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PUSHED BY THE CROWD OR PULLED
BY THE LEADERS? PEER EFFECTS
IN PAY-WHAT-YOU-WANT

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Pushed by the crowd or pulled by the leaders? Peer effects in Pay-What-You-Want

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Abstract

Literature on charitable giving often finds that seed money matters: the example of a wealthy donor is followed by others (List and Lucking-Riley, 2002). Nearly all relevant theoretical accounts (e.g. that leaders possess superior information on quality of the project) seem to apply to the closely related environment of Pay-What-You-Want mechanisms as well. Yet, as far as we can tell, no empirical study has tested for that until now. To fill this gap, we analyze data from 16 campaigns of BookRage (an equivalent of Humble Bundle, offering bundles of e-books). We make use of the fact that a fixed number of currently highest contributions are always displayed (along with mean contribution and total amount raised). Thus a discontinuity may be expected: contributions that are displayed might directly affect subsequent donors' behavior, in contrast to just slightly lower donations that are only observable as a (small) change in mean contribution. We find that the example of leaders makes no impact on willingness to purchase and amount paid. By contrast, the mean of past contributions has a positive impact on current contribution, yet a negative impact on the probability of contributing.

Keywords:

voluntary contribution, cultural goods, PWYW

JEL:

D4, D64

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1 Introduction

The Pay-What-You-Want (PWYW) mechanism is getting increased attention of both practitioners and scholars. As other participative pricing procedures it gives some hope for increased economic efficiency without sacrifice in seller's revenue.

One important, yet understudied issue is how early contributions affect behavior of those showing up later. It is of direct practical importance, as it may help predict success of a campaign based on early sales history. It may also tell the seller whether heavy advertising at the onset of a sales period, perhaps targeted at wealthy customers (who may contribute generously), is expected to be profitable. It may help shape optimal strategy of disclosing past contributions to potential new customers. From theoretical viewpoint, it may shed light on motivations of PWYW mechanism participants.

However, it takes high-quality data of individual decisions to identify causal effect of earlier contributions. Indeed, if there is positive autocorrelation, it may be hard to tell if previous payments directly trigger those coming later or all of them are due to some external factors (temporarily) boosting demand.

In this project we use a unique data set of individual contributions in PWYW sales campaigns, involving collections of Polish-language e-books, run by Book Rage, an equivalent of the popular Humble Bundle service.

Because only eight highest contributions (updated instantly) are revealed to prospective customers, we can identify direct causal impact of such leading by example. Indeed, even if interest in the campaign varies over time, there is presumably little exogenous change in it between the time period just before any large contribution and just thereafter. We can thus test if these high past contributions make a difference for the number and magnitude of new contributions. To exclude the possibility that this approach captures some other type of interdependence between contributions, we additionally verify that slightly smaller contributions (with ranks 9-16) that are not revealed, make no difference.

We find that the mean of past contributions has a large effect on present contribution which may go beyond simple matching of the mean. By contrast, past top contributions that are revealed to users make no difference, neither in terms of encouraging purchase, nor increasing the amount. This finding suggests that users are more affected by what they perceive a prevailing social norm than an example of a handful of die-hard fans.

In the following section we provide a brief review of relevant literature, exploring possible reasons for which past contributions could matter. We then describe our data set in Section 3 and show the main econometric results in Section 4. We discuss some interpretations and implications of our findings in Section 5.

2 Literature review

Academic literature on PWYW is still somewhat underdeveloped. In the simplest model of rational agents motivated solely by their material self-interest, generally nobody should pay anything. Admittedly, one could envisage an equilibrium in a repeated game, in which the sum of PWYW contributions in each campaign just reaches the amount below which the producer threatens to leave the market or switch to fixed prices (Mak et al., 2010). However, there is typically a myriad of ways in which this minimum total amount could be divided among interested buyers, so it appears extremely unlikely that they can coordinate on one of them. Still, in practice most participants do pay positive amounts and PWYW often seems to be a viable business solution (Kim et al., 2009). How could that be explained? Social exchange norms appear to be a useful concept here. Based on general theory of social relationships (Fiske, 1992), Heyman and Ariely (2004) define two general categories to describe exchange relationships: money-market relationships and social-market relationships. While in money-market relationships, exchange is regulated by the price of a product, social-market relationships are characterized by social exchange norms (i.e. norms of distribution, norms of reciprocity and norms of cooperation – see Kim et al., 2009). These social exchange norms are not universal, and may vary between societies (Gneezy et al., 2012). For example, customers tip much more in the US than in Germany,¹ at fancy restaurants than at McDonald's etc.

