Trends in the publication of experimental economics articles

ERNESTO REUBEN
New York University Abu Dhabi, Center for Behavioral Institutional Design, Luxembourg Institute of Socio-Economic Research, e-mail: ereuben@nyu.edu

SHERRY XIN LI
University of Arkansas, e-mail: SLi@walton.uark.edu

SIGRID SUETENS
Tilburg University, e-mail: S.Suetens@uvt.nl

ANDREJ SVORENČÍK
University of Mannheim, e-mail: svorencik@uni-mannheim.de

THEODORE TUROCY
University of East Anglia, e-mail: T.Turocy@uea.ac.uk

VASILEIOS KOTSIDIS
University of Cambridge, e-mail: vk340@cam.ac.uk

ABSTRACT

We report data on the experimental articles published from 2000 to 2021 in seven leading general-interest economics journals. We also look at time trends in the characteristics of the published experimental articles, including citations and the nationality of the authors. We find an overall increasing trend in the publication of non-lab experiments in all journals. By contrast, the share of lab experiments has more than halved in the AER and remained low in other Top 5 journals. The diverging trends for non-lab and lab experiments are not universal as the shares of both have increased in two other high-ranking economics journals (JEEA and EJ). We also observe some heterogeneities in publication, citations, rankings, and locations of authors' affiliations across journals and types of experiments.

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In recent years, there has been increasing discussion within the Economic Science Association (ESA) about whether experimental methods in economics have plateaued or even declined. In a much-discussed editorial, Nikiforakis and Slonim (2015, 2019) show that since 2010 there has been a reduction in the publication of articles using lab experiments in the so-called "Top 5" journals and that much of this decline is accounted for by the number of experimental articles published in the *American Economic Review*.[1] Motivated by these findings and out of concern for what these trends imply for the career development of the next generation of experimental economists, the ESA Executive Committee created an ad-hoc committee to investigate further the publishing trends in experimental economics. This article is one of the outcomes of this investigation.

We update, broaden, and deepen the analysis of Nikiforakis and Slonim to develop a fuller picture of the state of research using experimental methods in leading journals in economics. We construct a dataset tabulating all published articles using experimental methods, including standard lab settings, lab-in-the-field experiments, online experiments, and field experiments. In addition, we include two other well-regarded general-interest journals, the *Journal of the European Economic Association* and the *Economic Journal*.

In line with Nikiforakis and Slonim (2019), we show that the *American Economic Review* published relatively fewer experimental articles over the last decade, a decline attributable specifically to lab experiments. Meanwhile, the fraction of articles in the other Top 5 journals featuring lab experiments has remained low but constant. By contrast, the fraction of the other types of experimental articles (primarily field experiments) published in the Top 5 journals has risen between 2000 to 2021. Trends are quite different in the *Journal of the European Economic Association* and the *Economic Journal.* In these journals, we observe a positive trend in the publication of both lab and other types of experiments, with lab experiments accounting for the largest share.

We also analyze trends in the citations of these published articles and find that articles with lab experiments are generally cited less frequently than other experimental articles in the same journal. This difference is observed over the past two decades, even during years when the share of lab experiments is relatively high. Finally, we document trends in the characteristics of authors of experimental articles, who, over time, are increasingly more likely to be affiliated with "top 30" economics departments.

I. Methodology and data

We reviewed the articles published from 2000 to 2021 in the *American Economic Review* (AER), *Econometrica* (ECTA), *Quarterly Journal of Economics* (QJE), *Journal of Political Economy* (JPE), and

[1] See also Roberto Weber's keynote speech at the European ESA meetings in 2019. For a history of growing acceptance of experimental methods in the last third of the 20th century see Svorenčík (2016, 2020).

Review of Economic Studies (REStud), plus two other prominent general-interest journals, the *Journal of the European Economic Association* (JEEA) and the *Economic Journal* (EJ). Overall, we reviewed 9,357 articles. We identified articles that applied experimental methods. Specifically, we rely on whether authors refer to their method as either an experiment or a randomized control trial. We exclude natural experiments, where treatment assignment is not actively chosen by the experimenter, and randomized control trials in which the dependent variable is not at the individual level (e.g., evaluating the effect of a randomly assigned policy on county-level outcomes). We also exclude articles that do not regularly undergo peer review, such as comments, errata, editorials, and articles in the *AER Papers & Proceedings.*

Classifying experiments

We started by classifying these experiments into five coarse categories using the following criteria:

- *Standard lab*: experiments run in a classroom or lab at a university using students as subjects.
- *Lab-in-the-field*: experiments run in lab-like environments outside a university and with physically present, non-student subjects.
- *Online*: experiments run online, typically using subjects from online marketplaces like Amazon MTurk.
- *Field*: experiments run in field environments in which subjects make similar decisions to those regularly make in those environments. Subjects might or might not be aware that they are participating in the experiment. This category includes randomized control trials.
- *Miscellaneous*: for articles that do not fit in the above categories, use multiple types of experiments, or rely heavily on experimental data from other articles.

