

Goal Setting and Gym Attendance: A Field Experiment

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Abstract

We conduct a field experiment with a large, non-student gym, with members who want to go more often to the gym. The desired attendance goal is elicited in a survey prior to treatment revelation. There are two treatments: one with psychological cost, and one with psychological and potential monetary cost – a deposit contract. Treatment-takers were asked to set a weekly visit goal. We report four findings. More women than men express a desire for help, which is consistent with male overconfidence. We find a low take-up of the deposit contract, in line with other studies on commitment devices. Treatment-takers in both treatments set a lower goal for evaluation compared to the goal stated in the survey. Subjects with a shorter time horizon are less likely to take up treatment. The findings are consistent in a model of goal setting with present-biases and loss aversion.

Keywords: goal setting, nudges, field experiment.

JEL classification: D03, D9, I1

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Introduction

The ability to set goals is a distinctive feature of human behavior (Locke and Latham, 1990; 2004). When asked whether people are planning to put aside money for savings in the next twelve months, 80.9% of the Dutch population answers either “yes, certainly” or “yes, perhaps” (unweighed average, Dutch Household Survey of 2009). However, 16.2% of these people have not saved in the previous year (13.1% of all respondents). There appears to be a discrepancy between the setting of a goal and meeting a goal. One question is whether respondents in surveys state real, feasible goals or ideal, unattainable ones. In order to distinguish between these two possibilities, we would need to know the goals when people have to act upon them.

In this paper we provide evidence on how people set goals in the context of health behavior. We conduct a field experiment with a large, non-student gym in the Netherlands. We elicit attendance goals in a survey prior to treatment assignment. There are two treatments. In one treatment subjects set a goal of how many times a week they want to attend the gym. We asked them to walk by the frontdesk and say goodbye every time they attend the gym. In the second treatment we asked subjects to set a goal, deposit an amount of money at the gym, and walk by the frontdesk to say goodbye. In this deposit treatment subjects could earn money back out of their deposit for each week they met their attendance goal. With these two treatments we want to investigate how subjects set a goal – and subsequently realize their goal – when the incentives to meet the goal differ. Since we randomized subjects over the goodbye-treatment and the deposit-treatment, we have control over the intensity of incentives offered.

The main result is that in both treatments there is goal-shading. Conditional on taking up the treatment, subjects set a lower goal than they state in the survey prior to revealing the assigned treatment. This is not surprising in the high-cost deposit treatment, but is in the low-cost goodbye-treatment. This is consistent with a model of loss-aversion, in which the setting of a goal is a meaningful self-regulation device, but where there are psychological costs of failing to meet the goal (Koch and Nafziger, 2011). The second finding is that

there appears to be crowding out of goal realization. If the higher goal as stated in the survey is the true goal, then subjects do not meet this goal, but do meet the lower goal as set upon take-up. Overall attendance in the high-cost group increases during treatment, but not to the level of the preferred goal. And in any case, there are no lasting effects after the treatment is finished.

As far as we know, this paper is the first to show how people set goals and act upon them in a field experiment. A distinguishing feature of this study is the use of a non-student gym in the upper segment of the gym industry (e.g. mean age is 43.6, unlimited access is around 700 Euros for a year). Our subject pool is small, but is composed of people that already exercise regularly, but want to increase their gym attendance. Though for policy implications this is maybe not the most interesting group – since they already are going to the gym– this is a group experienced with exercising and goal setting in this specific health domain. A weaker point is that the take-up in the high-cost group is low, but we hope to show that this is not special for this type of treatment, nor for our question of interest. A policy implication from our results is that nudges and goal-setting are related, but that goal-setting in itself involves more strategic within-person behavior. This could be relevant for the design of commitment contracts, but also explain why the take-up of commitment devices is low.

This paper proceeds as follows. The next section relates this study to the literature on field experiments with gyms, goal setting and commitment devices. Then the details of the field experiment are shown, followed by the results. The paper ends with a discussion and conclusions.

Goal Setting, Gyms and Commitment Devices

The main model to explain time inconsistency is hyperbolic discounting (Strotz, 1956; Laibson, 1997; O’Donoghue and Rabin, 1999; and for an overview see Frederick et al., 2002). In this model people with a present bias are either naive, or sophisticated. The

naive people are not aware of their time-inconsistency, the sophisticated are, and they are the ones who want a commitment device to bind their future selves to desired behavior (Elster, 1979; and see Bryan et al., 2010, for an overview on studies of commitment devices).