A PWYW campaign may also be construed as a social-market relationship governed by social exchange norms. Indeed, customers are expected to avoid the feeling of guilt and damage to self image associated with paying less than what they perceive as 'fair'. They may thus contribute more or abstain from purchase altogether (Schmidt et al., 2014). What is perceived as fair in any particular sales campaign is likely to be shaped by past contributions, provided of course that they are observable. These may also be treated as signal of quality of the product. The same is largely true for charitable giving.

As said before, empirical research on PWYW is scarce, especially on dynamics of the process that could inform investigation of leadership by example. Riener and Traxler (2012) observed average prices paid for food in a Vienna restaurant using a PWYW system to decline somewhat and then stabilize over the period of two years. A negative trend, especially in returning customers, was also found by Schons et al. (2014) in their three-week experiment involving iced coffee.

By contrast, the closely related domain of charitable giving² has been studied much more intensely, see (Vesterlund, 2012). Some attention has in particular been paid to

¹It is difficult to tell what drives differences between countries. Lynn (1994) found that tipping is more prevalent in countries with higher level of neuroticism, possibly because customers anticipate being subject to service workers' envy.

²In fact, for some cases difficult to distinguish. e.g. church offering, donations and voluntary work for wikipedia etc.

the dynamics of the process. Interestingly, although voluntary contributions are typically modeled as simultaneous Public Good Games, donation decisions are in practice typically made on different dates. Both individual institutions (<http://www.worcsacute.nhs.uk/about-us/fundraising/recent-donations/>, <http://www.carevan.com.au/index.php/recent-fundraisers/134-recent-donations>) and global fundraising/crowdsourcing platforms such as indiegogo.com update donors on progress in the campaign, so that they may condition their decisions on earlier contributions. Fundraisers seem to firmly believe that leadership in giving is vital—large donations from respectable, wealthy individuals or institutions should first be secured in a silent phase before the campaign can go public List and Lucking-Reiley (2002).

Some field experiments seem to confirm that collective wisdom. For example, Martin and Randal (2008) manipulated the content of a glass donation box at an art museum. They registered more donations when the box was filled with money rather than empty for a start and higher donations when it was filled with bills rather than coins. Likewise, in their direct mail solicitation experiment List and Lucking-Reiley (2002) found a very large effect of seed money (10% vs. 67% of the amount needed) which increased both fraction of donors and average amount given. Also Shang and Croson (2005) observed larger contributions to the public radio when a high recent donation was mentioned (compared to the control treatment of no information on past donations).³ By contrast, seed money (\$1000 coming from an anonymous donor) had no impact of total contributions and reduced the fraction of subjects donating anything in a door-to-door fund-raising campaign for a university research center (Landry et al., 2006). Frey and Meier (2004) observed very similar frequency of charity donations in Swiss students being provided different statistics on their colleagues' behavior in the past. The results of Soetevent (2005) were somewhat equivocal. They found higher offerings in Dutch churches when they were collected in open baskets, so that everyone could see how much has been given, but the effect was neither very strong, nor robust, nor time-consistent.

Even if both anecdotal and more systematic field evidence suggests that revealing previous donations is beneficial, it is not clear *why* sequential nature of the mechanism should be preferred in the first place. Several features of the mechanism could play a role.

First, there is an issue of non-constant returns on donation. This could make sequential decisions *undesirable*. Indeed, Varian (1994) considers a sequential two-person contribution game with agents' utility being concave in total amount contributed. The first mover (leader) has incentive to give even *less* (free ride) than she would in an analogous but simultaneous game, because giving less increases marginal return for the follower.⁴ This prediction holds also for (some) heterogeneous preferences for the pub-

³But Murphy et al. (2015) failed to replicate this result.

⁴This result hinges on the strong assumption that the first mover can commit not to top her contri-

lic good and indeed simultaneous mechanisms have been found to perform better than sequential ones in experiments by Andreoni et al. (2002) and Gächter et al. (2010). Conversely, in a framework considered by Andreoni (1998), a certain minimum total amount of contributions is required for the project to bring any benefits (fixed cost). E.g. a \$100 million may be needed to build a stadium, with any cheaper project being impractical. In such a framework multiple equilibria typically arise and high initial contributions (seed money) may be the way to avoid ending up in the zero contribution equilibrium.

