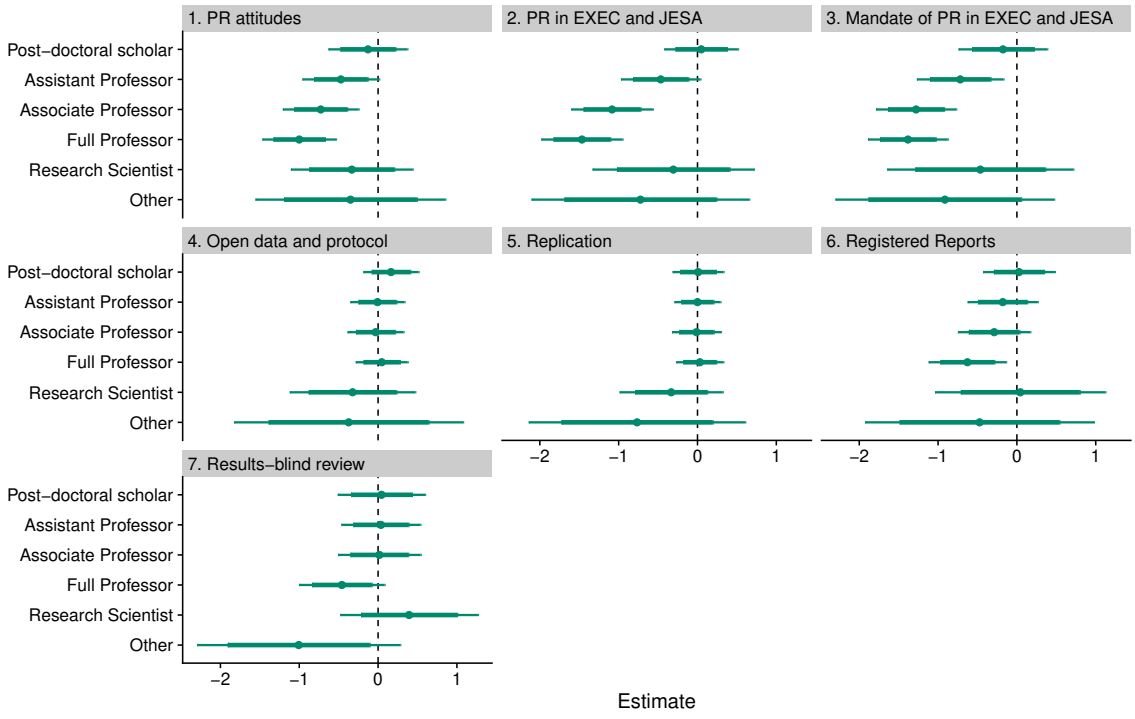

Figure 23: Heterogeneity of attitudes toward and support for pre-registration and other open science practices. *Notes*: Estimated coefficients from multiple regression models, where independent variables are dummy indicators for six career stages (the baseline category is *Graduate student*). The dependent variable in each panel is as follows: (1) pre-registration attitudes, (2) support of pre-registration in EXEC and JESA, (3) support of the mandate of pre-registration in EXEC and JESA, (4) support of open data and protocol, (5) support of replication studies, (6) support of Registered Reports, (7) support of Results-blind review. Bars indicate 99.5% (thin lines) and 95% (thick lines) confidence intervals. For full regression results, see Table B.2 in the Online Appendix.

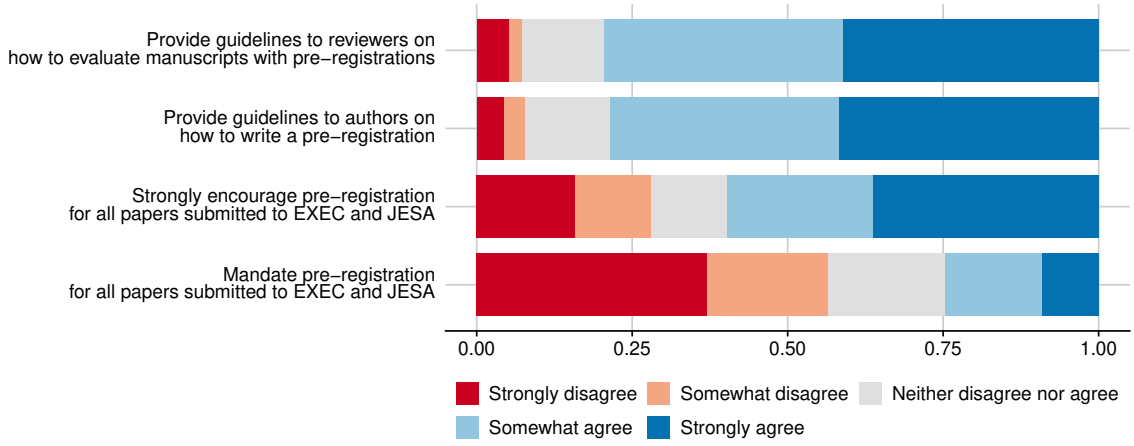

Figure 24: Role of the ESA in open science movement.

9.551, $p < 0.001$; support a mandate of pre-registration in EXEC and JESA: $t(464) = 6.899$, $p < 0.001$). Support for (a mandate of) pre-registration in EXEC and JESA also differs significantly by position (**Exploratory Hypotheses 2-3**; support pre-registration in EXEC and JESA: $F(6, 502) = 17.353$, $p < 0.001$ support a mandate of pre-registration in EXEC and JESA: $F(6, 501) = 16.317$, $p < 0.001$; Figure 23, panels (2) and (3); Table B.2, columns (2) and (3), in the Online Appendix).

Second, an overwhelming majority of respondents expressed a desire for the ESA to commit to publishing high-quality null results and replication studies, as well as to promote open data (see Figure 25).[20] There is little variation in opinions between those who favor pre-registration and those who do not, except regarding the consideration of pre-data collection review (i.e., Registered Reports), and results-blind review to a lower extent. Overall, it appears that respondents want the ESA to take a more proactive role in promoting open and transparent research.

5.5 What's Next?

We conclude this paper by discussing the limitations of our study and potential next steps. First, our pool of respondents is fairly small and unlikely to be fully representative of the broader population of experimental researchers or the profession as a whole, even based on observable characteristics. Second, our survey only covered certain aspects of pre-registration and other open science practices, without distinguishing between simple pre-registrations and more detailed analysis plans due to the difficulty of clearly defining the boundary between the two. Third, as with any survey-based study, our analyses rely on self-reported data, which may be subject to measurement error and response biases. Additionally, questions about be-

[20] In 2021, the Executive Committee of the ESA approved a policy for public availability of data and replication materials, applying to papers submitted to EXEC and JESA (Economic Science Association, 2022). A collection of replication packages published since the policy's implementation is available here: https://economicscience.github.io/replication/.

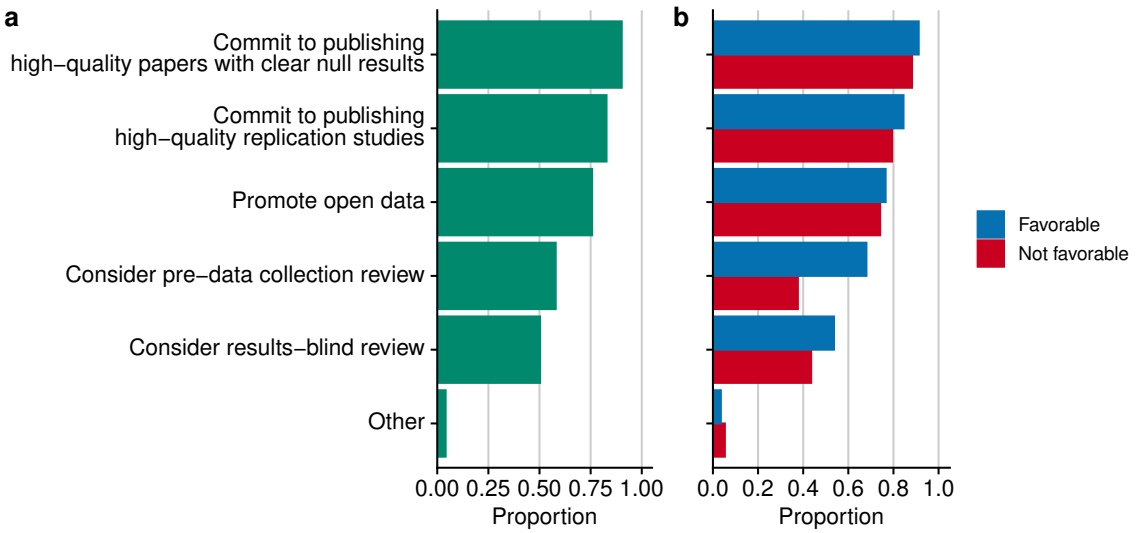

Figure 25: What other initiatives the participants think the ESA should consider to promote research transparency and open science. (a) All (N = 511). (b) By respondents' attitude toward pre-registration (not favorable, N = 170; favorable, N = 341)

liefs regarding norms were not incentivized. Fourth, our analyses are correlational and do not establish causal relationships between researchers' judgments and their pre-registration practices. Fifth, our survey provides a snapshot from the summer of 2023, and repeating it now could yield different results due to the rapidly evolving nature of this landscape. Finally, this study focused on documenting researchers' views and current practice of pre-registration, without pinning down concrete proposals for reform.

In light of these limitations, we conclude by articulating three directions for future work and the role that the ESA could play in each.

1. *Stimulating metascience research*: A lot of work needs to be done to evaluate the performance of existing open science institutions and to improve their design. A proper evaluation of these institutions requires not only more empirical evidence (observational studies and RCTs), but also a careful examination of the theoretical channels that may drive behavioral responses to existing incentive structures (Bergemann and Ottaviani, 2021).[21] Table 4 presents a (non-exhaustive) list of open questions that need more consideration. The ESA could promote metascience research by organizing workshops, launching special issues on the topic, or offering small grants or awards for researchers interested in pursuing this research program.

2. *Offering guidance to researchers*: The vast majority of respondents agreed that a professional association such as the ESA should provide guidelines on how to write and evaluate papers with pre-registration, and we noted that the demand appears particu-

[21] For instance, one might want to consider the design of publication incentives for authors and journal editors and how transparency policies might interact with those incentives to influence what research is produced and subsequently published.

Table 4: Open questions around the use of pre-registration.

Topic	Research questions
Peer evaluation	How do reviewers perceive deviations from pre-registrations and different reporting formats (e.g., populated PAPs)?
Research robustness	How does variation in the strength of guidelines or pre-registration incentives affect p-hacking and the credibility of research?
Research novelty	How do journal submission requirements or posted guidelines affect the novelty or riskiness of research?
Research speed	How does frontloading the work with detailed analysis plans affect overall research speed?
Process difficulty	What hurdles do researchers face in the process of writing, implementing, and communicating on their pre-registered analyses?
Information disclosure	How does incentivizing pre-registration impact total information disclosure (e.g., use of pilot data to inform pre-registrations, reporting of null results)?
Overall participation	How do differences in the design of registration platforms (searchability and standardization) affect participation in the institution?
Link to other practices	How do other open science practices (replication, open data/protocol, etc.) interact with pre-registration?
Views on open science	How do researchers perceive the growing emphasis on open science practices in advancing scientific research?

larly strong from early-career researchers. However, a recurring theme in this paper was that the views of the community appear highly heterogeneous in terms of how this practice should be conducted, implying that it might be difficult (if not impossible) to reach an agreement on a common set of principles. Short of that, the ESA could offer a set of guiding principles to help researchers decide how they wish to communicate transparently about their work and what elements they might want to consider should they want to write or examine a pre-registration.

3. *Enabling community engagement and reform*: Improving the functioning of our research ecosystem cannot happen without the engagement of the research community. Professional associations such as the ESA have an important role to play as a catalyst to foster discussions and develop concrete proposals to address some of the weaknesses of

our current incentive system. For example, the ESA could establish specialized working groups that bring together members from diverse backgrounds and experience levels—including early-career and senior researchers, economists employing different research approaches, journal editors, and potentially scholars from other disciplines. Additionally, the ESA could expand the role of "Data and Replicability Committee" to support these initiatives and enhance community engagement in advancing open science. These working parties could present the results of their work at ESA conferences and/or in online sessions to foster broader community conversations around possible solutions.

In closing, we hope to see more coordinated efforts to understand how various open science institutions are perceived, how they work, and how to improve them via careful evaluation and experimentation. This paper is only a minor step in this direction, but it illustrates, in our view, the usefulness of collaborative efforts from researchers who have had different experiences with pre-registration and other open science practices. If anything, the production of this paper taught us that ensuring the transparent and efficient communication of scientific results is not something researchers should take for granted, and we are very grateful for this valuable lesson.[22]

Acknowledgements. We thank Lawrence Clark, Iraa Dahiya, Daniel Evans, Deniz Hallik, Noriko Imai, Ira Kansara, Joseph Levine, Chaya Senichault, and Milan-Avin Spendel for their outstanding research assistance. We also thank Ted Turocy, the Vice President of Information of the ESA, for assembling the summary statistics of the members of the ESA. Additionally, we are grateful to Abel Brodeur, Valeria Burdea, Astrid Hopfensitz, Edward Miguel, Davide Pace, Arno Riedl, Simeon Schudy, Olmo van den Akker, Roberto Weber, and the audience at the 2023 ESA World Meeting in Lyon, the 12th BITSS Annual Meeting, and META-REP Conference 2024, for helpful discussion. Finally, we acknowledge financial support from the Japan Society for the Promotion of Science (KAKENHI No. JP22K21358 to T.I.), Deutsche Forschungsgemeinschaft through CRC TRR 190 (T.I. and L.N.), the Economic and Social Research Council (No. ES/V003461/1 to S.T.), Jan Wallander and Tom Hedelius Foundation (P23-0098 to A.D.), Knut and Alice Wallenberg Foundation and Marianne and Marcus Wallenberg Foundation (A.D.), and the Leibniz Association (SAW10868 to L.N.; K523/2023—Lab^2 to A.D. and L.N.).

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[22] We forgot to pre-register how we were going to discuss deviations from pre-registration.

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Online Appendix

Pre-Registration and Pre-Analysis Plans in Experimental Economics

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Contents

A Additional Materials

A.1 Pre-Registrations in Articles Published in Economics Journals

We examine patterns of pre-registration among papers containing an experimental study and published over the period 2017-2023 in 19 leading economics journals listed in Table A.1. We downloaded all papers from these journals and conducted a full-text keyword search to identify articles that included one or more keywords related to pre-registration and pre-analysis plans listed in Table A.2. Of the 13,828 PDF files we reviewed, 3,331 contain at least one keyword related to both pre-registration or pre-analysis plans and experiments.

Full-text keyword searches may sometimes flag papers that do not actually include pre-registration or pre-analysis plans. For instance, a paper that theoretically discusses the concept of pre-registration without presenting empirical or experimental data might still trigger a "hit" in our search process. Conversely, we might miss papers that do include pre-registration or pre-analysis plans if the authors describe them in unconventional way. While addressing the latter issue is difficult, to mitigate the former, our assistants manually reviewed the papers identified through the keyword search.

The dataset construction follows these key steps:

1. Check whether the paper uses observational or experimental data to exclude clearly irrelevant studies.
2. Check whether the paper includes pre-registration or detailed pre-analysis plans by checking acknowledgments or searching for platforms such as the AEA RCT Registry, AsPredicted, or Open Science Framework.
3. Extract pre-registration details, including the platform used and the associated link.
4. Classify the type of data used (e.g., laboratory, field, online experiment, observational data, replication study).

The research team addressed any ambiguities raised by the assistants and reviewed a randomly selected subset of the papers. At the end of the process, we identified 561 experimental (laboratory or field) papers that had corresponding pre-registration and pre-analysis plans.

Table A.1: List of journals.

American Economic Journal: Applied Economics	AEJApp
American Economic Journal: Economic Policy	AEJPol
American Economic Journal: Microeconomics	AEJMic
American Economic Review	AER
American Economic Review: Insights	AERI
Econometrica	ECMA
Economic Journal	EJ
Experimental Economics	EXEC
Games and Economic Behavior	GEB
Journal of Development Economics	JDE
Journal of Economic Behavior & Organization	JEBO
Journal of the European Economic Association	JEEA
Journal of the Economic Science Association	JESA
Journal of Political Economy	JPE
Journal of Public Economics	JPubE
Management Science	MgtSci
Quarterly Journal of Economics	QJE
Review of Economics and Statistics	REStat
Review of Economic Studies	REStud

TABLE A.2: Keywords used for the full-text search.

1	analysis plan
2	pre-analysis plan
3	␣pap␣
4	pap.
5	␣pre regist
6	␣preregist
7	␣pre-regist
8	␣register
9	␣registration␣
10	aea rct
11	aearct
12	socialscienceregistry
13	open science framework
14	␣osf␣
15	osf.
16	aspredicted
17	␣egap␣
18	␣ridie␣
19	clinicaltrials
20	␣experiment␣
21	␣laboratory␣
22	␣field␣
23	laboratory experiment
24	field experiment
25	online experiment
26	intervention
27	randomized trial
28	randomized control trial
29	␣rct␣
30	rct.

