

Summary of Paying Not to Go to the Gym
Stefano Della Vigna and Ulrike Malmendier (2006)

Research question

- How do consumers choose from a menu of contracts: monthly contract, annual contract, pay per visit?
- Why should this matter?
 - Theoretical problems: Consumers are usually assumed to have rational expectations about their future consumption frequency and choose the utility-maximizing contract.
 - Real world implication: should companies subsidize their employees' enrollment in health clubs given the low average attendance of members?

Data

- Data from three U.S. health clubs with information on 1) contractual choice 2) attendance
 - Contractual menu
 - ✧ Monthly contract: monthly fee is automatically withdrawn until the user cancels (in person or by sending a written note)
 - ✧ Annual contract: at the end of the year contract expires and members who wish to enroll have to sign up again. The club sends out reminder card a month before the contract expires
 - ✧ Pay-per-visit: pay \$12 per visit or purchase 10-visit pass for \$100. Attendance for this kind of users is not tracked
- 7,752 members over 3 years
- Companies located near the health clubs subsidize their employees' attendance → The record of attendance is probably precise because health clubs inform companies periodically about the number of employees enrolled and their attendance so they have incentive to accurately or over-record them.

Contract choice at enrollment

- Predictions of the Standard Model (derivation is in the working paper version)
 - Assumption
 - ✧ health club attendance requires immediate effort costs and delayed health benefits
 - ✧ effort costs are uncertain ex ante. It can be high or low. Individuals differ in the ex ante probability that costs will be high.

- Predictions
 - ✧ Prediction 1: payment per expected visit under the flat-rate contract(monthly contract or annual contract) should be smaller than the per-visit fee
 - ✧ Prediction 2: average initial attendance of annual members is higher than that of monthly members
 - Consumers who anticipate a high probability of being high-cost types (i.e. exercise less often) prefer the monthly contracts for its flexibility.
 - Consumers who believe they will be low-cost types (i.e. exercise more often) prefer the annual contracts
 - ✧ Prediction 3: average forecast of attendance equals the average actual attendance
- Empirical Analysis
 - Prediction 1
 - ✧ Monthly VS pay-per-visit
 - Method: Limit the analysis to the first six months to the first six months of tenure to target inexperienced users. Use the sample “no subsidy” to ensure comparability to standard health clubs with no corporate subsidy
 - Results
 - (Table 3) Average price per attendance(\$17.27) is higher than the price of pay-per-visit(\$10 or \$12). → prediction 1 does NOT hold
 - (Table 4) Only 20% of individuals pay less than \$10 per visit. 80% would have saved money choosing the pay-per-visit contract.
 - ✧ Annual VS pay-per-visit
 - Method: Restrict the analysis to users who joined the club at least 14 months before the end of the sample period to be able to observe the annual contract in its entirety. Use “no subsidy” sample
 - Results
 - (Table 3) Average price per attendance (\$15.22) is higher than the price of pay-per-visit(\$10 or \$12) → prediction 1 does NOT hold
 - (Table 4) Only 24% of individuals pay less than \$10 per visit.
 - Prediction 2
 - ✧ Method: Compare the average number of visits in months 2, 3, and 4 of users under monthly VS annual contract, excluding the first month because some procedures are different for the annual and monthly contract and months after the fourth because users with high cost can quit under the monthly contract but not under annual contract.