We classified 44.9% of the published articles using experiments as standard lab, 5.3% as lab-in-the-field, 4.1% as online, 37.0% as field, and 8.7% as miscellaneous. For the data analysis, we opt for an even simpler classification: LAB (standard lab) or OTHER (all other categories). This classification has two advantages. First, it splits the data roughly in half, ensuring that we have enough observations to make a meaningful analysis. Second, it is based on the definition of standard lab experiments, which we found was the most straightforward definition to apply. Nevertheless, in the appendix, we present our main findings further breaking down the OTHER category.

Affiliation ranking, location, and ESA membership

For each experimental article, we record the authors' affiliations. We assign one affiliation to each author. For authors affiliated with multiple institutions, we assign them to the first university affiliation they list.

We use the Tilburg University Economics Schools Research Ranking to assign rankings to the authors' affiliations (https://econtop.uvt.nl/). Specifically, we use the sandbox tool to rank institutions in 5-year intervals using journal impact factors as criteria. We rank the authors' affiliations depending on

the year their article was published.[2] Affiliations that do not appear in the rankings are assigned to the lowest rank. We report the fraction of authors per article affiliated with a top-30 or top-50 economics department.

We also collect data about the location of all authors' affiliations. Overall, 56.6% of all affiliations are in the United States (US) or Canada, 35.5% in Western Europe and the remaining 7.8% are in other regions. For simplicity, we analyze the percentage of authors in the US or Canada.

Lastly, we coded whether authors were either paying members of the ESA or had served on the association's Executive Committee. We had access to the list of ESA members only for recent years. Hence, we coded someone as an ESA member if they paid the membership fee at least once between 2018 to 2021 or if they had ever been part of the Executive Committee.

Citations

We record the number of citations for all the identified articles. We did so by consulting the "cited by" feature of Google Scholar. For each article, we record the number of citations each article has three and five years after publication. We present these as 3-year and 5-year citations. We opted for Google Scholar for citations for two reasons. First, it is one of the most used citation metrics. Second, it includes citations to working papers and thus represents a broader measure of an article's impact.

II. Results

We present the findings separately for articles published in the AER, the "Other Top 5" journals, and then the JEEA together with EJ. We separate AER from the other Top 5 journals because of its size—it publishes around twice as many articles as the other Top 5 journals—and the substantial decline in the publication of lab experiments in this journal. Table 1 shows the descriptive statistics by category (the top panel for LAB and the bottom panel for OTHER) and journal.

Fraction of experimental publications

In the 22-year period, 4.3% of all published articles are LAB experiments, and 5.3% are OTHER experiments. The share of experimental articles in the seven journals has increased over this period (by 2.7 percentage points). However, we see noticeable variation across time and journals. Figure 1 depicts the yearly fraction of published articles that use experimental methods from 2000 to 2021. The fraction is reported separately for LAB and OTHER.

[2] The intervals were 2001-2005, 2006-2010, 2011-2015, 2016-2019 as the rankings for 2020-2021 were not available.

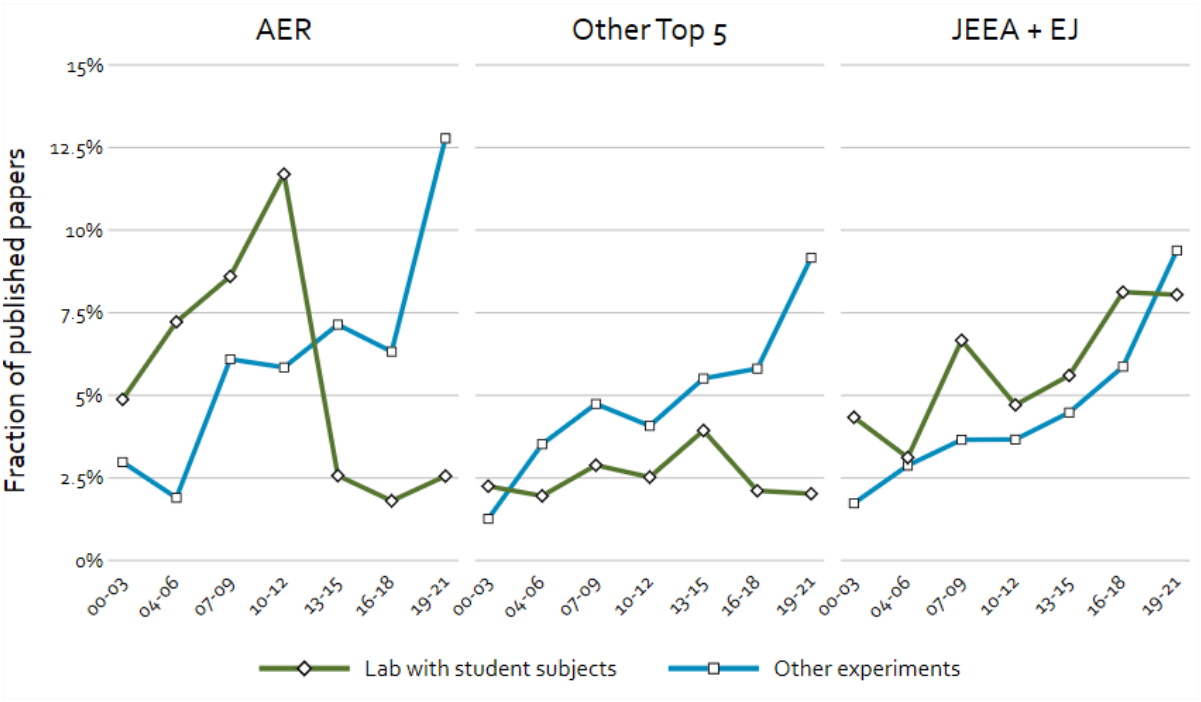

Figure 1 – Fraction published articles classified as experimental per year

We observe a clear increasing time trend in the fraction of OTHER experiments in all journals. Comparing the first to the second decade, we see that the fraction of OTHER experiments roughly doubles (p<0.001).[3]