Koch and Nafziger (2011) study the question whether goal setting by individuals can be a meaningful device for self-regulation. People in this model need to have some form of time inconsistency, and are aware of it (sophisticates), coupled with loss-aversion. The utility function consists of two subutility functions: instrumental utility – the utility of obtaining an outcome– and psychological utility – the utility gain associated with reaching a goal. The main result is that people set painful goals if the gain in instrumental utility is large, but also for small gains if the present bias is not too strong. In the case of smaller instrumental gains, people trade-off the expected loss of falling short of the goal with having no goal at all. For people with too large a present bias, goal setting does not work as a self-regulation device. The reason is that the goal that needs to be set in order to motivate the person is too large, and therefore the expected loss of falling short is not outweighed by the benefits. In our experiment we do not observe the instrumental utility gain of more frequent gym attendance, nor the parameters of present bias or loss aversion. However, we can infer from the fact that our subjects responded to our recruitment campaign that self-regulation was not feasible. If self-regulation would have been feasible, then there was no need to sign up for an experiment. Koch and Nafziger’s model however helps to interpret our findings on take-up of the treatment and subsequent goal setting.

Our study fits in a larger body of work on gym attendance. DellaVigna and Malmendier (2006) show with administrative data that gym members would have been better off if they had chosen a pay-per-visit contract, instead of an annual contract. They argue that gym members on average are partially naive: they are aware of their time-inconsistency, use annual membership contracts as a commitment device, but still overestimate the help of it. Three recent field experiments on commitment contracts in the gym are Goldhaber-Fiebert et al. (2010), Ackland and Levy (2011), and Royer et al. (2012). None of these studies explicitly takes into account the preferred goal of subjects. Our contribution is

that there is a gap between outcomes and desired goal, and that the the incentives in both are changed by the treatments offered. Charness and Gneezy (2009) have two treatments in which they pay students to attend the gym. They find the largest treatment effect on students that never went to the gym before, and the effect also lasts after the incentives are removed.

Other studies with commitment devices are: Benartzi and Thaler (2004), Ashraf et al. (2006), Beshears et al. (2011) in the context of saving; Giné et al. (2010) in quitting smoking; Volpp et al. (2008) in loosing weight; and Chow and Ackland (2011) in online gaming. In the literature on retirement savings and wealth accumulation the importance of planning was realized earlier, see e.g. Ameriks et al. (2003). In a lab experiment Bone et al. (2009) find that about half of the subjects do not plan. We show how offering a commitment device affects goal setting in a field experiment.

Design Field Experiment

We cooperate with a large non-student gym in The Netherlands (over 4,000 members). On January 15, 2010 we advertised with posters in the gym on the gym’s website with the following line: ”Would you like to go more often to the gym? But is not happening?”. See appendix for the details of the recruitment. The gym also sent an e-mail to all the members for which it had an e-mail address (around a third of the members). All three messages contain the same information: we are recruiting gym members, who want to exercise once a week or more, and who could use some support. We promised to pay a show-up fee of 25 Euros. We did not mention anything about the content of the treatments, or that the study was an experiment—it was framed as “research” and we mentioned the involvement of university researchers. Interested members registered at the frontdesk of the gym. Figure 1 gives an overview of the flow of participants. There were 104 members who registered at the frontdesk of the gym. We dropped 3 persons, one minor and two because of unavailability in the treatment period. For all members we have their age,

gender and data from the administration of the gym - as well as membership details and historical attendance. We invited 101 subjects for a survey. After completing the survey the instructions for the treatments were handed out. The survey contains questions on demographics, exercising behavior, financial circumstances and two tests on self-control see appendix for the wording of the questions. Instructors in the gym took body measures of the participants - weight, height, body fat percentage (a feature of the scale), hip size and pulse. Participants who completed the questionnaire received 15 Euros as a show-up fee at handing in the questionnaire. The remaining 10 Euros was paid out at the second session of body measuring, after the experiment. 75 people filled out the questionnaire. We have two treatments, which we label high-cost and low-cost. The ratio with which we randomized over these two groups is 7 : 3. We randomized on gender and age, and this was done before the survey was handed out. The subjects first filled out the questionnaire and learned after completing about their treatment assignment. Since subject know they participate in a research project, this is a framed field experiment in the classification of Harrison and List (2004).

