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RESEARCH NOTE

Measuring time preferences in large surveys

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Abstract
Time preferences may explain public opinion about a wide range of long-term policy problems with costs and benefits realized in the distant future. However, mass publics may discount these costs and benefits because they are later or because they are more uncertain. Standard methods to elicit individual-level time preferences tend to conflate risk and time attitudes and are susceptible to social desirability bias. A potential solution relies on a costly lab-experimental method, convex time budgets (CTB). We present and experimentally validate an affordable version of this approach for implementation in mass surveys. We find that the theoretically preferred CTB patience measure predicts attitudes toward a local, delayed investment problem but fails to predict support for more complex, future-oriented policies.

Keywords: Experimental research; public opinion; public policy; dynamic policy problems; survey; time preferences; discounting; delayed investment; social desirability bias; long-term policy; risk aversion

1. Introduction

Countries have long been struggling with addressing major policy challenges such as climate change, excessive public deficits, or the insolvency of pension funds. These challenges may be difficult to solve because they are political marshmallow problems (Mischel, 2014) that entail costly intertemporal trade-offs between immediate gratification and long-term benefits. In trying to explore this potential source of conflict over future-oriented policies, social scientists have become increasingly interested in measuring individual time preferences (Frederick *et al.*, 2002; Laibson, 2007; Andersen *et al.*, 2008; Falk *et al.*, 2016; Sheffer *et al.*, 2018) and assessing whether temporal discounting explains political behavior (Jacobs, 2016; Kertzer, 2017).[1] In political science, the concept of time discounting has typically been used in formal models of the dynamics of public goods provision (Baron, 1996), legislative decisionmaking (Baron and Ferejohn, 1989; Buisseret and Bernhardt, 2017), and international cooperation (Fearon, 1998). More recently, time preferences have, for example, been included in empirical studies of mass support for contributions to local public goods (Sheffer *et al.*, 2018), balanced budgets (Battaglini *et al.*, 2020), investments in public infrastructure (Jacobs and Matthews, 2012, 2015), and military interventions (Kertzer, 2017).

A significant portion of previous research on political marshmallow problems has examined the mass politics of long-term policy challenges relying on time preference measures that are subject to two types of criticism. First, the long-term payoffs to policy investment today are not only

[1]The number of articles published in political science, economics, sociology, and psychology that engage with aspects of decisionmaking related to time discounting has increased from 5 in 1990 to over 4000 in 2018. These numbers are based on a web of science search for "discounting", "time preferences", or "patience". These data are available as part of the replication archive for this study.

temporally distant, but also more uncertain. Therefore, scholarship interested in explaining support for future-oriented policy would benefit from individual-level measures that are able to disentangle patience from risk acceptance. Yet, the most widespread methods to elicit time and risk preferences are susceptible to conflating these two forces. This is problematic because if opposition to investing in long-term policy – such as climate mitigation, disaster preparedness, or the solvency of pension funds – is driven by risk aversion, then uncertainty-reducing efforts promise to increase public support for such investments. If, however, voter preferences reflect impatience, raising long-term policy support would require focusing on and re-designing the temporal distribution of benefits and costs. In addition, voters who are risk averse may not necessarily also be impatient and vice versa. This illustrates that whether patience or risk aversion accounts for political conflict over long-term investment has important implications for the optimal design of public policy.

A second concern could be that when asked to self-assess and state their level of patience as well as attitudes toward policy, respondents may be affected by social desirability bias. A potential solution to both of these problems introduces convex time budgets (Andreoni and Sprenger, 2012; Andreoni *et al.*, 2015) to generate estimates of patience and risk acceptance. This technique rests on a choice exercise in which respondents choose between combinations of sooner and later payments. So far, the convex time budgets (CTB) approach has only been used in lab experiments and is very costly due to the considerable monetary incentives.