We observe different patterns across journals for LAB experiments. In AER, we see a sharp increase in the first decade followed by a sharp drop in the second (p=0.02). Hence, while AER used to publish a higher fraction of LAB experiments than Other Top 5 journals, this has not been the case since 2013. In Other Top 5 journals, the fraction of LAB experiments has remained stable at 2.5% in the first decade and 2.4% in the second (p=0.863). Lastly, in JEEA+EJ, the fraction of LAB experiments has increased from 4.6% in the first decade to 6.8% in the second (p=0.046).

Characteristics of authors of experimental publications

Next, we analyze the authors' characteristics to see whether they help explain the publication patterns reported above. There are various reasons why authors of LAB experiments and OTHER experiments could differ. Therefore, we focus on whether these differences have changed over time in ways consistent with the differing trends in the publication of LAB and OTHER experiments. For instance, a potential explanation for the relative decline of LAB experiments in AER and the Other

[3] These statistical comparisons are based on OLS regressions. In all regressions the dependent variable corresponds to the fraction of LAB or OTHER experiments published by each journal in each year. As independent variables, we use dummy variables identifying the different journals (AER, Other Top 5, or JEEA+EJ), experiments (LAB or OTHER), and decades (2000-2010 or 2011-2021) and their interactions. We use two-sided Wald tests based on robust standard errors to test the different hypotheses. The results are qualitatively and quantitively similar if instead we use panel regressions with journal fixed effects.

Top 5 journals is that authors from top departments in the US have shifted from publishing lab experiments to field experiments.

We start by looking at the number of authors per article. On average, the number of authors has increased over decades for both categories of experiments. However, the increase has been smaller for LAB experiments (from 2.51 to 2.64, p=0.265) than OTHER experiments (from 2.36 to 3.07, p<0.001).[4] As a consequence, while there is no difference in the number of authors between LAB and OTHER experiments in the first decade (p=0.277), a significant difference emerges in the second (p<0.001).

Next, we look at the ranking of the authors' affiliations. Table 1 shows the mean fraction of authors per article whose primary affiliation is in the top 30 or top 50 at the time of publication. In all three journal groups, LAB experiments have a significantly smaller fraction of authors affiliated with the top 30 or top 50 economics departments (p<0.001). However, although this is a consistent gap, it has not changed markedly over decades (p>0.257). It is worth noting that, given the diverging publication trends of LAB and OTHER experiments at AER, the rankings gap has resulted in an increase in the fraction of authors from top 30 departments publishing experiments in this journal.[5] Seen differently, while experiments published in AER in the 2000s were less likely to be written by authors from top 30 departments than in the Other Top 5 journals (p=0.040), this is no longer the case after 2010 (p=0.279).[6]

Next, we turn to the authors' location. Table 1 shows the fraction of authors per article whose first affiliation is in the US or Canada. To varying degrees, LAB experiments are less likely to be authored by researchers based in the US or Canada than OTHER experiments. However, changes in this difference are not consistent with the changes in publication patterns. For instance, the increasing share of OTHER experiments in the Other Top 5 journals and JEEA+EJ coincide with a decreasing fraction of authors based in the US or Canada, but this pattern is not seen for AER. Similarly, a decreasing fraction of authors based in the US or Canada coincides with a decreasing share of LAB experiments in AER but with constant shares in the Other Top 5 journals and JEEA+EJ.

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[4] In this and the following subsections, statistical comparisons are based on OLS regressions where the dependent variable corresponds to article characteristic that is being evaluated (i.e., the number of authors, the fraction of authors from top 30 departments, the fraction of authors based in the US or Canada, and the number of citations). Once again, as independent variables, we use dummy variables identifying the different journals (AER, Other Top 5, or JEEA+EJ), experiments (LAB or OTHER), and decades (2000-2010 or 2011-2021) and their interactions. We use two-sided Wald tests based on robust standard errors to test the different hypotheses. The results are qualitatively and quantitively similar with t-tests.

[5] Fréchette, Sarnoff, and Yariv (2022) report a similar finding.

[6] Baghestanian and Popov (2014) have documented that experimental economics researchers tend to be employed by a broader set of departments than researchers from other fields.

In summary, there are clear differences in the characteristics of departments of authors of LAB and OTHER experiments. However, these differences do not seem related to the increasing popularity of OTHER experiments or the publication trends of LAB experiments.

Citations

Figure 2 depicts the mean number of 3-year citations of experimental articles. The figure also contains the journals' mean 3-year impact factor on the righthand axis as a measure of general citation trends. Unfortunately, Google Scholar does not produce journal impact factors. Hence, we cannot say whether experimental articles are cited more or less than other articles.[7]

We observe different trends over decades across the different journals. In AER, 3-year citations have increased for both LAB and OTHER experiments (p<0.013). The same is true for OTHER experiments in the Other Top 5 journals (p<0.001), but not for LAB experiments, which are cited similarly across decades (p=0.784). Lastly, there is a different pattern in JEEA+EJ, where the 3-year citations of OTHER experiments have not changed over time (p=0.194) while those of LAB experiments have slightly increased (p=0.024). It is also worth noting that the increases in citations follow the same trend as the journals' impact factors.