Second, donors may be conditional cooperators, likely because of a social norm that dictates being (at least) roughly as generous as others. Indeed, a field experiment by Karlan and List (2007) found that a matching mechanism (a wealthy donor promising to, say, double contributions provided by others) increased donations. Likewise, in lab experiments using a modified Public Good Game follower's (simultaneous) decisions are typically highly correlated with that of the leader (Moxnes and Van der Heijden, 2003; Van der Heijden and Moxnes, 2003; Gaechter and Renner, 2003).⁵ Overall giving is also often higher than in analogous completely simultaneous games.

Third, as pointed out by Schelling (1960), early large contributions may help to build up trust that the cause is of high "quality". Particularly hefty contributions from well-known, respectable entities may be of importance here. Hermalin (1998) and Vesterlund (2003) formalize this idea by assuming that the leader has superior information about the quality of the project and can encourage others to contribute by setting an example.⁶ Specifically, if only she knows the return on investment in the project, investing a lot will trigger investment from less-informed followers. Such incomplete information about quality appears to be characteristic for most instances of (successful) uses of PWYW mechanism as well. In the setting considered by Hermalin (1998) total contributions may even be higher in equilibrium than in the symmetric information case, because the leader has to invest *above* that level to convince others that the project is worth it. This feature should in principle make it easier to persuade leaders to be generous.

Two lab experiments have tried to verify such a signaling model more directly by comparing full information vs. asymmetric information about returns from the project. Their results are somewhat in conflict: while according to Meidinger and Villeval (2002), leadership helps in both cases (thus being a matter of reciprocity rather than signaling), it only increases contributions under leader's superior information in (Potters et al., 2007).

As far as we now, no previous study was able to disentangle the effect of the *mean* of past contributions from the effect of *top* contributions. For example in (Martin and
bution at a later stage.

⁵Also in a field experiment (Chen et al., 2010) involving contributions of time and effort necessary to submit a rating of a movie, subjects who were informed they were contributing less than median improved dramatically, while those informed they were contributing more than median reduced their effort.

⁶The greatest difference between these models is that information is endogenous (costly to acquire) in the latter.

Randal, 2008) these two dimensions were almost perfectly correlated. Yet, this is an important distinction. We hypothesize that both mean and top contributions can be perceived as signals of quality. However, only the mean contribution will strongly affect the perceived social norm as to how much should be contributed. Indeed, if five thousand people contributed on average 8.43, then 10 looks like a decent contribution, no matter whether an isolated maniac gave 200, 300 or perhaps 500 (much like whether a donation of 10 dollars to a specific charity appears sufficient or not will not depend on whether Coca Cola Company gave 1 million or 10 million dollars).

3 Data

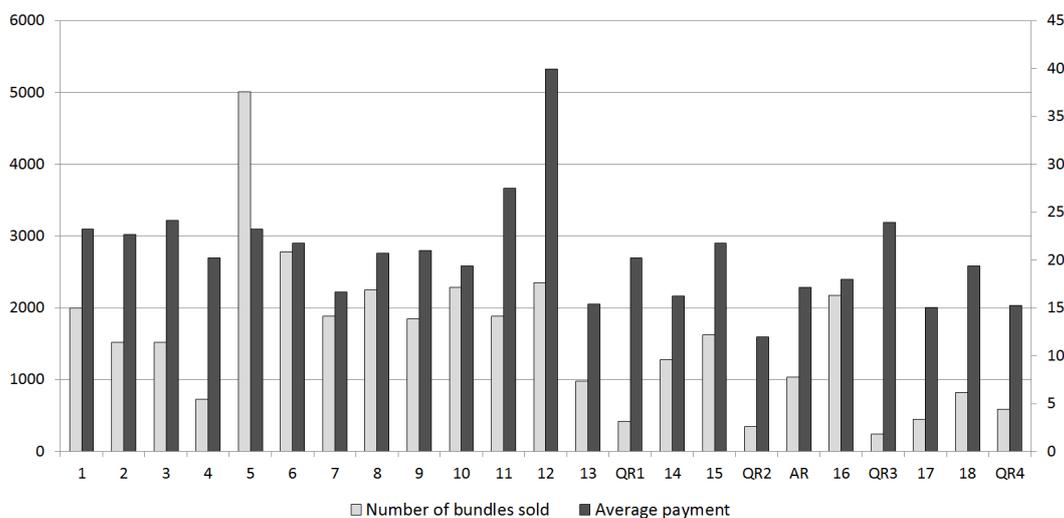
Data for our analysis was provided by BookRage.org, an organization distributing e-books in a pay-what-you-want (PWYW) setting. BookRage.org offers e-books in collections (so-called bundles) of several (most often four) titles, with buyers determining the price of purchase (the minimum contribution being set at 1 PLN). In addition to the titles available in a bundle, typically if a user contributes more than the current average of all previous contributions and/or exceeds a fixed threshold, (s)he is entitled to additional title(s) free of charge. There is thus an incentive to contribute above average.⁷ The titles distributed in a single collection always have a common characteristic which constitutes a theme of the particular collection. The bundles used in this paper were fairly heterogeneous, ranging from fantasy books by relatively unknown, young novel writers to contemporaneous economics. All the books were in Polish.

