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Paying for open access ☆

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ABSTRACT

Open access (OA) publishing upends the traditional business model in scientific publishing by requiring authors instead of readers to pay for the publishing-related costs. In this paper, we aim to elicit the willingness to pay (WTP) of authors for open access publishing. We conduct two separate field studies with different methodological approaches in different scientific disciplines (economics and medicine). First, a choice-based conjoint (CBC) analysis measures stated preferences of 243 economists in Germany, Austria, and Switzerland regarding their valuations of open access publishing in the "Top 5" economics journals. Second, a field experiment at four different open access medical journals elicits authors' self-determined ("Pay-What-You-Want") payments for open access publications. The results provide a plausible range of authors' valuations, given that the first study rather provides an upper bound and the second study a lower bound of authors' willingness to pay for open access publishing.

1. Introduction

The traditional model of scientific publishing that is based on charging readers subscription or usage fees for access to scientific content has been intensively criticized for many years (e.g., Malakoff, 2003). Key concerns are that scientists provide content for free but have to pay to read it, and that publishers monopolize the access to the results of taxpayer-funded research and turn it into private profits (e.g., Buranyi, 2017). As a result, the alternative model of open access (OA) publishing has gained momentum. The central idea of open access publishing is that every interested reader can access content without any restrictions (Laakso et al., 2011). However, not charging for access requires other forms of financing the services that publishers provide (e.g., layout, distribution). The key solution in most open access publishing models is that authors pay for these services via so-called article processing charges (APCs).

In this paper, we aim to elicit the willingness to pay (WTP) of authors for open access publishing. Authors want their papers to be read, discussed, and cited, so they want to facilitate access to them as much as possible. But how much are they willing to pay for it? This question is of great interest both from a business perspective and from a social welfare point of view. Publishers have to reinvent their business models and ask themselves whether they can cover their costs by charging authors rather than readers. The more authors are willing to pay for open access publishing, the more they can be

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charged for it. From a society's perspective, authors' willingness to pay enters social welfare both directly and indirectly as an indication of how much authors believe open access will increase the reception of their research. Thus, the higher the authors' willingness to pay, the more governments should push for a transition to open access and the more they should be willing to financially support this transition.

In Section 2, we provide background on open access publishing, related business models, and institutional arrangements. In Section 3, we report the results of a choice-based conjoint (CBC) analysis measuring stated preferences of 243 economists in Germany, Austria, and Switzerland regarding their valuations of open access publishing in the "Top 5" economics journals. The restriction to these "Top 5" journals has several advantages. First, all of them are general interest journals that are most highly regarded in all subfields of economics, so they are of similar importance to all economists. Second, the perceived quality differences between them are sufficiently small, so that quality does not dominate the willingness to pay for open access. Finally, all of these journals can be subscribed to or accessed via libraries at similar costs. For these reasons, they are ideally suited for a CBC analysis. However, we must keep in mind that these are top journals, so willingness to pay for open access is probably higher than for journals of lower rank. Moreover, the CBC study involved hypothetical choices. Thus, our results should be interpreted as an upper bound on the willingness to pay. We show how willingness to pay is correlated with participants' demographic characteristics and their perceptions of open access publishing, which provides some insights into the factors that determine the valuation of open access. In addition, our study also provides information about willingness to pay for the different journals, that is, how much more authors are willing to pay for their paper being published in journal A rather than in journal B.

One drawback of any CBC analysis is that it elicits hypothetical responses. In Section 4, we report on another study that uses field data on actual payments made by authors at four open access medical journals. These journals use a "Pay-What-You-Want" (PWYW) pricing strategy, that is, authors can voluntarily decide how much they want to contribute to the publishing costs of their open access publication. PWYW is a pricing strategy that delegates the pricing decision to the customer. The customer does not have to pay anything, but many customers make positive payments and are often willing to pay substantial amounts (Krämer et al., 2017; Schmidt et al., 2015). Therefore, the payments we observe here should be regarded as a lower limit of willingness to pay, as they only cover what authors are voluntarily willing to contribute to open access publishing. Furthermore, the medical journals using this strategy are more specialized than the "Top 5" economics journals included in the CBC analysis. Nevertheless, the results of this field study are consistent with the results of the CBC analysis, and both studies together provide a plausible upper and lower bound of authors' willingness to pay for open access. In the final section (Section 5), we discuss our findings and provide implications for policy makers.

2. Background on open access publishing

Publishers typically implement open access policies either as "pure" open access in journals that make all articles available to readers without restrictions and free of charge, or as "hybrid" open access in journals in which only the articles of authors who paid the publication fee are open, but all other articles are not, so libraries (and readers) still have to pay for access to these journals. The latter has raised criticism of "double dipping", that is, that publishers charge twice for access to an article via subscription fees and the APCs of the authors who want to "release" their paper for open access.

Some large research funding institutions and groups of universities have attempted to find institutional open access agreements with scientific publishers. The European Commission has made the transition to open access a priority, and many institutional funders are targeting at 100% open access in a few years.[1] One prominent example is "Projekt DEAL", an alliance of German universities and science organizations, which recently reached an agreement with Springer Nature, a large science publisher.[2] According to this agreement, scientists represented by Projekt DEAL can publish open access in Springer Nature's pure and hybrid open access journals, and access all non-open access articles. For this purpose, Projekt DEAL pays APCs for publications of eligible authors in Springer Nature's open access journals according to the publisher's APC price list, and pays for publication in hybrid journals "Publish and Read (PAR)" fees based on a reference budget and a reference number of articles.[3] The University of California announced a similar agreement, which is the largest open access agreement in North America to date, signaling increasing global momentum and support for the open access movement.[4]

A key question in any open access business model, and in institutional agreements such as Projekt DEAL, is how much to charge (from a publisher's perspective), or how much to pay (from an author's or scientific institution's perspective), for an open access publication. A better understanding of authors' willingness to pay for open access publishing can help publishers in calculating APCs, and it can support scientific institutions in their negotiations with publishers so that the scientific institutions do not have to rely on publishers' calculations ("list prices").

Given the importance of this question for authors, publishers, and funding institutions, it is surprising that prior research on open access publishing and related models have largely neglected the aspect of authors' willingness to pay for open access.[5] Research on open access publishing has shown that there is enough "money in the system" to fund a switch to an

[1] https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science/open-access_en.
[2] https://www.projekt-deal.de/springer-nature-contract/.
[3] The details of the agreement can be found at https://doi.org/10.17617/2.3174351.
[4] https://www.universityofcalifornia.edu/press-room/uc-reaches-groundbreaking-open-access-deal-leading-global-publisher.
[5] See also the discussion in this scientific blog entry: https://blog.scielo.org/en/2013/09/18/how-much-does-it-cost-to-publish-in-open-access.

open access system similar to the goals of Projekt DEAL (e.g., Schimmer et al., 2015). In addition, the high concentration and lack of competition has been a concern regarding the successful change to an open access regime (e.g., Björk, 2017).

3. Conjoint study

Conjoint analysis is a survey-based method used in marketing and economics to estimate consumer preferences. It is one of the most popular market research methods for assessing how consumers with heterogeneous preferences trade off the various benefits they derive from product attributes and the disutility of the price they have to pay (e.g., Wittink and Cattin, 1989). Conjoint analysis has been used primarily in consumer or business-to-business environments where respondents must make trade-offs related to their own or a company's budget. Considering that researchers typically have to make trade-offs related to their research budget (e.g., travel, paying subjects, or open-access fees), we believe that conjoint analysis is well suited to address our research question.