Notes: ␣ denotes a white space.

A.2 Journal Policies

We reviewed the submission policies of the 19 leading economics journals listed in Table A.1, along with *Nature Human Behaviour* and *Journal of Political Economy Microeconomics*. Below, we highlight any references to pre-registration and/or pre-analysis plans within these policies. Journals from Table A.1 that are not mentioned (including, for example, *Experimental Economics* and *Journal of the Economic Science Association*) do not include anything related to pre-registration or pre-analysis plans in their submission guidelines.

AEA journals. The "AEA Journal Policies" states (accessed March 14, 2025) includes the following statement.

> It is the policy of the AEA journals that all work involving field experiments must be registered prior to submission for publication. (Laboratory experiments do not need to be registered at this time.) Researchers may register during any phase of the trial—forthcoming, ongoing, or completed—but are encouraged to register early.
>
> Authors of papers using randomized controlled trials should include a self-reference using the following format: Author Names. Year. "Title." AEA RCT Registry. Month Day. DOI.

ECMA. The "Instructions for Submitting Articles" (accessed March 14, 2025) mention pre-registration, but the journal neither encourages nor mandates it.

> **Registry for Randomized Controlled Trials**: The American Economic Association operates a Registry for Randomized Controlled Trials (RCTs). The journal encourages authors of papers that use RCTs to register their experiments. Registration of RCTs is not mandatory. Registration is free. If you choose to register, please acknowledge registration in the acknowledgement footnote, including the registration number.

JEEA. In the "Instructions to Authors" (accessed March 14, 2025), the journal encourages pre-registration.

> **6. Pre-registration**
>
> *JEEA* encourages authors of papers that use RCTs to register their experiments (whether their experiment is based in the lab or the field). Registration of RCTs is not mandatory. Registration is free. If you choose to register, please acknowledge registration in the acknowledgement footnote, including the registration number.

JPE Micro. In early 2024, the journal published "Data Generation Guidelines" (accessed March 14, 2025).

> Authors of studies that generate their own data will be expected to register their project before data collection in one or more of the various trial registries and write a pre-analysis plan (PAP) before data collection. If a study is not pre-registered and has no PAP, then it should not be submitted to *JPE Micro*. **Studies submitted without the required pre-registration and PAP will be sent back to the author without a review.**
>
> **Pre-registration** is a publicly documented statement summarizing the study and the hypotheses the researcher plans to investigate before data are collected and analyzed. A subset of pre-registrations are **PAPs**, which offer greater detail about the researcher's plans. If used appropriately, registries and PAPs can help to tackle key issues in the credibility crisis such as p-hacking and the file drawer problem.

MgtSci. In the "Editorial Statement" (accessed March 14, 2025), the Behavioral Economics and Decision Analysis Department encourages authors to adhere to evolving standards and norms aimed at enhancing transparency.

> We value transparency and invite authors to document their research process. This may include, for example, disclosing pilots and various analysis attempts, preregistration of studies, and documenting deviations from initial plans and changes due to the review process. "Open science" norms evolve and can vary across disciplines. Authors are advised to keep up with the standards in their field and to conform when feasible and appropriate.

NHB. The journal has the following policy (accessed March 14, 2025).

> For non-clinical confirmatory research, we strongly encourage study pre-registration with an analysis plan. We ask that authors indicate at the time of submission if any of the work reported in their manuscript was pre-registered. If any of the reported studies were pre-registered, authors must provide an active link to the pre-registration in the Methods section and state the date of pre-registration. Authors must disclose all deviations from the pre-registered protocol and explain the rationale for deviation (e.g., flaw, feasibility, suboptimality). In cases of deviation from the pre-registered analysis plan for reasons other than fundamental flaws or feasibility, the originally planned analyses must also be reported. Editors and reviewers examine adherence to the protocol and transparent disclosure of deviations. Manuscripts reporting pre-registered research will not be accepted for publication until they meet these requirements.

REStud. The journal endorses the "Data and Code Availability Standard [v1.0]" (accessed March 14, 2025), which includes the following item.

> If applicable, pre-registration of the research is identified and cited.

A.3 Survey Invitation

Dear members of the ESA community,

Pre-registration and pre-analysis plans, whether they should be required and for which types of experimental studies, and how they should be written/interpreted are important questions for us experimental economists. Given the lack of clear guidelines on the topic, many researchers may struggle with practical questions on whether and what to register, and how.

On behalf of the ESA Data and Replicability Committee, I would like to ask you to participate in an anonymous survey that aims to collect information on researchers' current practices and attitudes toward pre-registration and pre-analysis plans in experimental economics. Our goal is to share survey results during a special session on the topic that will take place at the 2023 World ESA Meetings in Lyon (June 26-29), and ultimately write a report that contains information/guidelines for the profession on the use of pre-registration and PAPs. In addition, your opinions will inform the editors of the ESA journals. We encourage everyone to voice their opinion on this important matter.

The survey is expected to take about 15 minutes. If you would like to comment further on the issues targeted in the survey and/or would like to voice an opinion by name in the report that will be prepared, please email Seda Ertac (chair of the ESA data and replicability committee) at `sertac@ku.edu.tr`.

To participate in the survey, please click on this link:

[Link to the survey]

The survey will be available until June 25, but we would be grateful if you were taking the survey earlier to give the team enough time to analyze your responses.

Thank you very much for your help in this initiative.

Best regards,

Marie Claire Villeval,

President of the Economic Science Association

Figure A.1: Call for Survey. Invitation to the survey sent to the ESA members.

A.4 Demographic Information of the Conference Participants and ESA Members

We collected demographic information on the conference participants as follows. We began by scraping data on submitted abstracts from the official Economic Science Association website (https://economicscience.org/), which included presenters' names, affiliations, and co-authors. Following the ESA World Meeting in Lyon, we obtained a list of participants (names only) from the conference organizers. We then merged these datasets to create a comprehensive list. To code the demographic information, we took several steps. Gender was inferred from first names using genderize.io (https://genderize.io/). Academic career details and the year of (expected) Ph.D. completion were manually coded by reviewing participants' academic websites. For geographic location, we used ChatGPT to classify affiliations into one of four ESA regions: Asia-Pacific, Europe, North America, and Other.

We obtained summary statistics on the demographic characteristics of ESA members, including gender (limited to male/female options as of 2023) and the geographical location of primary affiliations. This data, provided by Ted Turocy, the Vice President of Information for the ESA, consists of aggregate statistics for each dimension separately (without cross-tabulation) and excludes any personally identifiable information.

A.5 List of Pre-Registered Hypotheses

TABLE A.3: Correspondence between pre-analysis plans and presented results.

		Pre-registered hypothesis	Discussed in
Primary	1	More junior scientists are more favorable to pre-registration.	Section 4.1
Primary	2	More junior scientists more strongly support pre-registration in EXEC and JESA.	Section 5.4
Primary	3	More junior scientists more strongly support a mandate of pre-registration in EXEC and JESA.	Section 5.4
Secondary	1	More junior scientists more strongly support open data and protocol.	Section 5.3
Secondary	2	More junior scientists more strongly support replication studies.	Section 5.3
Secondary	3	More junior scientists more strongly support Registered Reports.	Section 5.3
Secondary	4	More junior scientists more strongly support Results-blind review.	Section 5.3
Secondary	5	Scientists over/underestimate how favorable other scientists are toward pre-registration.	Section 4.1
Secondary	6	Scientists over/underestimate the fraction of scientists who have heard about pre-registration.	Section 4.1
Secondary	7	Scientists that prefer more detailed analysis plans in pre-registrations are more favorable toward pre-registration.	Section 4.2
Secondary	8	Scientists that are more favorable toward pre-registration more strongly believe that pre-registration improves the credibility of statistically significant findings.	Section 4.3
Exploratory	1	Attitudes toward pre-registration vary with position.	Section 4.1
Exploratory	2	The support of pre-registration in EXEC and JESA varies with position.	Section 5.4
Exploratory	3	The support of a mandate of pre-registration in EXEC and JESA varies with position.	Section 5.4
Exploratory	4	The support of open data and protocol varies with position.	Section 5.3
Exploratory	5	The support of replication studies varies with position.	Section 5.3
Exploratory	6	The support of Registered Reports varies with position.	Section 5.3
Exploratory	7	The support of Results-blind review varies with position.	Section 5.3

B Additional Results

We present tables and figures that supplement our pre-registered analyses (Tables B.1 and B.2 for **Secondary Hypotheses 1-4** and **Exploratory Hypotheses 1-7**) and offer additional descriptive evidence (Figures B.1-B.6).

Table B.1: Support of other open science institutions.

	(1)	(2)	(3)	(4)
Year of Ph.D. completion	0.002	0.002	0.026^{***}	0.019^{***}
	(0.005)	(0.004)	(0.006)	(0.006)
Constant	1.012	0.095	-48.516^{***}	-34.305^{**}
	(9.288)	(8.666)	(12.781)	(12.636)
Observations	437	457	439	410
R^2	0.0004	0.001	0.048	0.025

Notes: Dependent variables: (1) support of open data and protocol, (2) support of replication studies, (3) support of Registered Reports, (4) support of Results-blind review. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Table B.2: Exploratory analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post-doctoral scholar	−0.128	0.048	−0.176	0.164	0.008	0.027	0.043
	(0.178)	(0.167)	(0.201)	(0.125)	(0.115)	(0.162)	(0.197)
Assistant Professor	−0.472**	−0.466**	−0.718***	−0.008	0.000	−0.179	0.036
	(0.174)	(0.180)	(0.196)	(0.123)	(0.104)	(0.159)	(0.179)
Associate Professor	−0.727***	−1.083***	−1.279***	−0.031	−0.012	−0.288	0.016
	(0.171)	(0.184)	(0.181)	(0.127)	(0.111)	(0.164)	(0.187)
Full Professor	−1.000***	−1.466***	−1.383***	0.047	0.030	−0.627***	−0.459*
	(0.167)	(0.184)	(0.180)	(0.117)	(0.107)	(0.175)	(0.193)
Research Scientist (non-academic)	−0.333	−0.307	−0.463	−0.323	−0.333	0.043	0.393
	(0.275)	(0.365)	(0.421)	(0.284)	(0.233)	(0.385)	(0.311)
Other	−0.350	−0.724	−0.913	−0.373	−0.767	−0.473	−1.007*
	(0.429)	(0.492)	(0.494)	(0.518)	(0.489)	(0.517)	(0.459)
Constant	4.250***	4.224***	3.213***	4.573***	4.667***	4.373***	4.107***
	(0.114)	(0.118)	(0.142)	(0.091)	(0.086)	(0.123)	(0.139)
F	7.766***	17.353***	16.317***	0.951	0.858	3.393***	3.003**
Observations	512	509	508	504	505	503	503
R^2	0.077	0.163	0.158	0.014	0.027	0.044	0.038

Notes: Dependent variables: (1) pre-registration attitudes, (2) support of pre-registration in EXEC and JESA, (3) support of the mandate of pre-registration in EXEC and JESA, (4) support of open data and protocol, (5) support of replication studies, (6) support of Registered Reports, (7) support of Results-blind review. The baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

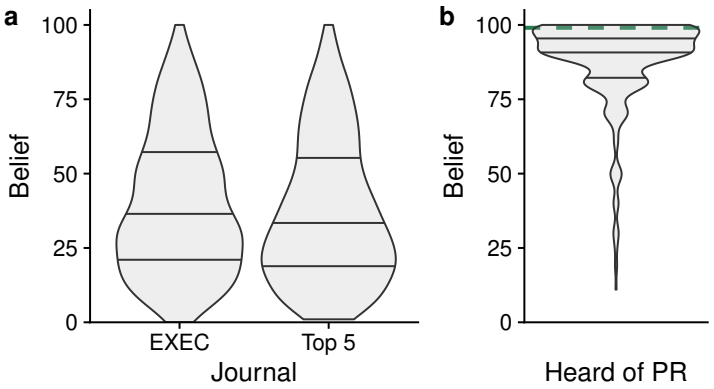


FIGURE B.1: Beliefs about prevalence of and familiarity with pre-registration. (a) Beliefs about the percentage of papers published in EXEC and top-5 journals between 2017 and 2022 that were pre-registered. (b) Beliefs about the percentage of participants who have heard about pre-registration. *Notes*: Horizontal lines in violin prots represent the 25th, 50th, and 75th percentiles. The green dashed line in panel (b) indicates the actual percentage of participants who have heard about pre-registration.

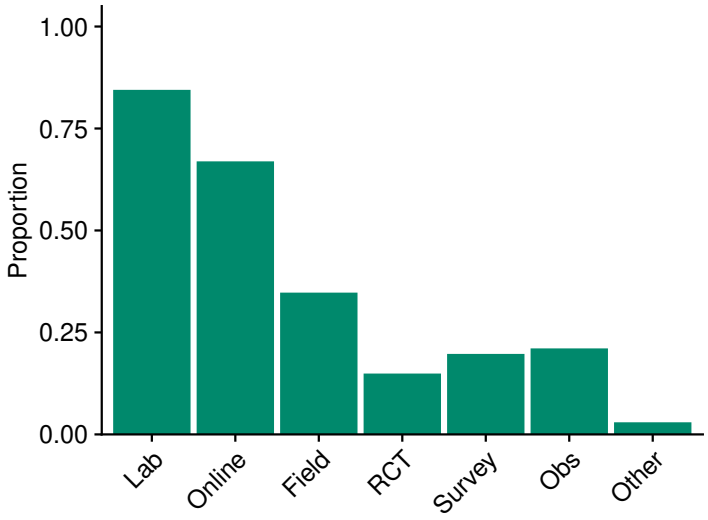


FIGURE B.2: Primary empirical method ($N = 519$). *Notes*: Multiple selection is allowed.

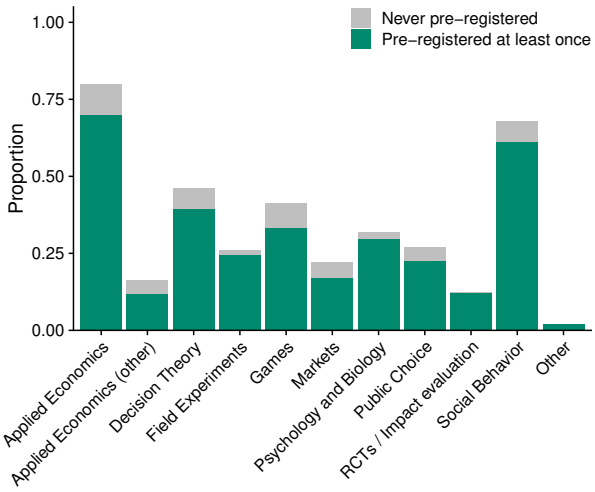


FIGURE B.3: Adoption by subfield of research. *Notes*: 474 participants responded to the question "What topics do your main research agenda(s) focus on?" where multiple selection was allowed. In the survey, the option "Applied Economics" was presented as "Applied Economics (charitable giving, economic development, labor market, etc.)".

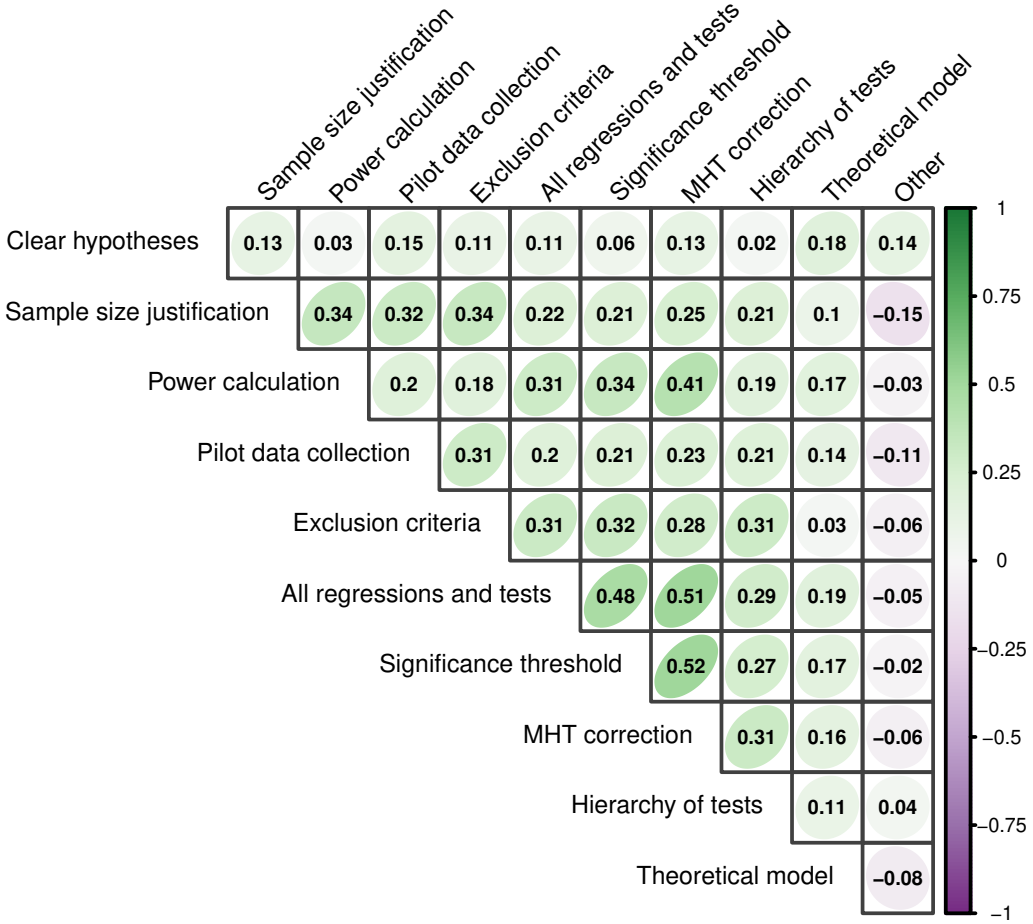


FIGURE B.4: Associations between elements that researchers think should be contained in a pre-registration.