TABLE 3—PRICE PER AVERAGE ATTENDANCE AT ENROLLMENT

Sample: No subsidy, all clubs			
	Average price per month (1)	Average attendance per month (2)	Average price per average attendance (3)
Users initially enrolled with a monthly contract			
Month 1	55.23 (0.80) <i>N</i> = 829	3.45 (0.13) <i>N</i> = 829	16.01 (0.66) <i>N</i> = 829
Month 2	80.65 (0.45) <i>N</i> = 758	5.46 (0.19) <i>N</i> = 758	14.76 (0.52) <i>N</i> = 758
Month 3	70.18 (1.05) <i>N</i> = 753	4.89 (0.18) <i>N</i> = 753	14.34 (0.58) <i>N</i> = 753
Month 4	81.79 (0.26) <i>N</i> = 728	4.57 (0.19) <i>N</i> = 728	17.89 (0.75) <i>N</i> = 728
Month 5	81.93 (0.25) <i>N</i> = 701	4.42 (0.19) <i>N</i> = 701	18.53 (0.80) <i>N</i> = 701
Month 6	81.94 (0.29) <i>N</i> = 607	4.32 (0.19) <i>N</i> = 607	18.95 (0.84) <i>N</i> = 607
Months 1 to 6	75.26 (0.27) <i>N</i> = 866	4.36 (0.14) <i>N</i> = 866	17.27 (0.54) <i>N</i> = 866
Users initially enrolled with an annual contract, who joined at least 14 months before the end of sample period			
Year 1	66.32 (0.37) <i>N</i> = 145	4.36 (0.36) <i>N</i> = 145	15.22 (1.25) <i>N</i> = 145

TABLE 4—DISTRIBUTION OF ATTENDANCE AND PRICE PER ATTENDANCE AT ENROLLMENT

Sample: No subsidy, all clubs				
	First contract monthly, months 1–6 (monthly fee \geq \$70)		First contract annual, year 1 (annual fee \geq \$700)	
	Average attendance per month (1)	Price per attendance (2)	Average attendance per month (3)	Price per attendance (4)
Distribution of measures				
10th percentile	0.24	7.73	0.20	5.98
20th percentile	0.80	10.18	0.80	8.81
25th percentile	1.19	11.48	1.08	11.27
Median	3.50	21.89	3.46	19.63
75th percentile	6.50	63.75	6.08	63.06
90th percentile	9.72	121.73	10.86	113.85
95th percentile	11.78	201.10	13.16	294.51
	<i>N</i> = 866	<i>N</i> = 866	<i>N</i> = 145	<i>N</i> = 145

TABLE 5—AVERAGE ATTENDANCE IN MONTHLY AND ANNUAL CONTRACTS
(*Sorting*)

	Average attendance during the n -th month since enrollment		
	Sample: All clubs		
	Month 2	Month 3	Month 4
Monthly contract	5.507 (0.0668) $N = 6219$	5.005 (0.0696) $N = 5693$	4.614 (0.0709) $N = 5225$
Annual contract	5.805 (0.1885) $N = 862$	5.629 (0.1934) $N = 841$	5.193 (0.1913) $N = 817$

✧ Result

- (Table 5) average attendance of users under monthly contract is 10% lower than that of annual contract → consistent with prediction 2

➤ Prediction 3

- ✧ Method: surveying 48 randomly chosen health club members in a mall. (The mall is not near the health club, so the respondents are not selected on health club attendance.) Asking 1) how often they expect to visit their health club in the next month, and 2) if they expect to attend on average five times/month, would they choose a monthly contract with \$70 per month (\$14 per visit) on ten-visit passes for \$100 (\$10 per visit)

✧ Result

- The average forecasted number of visits (9.50 times/month) is twice as large as average attendance (4.17 times/month) → inconsistent with prediction 3
- For question 2), 18 consumers prefer monthly contract while 30 prefer ten-visit passes
- Caution: the survey sample differs from health club sample

Contract choice over time

Interpretation

Conclusion

- Consumers who choose a monthly contract are 17% more likely to stay enrolled beyond 1 year than users who choose annual contract

Contract Choice over Time:

- concerning renewal decisions of monthly and annual members. Monthly contract is automatically renewed and requires a small effort to discontinue the membership. Annual contract automatically expires after 12 months. → What are the impacts of these differences on 1) cancellation lag 2) survival probabilities 3) average attendance?
- **Cancellation lag**
 - Prediction 4: Low attenders under the monthly contract delay cancellation for at most a few days.
 - ✧ Intuition: monthly members who have low expected attendance would switch immediately to pay-per-visit.
 - Finding 4: monthly members delayed cancellation by, on average, 2.31 months. The lag is at least 4 months for 20% of the users.
- **Survival probabilities**=the percentage of monthly/annual members still enrolled one year after the initial enrollment=the share of members still enrolled in a flat-rate contract at the 15th month
 - Prediction 5: Users who selected annual contract are more likely to be frequent users so they are more likely to renew the contract. However, because there is transaction cost associating with monthly contract cancellation, the survival probability of monthly members may increase. Nevertheless, here we assume that the effect of cancellation costs is very small (or less than \$70). Therefore, the initial sorting effect should dominate and annual members should have higher survival probability than monthly members.
 - Finding 5: (Table 6) The survival probability of monthly members is 17% higher than that of annual members.
 - ✧ Estimate survival s_i ($s_i = 1$ if individual i enrolled in the 15th month, i.e. survived and 0 otherwise) using the following equation:

$$s_i = 1 \text{ if } s_i^* = \alpha + \gamma M_i + \beta X_i + \varepsilon_i \geq 0$$

When, M_i is dummy variable for individuals with monthly contract ($M_i = 1$ if the first contract for individual is a monthly contract, and 0 otherwise);
 X are control variables
 - ✧ Regression results: γ is positive → users who originally enrolled in monthly contract were more likely to be enrolling in the 15th month
- **Average attendance** over time for...

- Annual contract
 - ✧ Prediction 6: After a year, users who expect low attendance switch to pay-per-visit. As a result, expected attendance in the second year is higher than that in the first year.
 - ✧ Finding 6: (Table 7) Average attendance in the second year (4.36) is significantly higher than that of the first year (5.98)
- Monthly contract
 - ✧ Prediction 7: After a month, users who expect low attendance switch to pay-per-visit. Therefore, the expected attendance should increase from month to month.
 - ✧ Finding 7: (Table 7) Average monthly attendance in the first six months is 20% higher than in the next six months and so on. Average attendance among survivors decreases over time. → opposite of annual contract

Interpretations of findings

● Enriched versions of the standard model

- Risk aversion
 - ✧ If assume additively separable (in income and health club net benefits) utility function, risk averse users may prefer flat-rate to pay-per-visit to minimize the variance of payments.
- Transaction costs
 - ✧ Users may choose flat-rate contract because they do not want to fill out the form every time they visit and fail to cancel the monthly contract because of transaction costs.
 - ✧ However, this argument is not valid because the actual transaction cost involves filling a simple form for 10-visit pass but the cost should be over \$70(the monthly contract price) to make users choose flat-rate contract.

● Nonstandard preferences and beliefs

- Membership benefits
 - ✧ A user may prefer flat-rate contract because of the image motivation that associates with being health-club member.
 - ✧ Therefore, annual contract should provide more membership utility as it signals stronger commitment. However, the survival probability of annual contract is lower than that of monthly contract (Finding 5)
- Time-variation in preferences
 - ✧ If people enroll whenever they are enthusiastic about exercise, when they

become less enthusiastic, they might not go to the gym that much (Finding 7) but still have some degree of enthusiasm to not cancel the contract (Finding 4).

- ✧ However, mean reversion cannot explain Finding 1, 5, and 6.
- Limited memory
 - ✧ Agents with limited memory may forget to cancel their membership promptly after they stop attending. As a result, low attenders under monthly contract delay cancellation (Finding 4) making the attendance of monthly users not higher month to month (Finding 6). On the other hand, annual contract expires after a year, so users with low attendance do not have to remember cancelling it, making the attendance higher in the second year (Finding 7).
 - ✧ However, rational consumers should be able to anticipate their future limited memory and be wary of the monthly contract, but instead 90% of flat-rate contract users are under monthly contract.
- Time inconsistency with sophistication
 - ✧ Exercising → Consumers expect themselves to have future self-control problems so they choose flat-rate contract as a commitment device. (Finding 1)
 - ✧ Cancellation → However, delays according to time inconsistency with sophistication theory is only about 0 to 15 days. (See Figure 3A) The probability that delay is longer than 4 months is also 0, inconsistent with Finding 4.
- Time inconsistency with partial naivete
 - ✧ Exercising → Users are overconfident about their self-control. Consequently, they overestimate their future attendance (Finding 3) and choose flat-rate contract (Finding 1)
 - ✧ Cancellation → The delays computed using $\beta = 0.7$ for naïve agents matches the delay observed in the data. The probability that the delays lasted more than 4 months are 20% (Finding 4) (See Figure 3A, 3B)