The subjects assigned to the high-cost treatment receive an offer to participate in a “deposit treatment”. The participant sets a goal of weekly gym visits for the next twelve weeks. This is a number between one and seven. Subjects were told that this goal would be registered in the administration of the gym. Apart from the membership fee, the subject pays an additional 180 Euros to the gym as a deposit. This is about 45 Euros more than the average price paid for a membership fee for 12 weeks. For each week the participant meets her goal, she receives 15 Euros in cash out of this deposit at the end of the week. If the participant does not meet her goal, the 15 Euros of that week is lost. Participants were told that this money was foregone, without being explicit what would happen to the money. When asked, gym staff members would say that the money would be used for administrative purposes. The gym deliberately did not want to have the money. We thought of giving it to a charity, but this would mix up the incentives. In the end the forfeited deposit money of the treatment takers (in total 160 Euros) was not at all sufficient to cover even the show-up fee.

The time period of the experiment is twelve weeks, so a subject in the high-cost group could recoup the entire deposit if she meets her goal for twelve weeks. The gym has provisions in cases of illness or vacation. Certain types of membership contracts could freeze their contract in those instances. We followed the gym policy - if a participant in the treatment group would go for a vacation or called in sick, those weeks would not count for the deposit. We added the missing weeks to the end, so that there is in total twelve weeks of treatment. This was all communicated in the instructions, see appendix .

These features make the high-cost treatment a commitment device. This contract is only attractive to sophisticate hyperbolic discounters. People with exponential discounting are not interested and naïves are not aware of their self-control problem. It is a commitment device because a self at time 0 wants to bind future selves by committing to a goal and subsequent visiting behavior. Conditional on take-up the decision each week is to go to the gym and collect the money, or forfeit part of the deposit. Increasing the costs this week is supposed to outweigh the benefits of procrastinating a week. This effect is larger if people are loss-averse on top of that. Gruber and Köszegi were among the first to suggest a bond as a self-commitment device (2001).

We asked the people in the low-cost treatment to set a weekly visit goal as well. The instruction to the subjects in this group is to walk past the frontdesk after each time they exercised, and say goodbye to a staff member. The high-cost and the low-cost treatment have the personal interaction effect in common. We can estimate the effect of the deposit treatment if the deposit effect and the personal interaction effect are linear and separable. We have no proper control group.

We had three reasons in mind for this particular design. We chose twelve weeks, because we were interested to see if there are habit formation effects. Charness and Gneezy (2009) find habit formation effects after four weeks of treatment, but only for those subjects that previously never attended the gym. Given that we our subjects are already regularly going, we thought that a longer time period was needed. The second consideration is the choice of the weekly amount in the deposit group. This needed to be large enough to provide a *weekly* incentive (Gneezy et al. 2011), but small enough that twelve times this amount was

feasible to pay upfront. We were also concerned that there might be an incentive-effect of seeing a staff member for the participants in the deposit-group when they say goodbye, or collect the deposit money. By asking the subjects in the low-cost group to say goodbye, we effectively made this a second treatment, and we try to hold this interaction effect constant. A nice side-effect is that we also learned about the visiting goal subjects set in this group. Both treatments are in the spirit of nudges (Thaler and Sunstein, 2008). Subjects are free to set their own goal, but are being helped by minor interventions. We are aware attending the gym is not a goal in itself – most subjects have other goals, like losing weight or improving general fitness. We choose for attendance goals since it is easy to implement, easy to monitor and correlated with the other goals.

After filling out the first questionnaire, 7 out of 52 subjects assigned to the high-cost group took up treatment. A take-up rate of 13.5% for the commitment contract is low, but not uncommon in studies in commitment contracts. Ashraf et al. have take-up rate of 24% (2006), Giné et al. find 11% (2010), and Royer et al. have 13% (2012). They set a weekly goal and deposited 180 Euros with the gym. In the low-cost group, 16 out of 23 participants set a weekly goal. After all the participants finished 12 weeks of treatment, we invited all 75 participants who filled out the first questionnaire to come for a second session to take body measures. For the second measuring there were 48 out of 75 participants that showed up. We paid them the second part of the show-up fee of 10 Euros.