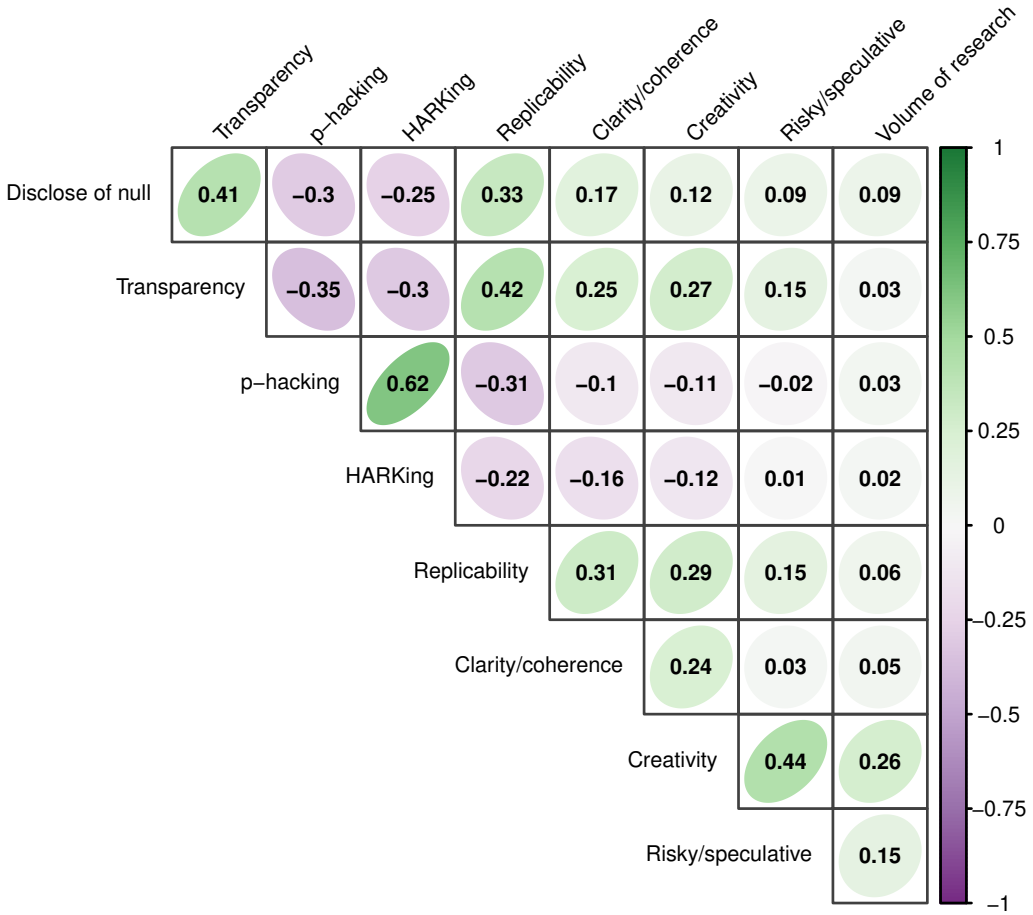


FIGURE B.5: Expected impact of pre-registration: Pairwise association measured by Kendall's τ_b.

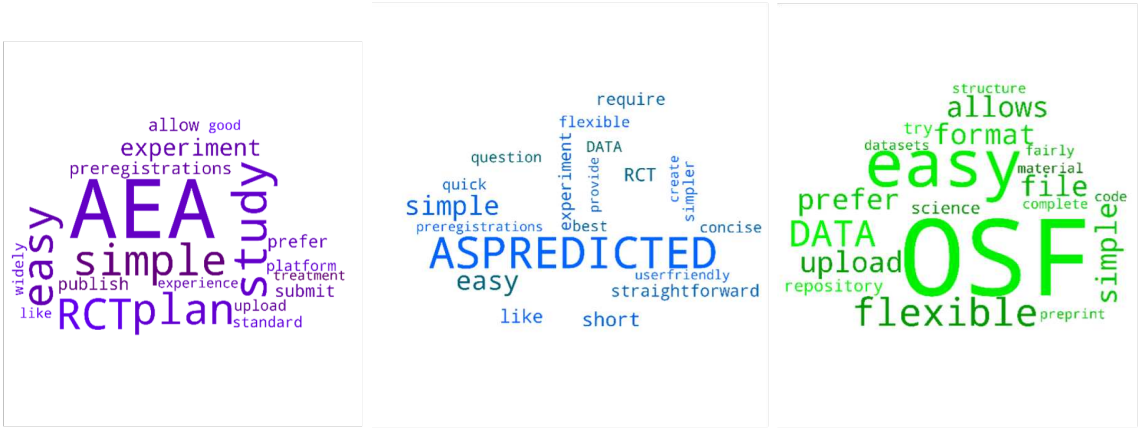


FIGURE B.6: Reasons for using a pre-registration platform.

FIGURE B.7: Association between opinions on Open Science practices.

C Literature Review

We review the literature on various aspects of open science practices, including the use of registries, content and precision of PAPs, adherence to PAPs and communication of deviations, and impact on research quality (see Table C.1 for an overview). While this is not an exhaustive or systematic review, we cover a diverse range of disciplines— both within and beyond economics— as well as various methodological approaches, including survey studies, experimental research, observational analyses, and theoretical work.

Surveys and Reviews on Open Science Practices

We review surveys of researchers regarding their practices and views on pre-registration, pre-analysis plans (PAPs), and other open science practices, such as data sharing. Additionally, we discuss reviews of trends in open science practices, including the use of PAPs across various disciplines, and explore the factors influencing participation, such as the type of research or the characteristics of researchers adopting PAPs.

Bakker et al. (2021). The authors investigate questionable research practices (QRPs) and open research practices (ORPs) among quantitative communication researchers. Their key research questions focus on the prevalence, acceptability, and perceived prevalence of QRPs and ORPs. The authors conducted a survey of 1,039 first and corresponding authors who published quantitative papers in the top 20 communication journals between 2010 and 2020. The survey, administered in September 2020, asked participants about their engagement in various QRPs and ORPs, as well as their perceptions of the prevalence and acceptability of these practices.

A significant number of respondents reported engaging in QRPs at least once, common practices including not reporting all analyses (64%) and HARKing (46%). Despite this, QRPs were generally viewed as unacceptable. The study also revealed evidence of pluralistic ignorance, wherein researchers personally disapprove of QRPs but believe such practices are widespread in the field. Conversely, researchers were optimistic about the potential of ORPs to improve communication research, although adoption rates varied (e.g., 47% had pre-registered a study, and 85% had shared papers publicly). The authors acknowledge several limitations, such as the potential for social desirability bias in self-reported QRP use and the exclusive focus on quantitative researchers. Additionally, the sample included relatively few early-career researchers.

In comparison to our findings, the authors report that 47% of their respondents had pre-registered a study at least once, which is lower than the 86% in our sample but still reflects substantial adoption. More directly relevant, they found that researchers were generally optimistic about pre-registration improving communication research. This aligns with our Result 3, the majority of respondents were favorable toward pre-registration. The authors also

note some skepticism and unfamiliarity with pre-registration among researchers, which is consistent with our findings on reasons for not pre-registering (Result 6).

Logg and Dorison (2021). The authors investigate the adoption and perceptions of pre-registration in the social and behavioral sciences focusing on who currently pre-register, why some researchers are reluctant to adopt this practice, and how researchers can create effective pre-registrations. The study combines both observational and survey components. The observational part reviews 322 empirical articles published in *Organizational Behavior and Human Decision Processes* from 2015 to 2020, investigating the adoption rates of open science practices— though this is the only journal analyzed. The survey component consists of an online survey of 248 active behavioral science researchers conducted in 2020, which assesses their current practices and views on pre-registration.

Key findings indicate that pre-registration adoption lags behind other open science practices, such as sharing data and materials. Generational differences are evident, with early-career researchers more likely to pre-register and hold favorable views of the practice. The survey also revealed uncertainty among researchers about the perceived costs and benefits of pre-registration. In response, the authors address common concerns, emphasizing advantages like improved research clarity, enhanced collaboration efficiency, and better mentorship opportunities.

The study finds that 50% of respondents were pre-registering for unpublished projects, which, while lower than our 86% adoption rate (Result 3), still demonstrates significant uptake. The authors also highlight generational differences, noting that early-career researchers are more inclined to pre-register, providing a more nuanced perspective on our Result 4, which discusses the ambiguous impact of academic age on pre-registration practices.

Miguel (2021). The author investigates the adoption and impacts of open science practices in economics over the past two decades, focusing on key research questions: How have open science practices such as data sharing, pre-registration, and pre-analysis plans been adopted in economics? What evidence exists regarding their benefits and costs? The paper employs a combination of observational data and a literature review. It analyzes survey data from a sample of 204 economists surveyed in 2017 to track the adoption of open science practices over time. Additionally, it reviews evidence from several empirical studies, including an analysis of the effects of journal data-sharing policies (based on a sample of papers from two journals, 2001-2009) and a study on editorial statements and null results (sample of papers from eight health economics journals, 2014-2018).

The findings reveal that open science practices have been rapidly adopted in economics over the past 15 years, with nearly 90% of surveyed economists having shared data by 2017. There is also evidence that data sharing can increase citations, pre-registration improves research quality, and editorial statements promote the publication of null results. However,

challenges remain, particularly in fields like structural economics.

The results on the rapid adoption of pre-registration in economics align with our Result 1, which shows a significant growth in pre-registered studies from 2017 to 2023. Furthermore, the author's discussion of economists' attitudes towards pre-registration aligns with our Result 2, where a 2020 survey revealed that 80% of development economists favor pre-registration practices. This widespread support is consistent with our finding that the majority of respondents view pre-registration positively. Additionally, the paper explores the reasons behind pre-registering, which are closely related to our Result 5 and Result 11, highlighting improved research credibility as a key advantage of pre-registration in economics.

Toribio-Flórez et al. (2021). The authors present a survey study examining early career researchers' (ECRs) knowledge, attitudes, and implementation of open science practices within the Max Planck Society in Germany. The key research questions focus on ECRs' familiarity with, views on, and use of a variety of open science practices, including open-access publishing, open data, pre-registration, registered reports, and replication studies. Data were collected via an online survey in 2019, with responses from 568 doctoral researchers across 71 Max Planck Institutes. This sample represented about 11% of the total doctoral researcher population at the Max Planck Society.

The study finds that while ECRs generally had positive attitudes toward open science practices, actual implementation was low. Knowledge and positive attitudes were associated with a higher likelihood of adoption. Some variation was observed across disciplines, with humanities and social sciences researchers reporting higher levels of knowledge and use of pre-registration compared to other fields. Gender differences also emerged, with female researchers expressing more interest in learning about open science practices.

The authors report lower implementation rates compared to our Result 3, with only 7% of respondents having used pre-registration in the past 12 months. They also noted disciplinary differences, with humanities and social sciences researchers showing higher knowledge and use of pre-registration, which partially aligns with our Result 4, indicating heterogeneity based on research type. Although the study does not directly compare ECRs with more senior researchers, it finds that ECRs generally hold positive attitudes towards open science practices, such as pre-registration, aligning with our Result 4, which suggests that younger researchers are more receptive to pre-registration.

Sarafoglou et al. (2022). The authors focus on researchers' perceived benefits and challenges of pre-registration in psychology studies. The central research question examines how pre-registration impacts various aspects of the research workflow, considering both experienced and anticipated perspectives. Survey respondents included researchers who had published pre-registered studies ($N = 299$) and those who had not ($N = 56$). Data were collected between 2019 and 2020 via an online questionnaire.

The authors found that researchers generally held positive views about pre-registration, particularly regarding its impact on improving research quality, specifically in areas like analysis plans, hypotheses, and study design. However, it was also seen as increasing work-related stress and extending project duration. Researchers with pre-registration experience expressed more favorable opinions overall compared to those without. The majority of experienced researchers indicated that they would recommend pre-registration and planned to use it in future projects, while only a minority of inexperienced researchers expressed the same. A key limitation of the study was potential self-selection bias, particularly among the non-pre-registration group, which had a very low response rate (2.8%).

Our Result 2 aligns with this study, as we also found that the majority of respondents view pre-registration positively. Additionally, our finding that 86% of respondents have pre-registered at least one project (Result 3) corresponds with the paper's report that 65% of researchers with pre-registration experience responded to their survey.

Ferguson et al. (2023). The authors investigate the prevalence of lifetime usage of open science practices, specifically data/code posting and pre-registration, among economists, political scientists, psychologists, and sociologists. The sample includes 3,257 authors who published in top-10 journals and graduate students from top-20 ranked North American departments across these four disciplines. The survey was administered twice over, in 2018 and 2020, measuring self-reported lifetime use of open science practices, as well as attitudes and perceived norms. To validate self-reports, the researchers supplemented their survey with web-scraping and manual audits of public websites.

As of 2020, nearly 90% of scholars had engaged in at least one open science practice, with data/code posting (88%) being more common than pre-registration (58%). The findings indicate a growing adoption of these practices, rising from 49% in 2010 to 87% in 2020. The study also provides evidence that scholars tend to underestimate the prevalence and support for open science within their fields. However, the sample is limited to researchers who publish in top journals and students affiliated with top departments, which may not fully represent each discipline, and the reliance on self-reports introduces potential biases despite efforts to verify public behavior.

The results further reveal that published authors are more likely to engage in open science than early-career researchers, though career-length effects cannot be ruled out. In terms of attitudes, the authors state: "We find little credible evidence of a difference between the stated support of newer entrants to fields and published authors."

Spitzer and Mueller (2023). The authors explore the attitudes, motivations, and perceived obstacles of psychological researchers regarding pre-registration and identify factors that influence researchers' intention to pre-register their studies. The authors used a mixed-methods approach, conducting an online survey with both qualitative and quantitative elements. The

study sample consisted of 289 psychological researchers recruited through their publications on Web of Science, PubMed, PSYNDEX, PsycInfo, and pre-registrations on OSF Registries. Data was collected in 2021.

The main quantitative variables recorded were attitudes, subjective norms, perceived ease or difficulty of pre-registration, intention to pre-register, motivations, and obstacles. The authors used a theory of planned behavior as a framework, hypothesizing that attitudes, subjective norms, perceived behavioral control, and perceived importance of pre-registration would positively influence researchers' intention to pre-register. They also investigated whether research experience influenced attitudes, motivations, and perceived obstacles.

The authors find that researchers' attitudes, subjective norms, perceived behavioral control, and perceived importance of pre-registration significantly predicted their intention to pre-register. Research experience influenced attitudes and motivations, with early career researchers having more positive attitudes and higher motivation, but did not affect the perception of obstacles. Qualitative analyses revealed that the most common perceived benefits of pre-registration were improved planning and documentation, transparency, higher quality, and replicability. The main obstacles were the effort and time required, low flexibility, inadequate dealing with deviations, and lack of knowledge about the process, e.g., what should be included in a pre-registration.

Relative to our survey results, there is alignment on the generally positive attitude towards pre-registration among researchers. In our survey, 86% of respondents had pre-registered at least one project, while the attached study found that about 62% of researchers reported having pre-registered before. Both studies also identified similar obstacles to pre-registration, particularly the time-consuming nature of the practice. The attached paper reports that perceived effort and time costs were the most voiced obstacles, which aligns with our Result 6 where researchers mentioned the time-consuming character as a reason for not pre-registering. However, there is a notable difference in how often researchers report checking pre-registration documents. Our Result 12 indicates that about 70% of reviewers check pre-registration documents at least some of the time, whereas the attached study found that only about 29% of participants always or most of the time read the corresponding pre-registration of a paper. This discrepancy could be an interesting area for further investigation.