We show using an experimental design that changing the costly, original payoff mechanism of the CTB approach by either reducing the payoffs by an order of magnitude or employing hypothetical decisions yields measures of time preferences with nearly identical distributions in a large, non-probability quota sample meant to be representative of the adult population in the United States. We then evaluate the validity of the CTB patience measure by exploring whether it predicts future-oriented policy opinions. Using a local delayed investment problem in which respondents select between a constant and a backloaded investment schedule to address water supply issues, we find that patience correlates in theoretically meaningful ways with individuals' choices. However, when examining support for a wide range of large-scale, future-oriented policies such as climate mitigation, climate technology, human capital investment, and fiscal discipline, we find that patience as measured by the CTB approach does not predict individuals' policy views. In contrast, the stated-preference patience measure tends to predict both support for policies with a significant dynamic component and approval of a policy that lacks a clear temporal dimension. These results are consistent with the view that the relationship between stated-preference patience measures and future-oriented policy positions may be spurious and could potentially result from social desirability bias.

2. Measuring time preferences

The widely used stated-preference approach asks respondents to indicate how willing they are to give up something that is beneficial today in order to benefit more from that in the future (see Appendix A). This survey item and others like it are easy for respondents to understand and require only a single question for which almost all respondents provide an answer. The measure, however, has at least two weaknesses. First, it may conflate risk and time preferences (Andersen *et al.*, 2008; Andreoni and Sprenger, 2012; Andreoni *et al.*, 2015). Respondents could be reluctant to sacrifice a current benefit for a future gain because they do not value the future or because they are risk averse and view the later gain as more uncertain. Second, respondents' self-assessments may be influenced by social desirability bias. Individuals who indicate to be willing to give up something today for a later benefit may value the future or they may be providing the response they think describes themselves positively. Both weaknesses seem important for studies that seek to understand support for future-oriented policies.

A second widely used approach to measuring patience is the staircase method, which relies on multiple price lists. This choice-based technique asks individuals to make repeated choices between a payment today and larger payments at some point in the future.[2] The staircase method allows researchers to identify the switching point, i.e., the point where a respondent switches from selecting the sooner over the later payment to preferring the later payment over the sooner payment. This information is used to compute an approximate discount rate for each respondent. The staircase method seems less prone to social desirability bias as there is no clear answer option that would make the respondent conform with what is perceived as socially desirable. Further, in applications that actually pay respondents for one of their choices, the measurement strategy is substantially incentivized. Yet, individuals could prefer the payment today because they do not value the larger later payment as much as the present smaller payment because of the temporal delay or because they are averse to the higher risk associated with the later payment. As a consequence, measures of patience would be confounded by risk aversion. This potential confounding problem is an important limitation that motivates the CTB method (Andreoni and Sprenger, 2012; Andreoni *et al.*, 2015) as an alternative way of eliciting time preferences.

The CTB method starts with considering the allocation of payments x_t and x_{t+k} between two periods t and $t+k$. Preferences over these two payments are assumed to be described by the following utility function:

$$U(x_t, x_{t+k}) = \begin{cases} x_t^\alpha + \beta\delta^k x_{t+k}^\alpha, & \text{if } t = 0. \\ x_t^\alpha + \delta^k x_{t+k}^\alpha, & \text{if } t > 0. \end{cases} \tag{1}$$

The parameter δ measures long-run exponential time discounting, β measures the preference for payments now ($t = 0$) and thus captures present bias, and α measures utility function curvature or the extent of risk aversion. The objective of the CTB approach is to obtain a valid measure of time preference (δ) at the individual level that is not conflated by risk aversion. To this end, the CTB technique asks respondents to choose repeatedly between a bundle of payments that will be received at time t and at $t+k$ in the future. Each budget includes both extreme cases in which the full payment is realized at time t or at time $t+k$ as well as four convex combinations of these payoffs (see Appendix Figure A.1).

The choices an individual makes under varying levels of delay provide information about time discounting or patience δ. The introduction of the four convex combinations, which distinguishes the CTB approach from the staircase method, allows the researcher to hold the delay in convex combinations of sooner and later payments constant (e.g., 5 weeks) and to examine the sensitivity of an individual to changes in prices. With the delay in the later payments held constant, this price sensitivity provides information about utility function curvature which captures an individual's level of risk aversion (α). Choices at the extremes are consistent with risk-neutrality ($\alpha = 1$). Interior choices indicate risk aversion ($\alpha < 1$). In addition, the approach also allows for the separate identification of present bias β. The parameters of interest δ, α, and β can be estimated by ordinary least squares or nonlinear least squares.