Notes

- The results are insensitive to any $\mu \in [10, 30]$ and $\sigma^2 \in [1, 49]$
- However, when $\sigma > 4$, the calibrations of the naïve model do not match the data.
- Overestimation of net benefits
 - ✧ People overestimate their future benefits of attendance and underestimate future costs so they signed up for flat-rate contract.
 - ✧ However, this does not explain higher survival for the monthly than for the annual contract.

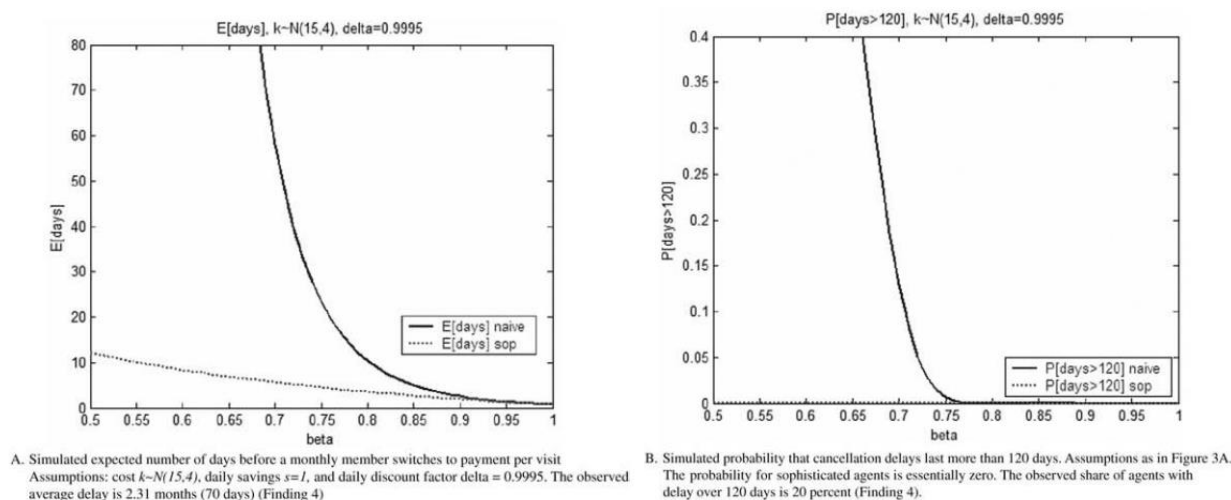


FIGURE 3. CALIBRATION OF EXPECTED DELAY IN CANCELLATION

➤ Persuasion

- ✧ Consumers may choose flat-rate contract because health-club employees persuade them to do so by 1) not providing sufficient information about pay-per-visit or 2) urging people to choose flat-rate contract
- ✧ Tested 1) empirically and found that it is not the case.
- ✧ However, persuasion does not explain why people overestimate their attendance (Finding 3) and if health club employees do persuade people to be in flat-rate contract, the survival rate of both monthly and annual contract should be the same.

Conclusion

- Leading explanation for the findings is time inconsistency with partial naivete, i.e. overestimation of future self-control/efficiency.
- Health clubs can observe the pattern of consumer behavior to maximize profit.
- (?) From this paper we could observe (β, δ) preferences. Does preference become time-consistent when the future benefit is explicit (e.g. monetary reward VS health benefits)?