To better understand preferences and willingness to pay for open access publishing, we conducted a choice-based conjoint study (also termed discrete choice experiment). This method of preference measurement is particularly well suited for our setting. First, CBC requires respondents to make choices and therefore provides a high degree of realism, as also consumers in a marketplace usually have to make trade-off decisions and choose among alternatives. Second, the hypothetical nature of the choices made in the CBC allows us to measure preferences both for actual journals, with their actual open access policies and publication fees, and for hypothetical combinations of journals, open access policies, and publication fees.

3.1. Method

In CBC analysis, consumers' preferences for product attributes are elicited by offering them the choice from a selection of product alternatives (represented by combinations of well-defined product attributes). Respondents are asked to choose their most preferred option from a set of product alternatives or, if available, to select the "no-choice option" to signal that none of the alternatives is acceptable to them. This procedure is repeated for multiple sequential choice sets, each set containing alternatives that are systematically varied according to an experimental design. The elicited information allows estimating the respondents' utility functions and provides insights into their preferences for product attributes and their willingness to pay. The aim is to uncover how much consumers like or value (i.e., derive a utility from) specific products, which then leads to a choice. Conjoint analysis assumes that products are bundles of attributes. The method seeks to uncover the utilities that each attribute (and attribute level) adds to the overall utility of a product by systematically varying specific levels of the attribute.

Conjoint analysis is a decompositional method, that is, it elicits the total utility respondents obtain from the experimentally varied product concepts and then decomposes the total utility into the utility of the products' attributes including the price (so-called "part-worth utilities" or just "part-worths") using statistical methods. Prior research on conjoint analysis and preference measurement is usually based on the assumption of a linear-additive utility model (Cui and Curry, 2005). For the purpose of our study, we also assume that the utility function is additively separable in the journal, the open access policy, and the publication fee. This assumption appears well justified in the current context because the journals under consideration are similar in terms of readership, prestige, and citations, so there is no obvious reason why the effect of open access policy and publication fee should differ across journals.

The basis for the utility model in CBC is random utility theory (RUT). RUT proposes that the overall utility u of consumer c for a product i is a latent construct that includes a systematic component v and an error component ε, i.e., $u_{c,i} = v_{c,i} + \varepsilon_{c,i}$ (McFadden, 1981). The theory's underlying assumption is that a consumer chooses the most preferred product from the set of alternatives, which is the product that offers the highest net utility (Louviere and Woodworth, 1983).

Choice models can be differentiated according to the assumptions about the stochastic error component (see Train, 2012 for an overview). Assuming the error to be independent and identically distributed as Type I extreme value (i.e., Gumbel), consumers' choice behavior can be described by a multinomial logit (MNL) model. The MNL model thus translates utilities into multinomial choice probabilities. For a detailed overview of the economic foundations of conjoint analysis, see Allenby et al. (2019) or Eggers et al. (2019).

Based on a random-utility model, we assume that the probability that respondent c chooses alternative i in choice set s is as follows:

$$Pr_{c,i,s} = \frac{exp(u_{c,i})}{exp(u_{c,NC}) + \sum_{i' \in I_s} \exp\left(u_{c,i'}\right)} = \frac{exp\left(\sum_{j \in J} \sum_{m \in M_j} \beta_{c,j,m} \times x_{i,j,m} - \beta_{c,price} \times p_i\right)}{exp(\beta_{c,NC}) + \sum_{i' \in I_s} exp\left(\sum_{j \in J} \sum_{m \in M_j} \beta_{c,j,m} \times x_{i',j,m} - \beta_{c,price} \times p_{i'}\right)} \quad (1)$$

$$\forall\ c \in C,\ \ i \in I,\ \ s \in S,$$

Table 1
Attributes and attribute levels in conjoint study.

Attribute	Levels	Number of attribute levels
Journal	American Economic Review, Quarterly Journal of Economics, Econometrica, Journal of Political Economy, Review of Economic Studies	5
Open Access Policy	Pure Open Access, Hybrid Open Access, No Open Access	3
Publication Fee	$0, $500, $1,000, $1,500, $2,000, $2,500, $3,000, $3,500, $4,000	9

and the probability that consumer c chooses the no-choice option is

$$Pr_{c,NC,s} = \frac{exp(\beta_{c,NC})}{exp(\beta_{c,NC}) + \sum_{i' \in I_s} exp\left(\sum_{j \in J} \sum_{m \in M_j} \beta_{c,j,m} \times x_{i',j,m} - \beta_{c,price} \times p_{i'}\right)} \quad (2)$$

$$\forall\ c \in C,\ \ i \in I,\ \ s \in S.$$

The variable and parameter definitions are the following:

$Pr_{c,i,s}$	probability that consumer c chooses alternative i in choice set s
$Pr_{c,NC,s}$	probability that consumer c chooses the no-choice option NC in choice set s
$u_{c,i}$	utility of alternative i for consumer c
$u_{c,NC}$	utility of no-choice option NC for consumer c
$\beta_{c,j,m}$	parameter (part-worth) of the level m of attribute j for consumer c (assuming part-worth model)
$x_{i,j,m}$	dummy variable indicating whether product i features level m of attribute j
$\beta_{c,price}$	price (*publication fee*) parameter for consumer c (assuming vector model)
p_i	price (*publication fee*) of alternative i
$\beta_{c,NC}$	parameter (utility) for the no-choice option NC for consumer c
S	index set of choice sets
C	index set of consumers
I	index set of alternatives
I_s	index set of alternatives in choice set s (not including the no-choice option NC)
J	index set of attributes without price (*publication fee*)
M_j	index set of levels for attribute j

To estimate economists' preferences for open access publishing, we designed a (conjoint) survey. The survey consisted of two parts. In the conjoint portion of the survey, we first introduced respondents to the attributes and attribute levels included in the choice tasks. We considered the three attributes with the following associated levels depicted in Table 1.

We explained to respondents that they would see a series of choice tasks, each featuring three different alternatives to publish their paper and an option not to choose any of the alternatives (in which case their paper would not be published in any of the journals appearing in the task—"no choice" option). Alternatives and choice tasks were created according to a computer-generated randomized design using Sawtooth Software's balanced overlap method (Lighthouse Studio 9.8.1). Each respondent was exposed to fourteen choice tasks (twelve random tasks and two fixed tasks). A sample choice task is shown in Fig. 1. Respondents were also asked to assume that their paper would be accepted by any of the suggested journals with certainty, if they chose this journal. We also explained to them that each choice was independent of all other choices.

In the second part of the survey, we asked respondents about the maximum fee that they were willing to pay to release their paper as an open access (vs. no open access) publication in each of the journals, their publishing behavior, their attitudes and opinions related to open access publishing, and their demographics. These control variables allow us to examine whether and how willingness to pay is related to age, sex, tenure, and attitudes and opinions towards open access publishing.

3.2. Results and discussion

To recruit respondents, we sent an invitation to participate in our survey by e-mail to 1685 economists at universities in Austria, Germany, and Switzerland in November 2019. We received 246 completed questionnaires. It is a common and well-accepted practice to remove respondents who "straight-line" or always select the same option (such as the rightmost choice) (Allenby et al., 2014). The idea is that these "straight-liners" are not putting sufficient effort into the choice task (Allenby et al., 2014). Of the 246 complete questionnaires, only three respondents displayed straight-line behavior and were eliminated. The remaining 243 respondents were considered for inclusion in the analysis.

Our sample is largely male (79.4%), with a median age of 42 years. The majority of the respondents are professors (50.6%), followed by postdoctoral researchers (19.3%), and assistant professors (16%). The vast majority (90.9%) of them is employed at public universities.