3. CTB time preferences, costs, and alternative payoff mechanisms

Measuring time preferences using CTB as most commonly implemented costs about \$20 per respondent in incentives only. Given that most social science surveys have 1000 respondents or more, these costs could be prohibitive. We investigate modifications of the standard payoff mechanism for the CTB approach such that it produces similar estimates at a substantially lower cost.[3]

[2]Appendix B reports the exact question wording in typical implementations.

[3]The study was reviewed by the Institutional Review Boards at Stanford University (eProtocol # 46325) and Washington University in St. Louis (IRB ID # 201803178). The survey instrument is available as part of the replication archive for this study.

We implement the CTB method with four different, randomly assigned payoff mechanisms. The *Benchmark CTB* payoff mechanism is an exact replication of the laboratory protocols in Andreoni *et al.* (2015): respondents make 24 choices and are told that one of their 24 decisions will be randomly selected to determine their actual payments. This payoff mechanism is costly to implement in mass surveys, but providing weaker incentives or merely hypothetical payouts could inflate measures of patience. We evaluate whether this is the case by testing *Benchmark CTB*, which uses the fully incentivized payoff mechanism that results in an average payoff of about $20 per respondent, against three more affordable alternatives. *CTB Lottery* asks respondents to make the same 24 choices as in the benchmark case but are told that only 20 percent of the respondents will actually receive a payment. In *CTB Hypothetical Low* no actual payments are promised. We add a fourth payoff mechanism, *CTB Hypothetical High*, in which the 24 choices range from sooner payments of $0 to $1,900 and later payments from $0 to $2,000 as opposed to $0 to $19 and $0 to $20 in the other payoff mechanisms and no actual payments are promised. Appendix C reports the exact instructions.[4] The experiment was fielded in June 2018 to an online, non-probability quota sample of 5,820 adult respondents in the United States (see Appendix D).[5] Quotas were set on age, education, and gender and the sample matches the margins of the adult population with respect to these sociodemographics.

We estimate patience (δ) at the individual level by regressing the natural log of the ratio of the sooner and later combination of payments chosen by the respondent on the number of days to the first payment (t), the number of days that the payment is delayed (k), and the natural log of the price ratio of the later payments to the sooner payments. The estimate of an individual's discount factor δ is then equal to the exponent of the ratio of the coefficient on k and the coefficient on the natural log of the price ratio.[6]

Two important issues become evident. First, some respondents always choose one of the corner options in "sooner" and "later" space which makes it impossible to estimate parameters for these individuals.[7] We follow Andreoni *et al.* (2015) and exclude these observations. Second, given the relatively small number of choices, it is possible for the estimates for any one person to take on extreme and implausible values. Therefore, we trim our CTB estimates of individual time preferences by setting all values below the 5th percentile and above the 95th percentile equal to missing. We are using the trimmed measure for all analyses unless indicated otherwise.

We compare several statistics of the CTB patience parameters in Table 1 which reports the mean, median, difference-in-means, and the p-value for the Kolmogorov–Smirnov test of the null hypothesis of the distributions of patience (δ) being equal across the four payoff mechanisms. The mean and median is close or equal to 1 in all four samples. While there exist small differences in the means at the third decimal place, only the difference between *CTB Hypothetical High* and the other three payoff mechanisms is statistically significant.[8]

[4]In a follow-up survey (see section 1) we explored respondents' levels of understanding of the CTB task using four quiz items. Ninety-one percent of the respondents answered at least one question correctly, 78 percent answered at least two questions correctly, 64 percent answered at least three questions correctly, and 40 percent answered all four questions correctly. Appendix D reports the wording for these quiz items.

[5]Ansolabehere and Rivers (2013) show that opt-in Internet panel samples produce estimates of political variables that are very similar to those found in samples that rely on random digit dialing of landlines and cell phones or recruitment by mail. Bechtel *et al.* (2014) find that a non-probability online quota sample replicates the correlational structures of political attitudes in a random-digit-dialing telephone sample.