If we compare 3-year citations of LAB experiments to OTHER experiments, we see a clear pattern. LAB experiments receive fewer 3-year citations. In AER, on average, LAB experiments receive 78.42 citations while OTHER experiments receive 142.54 (p<0.001). LAB experiments published in Other Top 5 journals receive 70.58 citations compared to 147.08 by OTHER experiments (p<0.001). Finally, in the JEEA+EJ, LAB experiments receive 34.89 citations while OTHER experiments receive 62.36 (p=0.001). Since the distribution of citations can be highly skewed, we also evaluated this difference with quantile regressions. We find that LAB experiments receive fewer 3-year citations than OTHER experiments at the 25^{th} (p<0.037), 50^{th} (p<0.001), and 75^{th} (p<0.001) quartiles.

We also test whether the difference in citations is driven by the differences in the author characteristics identified above. To do so, we rerun the linear regressions. However, in addition to the journal × experiment dummies, we also include interactions for the journal × fraction of authors in the top 30 departments, journal × fraction of authors in the US or Canada, and journal × number of authors. We find that articles with more authors, particularly from the top 30 departments, receive more citations. Still, the inclusion of these variables does not affect the gap between LAB and OTHER experiments.

Although we find a robust difference between the number of 3-year citations accrued by LAB and OTHER experiments, it is unclear whether this gap explains the publication patterns. In AER, for example, one could speculate that the gap in citations motivated editors interested in maximizing

[7] Fréchette, Sarnoff, and Yariv (2022) report that experiments tend to be cited more than the average article in Top 5 journals.

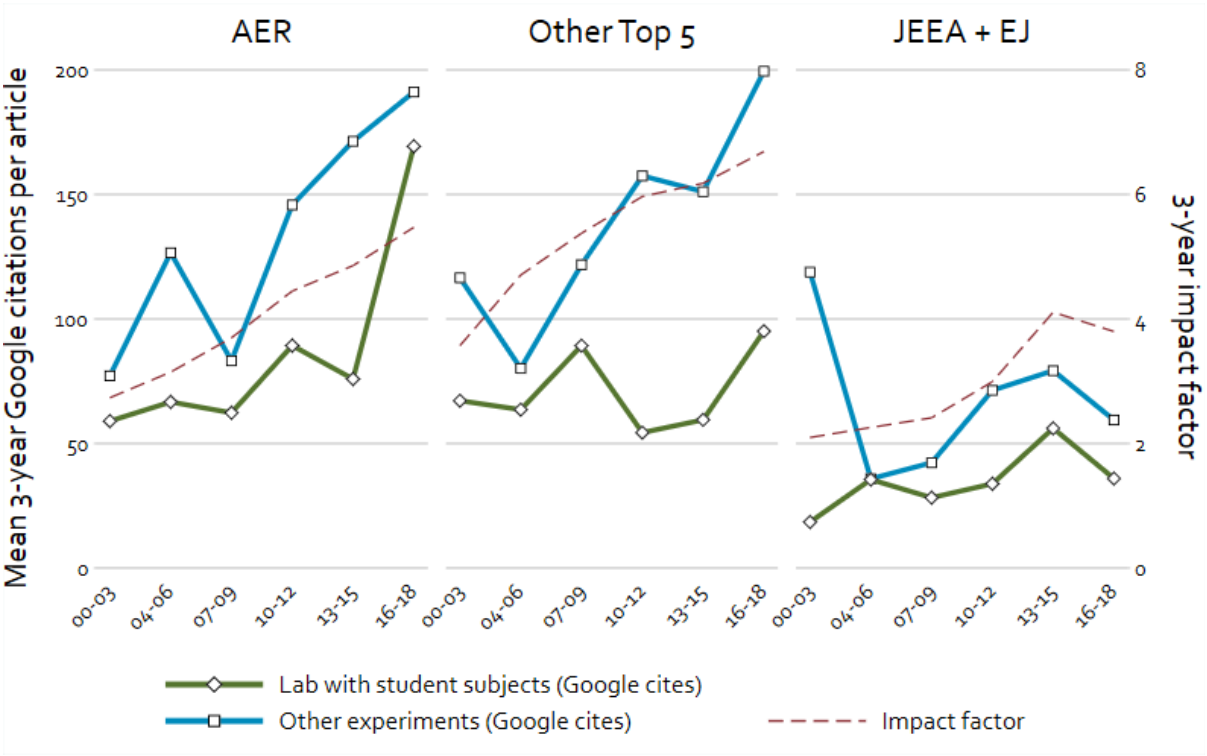

Figure 2 – Mean 3-year citations per article

Note: Citation data were collected in 2021 using the "cited by" feature of Google Scholar. Impact factors were collected from the SCImago Journal Rankings.

the journal's impact factor to shift from LAB to OTHER experiments. However, we do not see a similar decline in the publication of Lab experiments in the Other Top 5 journals, where the citations gap is even more prominent. Moreover, in JEEA+EJ, we see increasing trends in both the publication and citations of LAB experiments.