TABLE 6—PROBIT OF RENEWAL DECISION

Sample	Non-missing controls, all clubs						No subsidy, all		No subsidy II, all	
	Enrollment at 15th month		Enrollment at 16th month		Enrollment at 27th month		Enrollment at 15th month		Enrollment at 15th month	
	No controls (1)	Controls + time dummies (2)	No controls (3)	Controls + time dummies (4)	No controls (5)	Controls + time dummies (6)	No controls (7)	Controls + time dummies (8)	No controls (9)	Controls + time dummies (10)
Controls										
Dummy for enrollment with monthly contract	0.0483 (0.0218)**	0.066 (0.0221)***	0.0337 (0.0221)	0.0546 (0.0224)**	0.0011 (0.0260)	0.0271 (0.0254)	0.0634 (0.0479)	0.0694 (0.0501)	0.091 (0.0368)**	0.1019 (0.0372)***
Female		-0.0438 (0.0143)***		-0.0425 (0.0144)***		-0.0762 (0.0165)***		-0.0187 (0.0394)		-0.0186 (0.0277)
Age		0.0133 (0.0046)***		0.0155 (0.0046)***		0.0228 (0.0052)***		0.0304 (0.0111)***		0.0229 (0.0077)***
Age squared		-0.0001 (0.0001)**		-0.0002 (0.0001)**		-0.0002 (0.0001)***		-0.0003 (0.0001)**		-0.0003 (0.0001)***
Corporate member		0.0728 (0.0144)***		0.0676 (0.0145)***		0.0676 (0.0167)***		0.234 (0.0471)***		0.0024 (0.0319)
Student member		-0.1123 (0.0503)**		-0.0924 (0.0519)*		-0.0894 (0.0567)		0.1966 (0.2669)		-0.1173 (0.0666)*
Month and year of enrollment		X		X		X		X		X
Baseline renewal probability for annual contract	0.3983	0.4017	0.3906	0.3932	0.2609	0.2589	0.4701	0.5537	0.4252	0.4347
Number of observations	N = 4,962	N = 4,962	N = 4,833	N = 4,833	N = 2,860	N = 2,860	N = 715	N = 715	N = 1,384	N = 1,384

TABLE 7—ATTENDANCE AND PRICE PER AVERAGE ATTENDANCE OVER TIME

	Sample: No subsidy, all clubs			Sample: All clubs		
	Average price per month (1)	Average attendance per month (2)	Average price per average attendance (3)	Average price per month (4)	Average attendance per month (5)	Average price per average attendance (6)
Users initially enrolled with a monthly contract						
Months 1–6	75.26 (0.27) N = 866	4.36 (0.14) N = 866	17.27 (0.54) N = 866	44.77 (0.23) N = 6,875	4.33 (0.05) N = 6,875	10.35 (0.13) N = 6,875
Months 7–12	81.89 (0.26) N = 577	3.63 (0.17) N = 577	22.56 (1.07) N = 577	52.81 (0.31) N = 3,867	3.91 (0.07) N = 3,867	13.50 (0.26) N = 3,867
Months 13–18	81.27 (0.34) N = 331	3.89 (0.23) N = 331	20.88 (1.26) N = 331	52.99 (0.41) N = 2,131	4.41 (0.10) N = 2,131	12.03 (0.29) N = 2,131
Months 19–24	81.82 (0.37) N = 189	3.97 (0.31) N = 189	20.59 (1.62) N = 189	53.95 (0.59) N = 1,130	4.45 (0.14) N = 1,130	12.12 (0.39) N = 1,130
Users initially enrolled with an annual contract						
Year 1	66.32 (0.37) N = 145	4.36 (0.36) N = 145	15.22 (1.25) N = 145	44.16 (0.69) N = 598	4.19 (0.16) N = 598	10.55 (0.45) N = 598
Year 2	67.70 (1.07) N = 35	5.98 (0.87) N = 35	11.32 (1.67) N = 35	46.72 (1.68) N = 108	5.82 (0.45) N = 108	8.02 (0.68) N = 108