[6]Following the replication code for Andreoni *et al.* (2015), we substitute all payouts equal to 0 with 0.001.

[7]Andreoni *et al.* (2015) note that this occurred for about 10 percent (6 out of 64) of the undergraduate students who served as subjects in their laboratory setting. In our mass survey, it occurred for 16 percent of respondents. In addition, we explored whether corner options were more frequent for respondents that spent less time on the survey. We find that the correlation between selecting corner options and interview length is close to zero and insignificant ($r = -.01$, $p = .51$). Also, choosing corner options is neither strongly nor systematically correlated with how much time respondents spent on a CTB choice page before submitting their answer ($r = -.03$, $p = .11$).

[8]See also Appendix Table A.1.

Table 1. Means and distributions of CTB patience measures by randomized payoff mechanism

Payoff mechanism	Median	Mean	N		CTB lottery	CTB hypothetical low	CTB hypothetical high
Benchmark CTB (fully incentivized)	0.998	1.000	1066	Difference	0.000	0.000	−0.001
				p(t)	0.476	0.890	0.005
				p(L)	0.122	0.119	0.770
				p(KS)	0.979	0.345	0.000
CTB lottery	0.998	0.999	1097	Difference		0.000	−0.001
				p(t)		0.585	0.000
				p(L)		0.002	0.006
				p(KS)		0.166	0.000
CTB hypothetical low	0.998	1.000	1065	Difference			−0.001
				p(t)			0.005
				p(L)			0.188
				p(KS)			0.000
CTB hypothetical high	1.000	1.001	1163	Difference			
				p(t)			
				p(L)			
				p(KS)			

Note: The table reports the mean, median, and number of observations (N) of the estimated discount factor (δ, trimmed) by treatment condition along with the difference-in-means. In the fully incentivized Benchmark CTB condition the payout average was $20 per respondent. p(t) is the p-value of a *t*-test of the null hypothesis of no difference between the estimated parameters. p(L) is the p-value of Levene's test of the null hypothesis of equal variances centered at the mean. p(KS) is the p-value of a Kolmogorov–Smirnov test of the null hypothesis of equal distributions.

Appendix Figure A.2 suggests that the distributions of time preferences by payoff mechanism are tight and very similar.[9] This impression is confirmed by the small standard deviation of the patience parameters which is .01 or less. In addition, we formally test whether the variance of the benchmark patience parameter is significantly different from those that rely on weakly incentivized payoff mechanisms. Table 1 reports the p-value for Levene's variance equality test. We find that the variance of *Benchmark CTB* is not significantly different from the variance of patience elicited by the other payoff mechanisms. The p-values for the nonparametric Kolmogorov–Smirnov (KS) suggest that we cannot reject the null of equality for each combination of *Benchmark CTB*, *CTB Lottery*, and *CTB Hypothetical Low*. However, the KS test does reject the null hypothesis for the *CTB Hypothetical High* payoff mechanism. These results indicate that the CTB method can be adopted with fewer or arguably no respondents actually paid for their choices. Since the *CTB Hypothetical High* payoff mechanism generates patience estimates that differ systematically from the *Benchmark CTB*, we exclude these observations from all subsequent analyses and pool the estimates based on the remaining three payoff mechanisms.

4. Patience and public opinion about dynamic policy problems

4.1 Patience and delayed investment

We validate the CTB measure of patience in a delayed investment problem in which we inform respondents that the water pipe system in their region needs upgrades and repairs to secure the supply of fresh water to households.[10] The survey item instructs respondents that engineers have approved two repair plans that will solve the problem but differ in their timing of household payments. One plan has constant payments over five years. The other plan starts with lower payments and ends with higher ones (Appendix G shows the exact schedules and question wording). When discounting the future payments as part of computing the net present costs

[9]Appendix F reveals that our individual-level and aggregate-level estimates for *Benchmark CTB* are quite comparable to the laboratory results in Andreoni *et al.* (2015).

[10]The order in which this part of the survey, the CTB module, and other time preference items were placed rotated randomly across different respondents. There was no evidence of order effects in the results.