III. Discussion

We document trends in the publication of experimental research over the past two decades across seven prominent, general interest journals in economics. Our analysis shows that the decline in the fraction of experimental articles published in AER is limited to lab experiments with student samples. While we consider this decline worrying, we should note that the rate at which lab experiments are published in AER is now in line with that in the other Top 5 journals. In this respect, AER might have converged to the norm of the other Top 5 journals. On the bright side, lab experiments seem to be thriving in the other general-interest journals (JEEA and EJ). Beyond lab experiments, it is encouraging to see that the fraction of other experiments (primarily field experiments) has increased in all journals.

Overall, our data suggest that it is currently four times more difficult to publish a lab experiment in a Top 5 journal than other types of experiments. Sure enough, this calculation assumes that the number submissions of lab experiments is similar to that of other types of experiments. However,

given that the barriers to entry of lab experiments are typically lower, it is unlikely that the share of submissions of lab experiments is much lower than that of other experiments. Nevertheless, we would need submission data to reach a final conclusion.

We also find that lab experiments are less likely to be written by authors from the top 30 economics departments compared to other types of experiments. An open question is whether other experiments have higher barriers to entry, which makes them inaccessible to researchers in lower-ranked departments, or whether top departments hire fewer researchers who do lab experiments. Nonetheless, this difference does not explain the publication trends of lab and other types of experiments.

A finding that is worth thinking carefully about is that lab experiments are cited less than other experiments. Remarkably, this citation gap is persistent throughout the analyzed period and is observed in all journals. There are many plausible explanations. The simplest possibility is that citation practices (Anauati, Galiani, and Gálvez, 2020) vary between authors of lab and other types of experiments. More problematic is the possibility that non-experimental economists find lab experiments to be less persuasive or externally valid than other types of experiments, or alternatively, that the topics studied with lab experiments are less popular or less connected with other fields of economics than those investigated with other types of experiments. Thus, it would be important for future work to analyze not only the number of citations but also their source. It would be worrisome if lab experiments are predominantly used in more insular fields that are less appealing to the rest of the profession.

Do these results have implications for the ESA's priorities over the coming years? Are concerns about the state of experimental methods in economics driven primarily by the trajectory of lab experiments? Even though the analysis needed to answer these questions satisfactorily is beyond the scope of our data, we can make two observations we believe are relevant to the discussion.

First, the fraction of lab experiments using student subjects has dropped dramatically in the Top 5 journals, but not in the ESA's flagship journal *Experimental Economics* (EE). Specifically, we classified experimental articles in EE as either LAB and OTHER in two time periods: 2000-2004 and 2016-2020. The fraction of EE articles classified as LAB experiments equaled 84.9% in 2000-2004, which is not very different from the fraction in 2016-2020, 81.3% (p=0.462). By contrast, in these periods, the fraction of LAB experiments in the Top 5 journals fell from 62.9% to 16.9% in AER and from 57.6% to 22.5% in the other Top 5 journals (p<0.001). In JEEA+EJ, the fraction of LAB experiments has not changed (it went from 59.4% to 55.7%, p=0.712) but is still noticeably smaller than in EE.

Second, authors of LAB experiments are much more likely to be members of the ESA than authors of OTHER experiments. This pattern is depicted in Figure 3, which shows the mean fraction of authors of experimental articles who are ESA members. In all journals, authors of LAB experiments are