To analyze the conjoint data, we used the hierarchical Bayes model (HB) from Sawtooth Software. This enables us to estimate part-worth utilities at the individual level. Bayesian hierarchical models are now by far the dominant method for use in analysis of choice-based conjoint data (e.g., Allenby et al., 2014). The reason for the widespread use of Bayesian methods

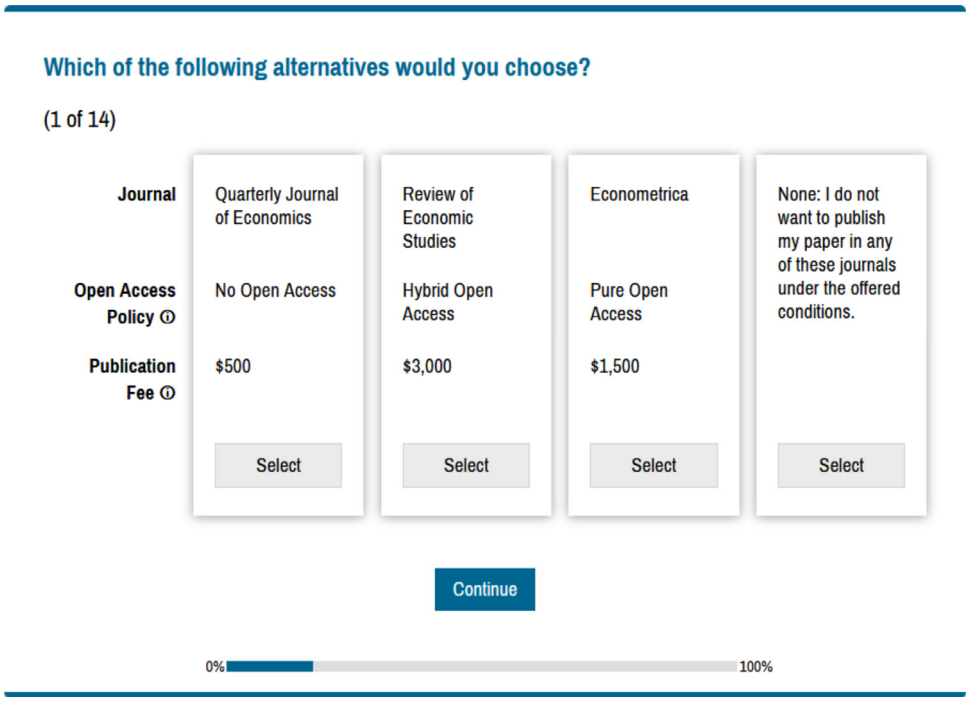

Fig. 1. Sample choice task.

is the ability to conduct inference at both the individual respondent level as well as on the aggregate level (Allenby et al., 2014).

The idea of the HB model is that the aggregate sample of respondents is used to determine the distribution of part-worth utilities. The distribution then serves as a basis to draw conditional estimates for each individual respondent given the respondent's choice data (Eggers et al., 2019). Thus, the HB model consists of two hierarchically connected levels. The lower level describes the probabilities of choosing a particular alternative given the respondent's part-worth utilities (i.e., the MNL model). The higher level relates the respondents' part-worth utilities to all other respondents by assuming a multivariate normal distribution of the utilities, characterized by a vector of means and a matrix of covariances. Using an iterative process (e.g., Metropolis-Hastings algorithm), the model parameters can then be estimated (Chen et al., 2000).

Twelve of the fourteen choice tasks that we included in our survey were randomly generated and used for part-worth estimation. We used the two fixed tasks for reliability[6] and validity[7] testing. We specified a part-worth (dummy) coding for the attributes *journal* and *open access policy*, whereas we coded *publication fee* as a linear[8] term. Additionally, we imposed a sign restriction on the *publication fee* coefficient to only negative values (Daly et al., 2012). We used a total of 100,000 Markov Chain Monte Carlo (MCMC) iterations, with 20,000 iterations for burn-in purposes and 80,000 iterations after convergence. The estimated part-worth utilities (averages) are provided in Table 2.

To characterize the relative importance of each attribute, we consider attribute importances.[9] The attribute importance $w_{c,j}$ of consumer c for attribute j (from the set of attributes: *journal*, *open access policy*, *publication fee*) can be calculated based on the relative range of the part-worth utilities, that is, the difference between the most and the least preferred attribute level, relative to the sum of the ranges across all attributes:

$$w_{c,j} = \frac{max\left(\beta_{c,j}\right) - min\left(\beta_{c,j}\right)}{\sum_{j \in J}\left(max\left(\beta_{c,j}\right) - min\left(\beta_{c,j}\right)\right)} \tag{3}$$

The average importance of the attributes (calculated on the respondent level and then averaged) is reported in Table 3.

[6] 91.36% of the participants answered consistently (i.e., they chose the same alternative in the two fixed tasks).

[7] First choice hit rates were 86.42% and 86.01%.

[8] We assumed the (negative) effect of the publication fee on utility to be linear, i.e., a vector utility function (Orme 2007, p. 2). The use of a part-worth utility function allows to account for nonlinearities in publication fee. However, we chose to use a linear publication fee function because using a part-worth utility function comes at the cost of increased parameters to estimate. Moreover, using a linear publication fee parameter simplifies the calculation of respondents' WTP.

[9] For a detailed discussion of attribute importance, see Eggers et al. (2019).

Table 2
Average part-worth utilities.

		Average utilities[a]	SD[b]
Journal	American Economic Review	15.59	24.83
	Quarterly Journal of Economics	1.85	26.71
	Econometrica	13.51	29.22
	Journal of Political Economy	−6.83	17.07
	Review of Economic Studies	−24.13	31.05
Open Access Policy	Pure Open Access	28.00	26.41
	Hybrid Open Access	0.21	8.41
	No Open Access	−28.21	27.17
Publication Fee[c]		−45.18	18.90
None		−104.64	190.61

Note: $N = 243$.
[a] Average of the part-worth utilities estimated on the individual level for each respondent.
[b] Standard deviation reflects heterogeneity among respondents.
[c] Publication Fee coefficient expressed in $1000s.

Table 3
Average importances of attributes.

	Average importance	SD
Journal	19.03%	20.17
Open Access Policy	20.73%	15.36
Publication Fee	60.24%	25.20

$N = 243$.

Result 1: *Journal* and *open access policy* are about equally important in affecting the choices of respondents. *Publication fee* has the greatest influence on respondents' choices (∼60%) and is about three times as important as each of the other two attributes (∼20% each).

In this paper, we are particularly interested in respondents' preferences for the *open access policy* attribute. The part-worth utilities in Table 2 reveal that, on average, pure open access is preferred to hybrid open access (28.00 vs. 0.21), and hybrid open access is preferred to no open access (0.21 vs. −28.21).

Fig. 2 illustrates the distribution of the individual-level part-worth utilities from the HB estimation. The figure reveals considerable heterogeneity in the preferences of the respondents for the different attributes and attribute levels. This heterogeneity across respondents is particularly evident in the attribute levels *Quarterly Journal of Economics*, *Econometrica*, and *Review of Economic Studies*, as well as in the two extreme levels of *open access policy*, pure open access and no open access (see also the standard deviations reported in Table 2).

Table 2 further reveals that the respondents in our sample, on average, prefer a publication in the *American Economic Review* over a publication in *Econometrica*, a publication in *Econometrica* over a publication in the *Quarterly Journal of Economics*, a publication in the *Quarterly Journal of Economics* over a publication in the *Journal of Political Economy*, and a publication in the *Journal of Political Economy* over a publication in the *Review of Economic Studies*.