BookRage.org organizes the distribution in campaigns which last either 7 (the *Quick-Rage* bundles) or 14 days; the time until finish is presented throughout the whole duration of the bundles. Most of the titles are newly edited for the digital format and may even be published for the first time. BookRage.org has a strict policy of not selling the titles outside the campaign periods, which implies that clients interested in a purchase of one or few titles can only do it during the campaign. It cannot be excluded of course, that some titles may also be available from file-sharing services (or, more likely, become available after the campaign). For example, from one of the previous BookRage bundles (*Oblicza Przeszłości*) we were able to find 5 out of 6 titles available on the Polish file-hosing website Chomikuj.pl. On the other hand, from a currently ongoing (2015-07-06) bundle, we found only 1 out of 5 titles uploaded. Whether a specific title is available from an unauthorized source or not is probably dependent on its popularity, publishing date and whether it had been available in digital form before.

During the campaign, BookRage.org displays in real time two types of information. First, all visitors are informed about the current average price with the precision of

⁷The service is modeled after HumbleBundle.com, who focus on the distribution of video games and books.

Figure 1: Mean contribution and number of bundles sold, by campaign



two decimal places. This average is computed based on all previous purchases and is updated with each consecutive payment, i.e. it changes even several times per second although – admittedly – the changes to the average may be negligible and thus invisible to the website visitor. Second, all visitors see the current top eight contributors – their nicknames and amounts given. One thus has to beat the eight’s highest contribution in order to be listed.

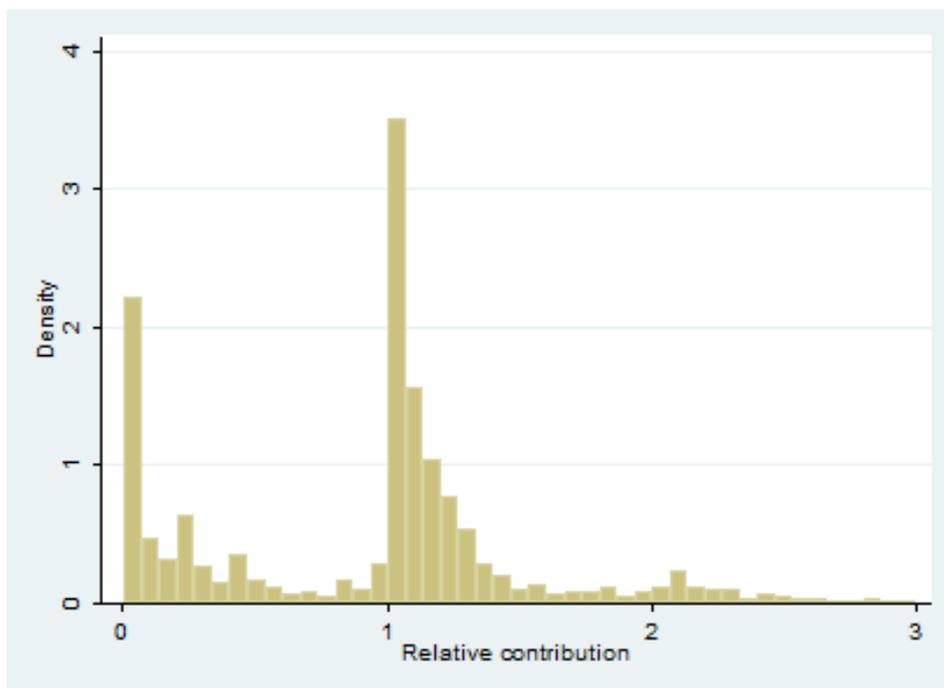
Since the titles distributed by BookRage.org are newly prepared for digital contribution (and often for the first time), their exact quality is unknown and cannot be directly inferred from reviews or other alternative sources. Moreover, the files of the books sometimes undergo revisions before the campaign concludes, which means that the ultimate quality is known only at the end of the campaign. Past contributions, however, can be a signal of quality (as anticipated by others). As mentioned before, mean (but not top) past contributions are also likely to shape what is perceived as social norm dictating appropriate contribution level. We can thus disentangle these two effects: if top past contributions matter, quality signaling is likely to be taking place. If they do not matter but past mean contribution does, the effect is probably due to social norm.