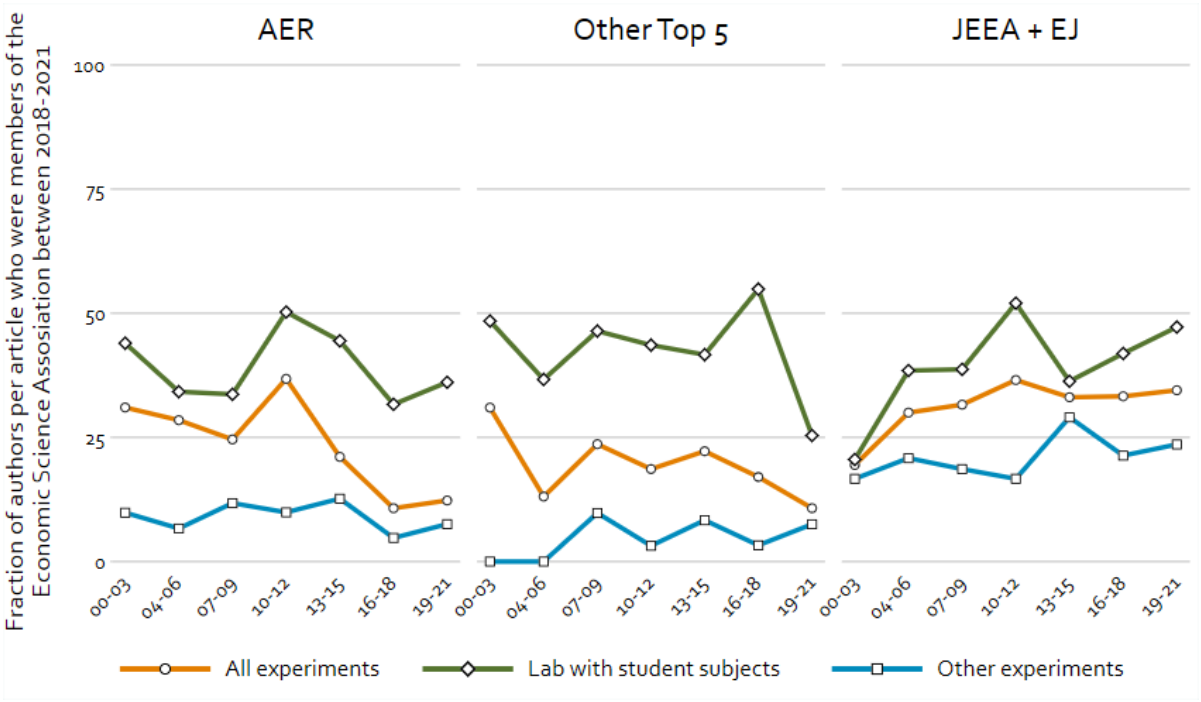

Figure 3 – Fraction of authors who were paying members of the ESA between 2018 and 2021 or had served in the ESA's Executive Committee

considerably more likely to be ESA members than authors of OTHER experiments (p<0.001). Curiously, despite the significant changes in the relative popularity of LAB vs. OTHER experiments, the fraction LAB and OTHER experiments published by ESA members has not changed much. We think this is a worrying observation. As OTHER experiments keep gaining popularity, the fact that these authors tend not to be ESA members means that the association's presence in general interest journals is at risk. This decline is already seen in Figure 3 for AER and the other Top 5 journals, for which the fraction of experiments published by ESA members has significantly decreased from the first to the second decade (p<0.036).

Do our findings paint a negative picture for experimental economics research? We cautiously like to think that they do not. Other types of experiments are thriving, including articles using lab-like environments such as lab-in-the-field and online experiments (see also Fréchette, Sarnoff, and Yariv, 2022). Moreover, while the heyday for standard lab experiments at AER appears to be in the past, this trend can reverse if new exciting questions emerge that are best suited for lab tests.

We do not suggest that the concerns shared by many in the field are ungrounded. There can be increasing unfriendliness towards experimental methods in areas not captured by analyzing trends in publications. For example, the hiring and promotion of experimental economists might be getting more difficult, or the reasons given for rejections in top journals might be changing.

Our study also shows that the face of experimental economics in the top economics journals is changing, while the composition of ESA's membership might not be. Therefore, if the ESA wishes to keep being a relevant player at the top of the economics profession, it may need to reach out to

researchers beyond those focusing on lab experiments. The ESA grew around standard lab experiments at a time when conducting any type of controlled experiment was difficult. It is not just tastes but technology which has made different modes of experimentation feasible today. Thus, we believe the ESA can evolve into a more inclusive association for researchers using all types of experiments. We end with an extract from the song "Experiment" by Cole Porter, kindly suggested by Nikos Nikiforakis:

"... You all have learned reliance / On the sacred teachings of science / So I hope, through life you never will decline / (In spite of philistine defiance) / To do what all good scientists do... / Experiment... / Be curious / Though interfering friends may frown / Get furious / At each attempt to hold you down."

Replication materials

The replication material for the study is available at https://doi.org/10.3886/E173861V1

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Table 1 – Descriptive statistics

Note: All variables related to the number of characteristics of authors are first calculated for each article and then averaged across articles. Citations are based on Google Scholar searches done in early 2021. Rankings of affiliations are based on the Journal Impact Factor found in the Tilburg University Worldwide Economics Schools Research Ranking.

	AER			Other Top 5			JEEA + EJ		
	2000 to 2007	2008 to 2014	2015 to 2021	2000 to 2007	2008 to 2014	2015 to 2021	2000 to 2007	2008 to 2014	2015 to 2021
Total number of published articles	724	767	796	1383	1178	1577	919	930	1083
Articles classified as LAB									
Percentage of published articles	6.49	7.95	2.14	2.24	3.06	2.22	4.13	5.70	7.76
3-year citations per article (mean)	60.21	83.64	145.63	77.55	54.78	90.17	26.24	38.09	38.67
3-year citations per article (median)	46.38	52.30	137.63	75.35	52.28	91.00	25.97	28.04	29.43
5-year citations per article (mean)	119.72	148.79	119.67	151.16	102.50	154.30	47.82	69.30	94.08
5-year citations per article (median)	90.77	98.70	119.67	152.71	96.22	150.30	45.24	46.58	80.75
Number of authors per article (mean)	2.32	2.80	2.82	2.42	2.61	2.57	2.53	2.72	2.71
Percentage of authors affiliated to top-30 departments	31.03	30.46	30.88	41.13	34.95	47.67	9.87	17.48	17.36
Percentage of authors affiliated to top-50 departments	43.79	41.67	41.67	54.84	45.37	54.81	26.54	30.94	25.10
Percentage affiliations from U.S. and Canada	49.79	43.93	36.96	47.63	35.09	39.52	21.27	26.85	19.40
Articles classified as OTHER									
Percentage of published articles	2.76	6.00	9.80	2.60	4.50	7.61	2.39	4.41	7.11
3-year citations per article (mean)	88.95	144.39	172.42	102.61	147.60	183.67	59.27	67.37	57.49
3-year citations per article (median)	77.05	119.33	127.45	87.50	147.09	166.84	60.41	58.20	52.39
5-year citations per article (mean)	173.60	255.93	348.95	187.58	277.55	243.58	106.82	124.73	84.15
5-year citations per article (median)	150.35	210.83	215.95	161.11	259.75	222.11	105.18	108.15	80.54
Number of authors per article (mean)	2.15	2.93	2.92	2.50	3.15	3.25	2.09	2.61	3.17
Percentage of authors affiliated to top-30 departments	47.50	57.72	62.46	73.15	59.55	58.87	33.79	36.79	29.25
Percentage of authors affiliated to top-50 departments	62.50	69.63	72.11	81.94	65.36	64.03	36.06	40.89	38.11
Percentage affiliations from U.S. and Canada	45.92	50.34	52.55	63.66	56.16	50.74	36.74	33.63	22.03