Specifically, however, we are interested in whether and how much respondents in our sample are willing to pay for open access. From the conjoint data, we can compute a willingness-to-pay measure. We do this by expressing part-worths in monetary terms by dividing by the price coefficient. We first consider the change from no open access to pure open access. Therefore, we compute the difference between respondents' individual-level part-worths for "pure open access" and "no open access" and divide it by their *publication fee* coefficient. Summary statistics of this simple monetization of the difference in utility to a dollar measure are provided in Table 4.

In our sample, the median WTP (Sonnier et al., 2007) for having a paper published in a pure open access journal rather than a no open access journal is $1,037.8.[10] Fig. 3 shows a histogram of the monetized differences in part-worths.

Result 2: On average, respondents prefer pure open access to hybrid open access, and prefer hybrid open access to no open access. The median WTP (monetized difference in part-worths) for having a paper published in a pure open access journal rather than a no open access journal is about $1,000.

In the second part of our survey, we also asked respondents directly about their WTP for having their paper published as a "pure open access" publication (rather than a "no open access" publication) in the "Top 5" economics journals. The stated[11] WTP for the different journals range close together, which supports the assumption of additively separable utilities for *journal* and *open access policy*. If anything, the stated WTP for an open access publication in the *Review of Economic*

[10] We can likewise calculate a WTP measure for the feature-change from no open access to hybrid open access. The corresponding median WTP for having a paper published in a hybrid open access journal rather than a no open access journal is $524.2.

[11] Stated WTP may be different when payment is hypothetical (vs. real). In addition, different value elicitation methods may lead to undervaluation/overvaluation bias of WTP estimates (Miller et al., 2011; Voelckner, 2006).

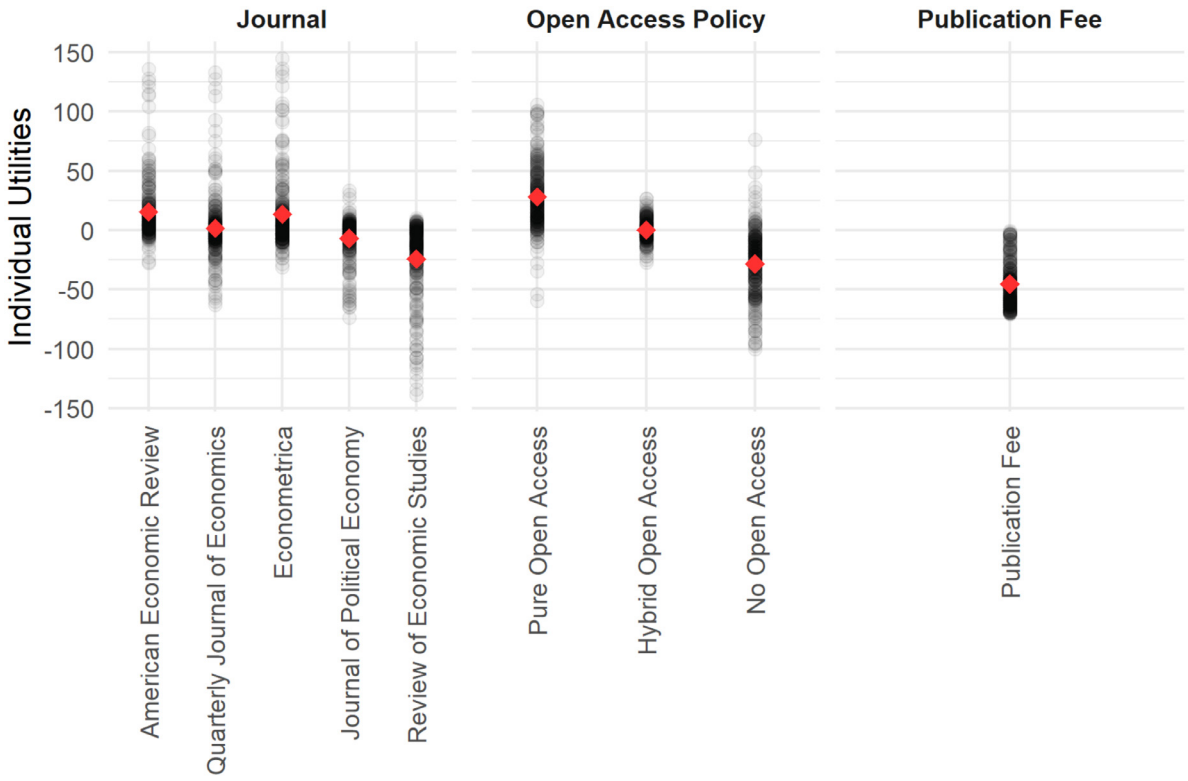

Fig. 2. Distribution of Individual-Level Part-Worths from HB Estimation. *Note*: Each point corresponds to the estimated utility (normalized) of a respondent ($N = 243$). Red diamonds represent means (see Table 2). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

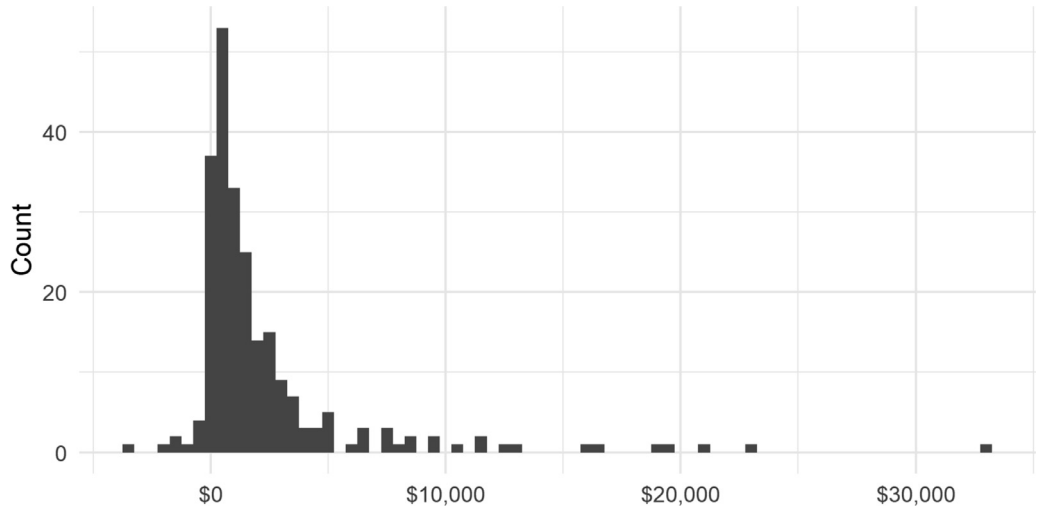

Fig. 3. Histogram of Monetized Differences in Part-Worths (Pure Open Access – No Open Access). *Note*: Only observations above the 1st percentile and below the 99th percentile included ($N = 237$).

Table 4
Monetized difference in part-worths (Pure Open Access – No Open Access).

N	Mean ($)	SD ($)	Median ($)	Min ($)	Max ($)
243	2173.5	11,806.1	1037.8	−15,1181.1	54,122.6

Table 5
Stated willingness-to-pay for open access publication and Social Sciences Citation Index (SSCI) Journal Impact Factor (JIF) for "Top 5" Economics Journals.

Journal	N	Mean ($)	SD ($)	Median ($)	Min ($)	Max ($)	SSCI JIF*
American Economic Review	243	1547.1	2171.3	1000	0	25,000	5.561
Econometrica	243	1526.6	2155.8	1000	0	25,000	3.992
Journal of Political Economy	243	1430.5	2077.0	1000	0	25,000	5.504
Quarterly Journal of Economics	243	1531.9	2389.7	1000	0	30,000	11.375
Review of Economic Studies	243	1323.9	1819.4	800	0	20,000	4.890

* 2019 Journal Impact Factors. Retrieved from https://jcr.clarivate.com on October 12, 2020.