3.1 Descriptive statistics

In total, we obtained data from 23 campaigns, with a total of 36,013 purchases. The mean contribution in all campaigns amounted to 22.04 PLN (approx. 5 euro). Bundle-specific mean amounts and numbers of bundles sold are displayed in Figure 1.

Figure 2 represents the distribution of the ratio of the contribution to mean past con-

Figure 2: Distribution of contributions relative to mean past contribution



tribution within the campaign.⁸ It is very strongly bi-modal, with miniscule contribution and matching the mean or slightly overshooting it (often due to rounding) being popular choices. Very few individuals contribute just a bit less than the mean.

Figure 3 shows typical dynamics in a few campaigns. Periods of lower activity can be easily spotted, which obviously correspond to night hours (vast majority of customers were in the same time zone). It is also remarkable how stable the mean contribution is, even though a substantial number of individual entries are much higher or nearly zero. Inevitably, it reduces the statistical power to detect the effect of changes in the mean. Clustering of observations just above the mean can also be noted, as in Figure 2.

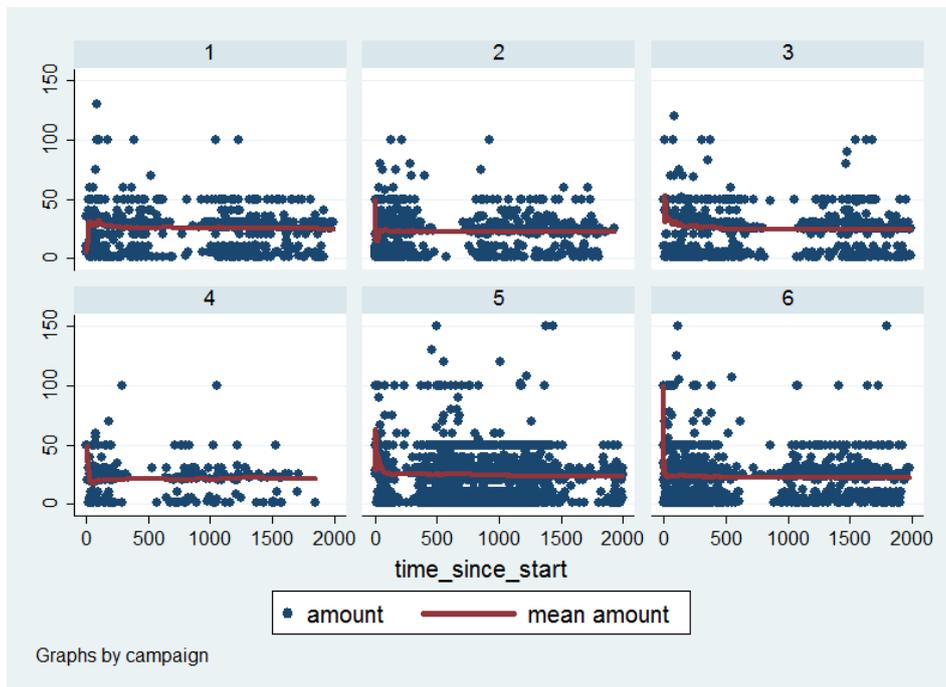
4 Results

We first analyze the impact of past contributions on the number of purchases. We consider one-minute periods of each campaign. The distribution of number of purchases is given in Table 1.