Registries and File Drawers

We review studies (both empirical and theoretical) examining whether registries can mitigate publication bias.

Fang, Gordon and Humphreys (2015). The authors analyze observational data around the introduction of a registration system for randomized control trials in medicine in 2005 by the International Committee of Medical Journal Editors. They use historical data on pat-

terns of published p-values in medical journals before and after the registration system was implemented, to assess if there were changes in the distribution of p-values that would suggest a reduction in publication bias. The dataset consists of p-values from studies published in prominent medical journals before and after the 2005 registration requirement. The main variables are the p-values and whether the study was published before or after the registration system was put in place.

In addition to the observational data, the authors conducted a pre-analysis survey of medical experts and social scientists to gather their expectations on the impact of registration and their perception of the specificity and sensitivity of the test used in the study. The authors found no distinguishable effect of registration on measures of bias in these journals, contrary to the expectations of most experts surveyed. The authors are social scientists, and note that inferring from the medical experience to the social science context is challenging due to differences in research types and registration requirements.

Their results contrast with our Result 11. While our survey respondents perceive pre-registered hypothesis tests as more credible, Fang, Gordon and Humphreys (2015) found no distinguishable effect of registration on measures of bias in medical journals. This discrepancy highlights a potential gap between researchers' perceptions of pre-registration's benefits and its measurable impact, at least in the medical field.

Felgenhauer (2021) The author presents a game-theoretic model of pre-registration requirements on scientific research, focusing on how such requirements affect researchers' behavior and the quality of published findings. The model assumes a researcher (sender) can conduct private experiments or engage in uninformative manipulation to support a claim before review by an editor (receiver). Without pre-registration, the researcher can run any number of experiments and selectively report results, while pre-registration limits them to at most one experiment.

The main findings are that pre-registration can discourage p-hacking but may also lead to more outright manipulation or faked studies. Specifically, researchers who would eventually manipulate after many failed experiments without pre-registration will still manipulate with pre-registration, but at an earlier stage. That is, pre-registration may incentivize more direct, difficult-to-detect data manipulation. However, for more conscientious researchers, pre-registration can improve publication quality by limiting excessive experimentation without inducing manipulation. He finds that pre-registration improves overall welfare depending on researchers' opportunism, experimental precision, and the relative costs of experimentation versus manipulation. Welfare improvements are larger for "less opportunistic" researchers.

The theoretical results provide some context for our key results. The model's prediction that pre-registration can discourage p-hacking but potentially encourage outright manipulation aligns with our Result 11, which shows that pre-registered hypothesis tests are perceived as more credible than non-registered tests. This theoretical framework offers a potential ex-

planation for why researchers view pre-registered results as more credible. Additionally, the paper's discussion of the trade-offs between experimentation and manipulation under pre-registration requirements provides context for our Result 5, which indicates that researchers pre-register to signal credibility and meet journal requirements.

Libgober (2022) The author uses a game-theoretic sender-receiver model to examine how transparency requirements in empirical research affect experimental design and information acquisition. His key research question is whether making certain aspects of experiments observable to consumers of research improves or worsens the informativeness of research outputs.

In the model, a researcher (sender) chooses an experiment characterized by multiple dimensions, while a consumer of research (receiver) observes the experiment's outcome and potentially some aspects of the experiment design. The model assumes the sender's experiment choice is parameterized by a tuple (a_1, a_2), with associated costs. The main finding is that limited transparency, where some experimental dimensions remain unobservable, can sometimes lead to more informative research compared to full transparency. This counterintuitive result emerges because the need to establish credibility under limited transparency can induce researchers to invest in costly but informative experiment dimensions to compensate for the perception of potential bias in unobserved dimensions. The paper characterizes conditions related to the complementarity between experiment dimensions under which limited transparency is beneficial. This is also relevant to the "peer perceptions" dynamic discussed below. The results have some policy implications. For example, it suggests that pre-registering explanatory variables may be beneficial, but pre-registering robustness checks may not be necessary. The paper also indicates that optimal transparency policies may depend on researchers' career stages, which may provide a theoretical framework that could help explain the ambiguous impact of academic age on pre-registration practices observed in our survey (our Result 4).

Content and Precision of Pre-Analysis Plans

We review empirical studies that document the diversity of practices regarding what is pre-registered and the extent of detail in PAPs.

Bakker et al. (2020). The authors examine whether pre-registrations completed using a structured format (with detailed instructions) restrict the opportunistic use of researcher degrees of freedom better than those using an unstructured format. The researchers conducted an observational study comparing 53 pre-registrations from a structured format (the OSF Pre-registration Challenge) and 52 from an unstructured format (the standard OSF registration) on the Open Science Framework. They evaluated the pre-registrations against 29 researcher

degrees of freedom using a coding protocol, assigning scores from 0-3 to indicate how well each degree of freedom was restricted. The data were collected in 2016.

The main finding was that pre-registrations using the structured format received significantly higher median transparency scores than those using the unstructured format. The structured format outperformed the unstructured format on 22 of 29 degrees of freedom, with significant differences on 14. However, neither format performed exceptionally well overall, with median transparency scores of 0.81 and 0.57 out of 3 for structured and unstructured formats, respectively.

Their finding that structured pre-registration formats better restrict researcher degrees of freedom than unstructured formats aligns with our Result 8, where respondents emphasized the importance of clear hypotheses and data collection/analysis details in pre-registrations. Additionally, the authors' observation that even structured pre-registrations have substantial room for improvement relates to our Result 9, where over half of the respondents believe researchers should be allowed to deviate from pre-registrations if clearly explained.

Structured formats performed particularly well in clarifying inference criteria and handling missing data compared to unstructured formats. However, both formats struggled with certain aspects, such as restricting the inclusion of additional variables that could be used as covariates or moderators, where scores were near zero. Interestingly, the authors found very low concordance among coders about the number of hypotheses in pre-registrations (only 14% agreement), indicating that even basic elements like clearly stating testable hypotheses can be challenging.

Some limitations include the non-random assignment of researchers to formats, potential bias in coding due to obvious format differences, and the fact that structured format registrations had undergone a basic completeness review.

van den Akker et al. (2023*a*). The authors analyze 300 pre-registered psychology studies from 2014-2020 that had won Preregistration Challenge prizes or earned Preregistration Badges for their producibility of pre-registrations and their consistency with corresponding published papers. The authors use a coding protocol to extract information from pre-registrations and papers on various study parts: variable operationalization, data collection procedure, statistical model, and inference criteria. Two independent coders assessed each registration-study pair, scoring producibility from 0-2 and consistency from 0-1.

They find a mean reproducibility score of 1.33 out of 2 and a mean consistency score of 0.71 out of 1, indicating room for improvement in pre-registration practices. The authors found that operationalizations of variables were generally pre-registered more producibly and consistently than other study parts. Data collection procedures, statistical models, and exclusion criteria showed the least consistency between pre-registrations and papers.

The study also tested three hypotheses: 1) replication studies would be pre-registered more producibly and consistently than original studies, 2) more comprehensive pre-registration

templates would yield more producible and consistent pre-registrations, and 3) pre-registration reproducibility and consistency would improve over time. Only the second hypothesis was supported, with more comprehensive templates yielding more reproducible pre-registration.

Impact on Research Quality

We review studies assessing the causal impact of PAPs (using either observational and/or experimental evidence) on the quality of research, including transparency (reduction in questionable research practices such as p-hacking or HARKing), robustness, novelty and creativity, speed of research, and quality of writing.

Adda, Decker and Ottaviani (2020). The authors examine whether there is evidence of p-hacking or selective reporting in clinical trial results registered on ClinicalTrials.gov. The study uses an observational approach, analyzing the distribution of p-values and z-scores for primary outcomes in 12,621 phase II and phase III drug trials reported between 2007-2019. The authors develop a novel method to link phase II and III trials for the same drug/condition to examine selective continuation.

The main findings are: 1) There is no bunching of p-values just below 0.05, suggesting little p-hacking to achieve significance. 2) There is an excess of significant results in phase III compared to phase II trials, especially for industry sponsors. 3) For large pharmaceutical companies, this excess can be almost entirely explained by selective continuation of successful phase II trials. 4) For smaller companies, selective continuation explains only part of the excess, with some unexplained residual suggesting potential selective reporting.

Abrams, Libgober and List (2023). The authors examine the effectiveness of the AEA RCT Registry in addressing issues of publication bias and p-hacking. The study employs both empirical analysis and theoretical modeling.

The empirical component analyzes data from the AEA RCT Registry from its launch in May 2013 through 2021. Relevant to our Result 1, they show a significant increase in pre-registration rates over time, aligning with our Result 1 on the growth of published papers containing pre-registered studies. The authors examine registration rates for published RCTs in leading economics journals (sample of 442 field experiments) and assess the restrictiveness and fidelity of 900 randomly selected pre-registrations. They also analyze p-values and t-statistics from 60 registered and 60 unregistered published RCTs. They find that only 45% of published field experiments were registered, and less than half of registrations occurred before the intervention began. Pre-registrations often lack specificity in defining primary outcomes. The analysis finds similar evidence of p-hacking in both registered and unregistered studies. They also find that researchers who have stronger prior beliefs or initial evidence supporting their hypotheses (what they term "favorable initial signals") are more likely to pre-register.

The theoretical component develops a model of researchers' registration decisions, considering factors like signaling effects and option value. The model predicts that banning late registration could increase overall registration rates under certain conditions. The model suggests that banning late registration could increase overall registration rates, which provides an interesting policy perspective that could address some of the concerns raised in our Result 6 about the time-consuming nature of pre-registration.

Brodeur et al. (2024). The authors investigate whether pre-registration and pre-analysis plans (PAPs) reduce p-hacking and publication bias in RCTs published in leading economics journals. The study is empirical and observational in nature. The authors collect data on 15,992 test statistics from 314 RCTs published in 15 high-profile economics journals between 2018 and 2021. The main variables recorded include the test statistics, pre-registration status, and the presence of a PAP.

The authors find that the use of PAPs and pre-registration in economics increased substantially over the study period, from less than 15% of RCTs being pre-registered in 2018 to 40% in 2021. Their main analysis reveals little to no evidence that pre-registration alone reduces p-hacking or publication bias. However, the inclusion of a PAP in the pre-registration is associated with a decrease in p-hacking and publication bias. That is, pre-registration appears to enhance the credibility of results only when it includes a detailed PAP.

Decker and Ottaviani (2023). The authors evaluate the credibility of the results of clinical trials registered on ClinicalTrials.gov. The authors analyze the distribution of p-values from pre-approval drug trials reported to ClinicalTrials.gov, comparing pre-registered and non-pre-registered trials. The dataset consists of 10,120 p-values from primary outcomes of 4,810 trials and 54,337 p-values from secondary outcomes, collected from the ClinicalTrials.gov registry as of February 18, 2023.

The authors employ density discontinuity tests and caliper tests to detect patterns indicative of p-hacking or selective reporting. They find evidence of p-hacking in non-pre-registered trials, with a significant upward discontinuity in the z-score density at the 5% significance threshold. In contrast, pre-registered trials show no such discontinuity. Caliper tests confirm these findings and demonstrate that the effect of pre-registration remains robust when controlling for other trial characteristics and sponsor fixed effects. This strongly corroborates our Result 11.

There are some selection concerns. For example, the study can only analyze trials that report results to the registry, which may not be representative of all trials. Additionally, while the authors attempt to control for various factors, they cannot establish a definitive causal relationship between pre-registration and reduced p-hacking due to the observational nature of the study.

Lakens et al. (2024). The authors review the benefits of pre-registration and Registered Reports in scientific research. The authors analyze 18 surveys across scientific disciplines that examined research practices introducing systematic bias. They present data on self-reported rates of questionable research practices from these surveys, covering a population of researchers across multiple fields. The dates of the surveyed studies range from 2012 to 2023.

The main findings indicate that pre-registration and Registered Reports generally achieve their goals of increasing transparency and reducing bias. The authors report that pre-registered studies show improved transparency in reporting and that Registered Reports lead to more null results being published compared to traditional formats (44% vs. 96%). They also find that researchers generally view pre-registration positively and report benefits such as improved study planning and collaboration. The paper also discusses several limitations and criticisms of pre-registration, including concerns about stifling exploratory research and the potential for mindless use of pre-registration as a quality indicator. The authors acknowledge that most evidence on the effects of pre-registration is correlational and that causal claims are difficult to establish without randomized studies.

The review concludes by providing recommendations for implementing pre-registration in practice, such as making pre-registrations as detailed as possible and pre-registering analysis code. While primarily a theoretical/review paper, it integrates empirical findings from multiple metascientific studies to support its arguments and recommendations.

van den Akker et al. (2024). The authors examine whether pre-registered studies have lower proportions of positive results, smaller effect sizes, fewer statistical errors, more power analyses, and larger sample sizes compared to non-pre-registered studies. The study is observational, analyzing 193 pre-registered psychology studies that earned a Pre-registration Challenge prize or pre-registration badge prior to 2020, and 193 matched non-pre-registered studies published in the same year and on similar topics.

The main findings were mixed. Contrary to expectations, pre-registered studies did not have significantly lower proportions of positive results, smaller effect sizes, or fewer statistical errors compared to non-pre-registered studies. However, pre-registered studies were more likely to include power analyses (55% vs. 23%) and had larger sample sizes (median 216 vs. 116). Exploratory analyses also found that pre-registered studies had a greater scientific impact in terms of citations, Altmetric scores, and journal impact factors. This aligns with our Result 5, indicating that signaling credibility was the main reason for pre-registering studies, and our Result 11 shows that pre-registered hypothesis tests are perceived as more credible. However, the paper's findings that pre-registered studies did not have significantly lower proportions of positive results or smaller effect sizes compared to non-pre-registered studies suggest that the perceived credibility benefits may not fully translate to measurable differences in reported outcomes, highlighting the complexity of assessing impact of pre-registration.

Key limitations noted by the authors include potential self-selection bias of researchers

who choose to pre-register, difficulty in making causal claims about pre-registration effects, and challenges in consistently identifying and coding hypotheses and results across pre-registered and non-pre-registered studies.

Peer Evaluation

We review studies on how PAPs, including deviations from them, influence perceptions of research quality. Additionally, we examine studies on the monitoring and frequency of scrutiny of PAPs by reviewers, as well as the role journals currently play or should play in this process.

Mathieu, Chan and Ravaud (2013). The authors examine the use of clinical trial registry information during the peer-review process of medical journal manuscripts. The researchers conducted an online survey of 1,503 corresponding authors of recently published randomized controlled trials and 1,733 peer reviewers from three major medical journals. The survey, conducted in 2012, asked about respondents' knowledge, practices, and opinions regarding trial registration and peer review. Out of 3,033 invited participants, 1,136 (37.5%) provided usable responses.

The key finding is that only 34.3% (232) of respondents who had reviewed a trial manuscript in the past two years (676) examined the registered trial information. Among the 232 respondents who examined registered trial information during peer review, 94.4% checked the primary outcome, 83.2% reviewed eligibility criteria and planned sample size, and 81% looked at secondary outcomes. When discrepancies were found between the registry and manuscript, 88.8% of reviewers mentioned them in their referee reports, and 19.8% advised rejecting the manuscript. Common reasons for not checking registry information included lack of a registration number in the manuscript (34%), lack of time (33%), and perceived lack of usefulness. The authors conclude that journals could facilitate the use of registry information by providing direct links to registry records and including registered information with manuscripts sent for review.

Limitations of the study include a moderate response rate of 37.5% and potential selection bias, as reviewers from high-impact journals may be more aware of trial registration issues than reviewers for other journals. Additionally, the predefined response options in the survey may have limited participants' answers, though an open-ended question was included. Despite these limitations, the study provides valuable insights into the underutilization of trial registry information in the peer review process and suggests practical ways to improve transparency and reduce selective outcome reporting in clinical trial publications.

Ofosu and Posner (2020). The authors examine whether pre-analysis plans hamper publication in economics journals. The authors analyze experimental NBER working papers issued between 2011 and 2018 to compare publication outcomes for papers with and without

PAPs. Out of 973 experimental working papers, 82 (8.4%) mentioned a PAP. The analysis finds that papers with PAPs were 10 percentage points less likely to be published overall (44% vs. 54%), but among those published, papers with PAPs were 39 percentage points more likely to appear in top-5 economics journals (61% vs. 22%). This aligns with our key Result 5, that researchers use pre-registration to signal credibility. Additionally, controlling for publication status and other factors, papers with PAPs received about 14 more citations on average. Using data from their other paper (Ofosu and Posner, 2023), they find similar publication rates for PAP-based papers with and without significant results, suggesting null findings are not unduly penalized when studies follow PAPs. Finally, the paper finds that PAP-based papers with null results are not unduly penalized in publication. This relates to our Result 11, indicating that pre-registered hypothesis tests are perceived as more credible regardless of statistical significance.