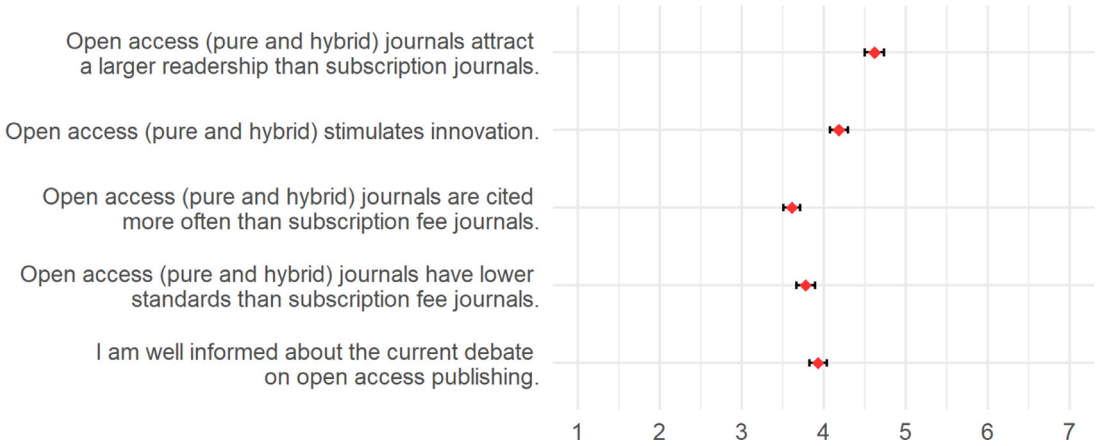

Fig. 4. Attitudes and Opinions Related to Open Access Publishing. *Note*: Red diamonds represent means. Error bars represent +/− 1 standard error. $N = 243$. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Studies is somewhat lower than for the other journals. We also find no significant relationship between the stated WTP and other journal indicators such as the Social Sciences Citation Index (SSCI) Journal Impact Factor (JIF). Interestingly, although the *Quarterly Journal of Economics* has an impact factor that is almost three times higher than that of *Econometrica*, the median WTP for having a paper published as pure open access (vs. no open access) are almost identical for both journals. Table 5 summarizes the responses.

In the survey, we also asked respondents about their general attitudes and opinions related to open access publishing. Specifically, we asked about their agreement with statements on advantages and disadvantages associated with open access publishing, and how well informed they felt about the current debate on open access publishing. Note that these statements refer to open access in general and to the status quo, i.e., to journals that are already open access today (which tend to be younger and less well established). We recorded responses on a 7-point Likert-type scale, ranging from 1 = "strongly disagree" to 7 = "strongly agree". Fig. 4 shows the results.

We are interested in better understanding our respondents' motivation to pay for open access. For example, if respondents want their work to be cited more often or read more, they should be willing to pay more if they believe that open access has a strong impact on citations and readership. To examine this question, we estimated simple linear models to explain the monetized differences in part-worths between *pure open access* and *no open access* by our respondents' attitudes and opinions regarding open access publishing and their demographics. The results are presented in Table 6. Note that we only include observations above the 1st percentile and below the 99th percentile of the dependent variable.

The regression results show that older respondents are less willing to pay for open access. Similarly, female respondents seem to be less willing to pay for open access.[12] There is also a tendency of respondents holding a professorship (*professor*) to be more willing to pay higher amounts for open access. More generally, the regressions indicate that a higher career level (position) tends to be associated with a higher willingness to pay for open access. This could be explained by the fact that full professors generally have larger research budgets than associate and assistant professors. However, *postdoctoral researchers* are an exception to this trend, suggesting that open access is particularly important to this group of researchers, despite presumably smaller research funds. An alternative explanation for why *postdoctoral researchers* are willing to pay more for open access than *assistant professors* is that they tend to be more often employed by collaborative research centers

[12] Note that the number of women among our respondents is rather small (N=42 in these regressions). Female respondents are statistically no less likely to be professors than male respondents in our sample. Female respondents are slightly younger (M=42.34, SD=8.99) than male respondents (M=44.49, SD=9.82), but the differences are small. Similarly, we find no relevant differences in terms of their attitudes and opinions toward open access publishing. An analysis of how the other explanatory variables are moderated by the female dummy can be found in the Appendix.

Table 6
Linear regressions.

	Dependent variable Monetized differences in part-worths (Pure Open Access – No Open Access)					
	(1)	(2)	(3)	(4)	(5)	(6)
Larger Readership	395.80***					78.64
	(126.76)					(160.98)
More Citations		586.43***				458.38**
		(175.50)				(213.31)
Stimulates Innovation			322.15***			37.45
			(124.55)			(178.71)
Lower Standards				−315.56*		−132.37
				(176.02)		(192.65)
Well Informed					224.73*	142.85
					(123.34)	(125.34)
Age	−71.31**	−65.90**	−67.53**	−61.76**	−72.84**	−58.73**
	(30.56)	(30.92)	(30.52)	(27.67)	(30.21)	(28.36)
Female (Dummy)	−1622.58***	−1624.90***	−1642.78***	−1776.70***	−1674.45***	−1632.70***
	(425.84)	(426.84)	(435.90)	(443.20)	(437.71)	(439.12)
Position						
Professor	3627.39***	3047.96***	3847.05***	2803.35***	2972.55***	2570.19***
	(732.05)	(878.71)	(738.46)	(680.93)	(673.41)	(909.23)
Associate Professor / Senior Lecturer	2460.60***	1573.53**	2545.41***	1526.53**	1748.93***	1180.73
	(550.30)	(762.30)	(585.28)	(614.04)	(589.33)	(852.04)
Assistant Professor / Lecturer	1949.72***	1659.01**	2331.13***	1326.92*	1630.45***	1356.71
	(560.80)	(754.46)	(612.33)	(746.55)	(614.54)	(962.87)
Postdoctoral Researcher	2868.30***	2364.38**	3174.69***	2310.61**	2457.53**	1986.70**
	(947.54)	(1051.58)	(960.13)	(940.39)	(972.39)	(1004.10)
Adjunct Professor / Research Fellow / Researcher	1,878.31**	644.79	1,575.72***	399.01	905.24	244.28
	(801.87)	(831.01)	(600.41)	(745.23)	(596.42)	(1,058.86)
Constant	899.96	930.13	974.95	4280.44***	2483.20**	906.63
	(1131.47)	(1346.76)	(1257.27)	(1557.78)	(1053.06)	(2028.60)
Observations	237	237	237	237	237	237
R^2	0.08	0.10	0.07	0.07	0.06	0.11
Adjusted R^2	0.05	0.07	0.04	0.04	0.03	0.06
F Statistic	2.56**	3.21***	2.17**	2.13**	1.83*	2.30***
	(df = 8; 228)	(df = 8; 228)	(df = 8; 228)	(df = 8; 228)	(df = 8; 228)	(df = 12; 224)

Note: Only observations above the 1st percentile and below the 99th percentile of the dependent variable included.
Robust standard errors in parentheses. Position reference category: "Unemployed/Left Science".
*$p<0.1$; ** $p<0.05$; *** $p<0.01$.

or other temporary funding lines of national research agencies, which have larger funds available for publication fees than assistant professors, who are typically employed by universities and have smaller budgets.