Because of this extremely skewed distribution having (by construction) only natural numbers as support, we use the Poisson regression. We allow errors to be clustered within each campaign and, in view of bundle heterogeneity shown in figure 1, we include bundle-

⁸Rare outliers exceeding the value of 3 have been omitted

Figure 3: Dynamics of contributions



First six campaigns are displayed. Each dot represents one contribution. The horizontal axis shows time since campaign start in minutes truncated at 2000. The vertical axis shows amounts in PLN, with some outliers above 150PLN omitted to provide a clearer picture.

Table 1: Distribution of number of clients per minute

clients	Freq.	Percent	Cum. Perc.
0	481,125	95.53	95.53
1	17,574	3.49	99.02
2	3,200	0.64	99.66
3	941	0.19	99.84
4	371	0.07	99.92
5	172	0.03	99.95
more	251	.05	100.00
Total	503,634	100.00	

specific constants. We also control for log time since campaign start (also squared). In model C1 we include mean past contributions and the magnitudes of each of the top 16 contributions (both measured at the start of the minute in question). In model C2 we additionally control for hour of the day, which, by eye-balling of the previous section, mattered a lot.

We find that past mean contributions have a negative effect, which is of similar size in both models. This could be because matching the mean is more costly when the mean is higher, so those intending to do so may altogether resign from purchasing or possibly wait, hoping it will go down. However, statistical significance of this effect is mostly due to the very large number of observations. Indeed, its size is small, e.g. fixed effects of particular campaigns can be ten times higher (recall also that except the very beginning, the mean hardly varies within each campaign). Top contributions also matter very little. Although significant, positive impact of `max_price_8` (the lowest of top contributions that is displayed) is somewhat intuitive, again, its absolute size is very small as compared to bundle effects and similar to (negative) effect of `max_price_13`, which can be only a random occurrence. Jointly, maximum contributions ranked 1-8 are not significant (and, not surprisingly, the same is true for those ranked 9-16).

We now turn to the level of contributions. We thus treat each actual transaction (rather than each minute) as a separate observation. The distribution of the contribution level is highly non-normal, as shown before. Moreover, it is interesting to explore if the impact of mean past contributions is the same for different quantiles of this distribution – the median can plausibly be affected because customers want to enjoy the bonus for matching the mean. If, say, the eight decile is affected, however (which is almost always higher than past mean anyway), this would suggest that some informal pressure plays a role above and beyond the monetary incentive. While it could in principle be interesting to explore the effects for low quantiles as well, they are non-existent because a substantial fraction of contribution is equal to 1 PLN, so that low quantiles are constant. We thus report four models: in models A1 (A standing for Amount) and A2 we regress the median

Table 2: The number of clients per minute: Poisson regressions

	C1	C2
mean	-0.051***	-0.057***
max_price_1	-0.001	-0.002
max_price_2	0.001	-0.001
max_price_3	0.003	0.003
max_price_4	0.001	0.003
max_price_5	-0.012	-0.008
max_price_6	0.009	0.006
max_price_7	0.003	-0.004
max_price_8	0.020***	0.022***
max_price_9	-0.013	-0.008
max_price_10	-0.007	-0.015*
max_price_11	-0.001	-0.000
max_price_12	0.010	0.015*
max_price_13	-0.034***	-0.028**
max_price_14	0.032**	0.020
max_price_15	-0.004	0.002
max_price_16	0.005	0.005
log_time_since_start	-0.449**	-0.179
log_time_since_start2	-0.023**	-0.039***
campaign dummies	YES	YES
hour of the day dummies	NO	YES
Observations	503,516	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: The amount contributed: quantile regressions