Appendix

In this appendix, we redo the article's main results separating the OTHER experiments category into two subcategories: field experiments and the remaining experiments (i.e., lab-in-the-field, online, and articles using a combination of methods). Field experiments account for 37.0% of all experimental publications, leaving the remaining experiments with 18.1%.

Figure A1 displays the yearly fraction of published articles using LAB, field, and the remaining experiments. The figure shows that the significantly increasing trend reported for OTHER experiments is present in both subcategories. Figure A2 depicts the average number of 3-year Google Scholar citations. On the whole, we see that LAB experiments tend to be less cited than field experiments or experiments in the remaining subcategory. An OLS regression with 3-year citations as the dependent variable and controls for author characteristics confirms that field experiments are significantly more cited than LAB experiments in AER and the Other Top 5 journals (p<0.003) and weakly significantly more in JEEA+EJ (p=0.062). Experiments in the remaining subcategory are significantly more cited than LAB experiments in JEEA+EJ (p=0.006). They are also more cited in AER and the Other Top 5 journals, but the difference is not statistically significant (p=0.127 and p=0.220). Lastly, Figure A3 shows the fraction of authors of published experiments who are ESA members. We find a larger fraction of ESA members among authors of LAB experiments than field experiments in all journals (p<0.001). The same is true for experiments in the remaining subcategory, but the difference is statistically significant only in AER and the Other Top 5 journals (p<0.001; for JEEA+EJ, p=0.111).