The authors do not directly explore the role of journals in monitoring PAPs or provide data on how often reviewers examine them. The higher rate of publication in top-5 journals and increased citations for papers with PAPs suggest that these studies may be viewed as more credible or rigorous. However, these findings rely on purely observational evidence and thus come with the caveat that several unobserved factors could explain differences between papers with and without PAPs.

Kasy and Spiess (2023). The authors present a principal-agent model where a decision-maker relies on selective but truthful reports from an analyst with private information and potentially misaligned objectives. The focus is on the decision-maker's (journal's) optimal decision rules. The framework assumes the analyst has access to data and non-aligned objectives compared to the decision-maker. A key assumption is that the implementation of statistical decision rules requires an incentive-compatible mechanism due to this misalignment.

They find that valid statistical inference requires pre-analysis plans under these conditions, which mimic our Result 5 on signaling credibility. The authors characterize which decision rules can be implemented and derive optimal statistical decision rules subject to implementability constraints. For hypothesis tests specifically, they show that optimal rejection rules should pre-register a valid test for when all data is reported, and make worst-case assumptions about unreported data. They demonstrate that optimal tests can be found as solutions to linear programming problems.

The paper provides guidance for both decision-makers and analysts on how to design and implement optimal PAPs. For decision-makers (i.e., journals), they recommend requiring analysts to pre-specify full-data tests that control size, and to make worst-case assumptions about unreported data when implementing these tests. For researchers, the authors suggest choosing full-data tests that maximize expected power given their prior beliefs, and provide an interactive web app to facilitate this process. They also propose the use of simpler, more easily interpretable tests as a practical alternative to fully optimal but complex PAPs. The authors

provide software to facilitate optimal PAP design, but it is largely theoretical and complex. The paper's discussion of the trade-offs between fully optimal but complex PAPs and simpler, more practical implementations provides context for understanding the concerns about the time-consuming nature of pre-registration mentioned in our Result 6.

Williams (2023). The author investigates the tradeoffs of pre-registering study designs in academic research using a game-theoretic model. He is interested in how pre-registration affects the alignment of incentives between a researcher conducting a study and an evaluator deciding whether to publish the results, and under what conditions pre-registration can improve the credibility and informativeness of research. In the model, a researcher designs and conducts a study, then reports the results to an evaluator who decides whether to publish based on the perceived information content. The researcher's objective is to maximize the chances of publication. The model considers different scenarios, such as when the researcher and evaluator have symmetric or asymmetric information about the study's context.

The findings suggest that when the researcher and evaluator have symmetric information, their interests are closely aligned, and pre-registration is largely redundant if the researcher is not too risk-averse. In fact, pre-registration can be harmful if it limits the researcher's ability to disclose all relevant information. However, when the researcher has superior private information, pre-registration can serve as a credible signal of confidence in a hypothesis or help convey details that cannot be credibly revealed post-study. The paper also examines a more flexible form of pre-registration, where plans are not binding but serve as cheap talk. This can be beneficial when the researcher has private information, and certain types of researchers prefer to distinguish themselves ex ante.

Purgar et al. (2024). The authors argue that registration of studies (both pre-registration and registered reports) could substantially reduce research waste in ecology. The authors conducted an exploratory survey of meta-studies from other fields examining the impact of pre-registration and registered reports, identifying 36 relevant studies primarily from medicine and psychology. These meta-studies compared registered reports to non-registered reports, pre-registered studies to non-pre-registered studies, and results reported in pre-registrations to those in resulting publications.

These meta-studies showed that pre-registered studies had higher methodological quality, lower risk of bias, and larger sample sizes compared to non-registered studies. The authors propose several novel aspects for an ecological registration system, including modular registration, allowing result submission to registries, and implementing data and software management plans. The paper also outlines actions that funders, publishers, and research institutions could take to support registration in ecology, such as developing appropriate infrastructure, creating registration tools and templates, providing expert support, and implementing incentives and mandates.

Adherence to PAPs and Communication of Deviations

We review empirical studies documenting deviations from PAPs, including the nature and frequency of these deviations and whether they are reported in published papers. Additionally, we examine theoretical and methodological studies that discuss best practices for communicating deviations.

Claesen et al. (2021). The authors examine the extent to which published pre-registered studies adhere to their original pre-registration plans and disclose any deviations. This was an observational study analyzing 27 pre-registered studies published in the journal *Psychological Science* between February 2015 and November 2017. The authors assessed each study's adherence to its pre-registration plan on six methodological aspects: research question/hypothesis, variables, sample size, exclusion criteria, procedure, and analysis.

The main findings were that only 2 out of 27 studies (7%) fully adhered to their pre-registration plans, while 24 studies (89%) had at least one undisclosed deviation. Deviations were most common for sample size, exclusion criteria, and statistical analyses. This contrasts with our Result 9, where over half of the respondents believe researchers should be allowed to deviate from pre-registrations as long as deviations are clearly explained. Only 1 study (4%) disclosed all of its deviations from the pre-registration. The authors also found that 11 out of the original 38 pre-registration plans examined were excluded from full analysis due to accessibility issues or lack of methodological details.

Key limitations noted by the authors include the small sample size focused on early adopters of pre-registration in one journal, potential subjectivity in assessing adherence, and inability to check adherence against raw data and analysis code. The authors suggest the findings may not generalize beyond this early sample, as pre-registration practices are likely improving over time.

Ofosu and Posner (2023). The authors are interested in whether PAPs registered in the early days of pre-registration (2011-2016) were sufficiently clear, precise, and comprehensive to achieve their objective of preventing "fishing" and reducing the scope for post-hoc adjustment of research hypotheses. They draw on a representative sample of 195 PAPs registered on the EGAP and AEA registries between 2011-2016, stratified by year, initial private/gated status, and registry. They also analyzed a subset of 93 PAPs from projects that resulted in publicly available papers. These observational results are supplemented by a survey of potential PAP users in the EGAP and IPA networks, on how PAPs and pre-registration factor into the respondents' research practices.

The PAPs were coded according to a common rubric that recorded details such as the pre-specified hypotheses, variables, sampling strategy, inclusion/exclusion rules, and statistical models. For the subset of PAPs with papers, the authors also assessed how faithfully the papers adhered to the pre-registered specifications. The main findings reveal significant variation in

the extent to which these early PAPs were sufficiently clear, precise, and comprehensive to limit the scope for fishing and post-hoc adjustments. Only 53% of PAPs met the authors' four key requirements for a complete PAP. Some limitations arise in the subjective nature of certain coding items and the focus on the early period of PAP usage rather than more recent practices.

van den Akker et al. (2023*b*). The authors examine the prevalence of selective hypothesis reporting in psychological research by comparing pre-registered hypotheses to those reported in corresponding published articles. The researchers analyzed 459 pre-registered studies from 259 articles, identifying 2,119 hypotheses, for how often hypotheses were omitted, added, promoted, demoted, or changed between pre-registration and publication, and whether these practices differed between replication and original studies or were associated with statistical significance.

The study was observational, analyzing existing pre-registrations and publications rather than conducting new experiments. Data was collected from studies that won Pre-registration Challenge prizes or earned Pre-registration Badges, primarily from 2017 to 2019. The main variables recorded included the number and content of hypotheses in pre-registrations and articles, their replication status, and statistical significance.

The researchers found that over half of the studies contained omitted hypotheses (52%) or added hypotheses (57%), while about one-fifth (18%) contained hypotheses with direction changes. Replication studies were less likely to include selectively reported hypotheses than original studies. However, the authors did not find strong evidence that added or changed hypotheses were more likely to be statistically significant.

Key limitations included potential bias in the sample due to selecting only studies with pre-registration prizes/badges, which may have higher quality pre-registrations than average. The authors also note difficulties in consistently identifying hypotheses across pre-registrations and articles due to vague phrasing, which may have inflated estimates of omitted hypotheses.

Lakens (2024). The author discusses how researchers should handle and report deviations from pre-registered analysis plans, specifically in academic psychology. There is no empirical component.

The author develops a framework grounded in error-statistical philosophy and methodological falsificationism. He argues that deviations should be evaluated based on their impact on both the severity of the statistical test (how well it can detect true effects and avoid false positives) and the validity of the scientific inference. Lakens identifies five main categories of reasons for deviations: unforeseen events, errors in the pre-registration, missing information, violations of untested assumptions, and falsification of auxiliary hypotheses. For each, he provides guidance on how to report and justify deviations.

The author's point of interest is that not all deviations necessarily reduce test severity or

validity— in some cases, deviations can actually increase them. Lakens argues researchers should transparently report deviations, specifying when, where, and why they occurred, followed by an evaluation of how the deviation impacts test severity and inference validity. This aligns with our respondents' views on the importance of clarity in reporting deviations (Result 9). He provides examples of how to report different types of deviations. Lakens' framework is somewhat limited: he suggests that whether deviations truly increase validity can only be determined through subsequent replication studies. The paper also does not provide quantitative metrics for assessing severity or validity changes.

Willroth and Atherton (2024). The authors address the issue of transparently reporting deviations from pre-registered research plans in psychology. The authors developed a standardized template for reporting pre-registration deviations, aiming to increase transparency and credibility in pre-registered research. To inform the development of this template, they conducted a survey of 34 psychology journal editors to understand current practices and perceptions regarding pre-registration deviations. The sample consisted of editors from 16 psychology journals, collected in 2023. Key variables included editors' estimates of deviation prevalence, perceptions of deviation justifiability, and current editorial practices.

The main findings indicate that editors estimate 82% of pre-registered studies contain deviations, but only 55% report them. Editors viewed disclosed deviations neutrally to slightly positively, but undisclosed deviations very negatively. These relate to our Result 9, where over half of the respondents believe researchers should be allowed to deviate from pre-registrations if clearly reported. The authors present a "Preregistration Deviations Table" template for standardized reporting, including columns for deviation details, original wording, deviation description, and reader impact. They provide guidance on what constitutes a deviation, how to prevent them, when to deviate, and how to report them transparently.

They show that editors generally view deviations due to data collection errors, inappropriate pre-registered plans, or new knowledge as more justifiable than those due to reviewer suggestions or miscommunications among co-authors. Additionally, the authors' survey found that only 24% of journals have instructions for reporting deviations in their author guidelines, and just 9% instruct reviewers to check for deviations.

Key limitations include the small sample size of editors surveyed and selection bias in who responded. The effectiveness of the proposed template has not been implemented.

Table C.1: Literature on pre-analysis plans.

Study	Method	Prevalence	Attitudes	Precision	Adherence	Effects	Key messages
Bakker et al. (2021)	Survey of 1,039 communication researchers	✓	✓		✓		47% had pre-registered a study; researchers optimistic about open research practices
Logg and Dorison (2021)	Analysis of 322 articles, survey 248 researchers	✓	✓				Pre-registration adoption lags; early-career researchers more likely to pre-register
Miguel (2021)	Literature review and survey analysis	✓	✓				Rapid adoption of open science practices in economics
Toribio-Flórez et al. (2021)	Survey of 568 doctoral researchers	✓	✓				7% used pre-registration in past 12 months; positive attitudes but low implementation
Sarafoglou et al. (2022)	Survey of 355 researchers	✓	✓				Positive views of pre-registration; more positive with experience
Ferguson et al. (2023)	Survey of 3,257 social scientists	✓	✓				Nearly 90% used open science practice by 2020; 58% used pre-registration
Spitzer and Mueller (2023)	Survey of 289 psychologists	✓	✓				Attitudes predict intention to pre-register
Fang, Gordon and Humphreys (2015)	Analysis of p-values and survey				✓	✓	No distinguishable effect of registration on measures of bias in medical journals
Felgenhauer (2021)	Theory			✓		✓	Pre-registration can lead to more outright manipulation
Libgober (2022)	Theory			✓		✓	Limited transparency can be more informative than full transparency
Bakker et al. (2020)	Comparison of 105 pre-registrations	✓		✓	✓		Structured format better restricts researcher degrees of freedom
van den Akker et al. (2023*a*)	Analysis of 300 pre-registered studies	✓		✓	✓	✓	Insufficient detail in psych pre-registrations; no improvement over time
Adda, Decker and Ottaviani (2020)	Analysis of 12,621 drug trials					✓	No evidence of p-hacking; selective continuation explains excess of significant results
Abrams, Libgober and List (2023)	Analysis of AEA RCT Registry	✓		✓		✓	45% of experiments registered; similar p-hacking in reg'd and unreg'd studies
Brodeur et al. (2024)	Analysis of 15,922 stats from 314 RCTs			✓	✓	✓	Detailed PAPs reduce p-hacking; undetailed registrations have no or negative effects
Decker and Ottaviani (2023)	Analysis of 4,810 registered clinical trials			✓	✓	✓	No p-hacking in pre-registered trials; evidence in non-pre-registered trials
Lakens et al. (2024)	Literature review and analysis of 18 surveys	✓	✓	✓	✓	✓	Increase in transparency, reduce bias; recommendations for implementation
van den Akker et al. (2024)	Comparison of 386 psychology studies				✓	✓	Larger sample sizes in pre-registered studies; no difference in results
Mathieu, Chan and Ravaud (2013)	Survey of 1,136 authors and reviewers		✓	✓	✓		Only 34.3% of reviewers examined registered trial information during peer review
Ofosu and Posner (2020)	Analysis of 973 papers and survey	✓	✓			✓	PAPs affect publication rates and journal prestige
Kasy and Spiess (2023)	Theory			✓		✓	Valid statistical inference requires pre-analysis plans; recommendations and software
Williams (2023)	Theory	✓		✓		✓	Flexible pre-registration as cheap talk
Claesen et al. (2021)	Analysis of 27 pre-registered studies				✓		7% fully adhered to pre-registration; 89% had undisclosed deviations
Ofosu and Posner (2023)	Analysis of 195 PAPs			✓	✓		Only 53% of PAPs met key requirements for completeness
van den Akker et al. (2023*b*)	Analysis of 459 pre-registered studies			✓	✓		High rates of hypothesis omission and addition
Lakens (2024)	Theoretical framework			✓	✓	✓	Evaluate deviations based on test severity and inference validity
Willroth and Atherton (2024)	Survey of 34 psychology journal editors			✓	✓		82% contain deviations; 55% report them

D Populated Pre-Analysis Plan

We present a copy of the pre-analysis plans we registered on the Open Science Framework (https://osf.io/e5yz4/). The colored boxes highlight survey results, empirical response frequencies, and statistical analysis findings.

D.1 Survey data collection

In the survey, we will measure awareness, adoption, attitudes, norms, and beliefs about pre-registration and pre-analysis plans, as well as other Open Science Practices, through a set of survey questions presented in a multiple-choice or Likert scale format. We will send the link to the survey to all members of the Economic Science Association and send the announcement to the ESA mailing list. We will stop the data collection before the ESA World Meeting in Lyon begins on 26 June 2023. The survey is included as an Appendix to this pre-analysis plan.

534 participants completed the survey. The following analyses keep 519 participants who completed the survey before the ESA World Meeting started on the afternoon of June 26, 2023.

D.2 Inclusion/exclusion criteria

We list below our inclusion/exclusion criteria for the descriptive results as well as the analyses and tests we will present.

1. General: Participants who answer that they do not conduct any empirical research by clicking *"I do not do any empirical research"* cannot proceed with the survey and will be excluded from all descriptive results and analyses and tests below. Participants who do not complete the survey will also be excluded from all descriptive results and analyses and tests below (completing the survey is defined as clicking on the final submit button).

2. Descriptive results: It is possible to skip specific questions in the survey (i.e. we do not use "forced response") and still complete the survey, and we will include all participants who answered a specific survey question (among those that complete the survey). The sample size in the descriptive results can therefore vary across survey questions (as we allow participants to skip questions).

3. Analyses and tests: We will include all participants (among those that complete the survey) with an observed value on all the variables included in the relevant analysis (and the number of participants included in each analysis can thus vary across the analyses as we allow participants to skip questions). In some cases, survey questions will have the answering option *"Not sure"* and for some variables participants who chose this option will be excluded in the construction of a variable and therefore in the analyses including this variable (but this is detailed in the description of the variables used in the analyses and tests below).

D.3 Variables used in the analyses and tests

Attitudes towards pre-registration. This variable is based on the question "What is your general opinion on pre-registering hypotheses or analysis plans in advance of a research project?" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will code this variable from 1-5 as: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5. Participants answering *"Not sure"* are coded as missing on this variable and are not included in the analyses including this variable.

1	2	3	4	5	6
47	70	54	172	172	4
0.09	0.13	0.10	0.33	0.33	0.01

Notes: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5, *Not sure*=6.

Attitudes towards pre-registration– binary coding. This variable is based on the question "What is your general opinion on pre-registering hypotheses or analysis plans in advance of a research project?" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will here code this as a binary variable with the response options *"Very favorable"* and *"Somewhat favorable"* coded as 1 and the remaining four response options coded as 0 (*"Very unfavorable"*/ *"Somewhat unfavorable"*/ *"Neither favorable nor unfavorable"*/ *"Not sure"*).