quantile	.5		.8	
	A1	A2	A3	A4
mean	0.764***	0.762***	0.369	0.697*
max_price_1	-0.002	-0.002	0.003	0.002
max_price_2	-0.001	-0.001	0.004	-0.018
max_price_3	0.001	0.001	0.006	0.017
max_price_4	-0.002	-0.002	-0.033	-0.062
max_price_5	-0.000	-0.001	0.017	0.035
max_price_6	-0.001	-0.001	-0.005	-0.000
max_price_7	-0.003	-0.003	-0.002	-0.007
max_price_8	0.005	0.005	-0.002	0.008
max_price_9	0.002	0.002	-0.017	-0.056
max_price_10	-0.002	-0.002	0.020	0.033
max_price_11	0.001	0.000	0.044	0.088
max_price_12	0.009	0.008	-0.047	-0.078
max_price_13	-0.019**	-0.017**	-0.022	-0.056
max_price_14	0.009	0.009	0.010	0.029
max_price_15	0.008	0.006	-0.021	-0.037
max_price_16	-0.011*	-0.010	0.026	0.034
log_time_since_start	0.113	0.089	0.065	1.326
log_time_since_start2	-0.008	-0.006	0.003	-0.056
campaign dummies	YES	YES	YES	YES
hour of the day dummies	NO	YES	NO	YES
Observations	35,643			

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

of the amount contributed, while we use the eight decile in A3 and A4 (findings for other high deciles are similar). In A1 and A3 we use past mean contribution and past top contributions (ranked 1-16), as well as bundle dummies and log time (also squared) since campaign start as regressors. In models A2 and A4 we additionally include day of the hour dummies.

We find that mean past contribution has a very strong impact on the median and a weaker, only marginally significant impact on the eight decile. Past top contributions are not significant, neither individually nor jointly.

5 Conclusions

We found that past contributions do play a role in PWYW in that customers are trying to match the mean. Unfortunately, in all the campaigns in our data set, matching the

mean was always rewarded with an extra e-book, so we cannot completely disentangle social norm from monetary incentives. However, considering the fact that four books were always available for the symbolic price of 1PLN, 20PLN or so for the fifth title was probably more than the maximum willingness to pay, especially because it could become available on file-sharing services for free or almost for free. Moreover, the mean of past contributions also increases high quantiles of the distribution, which are higher than the past mean anyway, so that pecuniary motives are absent (although these effects are not always significant).

By contrast, we do not observe any effect of past top contributions, neither on the number of transactions, nor on the amount offered. This suggests that it is emerging social norm as to what is the appropriate amount to be paid that affects consumers' behavior, rather than quality signaling. This is an intriguing finding, given the emphasis on signaling in existing literature and inherent uncertainty about quality of the products in our data.

The fact that top contributions did not matter could be due to their relatively low level. Rarely exceeding 200 PLN (50 euro), they could be a relatively cheap (and thus weak) signal of quality (compared to a wealthy donor contributing thousands or millions to some charitable cause). The contributors were also either anonymous or only identified by a nick name,⁹ which could have reduced their credibility. It is also possible that customers, typically frequent readers, believed they could judge the quality quite well and thus ignore the signal. Only new studies using other data sets and also allowing disentanglement of the impact of mean vs. top contributions will make it possible to tell how general this null result could be. In particular, it should be investigated if this tendency is characteristic for PWYW environments or also applies to charitable giving proper.

⁹We will investigate if this distinction made a difference as soon as we obtain relevant data from BookRage.org.

References

- Andreoni, James**, “Toward a theory of charitable fund-raising,” *Journal of Political Economy*, 1998, *106* (6), 1186–1213.
- , **Paul M Brown**, and **Lise Vesterlund**, “What makes an allocation fair? Some experimental evidence,” *Games and Economic Behavior*, 2002, *40* (1), 1–24.
- Chen, Yan**, **F Maxwell Harper**, **Joseph Konstan**, and **Sherry Xin Li**, “Social comparisons and contributions to online communities: A field experiment on movie-lens,” *The American economic review*, 2010, pp. 1358–1398.
- der Heijden, Eline Van** and **Heijden Moxnes**, *Leading by Example?: Investment Decisions in a Mixed Sequential-simultaneous Public Bad Experiment*, Tilburg University, 2003.
- Fiske, Alan P**, “The four elementary forms of sociality: framework for a unified theory of social relations,” *Psychological review*, 1992, *99* (4), 689.
- Frey, Bruno S** and **Stephan Meier**, “Social comparisons and pro-social behavior: Testing" conditional cooperation" in a field experiment,” *American Economic Review*, 2004, pp. 1717–1722.
- Gächter, Simon**, **Daniele Nosenzo**, **Elke Renner**, and **Martin Sefton**, “Sequential vs. simultaneous contributions to public goods: Experimental evidence,” *Journal of Public Economics*, 2010, *94* (7), 515–522.
- Gaechter, Simon** and **CESifo Elke Renner**, “Leading by example in the presence of free rider incentives,” 2003.
- Gneezy, Ayelet**, **Uri Gneezy**, **Gerhard Riener**, and **Leif D Nelson**, “Pay-what-you-want, identity, and self-signaling in markets,” *Proceedings of the National Academy of Sciences*, 2012, *109* (19), 7236–7240.
- Hermalin, Benjamin E**, “Toward an economic theory of leadership: Leading by example,” *American Economic Review*, 1998, pp. 1188–1206.
- Heyman, James** and **Dan Ariely**, “Effort for payment a tale of two markets,” *Psychological science*, 2004, *15* (11), 787–793.
- Karlan, Dean** and **John A List**, “Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment,” *American Economic Review*, 2007, *97* (5), 1774–1793.