In terms of attitudes and opinions related to open access publishing, we find that respondents who indicate that they feel *well informed* about the current debate on open access publishing show a higher willingness to pay for open access. More importantly, we find that respondents who tend to agree more with statements such as open access journals "attract a larger readership" or "are cited more often" are also more willing to pay more for open access. While *larger readership* and *more citations* can be regarded as rather self-interested advantages of open access publishing, agreement with the statement that open access *stimulates innovation* is rather a prosocial motive to pay for open access. Our results thus indicate that respondents are willing to pay for open access publications for both selfish and prosocial reasons. The tendency that respondents who agree with the statement that open access journals have *lower standards* are also less willing to pay for open access is consistent with the other findings. However, when we include all variables related to attitudes and opinions about open access publishing in a single model (6), all coefficients have the expected signs, but only *more citations* shows significance. This suggests that more expected citations for open access journals (vs. subscription journals) is the dominant attitudinal variable.

Result 3: The WTP for open access (vs. no open access; monetized difference in part-worths) correlates significantly with respondents' attitudes and opinions (including prosocial reasons) regarding open access publishing and their demographics. We find no relationship between respondents' stated WTP for having a paper published as pure open access (vs. no open access) and the Social Sciences Citation Index Journal Impact Factor for the "Top 5" economics journals.

4. Field experiment

To get additional insights into the willingness to pay for open access from a different perspective, we conducted a field experiment with an international medical and science publisher. The publisher offers a Pay-What-You-Want (PWYW) pricing model at four of its pure open access journals. PWYW is a pricing model where the seller delegates the pricing power

Table 7
Summary statistics of *payment*.

Reference price	N	Mean ($)	Median ($)	SD ($)	Paid nothing	
					N	%
$1600	58	806.78	600	593.05	2	3.4
$1900	54	915.37	950	682.14	1	1.9
$2100	52	786.92	500	698.87	4	7.7
$2400	51	811.04	500	840.60	5	9.8
Total	215	830.26	600	702.09	12	5.6

completely to the buyers (Gneezy et al., 2010; Kim et al., 2009). So far, PWYW has mainly been applied in service industries (e.g., restaurants, theaters) and for the sale of digital products like software (e.g., humblebundle.com) (Krämer et al., 2017).

More recently, several publishers of open access journals like Cogent OA (belonging to the Taylor & Francis Group), edp Sciences, and Thieme Publishers have started to experiment with the PWYW model for article processing charges (APCs) of open access journals. Spann et al. (2017) provide a first scientific investigation of PWYW as a pricing model for open access publishing.

4.1. Method

Neoclassical economic theory predicts that buyers (i.e., authors in open access publishing) pay nothing if they are not required to do so. However, in the case of open access publishing, authors may be willing to pay positive APCs voluntarily for reasons of fairness and reciprocity. For example, authors may be motivated to compensate for the publisher's production costs or to reciprocate the publisher's generosity. In addition, authors may pay voluntarily for open access if they believe that the journal will not be sustainable if production costs are not covered. Furthermore, authors may use their payment to signal to others (and potentially to themselves) the value they attach to their publication.

We use PWYW as a signal of WTP. Prior research has shown that people's PWYW payments are higher when their valuations are higher (Schmidt et al., 2015). Based on this positive correlation, actual PWYW payments can serve as a proxy for the lower bound of actual WTP.

An important design aspect of PWYW pricing is the provision of reference prices. Prior research has shown that reference prices can have a significant impact on buyers' payment behavior and PWYW profitability (e.g., Schröder et al., 2015). Collaborating with the publisher, we were able to examine experimentally the effects of different reference prices of APCs in the context of PWYW pricing for open access publishing. Specifically, we examined the effects of four different reference price levels ($1,600 vs. $1,900 vs. $2100 vs. $2400) on authors' PWYW payments.

This field experiment enables us to investigate the actual behavior of researchers in the context of paying for open access publishing. Thus, the experiment augments our findings from the conjoint study (stated preferences) with revealed preference data obtained by observing individual choices in a real market. In addition, we can derive interesting insights from the results regarding the question of what motivates researchers to pay (voluntarily) for open access. Finally, the experiment allows us to study the effects of reference prices on PWYW payments in a novel domain.

Together with the publisher, we implemented the following procedure at each of the four peer-reviewed journals. After the acceptance decision of their article, authors were contacted by the publisher and asked to specify the amount of APCs they wanted to pay for their publication via PWYW.[13] Authors were randomly assigned to one of four possible forms on which they had to state their individual open access publication fee. Besides the instructions on how to fill in the form, this letter also mentioned the amount of a regular publication fee (i.e., the reference point). Depending on the experimental condition, the letter stated that a regular publication fee was $1600, $1900, $2100, or $2400. It was also possible for the authors to pay no APCs at all and set a publication fee of $0.

4.2. Results and discussion

From the introduction of the PWYW pricing model in 2017 until the end of 2019, we observed a total of 215 accepted articles and thus decisions on PWYW payments. Our key dependent variable is the absolute amount of the PWYW *payment*. Table 7 provides summary statistics of the data, stratified by reference price.

Two findings are immediately apparent from Table 7. First, authors make substantial voluntary PWYW payments for open access publications without being forced to do so and regardless of the level of the communicated reference price. Second, the variation in payments is high. To examine the variance more closely, we visualize the distribution of *payment* in Fig. 5.

Looking at Fig. 5, we notice that payments vary between $0 and the respective reference price, but mean payments range close together. We observe very few zero payments (see also Table 7). These values fall in a similar range to the results of

[13] Note that authors were approached by the publisher, not by the editor, who was not involved in the payment process. Thus, there is no incentive for authors to pay a higher price in order to get a more favorable treatment in future submissions. Reciprocity clearly plays a major role in human interaction (see e.g. Fehr & Gächter, 2000; Fehr & Schmidt, 2006), but this confounding effect should be ruled out by design in our study. Nevertheless, we cannot completely rule out the possibility that the authors mistakenly believed that the editor would learn of their payments.

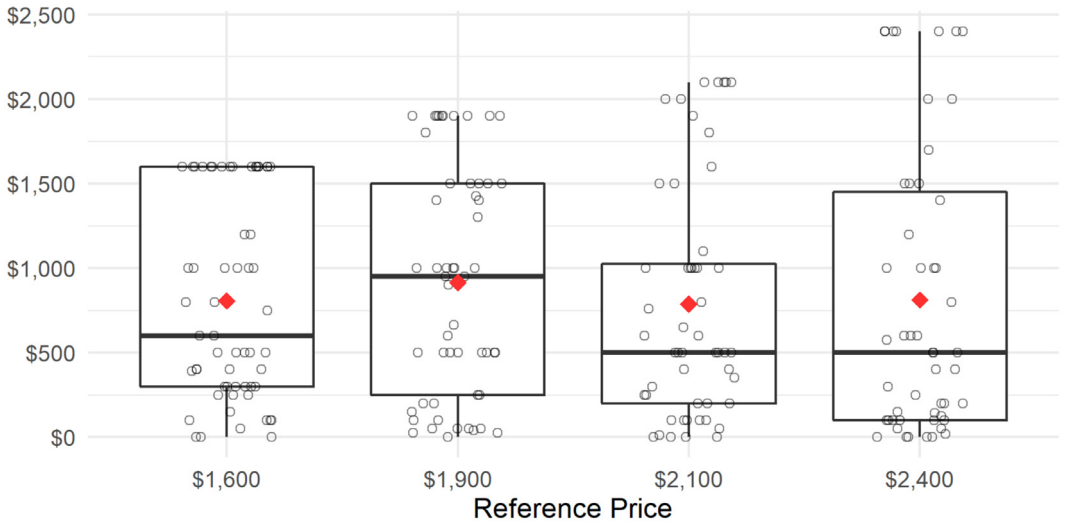

Fig. 5. Boxplots of *Payment*. *Note*: Each point corresponds to a payment (jittered). Red diamonds represent means. Center lines are medians. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

earlier PWYW field studies, for example Gautier and van der Klaauw (2012) [hotel rooms: 8.0−14.4%], Kim et al. (2009) [deli, cinema, and restaurant: 0%], Riener and Traxler (2012) [restaurant: 0.53%], and Schlüter and Vollan (2015) [flowers: 6.8%]. Payments at a reference price of $1900 tend to pool at rather high amounts of $1000, $1500, and $1900, which explains the slightly higher average payment at this reference price level (see Table 7). Overall, the reference price level does not seem to have a strong systematic effect on the level of voluntary PWYW payments. If anything, we can observe a tendency for PWYW payments to be slightly higher at a reference price of $1900 than at the other reference prices. More specifically, the median payments appear to depend on the reference price in a non-linear way ("inverted-U"), such that authors first increase their payments as a function of the reference price, but reduce them when reference prices are above a threshold. We tested the significance of this inverted-U using quantile regression but found no statistically significant support for this relationship. Interpreting the reference prices as a robustness check of the observed PWYW payments, we conclude that payments are relatively robust. Overall, these results show that authors are willing to make substantial payments to publishers for open access publications.