0	1
175	344
0.34	0.66

Notes: *Very favorable*/ *Somewhat favorable*=1, *Very unfavorable*/ *Somewhat unfavorable*/ *Neither favorable nor unfavorable*/ *Not sure*=0.

Support of pre-registration in EXEC and JESA. This variable is based on the response to the statement "In my view, the ESA should strongly encourage pre-registration for all studies submitted to EXEC and JESA" with the answering options: *Strongly disagree*, *Somewhat disagree*, *Neither agree nor disagree*, *Somewhat agree*, *Strongly agree*. We will code this variable from 1-5 as: *Strongly disagree*=1, *Somewhat disagree*=2, *Neither agree nor disagree*=3, *Somewhat agree*=4, *Strongly agree*=5.

1	2	3	4	5
82	62	63	121	186
0.16	0.12	0.12	0.23	0.36

Notes: *Strongly disagree*=1, *Somewhat disagree*=2, *Neither agree nor disagree*=3, *Somewhat agree*=4, *Strongly agree*=5.

Support of mandate of pre-registration in EXEC and JESA. This variable is based on the response to the statement "In my view, the ESA should mandate pre-registration for all studies submitted to EXEC and JESA" with the answering options: *Strongly disagree*, *Somewhat disagree*, *Neither agree nor disagree*, *Somewhat agree*, *Strongly agree*. We will code this variable from 1-5 as: *Strongly disagree*=1, *Somewhat disagree*=2, *Neither agree nor disagree*=3, *Somewhat agree*=4, *Strongly agree*=5.

1	2	3	4	5
190	100	96	80	47
0.37	0.19	0.18	0.15	0.09

Notes: *Strongly disagree*=1, *Somewhat disagree*=2, *Neither agree nor disagree*=3, *Somewhat agree*=4, *Strongly agree*=5.

Support of open data and protocol. This variable is based on the question "What is your general opinion on the following practices? Open data and protocol" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will code this variable from 1-5 as: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5. Participants answering *"Not sure"* are coded as missing on this variable and are not included in the analyses including this variable.

1	2	3	4	5	6
6	6	41	111	318	26
0.01	0.01	0.08	0.21	0.61	0.05

Notes: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5, *Not sure*=6.

Support of replication studies. This variable is based on the question "What is your general opinion on the following practices? Replication studies" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will code this variable from 1-5 as: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5. Participants answering *"Not sure"* are coded as missing on this variable and are not included in the analyses including this variable.

1	2	3	4	5	6
6	6	16	110	367	5
0.01	0.01	0.03	0.21	0.71	0.01

Notes: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5, *Not sure*=6.

Support of Registered Reports. This variable is based on the question "What is your general opinion on the following practices? Registered Reports" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will code this variable from 1-5 as: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5. Participants answering *"Not sure"* are coded as missing on this variable and are not included in the analyses including this variable.

1	2	3	4	5	6
16	43	74	129	222	24
0.03	0.08	0.14	0.25	0.43	0.05

Notes: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5, *Not sure*=6.

Support of Results-blind review. This variable is based on the question "What is your general opinion on the following practices? Results-blind review" with the answering options: *Very favorable*, *Somewhat favorable*, *Neither favorable nor unfavorable*, *Somewhat unfavorable*, *Very unfavorable*, *Not sure*. We will code this variable from 1-5 as: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5. Participants answering *"Not sure"* are coded as missing on this variable and are not included in the analyses including this variable.

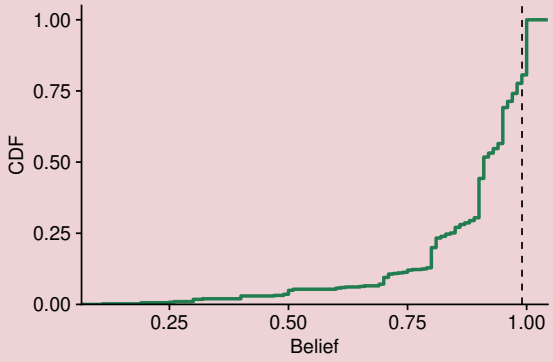
1	2	3	4	5	6
15	65	88	128	158	54
0.03	0.13	0.17	0.25	0.30	0.10

Notes: *Very unfavorable*=1, *Somewhat unfavorable*=2, *Neither favorable nor unfavorable*=3, *Somewhat favorable*=4, *Very favorable*=5, *Not sure*=6.

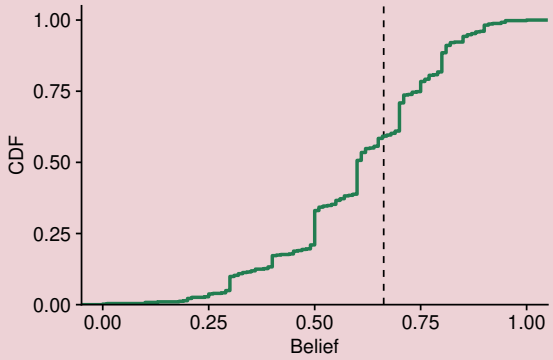
Heard about pre-registration. This variable is based on the question "Have you heard of the practice of pre-registering hypotheses or analysis plans in advance of a research project?" with the answering options: *Yes*, *No*. We will code this variable as *Yes*=1 and *No*=0.

No	Yes
5	514
0.01	0.99

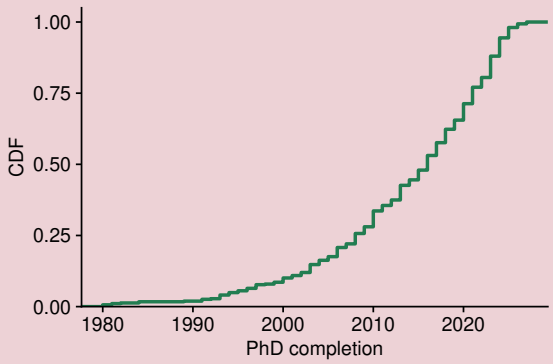
Beliefs: heard about pre-registration. This variable is based on the question "Consider all participants in this survey. What percentage do you think answered 'Yes' to the question 'Have you heard of the practice of pre-registering hypotheses or analysis plans in advance of a research project?'" with an answering scale from 0% to 100% of participants. The answers are divided by 100 for this variable so that the variable is a fraction between 0 and 1.



Beliefs: attitudes towards pre-registration. This variable is based on the question "Consider all participants in this survey. What percentage do you think answered 'Somewhat favorable' or 'Very favorable' to the question 'What is your general opinion on pre-registering hypotheses or analysis plans in advance of a research project?'" with an answering scale from 0% to 100% of participants. The answers are divided by 100 for this variable so that the variable is a fraction between 0 and 1.



Year of Ph.D. This variable is based on the question "In what year did you complete or do you expect to complete your Ph.D.?" with the answering options: *2028 or later*, *2027*, ..., *1981*, *1980 or earlier*. This is a continuous variable (year) with top/bottom censoring, and we interpret this as a proxy for juniority/seniority. We will code the two endpoints as *2028 or later*=2028 and *1980 or earlier*=1980.



Position. This variable is based on the question "What is your career stage?" with the answering options: *Graduate student*, *Post-doctoral scholar*, *Assistant Professor (without tenure)*, *Assistant Professor (with tenure)*, *Associate Professor (without tenure)*, *Associate Professor (with tenure)*, *Full Professor*, *Research Scientist in a non-academic position*, *Other*. Based on the answers to this question, we will construct the following categorical variable with 7 categories and 6 dummy variables: *Graduate student* (baseline category), *Post-doctoral scholar*, *Assistant Professor (with or without tenure)*, *Associate Professor (with or without tenure)*, *Full Professor*, *Research Scientist in a non-academic position*, *Other*.

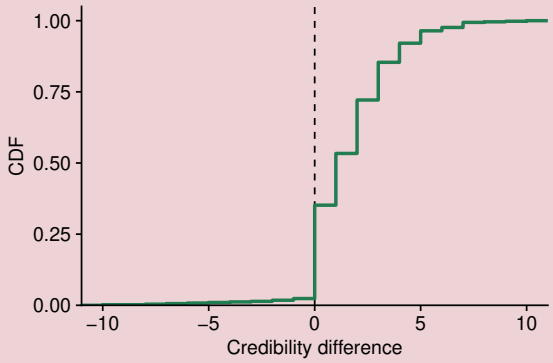
1	2	3	4	5	6	7
76	82	99	109	124	12	10
0.15	0.16	0.19	0.21	0.24	0.02	0.02

Notes: *Graduate student*=1, *Post-doctoral scholar*=2, *Assistant Professor (with or without tenure)*=3, *Associate Professor (with or without tenure)*=4, *Full Professor*=5, *Research Scientist in a non-academic position*=6, *Other*=7.

Elements of pre-registration. This variable is based on the question "What elements do you think a pre-registration should contain? Please select all that apply" with the answering options: *Clear hypotheses*, *Sample size justification*, *Detailed power calculations*, *Whether any prior (pilot) data was collected*, *Criteria for excluding observations (e.g. treatment of outliers)*, *All regression specifications and tests*, *The significance threshold used in tests*, *Correction for multiple hypothesis testing*, *A hierarchy of tests (primary, secondary, exploratory)*, *The theoretical model if theoretical model will be included in the paper*, *Other (please indicate in the box below)*. Based on the answer to this question we will construct a variable between 0-10 based on the number of boxes ticked, not counting the last answering option *"Other"* (as that is hard to interpret).

0	1	2	3	4	5	6	7	8	9	10
15	53	60	71	91	77	53	34	22	24	19
0.03	0.10	0.12	0.14	0.18	0.15	0.10	0.07	0.04	0.05	0.04

Credibility difference of pre-registration. This variable is based on the "two-part" question "Imagine you are reading a paper with a pre-registration. On a scale of 0 (not at all) to 10 (extremely), how would you rate the credibility of a statistically significant finding ($p < 0.05$) based on a:" with two answering scales from 0-10 for "Pre-registered hypothesis test" and "Non-pre-registered hypothesis test". Based on the answers to this two-part question we will construct a variable for the difference in the 0-10 scale answer for "Pre-registered hypothesis test" and the 0-10 scale answer for "Non-pre-registered hypothesis test" (a positive value on this variable implies a higher-rated credibility of a statistically significant finding from a pre-registered hypothesis test).



D.4 Analysis of selection

We will present unweighted descriptive statistics and analyses in the paper, treating equally each observation in our sample. However, our survey respondents may not be fully representative of the entire ESA population. To test for selection, we will conduct z-tests of equality of proportions between the survey respondents who indicated being ESA members and basic observable characteristics of the ESA members that will be available to us at a later time (only participants that complete the survey will be included in these tests).

We will carry out these tests of selection for the following binary 1/0 variables in the survey: female (1=*"Female"*; 0=*"Male"*/ *"Non-binary/third gender"*/ *"Prefer not to say"*); Ph.D. student (1=*"Graduate student"*; 0=*"Post-doctoral scholar"*/ *"Assistant Professor (without tenure)"* / *"Assistant Professor (with tenure)"*/ *"Associate Professor (without tenure)"*/ *"Associate Professor (with tenure)"*/ *"Full Professor"*/ *"Research Scientist in a non-academic position"*/ *"Other"*); location Asia-Pacific (1=*"Asia-Pacific"*; 0=*"Europe"*/ *"North America"*/ *"Other"*); location Europe (1=*"Europe"*; 0=*"Asia-Pacific"*/ *"North America"*/ *"Other"*); location North America (1=*"North America"*; 0=*"Europe"*/ *"Asia-Pacific"*/ *"Other"*); location other (1=*"Other"*; 0=*"North America"*/ *"Europe"*/ *"Asia-Pacific"*).

Subsample analysis

We will carry out an additional analysis focusing on the presenters and attendees of the ESA World Meeting in Lyon (26-29 June 2023). We identify survey participants who planned to (at the time of the survey) attend the conference from the question "Will you be attending the ESA World Meeting in Lyon (26-29 June)?" Participants answering *Yes, as a presenter* or *Yes, as an attendee* will be coded as a "conference participant." We will obtain the names of the conference attendees from the ESA after the conference.

We will look at the binary 1/0 variables defined above (female, location Asia-Pacific, location Europe, location North America, location other), 7-category variable "Position", year of Ph.D., 1/0 binary variables indicating "experience with pre-registration" and "using field experiment and/or RCT in research." We will measure the values of these variables from the survey responses if they took part in the survey. For the other conference attendees who did not participate in the survey, we will collect data from their CVs and websites.

The variable "experience with pre-registration" is based on the question: "Have you pre-registered one or several of your research projects?" with the answering options: *Yes*, *No*. We will code this variable as *Yes*=1 and *No*=0. The variable "using field experiments and/or RCTs in research" is based on the question "What type(s) of empirical methods do you primarily use in your research?" This question has the following 7 answering options: *Lab experiment*, *Field experiment*, *Online experiment*, *RCT/impact evaluation*, *Unincentivized survey (no experiment)*, *Observational data*, *Other*. Participants can tick several options (boxes) in this question. We will code the "field experiment/RCT" variable as 1 for all participants that tick the *"Field ex-*

periment" box and/or the *"RCT/impact evaluation"* box irrespective of what additional boxes they also tick, and all other participants that answer the question will be coded as 0.

We will construct the same set of variables for the conference attendees who did not take part in the survey as follows. We will obtain the attendees' names from the ESA after the conference. We will collect gender, position, year of Ph.D., and location from CVs or personal/university websites. For empirical research methods, we will first check whether the keywords "field experiment" or "RCT/impact evaluation" are mentioned on the CV or website. We then check if any of the papers is about "field experiment" or "RCT/impact evaluation." For experience with pre-registration, we first search attendees' names on the AEA RCT Registry. We then check whether any of the attendee's papers mention pre-registration. We will email attendees for whom we could not find evidence of pre-registration or studies using a field experiment or RCT to ask if our conclusion is correct. We will modify our coding if they say they pre-registered/conducted a field experiment or RCT, and continue to treat their entries as a "no" if we do not get responses.

We will conduct the following tests comparing the basic observable characteristics of the survey participants who (planned to) attend the ESA World Meeting in Lyon and the characteristics of the conference attendees: z-tests of equality of proportions for binary variables, an independent samples t-test (assuming equal variances) for "Year of Ph.D.", and a chi-squared test for "Position."

Notes: The two characteristics mentioned in the plan— experience with pre-registration and the use of field experiments and/or RCTs in research— were intended to facilitate comparisons between respondents and attendees. However, we found them to be imprecise and challenging to code using publicly available information. Similarly, ESA membership data does not accurately reflect members' career stages. Due to these limitations, we are deviating from our original plan and focusing solely on gender, position, and ESA region.

Table D.1: Demographic characteristics of the survey respondents, ESA World Meeting participants, and ESA members.

	Respondents		Participants		Members	
	Prop.	N	Prop.	N	Prop.	N
Female	0.321	433	0.405	457	0.387	1,197
Ph.D. student	0.145	433	0.258	457	–	–
ESA region: Asia-Pacific	0.102	432	0.096	459	0.180	1,197
ESA region: Europe	0.620	432	0.773	459	0.513	1,197
ESA region: North America	0.257	432	0.120	459	0.284	1,197
ESA region: Other	0.021	432	0.011	459	0.023	1,197
Respondents vs. Participants						
Female	$\chi^2(1) = 6.39, p = 0.012$					
Ph.D. student	$\chi^2(1) = 6.39, p < 0.001$					
ESA region	$\chi^2(3) = 31.39, p < 0.001$					
Respondents vs. Members						
Female	$\chi^2(1) = 5.63, p = 0.018$					
ESA region	$\chi^2(3) = 19.94, p < 0.001$					

Notes: We restrict the "Respondents" sample to 437 participants who indicated being ESA members.

D.5 Descriptive results

We will report descriptive results for all the questions included in the survey either in the main text or in the Online Appendix. For survey questions with categorical answering options, we will report the percentages of participants who replied to each answering option. For continuous questions (including Likert scale questions), we will report the mean and standard deviation and the empirical cumulative distributions. The survey also includes some open-ended questions about why they for instance use a specific pre-registration platform. To summarize these open-ended questions, we will present word clouds that show the 100 most frequent words, weighted by their relative frequency, after removing stop words, ciphers, punctuation, and special characters.

D.6 Analyses and tests

We will test the below hypotheses in the study. In testing these hypotheses, we will interpret a two-sided p-value below 0.05 as "suggestive evidence" and a two-sided p-value below 0.005 as "statistically significant evidence" based on the recommendations of Benjamin et al. (2018). The tests will be divided into primary hypothesis tests, secondary hypothesis tests, and exploratory analyses. All OLS regressions below are estimated with robust standard errors.

D.6.1 Primary hypotheses

Primary hypothesis 1: More junior scientists are more favorable to pre-registration. We will carry out this test based on an OLS regression with the dependent variable "Pre-registration attitudes" and the independent variable "Year of Ph.D." We hypothesize a positive sign of this variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.2: Primary hypothesis 1. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(462) = 6.209$, $p < 0.001$.