- Kim, Ju-Young, Martin Natter, and Martin Spann**, “Pay what you want: A new participative pricing mechanism,” *Journal of Marketing*, 2009, *73* (1), 44–58.
- Landry, Craig E, Andreas Lange, John A List, Michael K Price, and Nicholas G Rupp**, “Toward an Understanding of the Economics of Charity: Evidence from a Field Experiment*,” *The Quarterly journal of economics*, 2006, *121* (2), 747–782.
- List, John A and David Lucking-Reiley**, “The effects of seed money and refunds on charitable giving: Experimental evidence from a university capital campaign,” *Journal of Political Economy*, 2002, *110* (1), 215–233.
- Lynn, Michael**, “Neuroticism and the prevalence of tipping: A cross-country study,” *Personality and Individual Differences*, 1994, *17* (1), 137–138.
- Mak, Vincent, Rami Zwick, and Akshay R Rao**, “Pay what you want” as a profitable pricing strategy: Theory and experimental evidence,” in “Proceedings of the Management Science and Operations Seminar Series” 2010.
- Martin, Richard and John Randal**, “How is donation behaviour affected by the donations of others?,” *Journal of Economic Behavior & Organization*, 2008, *67* (1), 228–238.
- Meidinger, Claude and Marie Claire Villeval**, “Leadership in Teams: Signaling or Reciprocating?,” 2002.
- Moxnes, Erling and Eline Van der Heijden**, “The effect of leadership in a public bad experiment,” *Journal of Conflict Resolution*, 2003, *47* (6), 773–795.
- Murphy, James J, Nomin Batmunkh, Benjamin Nilsson, Samantha Ray et al.**, “The Impact of Social Information on the Voluntary Provision of Public Goods: A Replication Study,” Technical Report 2015.
- Potters, Jan, Martin Sefton, and Lise Vesterlund**, “Leading-by-example and signaling in voluntary contribution games: an experimental study,” *Economic Theory*, 2007, *33* (1), 169–182.
- Riener, Gerhard and Christian Traxler**, “Norms, moods, and free lunch: Longitudinal evidence on payments from a Pay-What-You-Want restaurant,” *The Journal of Socio-Economics*, 2012, *41* (4), 476–483.
- Schelling, Thomas C**, “The strategy of conflict,” *Cambridge, Mass*, 1960.

- Schmidt, Klaus M, Martin Spann, and Robert Zeithammer**, “Pay what you want as a marketing strategy in monopolistic and competitive markets,” *Management Science*, 2014.
- Schons, Laura Marie, Mario Rese, Jan Wieseke, Wiebke Rasmussen, Daniel Weber, and Wolf-Christian Strotmann**, “There is nothing permanent except change—analyzing individual price dynamics in “pay-what-you-want” situations,” *Marketing Letters*, 2014, *25* (1), 25–36.
- Shang, Jen and Rachel Croson**, “Field experiments in charitable contribution: The impact of social influence on the voluntary provision of public goods,” *Unpublished manuscript*, 2005.
- Soetevent, Adriaan R**, “Anonymity in giving in a natural context—a field experiment in 30 churches,” *Journal of public Economics*, 2005, *89* (11), 2301–2323.
- Varian, Hal R**, “Sequential contributions to public goods,” *Journal of Public Economics*, 1994, *53* (2), 165–186.
- Vesterlund, Lise**, “The informational value of sequential fundraising,” *Journal of Public Economics*, 2003, *87* (3), 627–657.
- , “Voluntary giving to public goods: moving beyond the linear VCM,” in “Department of Economics, University of Pittsburgh Working Paper” 2012.



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