Result 4: Authors make substantial voluntary PWYW payments for open access publishing. The reference prices communicated to the authors have no significant influence on the amount of these payments. The variance of the payments is high.

Comparing the results of the conjoint study and the field experiment, we find consistent results regarding the median willingness to pay for open access, which is surprising given the differences between the two studies

Result 5: The median willingness to pay for open access is $1038 in the conjoint study and $600 in the PWYW field experiment. These figures provide a plausible range of authors' average willingness to pay for open access publishing.

5. Conclusion

This paper systematically investigates the willingness of authors to pay for open access publishing by conducting two separate field studies in different scientific fields (economics and medicine) with different methodological approaches. First, a choice-based conjoint analysis measures stated preferences of 243 economists in Germany, Austria, and Switzerland regarding their valuations of open access publishing in the "Top 5" economics journals. Second, a field experiment at four different open access medical journals elicits authors' self-determined ("Pay-What-You-Want") payments for open access publishing.

The results of the conjoint study show that the open access policy is an important factor for scientists when making publishing decisions. We find that economists prefer, on average, more open access to less open access, and have a median willingness to pay (monetized difference in part-worths) for having a paper published in a pure open access journal rather than a no open access journal of about $1,000. Analyzing the relationship between their attitudes and opinions and their estimated willingness to pay for open access publishing suggests that authors are willing to pay for open access for both selfish and prosocial motives.

Importantly, our results indicate that open access publishing is increasing welfare by providing an additional benefit to authors and inducing a willingness to pay for it. In the conjoint study, focusing on the "Top 5" economics journals, this additional benefit is stable and mostly independent of the specific journal. The voluntary payments we observe in the

Pay-What-You-Want field experiment support the findings of the conjoint study. The results across both studies provide a plausible range of authors' valuations, given that the conjoint study rather provides an upper bound and the second study a lower bound of authors' willingness to pay for open access publishing.

The two field studies conducted in this paper used two different methods in different scientific disciplines. Therefore, although our studies provide initial insights into researchers' preferences and willingness to pay for open access publishing, more research is needed. For example, future research may use incentive-compatible approaches to measure willingness to pay for open access publishing in these and further disciplines.

Our results provide implications for authors, publishers, and funding institutions. Authors learn about preferences and motives of their peers, which allows them to reflect and recalibrate their journal choices and open access decisions. Publishers can use our results for value-based pricing strategies towards authors and for negotiations with funding institutions. In a similar vein, our results regarding authors' willingness to pay for open access publishing provide funding institutions with additional data for the negotiations with publishers and information on the required public resources to meet policy goals of 100% open access. From a societal perspective, our results support the positive welfare implications of open access publishing, policies to promote open access publishing, and the provision of the resources needed for this transition.

Declaration of Competing Interest

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

Appendix

Table A1: Linear Regressions

Table A1
Linear regressions.

	Dependent variable Monetized differences in part-worths (Pure Open Access – No Open Access)					
	(1)	(2)	(3)	(4)	(5)	(6)
Larger Readership	448.92***					94.54
	(154.78)					(181.46)
Larger Readership × Female (Dummy)	−329.64*					−40.18
	(170.51)					(248.15)
More Citations		680.25***				511.10*
		(216.77)				(265.85)
More Citations × Female (Dummy)		−532.22**				−420.53
		(234.37)				(287.09)
Stimulates Innovation			380.91**			86.49
			(163.17)			(210.65)
Stimulates Innovation × Female (Dummy)			−273.66			−80.85
			(180.57)			(267.83)
Lower Standards				−332.45		−112.34
				(205.84)		(228.90)
Lower Standards × Female (Dummy)				242.97		66.29
				(226.81)		(249.39)
Well Informed					299.18*	173.26
					(159.85)	(161.19)
Well Informed × Female (Dummy)					−326.68*	−199.81
					(191.92)	(194.42)
Age	−81.90**	−75.57**	−74.19**	−74.28**	−81.63**	−63.98*
	(36.04)	(36.79)	(36.72)	(32.36)	(35.51)	(34.27)
Age × Female (Dummy)	74.60*	71.35*	64.64 (41.18)	72.76*	79.16*	61.04
	(40.23)	(41.56)		(37.60)	(41.07)	(39.96)
Female (Dummy)	−3490.16	−2227.76	−2522.94	−5656.58**	−3429.06	−968.63
	(2217.70)	(2386.04)	(2397.00)	(2216.79)	(2189.20)	(2997.03)
Position						
Professor	3766.68***	3109.66***	3992.85***	2932.58***	2898.77***	2619.87**
	(824.68)	(1009.25)	(824.74)	(769.72)	(800.43)	(1024.68)
Professor × Female (Dummy)	−129.53	−872.23	−1002.22	−391.29	−585.20	−911.14
	(1158.59)	(821.56)	(910.87)	(1006.27)	(955.67)	(1132.47)
Associate Professor / Senior Lecturer	2461.47***	1446.59*	2501.77***	1506.64**	1470.34**	1103.96
	(574.84)	(846.92)	(617.90)	(653.05)	(671.98)	(928.59)

(*continued on next page*)

Table A1 (*continued*)

	Dependent variable Monetized differences in part-worths (Pure Open Access − No Open Access)					
	(1)	(2)	(3)	(4)	(5)	(6)
Associate Professor/Senior Lecturer × Female (Dummy)	1198.89	754.66	584.80	972.86	944.21	466.03
	(1540.86)	(1273.62)	(1358.80)	(1314.11)	(1271.60)	(1490.98)
Assistant Professor / Lecturer	1823.58***	1481.91*	2297.86***	1183.32	1427.22**	1275.08
	(640.35)	(863.40)	(726.86)	(873.84)	(722.85)	(1117.59)
Assistant Professor / Lecturer × Female (Dummy)	1434.46	494.51	299.72	1067.34	585.19	122.61
	(1403.91)	(1134.06)	(1241.05)	(1202.60)	(1193.34)	(1435.05)
Postdoctoral Researcher	3202.14***	2596.30**	3574.43***	2526.68**	2684.56**	2304.02*
	(1172.44)	(1276.10)	(1200.26)	(1180.93)	(1169.29)	(1223.48)
Postdoctoral Researcher × Female (Dummy)	−284.17	−989.80	−1,338.17	−490.15	−900.07	−1208.87
	(1,616.18)	(1,422.77)	(1,458.40)	(1,533.72)	(1,530.04)	(1651.88)
Adjunct Professor / Research Fellow / Researcher	2,170.61*	661.00	1,489.90*	826.34	707.72	66.39
	(1,197.62)	(1,008.36)	(873.07)	(1,039.52)	(1,045.10)	(1,307.14)
Constant	1005.16	987.42	884.82	4811.35***	2641.95**	411.88
	(1385.10)	(1632.81)	(1672.42)	(1813.95)	1280.02)	(2568.54)
Observations	237	237	237	237	237	237
R^2	0.09	0.11	0.08	0.08	0.07	0.12
Adjusted R^2	0.03	0.06	0.02	0.02	0.01	0.03
F Statistic	1.61*	2.04**	1.37	1.31	1.20	1.35
	(df = 14;	(df = 14;	(df = 14;	(df = 14;	(df = 14;	(df = 22;
	222)	222)	222)	222)	222)	214)

Note: Only observations above the 1st percentile and below the 99th percentile of the dependent variable included. Robust standard errors in parentheses. Position reference category: "Unemployed/Left Science".
* $p<0.1$; ** $p<0.05$; *** $p<0.01$.