Table 2. Patience and support for constant investment schedules (waterpipe problem)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Patience CTB (trimmed)	1.191**	1.029*						
	(0.534)	(0.555)						
Patience CTB (trimmed): high			0.067***	0.053***				
			(0.017)	(0.018)				
Patience stated					0.015***	0.012***		
					(0.002)	(0.003)		
Patience stated: high							0.081***	0.052***
							(0.013)	(0.014)
Sociodemographics		Yes		Yes		Yes		Yes
Observations	2543	2278	2543	2278	4075	3605	4075	3605

Note: This table reports linear regression coefficients in which support for the constant investment plan is regressed on patience measures and sociodemographic variables. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Sociodemographic covariates: age: 35–49, age: 50–64, age: 65+, education: high school, education: some college, education: BA or higher, income: lower middle, income: upper middle, income: high, gender: female, race: white.

for each of the plans, the relative attractiveness of the constant payment option increases as patience increases. This is because for patient respondents, the higher later payments will entail higher present costs. As a result, the total net present costs for the backloaded plan increase. Thus, if time preferences were the main factor driving the choice over these two investment options, we would expect more patient individuals to be more likely to choose the constant payment option while less patient individuals should select the backloaded plan.

We embedded this item in a survey that we fielded together with YouGov in December 2018 and January 2019 to an online quota sample meant to be representative of the US population (N=4, 075).[11] We constructed the variable *Constant Payment* equal to one if respondents selected "Option 1", i.e., the constant investment plan, in the question above and zero if they selected "Option 2", i.e., the backloaded plan. The survey contained a CTB module using the *Hypothetical Low* approach described above.

We estimate a linear regression of *Constant Payment* on patience (including dichotomized versions of both the CTB and stated-preference measure which were both set equal to 1 if above the median and 0 otherwise) and, in some specifications, sociodemographic control variables. Table 2 reports these results. Columns 1 and 2 report the estimates for the CTB patience measure with and without control variables. It should be noted that the CTB measurement approach generated higher levels of missingness in the waterpipe survey than in the CTB study discussed above. We obtain a significantly positive coefficient for CTB patience in column 1, which is consistent with the hypothesis that more patient respondents are more likely to choose the constant payment option. Adding sociodemographic controls in column 2 attenuates the coefficient on CTB patience somewhat but the estimate remains positive and statistically significant. Columns 3 and 4 show that estimates are also positive and statistically significant using *Patience CTB (trimmed): High*, the dichotomized version of the CTB measure. Having an above-median value on the CTB patience score is correlated with a 5 to 7 percentage point increase in the probability of choosing the constant payment option.

The estimates for the raw and the dichotomous version of the stated-preference measures, which rely on the standard question wording (see Appendix A,) suggest magnitudes that parallel those for the CTB measure (Columns 5-8). Taken together, the results reported in Table 2 are consistent with the common conjecture that heterogeneity in how much individuals value the future accounts for lower than desirable investment levels for long-term projects. These results remain substantively unchanged when estimated on the weighted data (see Appendix

[11]Appendix H describes the sampling methodology and provides descriptive statistics.

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Table 3. Time preference measures and support for public policy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Agree: cut GHG emissions				Agree: invest in new climate technology				Agree: invest in human capital				Agree: cut public spending				Agree: paid maternity leave			
Patience CTB	−0.104				−0.573				−0.913				−1.507				−0.255			
	(1.063)				(1.059)				(1.048)				(1.068)				(1.043)			
Patience CTB: high		−0.017				−0.014				−0.039**				−0.030				−0.030		
		(0.019)				(0.019)				(0.019)				(0.019)				(0.019)		
Patience stated			0.015***				0.013***				0.018***				0.011***				0.008***	
			(0.003)				(0.003)				(0.003)				(0.003)				(0.003)	
Patience stated: high				0.072***				0.064***				0.109***				0.058***				0.035**
				(0.016)				(0.016)				(0.016)				(0.016)				(0.016)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Risk acceptance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2828	2828	4015	4015	2828	2828	4015	4015	2828	2828	4015	4015	2828	2828	4015	4015	2828	2828	4015	4015
R^2	0.018	0.019	0.020	0.020	0.016	0.016	0.020	0.020	0.009	0.011	0.016	0.020	0.008	0.009	0.014	0.014	0.050	0.051	0.044	0.044