Year of Ph.D.	0.039^{***}
	(0.006)
Constant	-74.086^{***}
	(12.543)
Observations	464
R^2	0.082

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Primary hypothesis 2: More junior scientists more strongly support pre-registration in EXEC and JESA.

We will carry out this test based on an OLS regression with the dependent variable "Support of pre-registration in EXEC and JESA" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.3: Primary hypothesis 2. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(465) = 9.551$, $p < 0.001$.

Year of Ph.D.	0.061^{***}
	(0.006)
Constant	-118.960^{***}
	(12.841)
Observations	467
R^2	0.161

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Primary hypothesis 3: More junior scientists more strongly support a mandate of pre-registration in EXEC and JESA.

We will carry out this test based on an OLS regression with the dependent variable "Support of mandate of pre-registration in EXEC and JESA" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.4: Primary hypothesis 3. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(464) = 6.899$, $p < 0.001$.

Year of Ph.D.	0.044^{***}
	(0.006)
Constant	-85.802^{***}
	(12.792)
Observations	466
R^2	0.094

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

D.6.2 Secondary hypotheses

Secondary hypothesis 1: More junior scientists more strongly support open data and protocol.

We will carry out this test based on an OLS regression with the dependent variable "Support of open data and protocol" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.5: Secondary hypothesis 1. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(437) = 0.323$, $p = 0.747$.

Year of Ph.D.	0.001
	(0.005)
Constant	1.504
	(9.286)
Observations	439
R^2	0.0003

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Secondary hypothesis 2: More junior scientists more strongly support replication studies.

We will carry out this test based on an OLS regression with the dependent variable "Support of replication studies" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.6: Secondary hypothesis 2. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(457) = 0.563$, $p = 0.574$.

Year of Ph.D.	0.002
	(0.004)
Constant	−0.223
	(8.635)
Observations	459
R^2	0.001

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Secondary hypothesis 3: More junior scientists more strongly support Registered Reports.

We will carry out this test based on an OLS regression with the dependent variable "Support of Registered Reports" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.7: Secondary hypothesis 3. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(439) = 4.102$, $p < 0.001$.

Year of Ph.D.	0.026^{***}
	(0.006)
Constant	-48.208^{***}
	(12.756)
Observations	441
R^2	0.048

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Secondary hypothesis 4: More junior scientists more strongly support Results-blind review.

We will carry out this test based on an OLS regression with the dependent variable "Support of Results-blind review" and the independent variable "Year of Ph.D." We hypothesize a positive sign of the coefficient of the independent variable as a higher number of years on the independent variable implies that the scientist is more junior.

Table D.8: Secondary hypothesis 4. t-test for the coefficient of the independent variable "Year of Ph.D.": $t(410) = 3.027$, $p = 0.003$.

Year of Ph.D.	0.019^{***}
	(0.006)
Constant	-34.318^{**}
	(12.605)
Observations	412
R^2	0.025

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Secondary hypothesis 5: Scientists over/under estimate how favorable other scientists are towards pre-registration.

This test will be carried out as an independent samples t-test not assuming equal variances comparing if the mean of the variable "Beliefs: attitudes towards pre-registration" differs from the mean of the variable "Attitudes towards pre-registration– binary coding." Only participants with a value on both of these variables will be included in the test. We have no directional hypothesis here about whether participants over- or underestimate how favorable other scientists are towards pre-registration.

The average belief about other scientists' attitudes is 0.6027 while their actual attitude is 0.6713. Scientists underestimated how favorable other scientists are towards pre-registration (Welch's t-test: $t(651.34) = -3.056$, 95% CI $[-0.113, -0.025]$, $p = 0.0023$).

Secondary hypothesis 6: Scientists over/under estimate the fraction of scientists who have heard about pre-registration.

This test will be carried out as an independent samples t-test not assuming equal variances comparing if the mean of the variable "Beliefs: heard about pre-registration" differs from the mean of the variable "Heard about pre-registration." Only participants with a value on both these variables will be included in the test. We have no directional hypothesis here about whether participants over- or underestimate the fraction that have heard about pre-registration.

The average belief about other scientists' knowledge about pre-registration is 0.8815 while their actual knowledge is 0.9901. Scientists underestimated the fraction of scientists who have heard about pre-registration (Welch's t-test: $t(885.65) = -13.801$, 95% CI $[-0.124, -0.093]$, $p < 0.001$).

Secondary hypothesis 7: Scientists that prefer more detailed analysis plans in pre-registrations are more favorable towards pre-registration.

We will carry out this test based on an OLS regression with the dependent variable "Pre-registration attitudes" and the independent variable "Elements of pre-registration." We hypothesize a positive sign of the coefficient of the independent variable.

TABLE D.9: Secondary hypothesis 7. t-test for the coefficient of the independent variable "Elements of pre-registration": $t(517) = 13.717$, $p < 0.001$.

Elements of pre-registration	0.261^{***}
	(0.019)
Constant	2.559^{***}
	(0.106)
Observations	519
R^2	0.241

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Secondary hypothesis 8: Scientists that are more favorable towards pre-registration more strongly believe that pre-registration improves the credibility of statistically significant findings.

We will carry out this test based on an OLS regression with the dependent variable "Credibility difference of pre-registration" and the independent variable "Pre-registration attitudes." We hypothesize a positive sign of the coefficient of the independent variable.

TABLE D.10: Secondary hypothesis 8. t-test for the coefficient of the independent variable "Elements of pre-registration": $t(504) = 10.692$, $p < 0.001$.

Pre-registration attitudes	0.764^{***}
	(0.071)
Constant	-1.252^{***}
	(0.279)
Observations	506
R^2	0.240

Notes: Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

D.6.3 Exploratory analyses

Exploratory analysis 1: Attitudes towards pre-registration vary with position.

We will carry out this test based on an OLS regression with the dependent variable "Pre-registration attitudes" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with primary hypothesis 1, we expect more junior scientists to be more favorable towards pre-registration, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.11: Exploratory analysis 1. Wald test of the joint significance of the 6 dummy variables: $F(6, 505) = 7.766$, $p < 0.001$.

Post-doctoral scholar	-0.128
	(0.178)
Assistant Professor	-0.472^{**}
	(0.174)
Associate Professor	-0.727^{***}
	(0.171)
Full Professor	-1.000^{***}
	(0.167)
Research Scientist (non-academic)	-0.333
	(0.275)
Other	-0.350
	(0.429)
Constant	4.250^{***}
	(0.114)
Observations	512
R^2	0.077

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 2: The support of pre-registration in EXEC and JESA varies with position.

We will carry out this test based on an OLS regression with the dependent variable "Support of pre-registration in EXEC and JESA" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with primary hypothesis 2, we expect more junior scientists to be more supportive of pre-registration in EXEC and JESA, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.12: Exploratory analysis 2. Wald test of the joint significance of the 6 dummy variables: $F(6, 502) = 17.353$, $p < 0.001$.

Post-doctoral scholar	0.048
	(0.167)
Assistant Professor	-0.466^{**}
	(0.180)
Associate Professor	-1.083^{***}
	(0.184)
Full Professor	-1.466^{***}
	(0.184)
Research Scientist (non-academic)	-0.307
	(0.365)
Other	-0.724
	(0.492)
Constant	4.224^{***}
	(0.118)
Observations	509
R^2	0.163

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 3: The support of a mandate of pre-registration in EXEC and JESA varies with position.

We will carry out this test based on an OLS regression with the dependent variable "Support of mandate of pre-registration in EXEC and JESA" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with primary hypothesis 3, we expect more junior scientists to be more supportive of a mandate of pre-registration in EXEC and JESA, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.13: Exploratory analysis 3. Wald test of the joint significance of the 6 dummy variables: $F(6, 501) = 16.317$, $p < 0.001$.

Post-doctoral scholar	-0.176
	(0.201)
Assistant Professor	-0.718^{***}
	(0.196)
Associate Professor	-1.279^{***}
	(0.181)
Full Professor	-1.383^{***}
	(0.180)
Research Scientist (non-academic)	-0.463
	(0.421)
Other	-0.913
	(0.494)
Constant	3.213^{***}
	(0.142)
Observations	508
R^2	0.158

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 4: The support of open data and protocol varies with position. We will carry out this test based on an OLS regression with the dependent variable "Support of open data and protocol" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with secondary hypothesis 1, we expect more junior scientists to be more supportive of open data and protocol, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.14: Exploratory analysis 4. Wald test of the joint significance of the 6 dummy variables: $F(6, 497) = 0.951$, $p = 0.458$.

Post-doctoral scholar	0.164
	(0.125)
Assistant Professor	−0.008
	(0.123)
Associate Professor	−0.031
	(0.127)
Full Professor	0.047
	(0.117)
Research Scientist (non-academic)	−0.323
	(0.284)
Other	−0.373
	(0.518)
Constant	4.573***
	(0.091)
Observations	504
R^2	0.014

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 5: The support of replication studies varies with position.

We will carry out this test based on an OLS regression with the dependent variable "Support of replication studies" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with secondary hypothesis 2, we expect more junior scientists to be more supportive of replication studies, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.15: Exploratory analysis 5. Wald test of the joint significance of the 6 dummy variables: $F(6, 498) = 0.858$, $p = 0.526$.

Post-doctoral scholar	0.008
	(0.115)
Assistant Professor	0.000
	(0.104)
Associate Professor	−0.012
	(0.111)
Full Professor	0.030
	(0.107)
Research Scientist (non-academic)	−0.333
	(0.233)
Other	−0.767
	(0.489)
Constant	4.667***
	(0.086)
Observations	505
R^2	0.027

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 6: The support of Registered Reports varies with position.

We will carry out this test based on an OLS regression with the dependent variable "Support of Registered Reports" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with secondary hypothesis 3, we expect more junior scientists to be more supportive of Registered Reports, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.16: Exploratory analysis 6. Wald test of the joint significance of the 6 dummy variables: $F(6, 496) = 3.393$, $p = 0.003$.

Post-doctoral scholar	0.027
	(0.162)
Assistant Professor	−0.179
	(0.159)
Associate Professor	−0.288
	(0.164)
Full Professor	−0.627***
	(0.175)
Research Scientist (non-academic)	0.043
	(0.385)
Other	−0.473
	(0.517)
Constant	4.373***
	(0.123)
Observations	503
R^2	0.044

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

Exploratory analysis 7: The support of Results-blind review varies with position.
We will carry out this test based on an OLS regression with the dependent variable "Support of Results-blind review" and the independent variable "Position" (consisting of 7 categories and 6 dummy variables; see above). In line with secondary hypothesis 4, we expect more junior scientists to be more supportive of Results-blind review, but not all the categories of the "Position" variable can be ranked in terms of seniority. We will test this hypothesis using a Wald test of the joint significance of the 6 dummy variables. The analyses carry little weight and should mainly be interpreted as hypothesis-generating for future studies.

TABLE D.17: Exploratory analysis 7. Wald test of the joint significance of the 6 dummy variables: $F(6, 496) = 3.003$, $p = 0.007$.

Post-doctoral scholar	0.043
	(0.197)
Assistant Professor	0.036
	(0.179)
Associate Professor	0.016
	(0.187)
Full Professor	−0.459*
	(0.193)
Research Scientist (non-academic)‘	0.393
	(0.311)
Other	−1.007*
	(0.459)
Constant	4.107***
	(0.139)
Observations	503
R^2	0.038

Notes: Baseline category is *Graduate student*. Robust standard errors are reported in parentheses. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.005$.

D.7 Statistical power: Minimum detectable effect sizes

As the sample size in the survey is not known in advance, it is difficult to estimate the statistical power of the above tests prior to the data collection (the standard deviation of the outcome variables is also difficult to estimate in advance). We will therefore report the minimum detectable effect size (MDE) in the primary and secondary hypothesis tests after observing the standard errors of the tests. The minimum detectable effect size will be estimated as the standard error $\times 2.8$ for tests at the 5% level ("suggestive evidence") and the standard error $\times 3.65$ for tests at the 0.5% level ("statistically significant evidence").

E Survey Questions

This is a copy of the survey questions presented to the participants, with the numbers in square brackets [...] indicating the number of participants who selected each option. The original Qualtrics file is available in the project repository on the Open Science Framework (https://osf.io/e5yz4/).

PRESENTATION

Description: This is a study about the prevalence of and opinions towards **pre-registration** and **pre-analysis plans** in experimental economics. The study is conducted by the **ESA Data and Replicability Committee**, and it should take approximately **15 minutes**. Your participation in this study will improve our understanding of current practices and attitudes towards pre-registration and pre-analysis plans in our profession. There are no known risks associated with this study that would go beyond those of everyday life.

Confidentiality: No personal data will be collected in this survey. Your anonymous data will be used in a presentation at the **ESA World Meeting in Lyon** (26-29 June) and the results will be written up in a **report to be shared with the members of the ESA**. The anonymized data will also be used in a methodological research paper on the use of pre-registration and pre-analysis plans in experimental economics. All the anonymized data produced in this survey may be used in future research, shared with other researchers, or made available on a public repository. In no circumstances will your identity or personal involvement in this survey be disclosed.

Your rights as a participant: Participation is entirely voluntary. You may leave the survey at any time without any penalty or prejudice. You can also skip questions in the survey.

Ethics approval: This study has been reviewed and approved by the ethics committee of Koc University (2023.142.IRB3.062), where the PI is listed as Seda Ertac (chair of the ESA Data and Replicability Committee). Should you have any questions, difficulties, or complaints, please contact the researchers at `sertac@ku.edu.tr` or `chr@ku.edu.tr`.

[Q.0.1] I have read the above and agree to participate in this survey:

- ☐ Yes [1]
- ☐ No [0]

[Q.0.2] What type(s) of **empirical methods** do you **primarily** use in your research? Please select all that apply.

- ☐ Lab experiment [437] [1]
- ☐ Field experiment [179] [2]
- ☐ Online experiment [346] [3]
- ☐ RCT / impact evaluation [76] [4]
- ☐ Unincentivized survey (no experiment) [101] [5]
- ☐ Observational data [108] [6]
- ☐ Other (please indicate in the box below): [Text box] [14] [7]
- ☐ I do not do any empirical research [8]

Definition

The definitions and practical implementations of pre-registration and pre-analysis plans may vary widely (Banerjee et al., 2020; Christensen and Miguel, 2018; Miguel, 2021).

For the purpose of this survey, we do not make a strict distinction between pre-registration and pre-analysis plans, and use these terms in the following way:

> 👉 By pre-registration and a pre-analysis plan, we mean:
>
> 1. writing down a subset of the study design, outcome variables of interest, hypotheses or planned statistical analyses **in advance** of analyzing the outcome data; AND
> 2. posting the document on a **public registry** where it will be **time-stamped**.
>
> ⚠ For our purposes, this may also include writing down hypotheses or planned statistical analyses for a previously collected experimental or observational dataset in advance of examining the data.

[Q.1.1] Have you **heard** of the practice of pre-registering hypotheses or analysis plans in advance of a research project?

- ☐ Yes [514] [1]
- ☐ No [5] [0]

[Q.1.2] What is your **general opinion** on pre-registering hypotheses or analysis plans in advance of a research project?

- ☐ Very unfavorable [47] [1]
- ☐ Somewhat unfavorable [70] [2]
- ☐ Neither unfavorable nor favorable [54] [3]
- ☐ Somewhat favorable [172] [4]
- ☐ Very favorable [172] [5]
- ☐ Not sure [4] [6]

Your experience with pre-registration

[Q.2.1] Have you pre-registered one or several of your research projects?

- ☐ Yes (personally or together with my collaborators on our joint projects) [447] [1]
- ☐ No [72] [0]

[Q.2.2] [If Q.2.1=No] Why haven't you pre-registered any of your research projects up to now? Please select all that apply. [Order randomized (except for the last option)]

- ☐ Pre-registration is time-consuming. [43] [1]
- ☐ The research projects I conduct are too complex to write a meaningful plan. [10] [2]
- ☐ The research projects I conduct are exploratory. [19] [3]
- ☐ I need to learn from the data how to analyze it. [27] [4]
- ☐ Pre-registration is not possible because I use existing datasets. [6] [5]
- ☐ I do not see what would be useful to pre-register. [16] [6]
- ☐ I do not want to be penalized for deviating from a pre-registration. [23] [7]
- ☐ It won't help me to do better research. [20] [8]
- ☐ My collaborators are not favorable to the idea of pre-registration. [6] [9]
- ☐ Other reasons (please describe in the box below): [Text box] [23] [10]

[Q.2.3] [If Q.2.1=Yes] What type(s) of research was it for? Please select all that apply.