References

Allenby, G.M., Brazell, J.D., Howell, J.R., Rossi, P.E., 2014. Economic valuation of product features. Quant. Market. Econ. 12 (4), 421–456. doi:10.1007/s11129-014-9150-x.

Allenby, G.M., Hardt, N., Rossi, P.E., 2019. Economic foundations of conjoint analysis. In: Dube, J.P., Rossi, P. (Eds.), Handbook of the Economics of Marketing. Elsevier, North Holland, pp. 151–192. doi:10.1016/bs.hem.2019.04.002.

Björk, B.C., 2017. Scholarly journal publishing in transition—from restricted to open access. Electro. Markets 27 (2), 101–109. doi:10.1007/s12525-017-0249-2.

Buranyi, S., 2017. Is the staggeringly profitable business of scientific publishing bad for science? The Guardian, June 27, https://www.theguardian.com/science/2017/jun/27/profitable-business-scientific-publishing-bad-for-science.

Chen, M.H., Shao, Q.M., Ibrahim, J.G., 2000. Monte Carlo Methods in Bayesian Computation. Springer, New York, NY doi:10.1007/978-1-4612-1276-8.

Cui, D., Curry, D., 2005. Prediction in marketing using the support vector machine. Market. Sci. 24 (4), 595–615. doi:10.1287/mksc.1050.0123.

Daly, A., Hess, S., Train, K., 2012. Assuring finite moments for willingness to pay in random coefficient models. Transportation 39 (1), 19–31. doi:10.1007/s11116-011-9331-3.

Eggers, F., Sattler, H., Teichert, T., Völckner, F., 2019. Choice-based conjoint analysis. In: Homburg, C., Klarmann, M., Vomberg, A. (Eds.), Handbook of Market Research. Springer, Berlin/Heidelberg, pp. 1–39. doi:10.1007/978-3-319-57413-4_23.

Fehr, E., Gächter, S., 2000. Cooperation and punishment in public goods experiments. Am. Econ. Rev. 90 (4), 980–994. doi:10.1257/aer.90.4.980.

Fehr, E., Schmidt, K.M., 2006. The economics of fairness, reciprocity and altruism – experimental evidence and new theories. In: S.-C. Kolm and J.M. Ythier (Eds.). Handbook of the Economics of Giving Altruism and Reciprocity, Vol. 1: Elsevier Amsterdam, 615–691.10.1016/S1574-0714(06)01008-6.

Gautier, P.A., van der Klaauw, B., 2012. Selection in a field experiment with voluntary participation. J. Appl. Econ. 27 (1), 63–84. doi:10.1002/jae.1184.

Gneezy, A., Gneezy, U., Nelson, L.D., Brown, A., 2010. Shared social responsibility: a field experiment in pay-what-you-want pricing and charitable giving. Science 329, 325–327. doi:10.1126/science.1186744.

Kim, J.Y., Natter, M., Spann, M., 2009. Pay what you want: a new participative pricing mechanism. J. Market. 73 (1), 44–58. doi:10.1509/jmkg.73.1.044.

Krämer, F., Schmidt, K.M., Spann, M., Stich, L., 2017. Delegating pricing power to customers: pay what you want or name your own price? J. Econ. Behav. Organ. 136, 125–140. doi:10.1016/j.jebo.2017.01.019.

Laakso, M., Welling, P., Bukvova, H., Nyman, L., Björk, B.-C., Hedlund, T., 2011. The development of open access journal publishing from 1993 to 2009. PLoS One 6 (6), e20961. doi:10.1371/journal.pone.0020961.

Louviere, J.J., Woodworth, G., 1983. Design and analysis of simulated consumer choice or allocation experiments: an approach based on aggregated data. J. Market. Res. 20, 350–367. doi:10.1177/002224378302000403.

Malakoff, D., 2003. Opening the books on open access. Science 302 (5645), 550–554. doi:10.1126/science.302.5645.550.

McFadden, D., 1981. Econometric models for probabilistic choice. In: Manski, C.F., McFadden, D. (Eds.), Structural Analysis of Discrete Data. MIT Press, Cambridge, MA, pp. 198–272.

Miller, K.M., Hofstetter, R., Krohmer, H., Zhang, Z.J., 2011. How should consumers' willingness to pay be measured? An empirical comparison of state-of-the-art approaches. J. Market. Res. 48 (1), 172–184. doi:10.1509/jmkr.48.1.172.

Orme, B., 2007. Three ways to treat overall price in conjoint analysis. https://sawtoothsoftware.com/resources/technical-papers/three-ways-to-treat-overall-price-in-conjoint-analysis.

Riener, G., Traxler, C., 2012. Norms, moods, and free lunch: longitudinal evidence on payments from a pay-what-you-want restaurant. J. Socio-Econ. 41 (4), 476–483. doi:10.1016/j.socec.2011.07.003.

Schimmer, R., Geschuhn, K.K., Vogler, A., 2015. Disrupting the subscription journals' business model for the necessary large-scale transformation to open access. http://hdl.handle.net/11858/00-001M-0000-0026-C274-7.

Schlüter, A., Vollan, B., 2015. Flowers and an honour box: evidence on framing effects. J. Behav. Exp. Econ. 57, 186–199. doi:10.1016/j.socec.2014.10.002.

Schmidt, K.M., Spann, M., Zeithammer, R., 2015. Pay what you want as a marketing strategy in monopolistic and competitive markets. Manag. Sci. 61 (6), 1217–1236. doi:10.1287/mnsc.2014.1946.

Schröder, M., Lüer, A., Sadrieh, A., 2015. Pay-what-you-want or mark-off-your-own-price – a framing effect in customer-selected pricing. J. Behav. Exp. Econ. 57, 200–204. doi:10.1016/j.socec.2014.10.007.

Sonnier, G., Ainslie, A., Otter, T., 2007. Heterogeneity distributions of willingness-to-pay in choice models. Quant. Market. Econ. 5 (3), 313–331. doi:10.1007/s11129-007-9024-6.
Spann, M., Stich, L., Schmidt, K.M., 2017. Pay what you want as a pricing model for open access publishing? Commun. ACM 60 (11), 29–31 https://cacm.acm.org/magazines/2017/11/222177-pay-what-you-want-as-a-pricing-model-for-open-access-publishing/fulltext.
Train, K.E., 2012. Discrete Choice Methods with Simulation. Cambridge University Press, Cambridge doi:10.1017/CBO9780511805271.
Voelckner, F., 2006. An empirical comparison of methods for measuring consumers' willingness to pay. Market. Lett. 17, 137–149. doi:10.1007/s11002-006-5147-x.
Wittink, D.R., Cattin, P., 1989. Commercial use of conjoint analysis: an update. J. Market. 53 (3), 91–96. doi:10.1177/002224298905300310.