Note: Coefficients from linear probability models with robust standard errors clustered by respondent in parentheses. Policy views were converted into indicator variables that are 1 if the level of agreement exceeds 7 on the 1 to 11 answer scale and 0 otherwise. Sociodemographic covariates: age: 35–49, age: 50–64, age: 65+, education: high school, education: some college, education: BA or higher, income: lower middle, income: upper middle, income: high, gender: female, race: white. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.2) and when adding the CTB risk acceptance parameter as a predictor (see Appendix Table A.3).[12]

4.2 Patience and support for future-oriented policy

We now explore mass support for "delayed gratification investments" that are needed to address political marshmallow problems across a range of long-term policy challenges. Our interest is in whether patience is predictive of the willingness to support cutting greenhouse gas emissions to address climate change, investing in new technologies to remove carbon from the air (carbon harvesting), cutting public spending to improve the sustainability of public debt, and investing in human capital to increase economic growth. We expect more patient respondents to be more supportive of such investments. We also analyze the relationship between patience and support for a short-term, placebo policy which would require all firms to offer paid maternity leave for 90 days. Our expectation is that patience should not predict support for paid maternity leave. This analysis utilizes our original survey data conducted in June 2018 and described above and in Appendix E. Appendix J provides the exact question wording for these survey items. To relax functional form assumptions we convert the 11-point disagree–agree scale into an indicator variable that is 1 if the level of agreement exceeds the median (which is 7 for all outcome variables) and is 0 otherwise.

Table 3 reports the results. We find that across a wide range of long-term policy issues, the CTB measure of patience fails to predict policy support. This result also holds when using a dichotomized version of the CTB measure. In contrast, the stated-preference patience measure predicts agreement across a range of long-term policies. To probe the ability of the patience measures to discriminate between more long-term and less long-term policies, we also measured support for paid maternity leave for which the intertemporal dimension is considerably less pronounced than for policy challenges such as climate changes. We find that the stated-preference measure is also predictive of support for paid maternity leave.[13] The findings are robust across alternative specifications (see Appendix Tables A.4, A.5, A.6, and A.7). Moreover, the patterns replicate in a follow-up study (see Appendix I and J) that featured the original policy view items with revised answer scales and an alternative placebo outcome (promoting gender equality in the military, see Table A.8) along with a set of alternative policy items that relied on different question wording and answer options (Table A.9).

5. Discussion

The question of whether public opinion about long-term policies depends on time discounting is complicated by measures that conflate time and risk attitudes and may be prone to social desirability bias. We show that affordable versions of the theoretically appealing CTB method to elicit individual-level time preferences are feasible in mass surveys, and that alternative payoff mechanisms relying on either lottery or hypothetical versions of the original instrument produce valid estimates compared to the costly benchmark incentivization. We validate the CTB measures in a simplified delayed investment problem where those who are more patient prefer a sequencing of costs that avoids high future payments. We find little evidence, however, that time horizons correlate with mass preferences over more complex, future-oriented policies. In contrast, the

[12]Appendix I reports additional results on the waterpipe problem that are based on an online, non-probability quota sample of Americans. Appendix I also provides details about the sample and sampling approach used for this additional study.

[13]In a follow-up survey we also find that the stated-preference measure is predictive of whether one would like policymakers to do more to promote gender equality in the military, which is another placebo policy that lacks a strong intertemporal component.

widely used stated-preference patience measure predicts support for all policies and placebo outcomes which could be due to social desirability bias.

Taken together, we believe that there is a reasonable case for considering the CTB approach for measuring time preferences in large surveys. However, important caveats should be kept in mind and improved upon in future research. Implementing the CTB method still causes significant costs because it requires a lot of survey time and generates missing observations. Future research could try omitting the present bias parameter from the estimation, decreasing the number of questions needed for producing patience parameters, or minimizing the number of respondents who do not switch between sooner and later payments by altering the payoff combinations or the length of time between payments.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/psrm.2023.10. To obtain replication material for this article, https://doi.org/10.7910/DVN/9CQZBD.

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