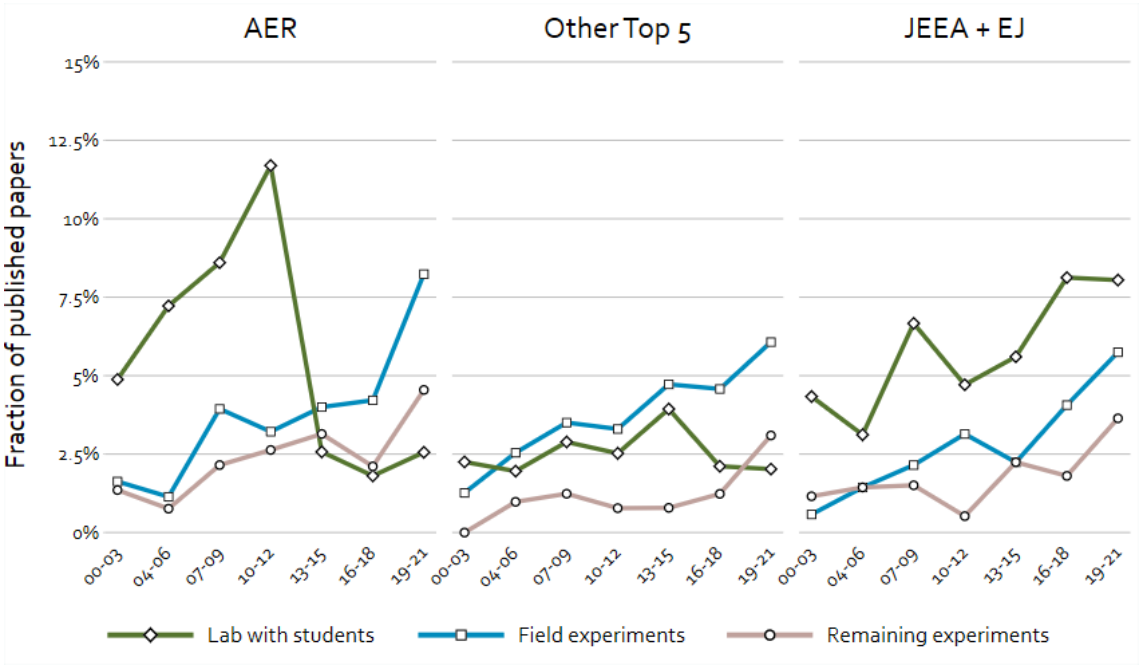

Figure A1 – Fraction published experimental articles per year

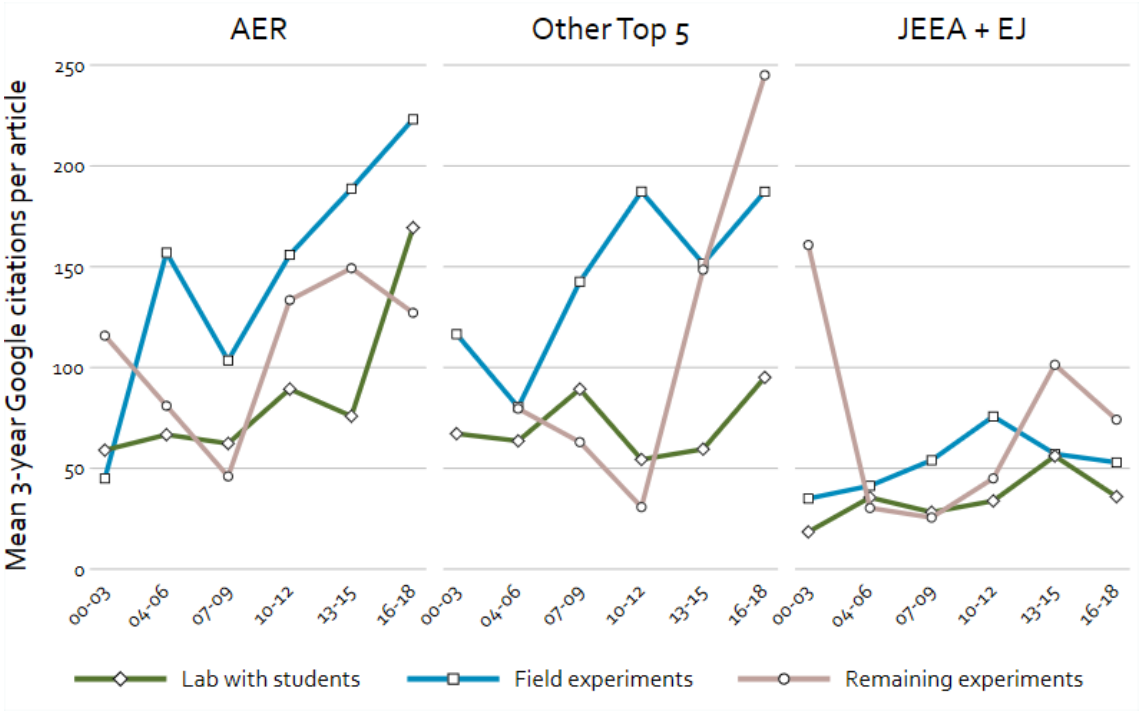

Figure A2 – Average 3-year citations per article

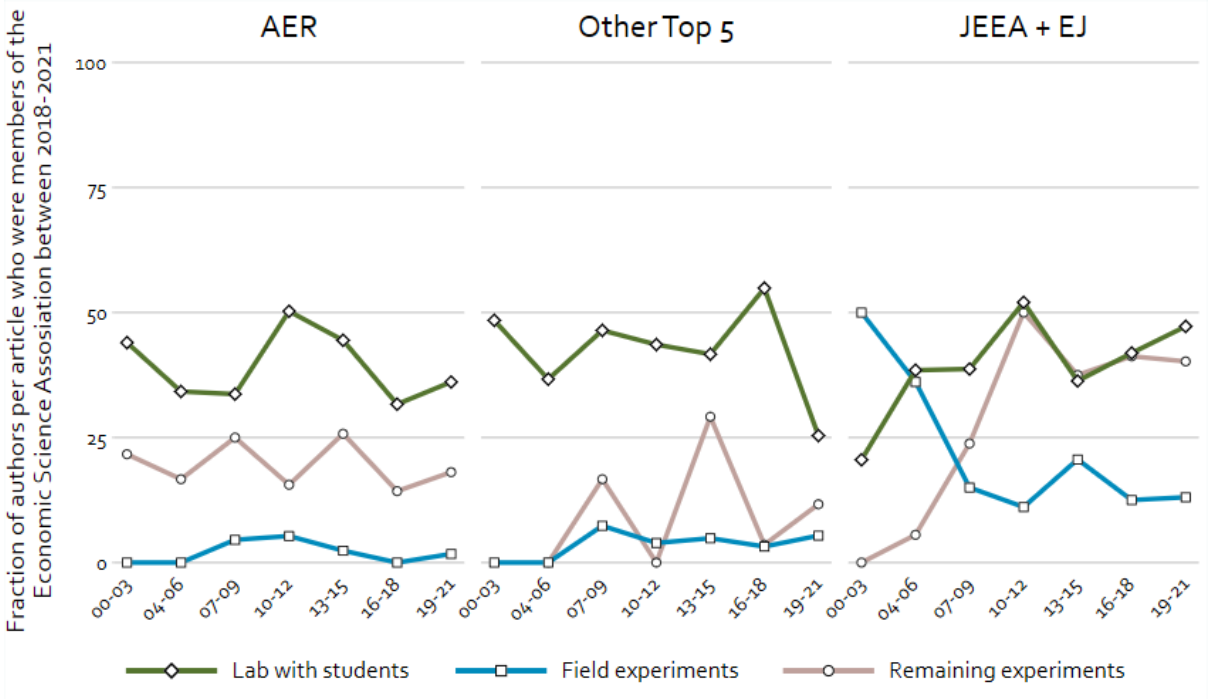

Figure A3 – Fraction of authors who were paying members of the ESA between 2018 and 2021 or had served in the ESA's Executive Committee