- ☐ Lab experiment [312] [1]
- ☐ Field experiment [148] [2]
- ☐ Online experiment [303] [3]
- ☐ RCT / impact evaluation [58] [4]
- ☐ Unincentivized survey (no experiment) [44] [5]
- ☐ Observational data [17] [6]
- ☐ Other (please indicate in the box below): [Text box] [6] [7]

[Q.2.4] [If Q.2.1=Yes] What were the main reasons that brought you (or your collaborators) to pre-register your research projects? Please select all that apply. [Order randomized (except for the last option)]

- ☐ Because it is required or recommended at top journals. [303] [1]
- ☐ To make sure the research design and analysis contain all key elements. [138] [2]
- ☐ Because it leads to more reliable results. [110] [3]
- ☐ To avoid making biased choices during the data analysis. [152] [4]
- ☐ To facilitate the work with collaborators or research assistants. [27] [5]
- ☐ To contribute personally to transparent research. [253] [6]
- ☐ To signal research credibility. [326] [7]
- ☐ Other reasons (please describe in the box below): [Text box] [30] [8]

[Q.2.5] [If Q.2.1=Yes] In what year did you or your collaborator(s) first pre-register a research project? [Dropdown with numbers: 2023, 2022, ..., 2011, 2010 or earlier]

[Q.2.6] [If Q.2.1=Yes] How many of your research projects were pre-registered by you or your collaborator(s) since then?

- ☐ All of them [147] [1]
- ☐ Most of them [169] [2]
- ☐ Some of them [108] [3]
- ☐ None [23] [4]

[Q.2.7] [If Q.2.6≠All of them] What were the reasons that brought you to not pre-register some of your research projects? Please select all that apply. [Order randomized (except for the last option)]

- ☐ Pre-registration is time-consuming. [124] [1]
- ☐ Some research projects I conducted were too complex to write a meaningful plan. [54] [2]
- ☐ Some research projects I conducted were exploratory. [149] [3]
- ☐ I needed to learn from the data how to analyze it. [82] [4]
- ☐ Pre-registration was not possible because I used existing datasets. [67] [5]
- ☐ I did not see what would be useful to pre-register. [71] [6]
- ☐ I did not want to be penalized for deviating from a pre-registration. [69] [7]
- ☐ I did not think it would help me to do better research. [95] [8]
- ☐ My collaborators were not favorable to the idea of pre-registration. [34] [9]
- ☐ Other reasons (please describe in the box below): [Text box] [54] [10]

Existing registration platforms

[Q.3.1] Which of the following registration platforms have you heard of? Please select all that apply.

- ☐ AEA RCT Registry (link) [431] [1]
- ☐ AsPredicted (link) [352] [2]
- ☐ ClinicalTrials.gov (link) [98] [3]
- ☐ Experiments in Government and Politics (EGAP) Registry (link) [31] [4]
- ☐ Open Science Framework (OSF) (link) [385] [5]
- ☐ Registry for International Development Impact Evaluations (RIDIE) (link) [2] [6]
- ☐ Other (please indicate in the box below): [Text box] [8] [7]

[Q.3.2] [If Q.2.1=Yes] Which of the following registration platforms have you **used** so far? Please select all that apply.

- ☐ AEA RCT Registry [250] [1]
- ☐ AsPredicted [232] [2]
- ☐ ClinicalTrials.gov [7] [3]
- ☐ Experiments in Government and Politics (EGAP) Registry [5] [4]
- ☐ Open Science Framework (OSF) [220] [5]
- ☐ Registry for International Development Impact Evaluations (RIDIE) [0] [6]
- ☐ Other (please indicate in the box below): [Text box] [6] [7]

[Q.3.3] [Only one selected in Q.3.2] Why do you use this registration platform for your work? Please explain below: [Text box]

[Q.3.4] [More than one selected in Q.3.2] Which registration platform do you prefer to use for your work and why? Please explain below: [Text box]

[Q.3.5] The various registration platforms differ in the extent to which pre-registrations are made **publicly available** and **searchable**.

Which of the following **disclosure policies** are you most favorable to?

- ☐ Make all pre-registrations automatically public once the data collection is concluded. [188] [1]
- ☐ Allow researchers to decide before the data collection whether to make their pre-registration public or not. [91] [2]
- ☐ Allow researchers to decide at any point in time whether to make their pre-registration public or not. [226] [3]

[Q.3.6] The platforms also differ in terms of the pre-registration format. Some impose **word/page limits** and require researchers to use a **template**, while others follow a less structured but more flexible format.

Which of the following **formats** are you most favorable to?

- ☐ Standardized pre-registration format with word/page limit and specific fields. [276] [1]
- ☐ Free-form pre-registration format with no word/page limit but some suggested fields. [230] [2]

[Q.3.7] Are there **any other features** (whether currently available or not) that you think registration platforms should have? Please indicate below: [Text box]

Breadth of application, implementation and reporting

In this section, we would like to ask you for your opinion on:

> 👉 the **breadth of application** of pre-registration practices;
> 👉 the **implementation** and **reporting** of pre-registered (vs. non-pre-registered) analyses.

Breadth of application

[Q.4.1] Which **type(s)** of studies should be pre-registered in your view? Please select all that apply.

- ☐ Lab experiment [337] [1]
- ☐ Field experiment [385] [2]
- ☐ Online experiment [345] [3]
- ☐ RCT / impact evaluation [396] [4]
- ☐ Unincentivized survey (no experiment) [229] [5]
- ☐ Observational data [189] [6]
- ☐ Pilot studies [76] [7]
- ☐ Other (please indicate in the box below): [Text box] [69] [8]

[Q.4.2] What **elements** do you think a pre-registration should contain? Please select all that apply.

- ☐ Clear hypotheses [462] [1]
- ☐ Sample size justification [318] [2]
- ☐ Detailed power calculations [127] [3]
- ☐ Whether any prior (pilot) data was collected [303] [4]
- ☐ Criteria for excluding observations (e.g., treatment of outliers) [333] [5]
- ☐ All regression specifications and tests [137] [6]
- ☐ The significance threshold used in tests [153] [7]
- ☐ Corrections for multiple hypothesis testing [125] [8]
- ☐ A hierarchy of tests (primary, secondary, exploratory) [207] [9]
- ☐ The theoretical model if one will be included in the paper [108] [10]
- ☐ Other (please indicate in the box below): [Text box] [67] [11]

Implementation and reporting

[Q.4.3] How much should one **follow** a pre-registration? Please select the statement you most agree with.

- ☐ The author(s) should execute the pre-analysis plan word for word. [14] [1]
- ☐ The author(s) can deviate parsimoniously from the pre-analysis plan as long as it is clear where and why. [163] [2]
- ☐ The author(s) can deviate as much as they want as long as it is clear where and why. [260] [3]
- ☐ The author(s) can use the pre-analysis plan for guidance but there is no need to follow it. [76] [4]

[Q.4.4] Which information should the authors **disclose** in the paper? Please select all that apply.

- ☐ Clear statement of which studies / treatments were pre-registered. [406] [1]
- ☐ Link to pre-registration document(s) on the front page of the paper. [343] [2]
- ☐ Distinct labeling of exploratory and pre-registered analyses in the main text. [285] [3]
- ☐ Clear comparison in the appendix of the pre-registration vs. analysis presented in the paper. [128] [4]
- ☐ Other (please indicate in the box below): [Text box] [33] [5]

Interpretation and peer review

[Q.5.1] Imagine you are reading a paper with a pre-registration.

On a scale of 0 (not at all) to 10 (extremely), how would you rate the **credibility of a statistically significant finding** ($p < 0.05$) based on a:

- Pre-registered hypothesis test
- Non-pre-registered hypothesis test

[Q.5.2] Have you ever **reviewed** a paper with a pre-registration for a journal?

- ☐ Yes [296] [1]
- ☐ No [210] [2]

[Q.5.3] [If Q.5.2=Yes] As a reviewer, did you **check the pre-registration documents**?

- ☐ Yes, for all papers with pre-registration I reviewed. [117] [1]
- ☐ Yes, for some of the papers with pre-registration I reviewed. [88] [2]
- ☐ No, I never checked the pre-registration documents. [89] [3]

[Q.5.4] [If Q.5.2=Yes AND Q.5.3≠No] How did checking the pre-registration documents **affect your evaluation of the paper under review**?

Generally speaking:

- ☐ It made my evaluation more positive. [59] [1]
- ☐ It did not affect my evaluation. [73] [2]
- ☐ It made my evaluation more negative. [27] [3]
- ☐ Other (please indicate in the box below): [Text box] [41] [4]

[Q.5.5] In general, **how often** do you think reviewers check pre-registration documents? [Slider 0%-100%]

[Q.5.6] Who do you think should check the pre-registration documents that accompany a submission?

- ☐ The editor in charge of the paper [46] [1]
- ☐ One specific reviewer [41] [2]
- ☐ All reviewers [182] [3]
- ☐ Another journal member (e.g., the data editor) [56] [4]
- ☐ Someone specifically appointed for this job [74] [5]
- ☐ Nobody (the authors are solely responsible) [73] [6]
- ☐ Other (please indicate in the box below): [Text box] [38] [7]

Beliefs about current practices and views

[Q.6.1] Consider all experimental papers published **between 2017 and 2022** in the journals listed below.

What **percentage** of these papers do you think were pre-registered? [Slider 0%-100%]

- Papers published in "Top 5" journals in economics
- Papers published in *Experimental Economics*

[Q.6.2] Consider all participants in this survey. What **percentage** do you think **answered "Yes"** to the question "Have you heard of the practice of pre-registering hypotheses or analysis plans in advance of a research project?" [Slider 0%-100%]

[Q.6.3] Consider all participants in this survey. What **percentage** do you think **answered "Somewhat favorable" or "Very favorable"** to the question "What is your general opinion on pre-registering hypotheses or analysis plans in advance of a research project?" [Slider 0%-100%]

[Q.6.4] Below is a list of statements about the **potential impact of pre-registration on a range of outcomes**.

Given what the current practices are, what do you guess is the likely impact of pre-registration on these outcomes? [1=Strongly decrease; 2; 3; 4; 5=Strongly increase]

- Disclosure of null results [7, 6, 92, 273, 130]
- Transparency of design and/or analytical choices [5, 7, 113, 252, 130]
- Amount of *p*-hacking [66, 288, 115, 28, 11]
- Amount of HARKing (hypothesizing after seeing the results) [93, 259, 116, 22, 18]
- Replicability of research [5, 13, 197, 223, 70]
- Clarity and coherence of presentation [16, 40, 260, 160, 30]
- Level of research creativity [74, 149, 239, 38, 7]
- Amount of risky/speculative research [84, 213, 173, 30, 7]
- Volume of research produced [31, 184, 267, 21, 5]

Other practices

This part asks you about **Registered Reports** and **Results-blind review**, two alternative publication mechanisms, which follow a two-stage peer-review system as follows:

- 👉 Authors submit a manuscript that contains **only** their research questions, hypotheses, detailed study designs, and analysis plans, but **absent any description of findings**.
- 👉 Submitted manuscripts meeting standards of methodological rigor receive an **"in-principle acceptance"**, which commits the journal to publish the final paper as long as the procedures described in the initial submission were followed.
- 👉 The authors submit a final manuscript that includes the approved protocol, the results, and the discussion. The second-stage review focuses on compliance with the protocol and whether the conclusions are justified by the evidence.

Importantly:

- In **Registered Reports**, no data collection occurs before the first-stage review process.
- In **Results-blind review**, the data collection and analysis may be ongoing or already completed before submission.

[Q.7.1] Have you **heard** of Registered Reports?

- ☐ Yes [417] [1]
- ☐ No [97] [0]

[Q.7.2] Have you **heard** of Results-blind review?

- ☐ Yes [239] [1]
- ☐ No [275] [0]

[Q.7.3] What is your **general opinion** on the following practices? [1=Very unfavorable; 2; 3; 4; 5=Very favorable; 6=Not sure]

- Open data and protocol [6, 6, 41, 111, 318, 26]
- Replication studies [6, 6, 16, 110, 367, 5]
- Registered Reports [16, 43, 74, 129, 222, 24]
- Results-blind review [15, 65, 88, 128, 158, 54]

Role of the ESA

We would like to hear your thoughts on the role that you think the ESA should play in light of recent trends in "Open Science."

[Q.8.1] What should be the ESA's role in the use of pre-registration? (EXEC: *Experimental Economics*; JESA: *Journal of the Economic Science Association*) [1=Strongly disagree; 2; 3; 4; 5=Strongly agree]

In my view, the ESA should:

- ... **strongly encourage pre-registration** for all studies submitted to EXEC and JESA. [82, 62, 63, 121, 186]
- ... **mandate pre-registration** for all studies submitted to EXEC and JESA. [190, 100, 96, 80, 47]
- ... provide **guidelines to authors** on how to write a pre-registration. [23, 17, 70, 189, 214]
- ... provide **guidelines to reviewers** on how to evaluate manuscripts with pre-registrations. [27, 11, 67, 198, 211]

[Q.8.2] What **other initiatives** should the ESA consider to promote research transparency and open science?

- ☐ Promote open data [388] [1]
- ☐ Commit to publishing high-quality replication studies [423] [2]
- ☐ Commit to publishing high-quality papers with clear "null" results [461] [3]
- ☐ Consider results-blind review (i.e., assessment of paper merits without seeing results) [257] [4]
- ☐ Consider pre-data collection review (e.g. Registered Reports) [296] [5]
- ☐ Other (please indicate in the box below): [Text box] [22] [6]

[Q.8.3] We will hold a **panel session on pre-registration and pre-analysis plans** at the ESA World Meeting in Lyon (26-29 June).

Please indicate below if there are **any topics** or **discussion points** you would like to be covered by the panel: [Text box]

[Q.8.4] Do you have any other comments or suggestions for the ESA? [Text box]

A little bit more about you

This is the final part of the survey.

[Q.9.1] Are you a member of the Economic Science Association?

- ☐ Yes [437] [1]
- ☐ No [80] [0]

[Q.9.2] Will you be attending the ESA World Meeting in Lyon (26-29 June)?

- ☐ Yes, as a presenter [181] [1]
- ☐ Yes, as an attendee [7] [2]
- ☐ No [328] [3]

[Q.9.3] What is your gender?

- ☐ Male [309] [1]
- ☐ Female [160] [2]
- ☐ Non-binary / third gender [3] [3]
- ☐ Prefer not to say [41] [4]

[Q.9.4] What is your career stage?

- ☐ Graduate student [76] [1]
- ☐ Post-doctoral scholar [82] [2]
- ☐ Assistant Professor (without tenure) [61] [3]
- ☐ Assistant Professor (with tenure) [38] [4]
- ☐ Associate Professor (without tenure) [12] [5]
- ☐ Associate Professor (with tenure) [97] [6]
- ☐ Full Professor [124] [7]
- ☐ Research Scientist in a non-academic position [12] [8]
- ☐ Other (please indicate in the box below): [Text box] [10] [9]

[Q.9.5] Where is your current position **located**, based on the ESA's regional groupings? If you hold several positions, please indicate the location of your **main** position.

- ☐ Asia-Pacific [49] [1]
- ☐ Europe [335] [2]
- ☐ North America [117] [3]
- ☐ Other (please indicate in the box below): [Text box] [10] [4]

[Q.9.6] In what **year** did you complete or do you expect to complete your Ph.D.? [Dropdown with numbers: 2028 or later, 2027, ..., 1981, 1980 or earlier]

[Q.9.7] Is economics your primary discipline?

- ☐ Yes [490] [1]
- ☐ No [24] [0]

[Q.9.8] [If Q.9.6=No] What is your primary discipline? [Text box]

[Q.9.9] [If Q.9.6=Yes] What topics do your main research agenda(s) focus on? Please select all that apply.

- ☐ Applied Economics (charitable giving, economic development, labor market, etc.) [378] [1]
- ☐ Applied Economics (other) [76] [2]
- ☐ Decision Theory (risk, ambiguity, beliefs, time, bounded rationality, learning, etc.) [218] [3]
- ☐ Field Experiments [123] [4]
- ☐ Games (bargaining, contests, coordination, information, networks, repeated games, etc.) [196] [5]
- ☐ Markets (auctions, finance, IO, macroeconomics, market design and matching, etc.) [105] [6]
- ☐ Psychology and Biology (cognition, emotions, gender and individual differences, neuroeconomics, etc.) [151] [7]
- ☐ Public Choice (public goods and common pool resources, voting and rent-seeking, etc.) [129] [8]
- ☐ RCTs / impact evaluation [59] [9]
- ☐ Social Behavior (communication, group behavior, lying and cheating, norms and morals, other-regarding preferences, etc.) [322] [10]
- ☐ Other (please indicate in the box below): [Text box] [10] [11]

Thank you so much for having taken the time to participate in this survey!

📅 What's next?

1. We will analyze the data and read all your responses.
2. We will hold a special panel session at the ESA World Meeting in Lyon (26-29 June) where we will mention preliminary results.
3. We will produce a report with the full results and provide some recommendations.
4. We will engage in discussions with the ESA journal editors.

[Q.9.10] In the meantime, please let us know about **any concerns or suggestions** you would like to bring to the ESA, either in the box below or by directly emailing Seda Ertac (sertac@ku.edu.tr), the chair of the ESA Data and Replicability Committee. [Text box]

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