Column *A* in Table 2 shows the characteristics of the subjects that completed the survey. Columns *B* and *C* in the same Table show the differences between the subjects assigned to the high-cost treatment and to the low-cost treatment. Table 9 in the appendix shows the decomposition between takers and defiers of both treatments. Overall the randomization between the high-cost and the low-cost group was quite successful. Even though we only randomized on age and gender, the differences on other variables are small. Column (*B* – *C*) of Table 2 shows that the subjects assigned to the low-cost treatment drink somewhat less alcohol, are more happy with life, and have a slightly higher gym attendance in the six months before the experiment. Columns *D*, *E* and *F* in Table 2 is the subset of respondents that we classify as goal-setters. The largest difference between the group of

goal-setters and the others is the expressed desire to exercise more often (which is exercise in general, not only going to the gym). Univariate differences between the subjects assigned to the high-cost and the low-cost group are similar to the differences between these groups overall. Since the gym has a large number of members we also draw a placebo group of 200 people from all non-responding members, with the same average characteristics as the responders' group. The F-statistic of the regression of observable characteristics on a dummy for the placebo-group and all other respondents is 0.97, with a p-value of 0.496; the F-statistic between the placebo-group and the group of goal-setters is 0.93, with a p-value of 0.537. We do not have goals for the placebo-group, but will use it to compare attendance.

Results

We present three sets of results. The first result is that women signed up more than proportional for the experiment. The second set of results is on how our subjects set a goal, and how they perform on different outcome variables. The last set of results tries to control for the self-selection bias in the take-up.

Finding 1: Women are more interested in help

Table 1 shows the characteristics of all the gym members in our gym. The last three columns show the characteristics of members that signed up and the significance of the test on the equality of means. Compared to all other gym members, there are three characteristics of our subject pool that stand out. The members that responded to our recruiting are on average older, mainly female, and are attending the gym already on a regular basis. The last fact is surprising, we have an overrepresentation of regular gym-goers (which is the group for which Charness and Gneezy (2009) do not find a treatment effect). Both the median and the mean of the average number of visits is higher in the months previous to the experiment. This is also clear from the desired attendance goal in the survey. The

mean desired attendance goal in the survey is 2.8 visits a week. Around 64% of the respondents also report doing other sports next to going to the gym, like running, tennis, etc. The impression is that subjects would like to substitute other sport activities with going to the gym, or want to increase their gym attendance from two times a week to three.

The proportion of women that signed-up is very large. It is true that women visit this gym less than men, but this does not explain this high a proportion of women signing up. The mean number of visits in the fall of 2009 of all members is 1.221 for men and 1.099 for women. This is about 11% lower, which less than the 37% more women in our sample. An explanation for this difference in gender could be that men tend to be more prone to overconfidence, and therefore are less likely to express help. Note that our recruitment material explicitly states that "...it is not happening". In the financial domain Barberis and Odean (2001) find that men excessively overtrade with stocks.

Overall this a-typical sample of gym members is probably a good group to study goal setting behavior. Though this is probably not the most important group for policy-makers—since these people are gym-members and gym-goers—they are acquainted with the gym and want to go more often. On the other hand the findings of DellaVigna and Malmendier gym study (2006) are for current gym members.

Finding 2: Goal-shading

We have two measures of goals, one before subjects learned about treatment assignment and one after. Subjects answered a question in the survey on desired gym attendance before they learned to which treatment they were assigned to. The wording of the question is: "How often a month WOULD you like to go to the GYM?" (emphasis also added in the questionnaire). The answers to this question are transformed into a visit goal per week. The second measure we have is the one set after subjects learned to which treatment they were assigned to. For the subjects that took up treatment we have the weekly attendance goal. The goal before treatment assignment is answered by 56 respondents in the survey, and the second goal is stated by 23 subjects who took up treatment. There are 5 subjects

that took up one of the treatments, but did not answer the ex ante goal in the survey. For those subjects the survey goal is imputed with the goal of taking up the treatment, so we have 61 goal-setters in our sample. The distribution of take-up of goal-setters over the two treatments is presented in the bottom row in the flowchart (Figure 1).

Table 3 summarizes the mean goal stated in the survey, the goal set for the subjects that took up treatment and the realization of the goals. The average goal as stated in the survey is 2.81 visits to the gym per week. This is a little higher in the low-cost treatment (3.05) and a little lower for the subjects assigned to the high-cost (2.68). Note that in general these are quite high attendance goals. The goal set by subjects who took up treatment is lower. The goal for the high-cost takers is on average 0.7 times a week lower – 1.86 versus 2.57 stated in the survey. A little bit surprising is that the takers of the low-cost treatment also set a lower goal: 2.50 versus 3.00 as stated in the survey. This is the first finding: conditional on taking up treatment, subjects in both treatments shade their goal.

Of course which goal we use matters to assess whether the goal is met. In Table 3 we present the realization of both goals. We drop the six weeks before the start of the treatment period, since we want to avoid confounding effects of the recruitment period on gym attendance as well as New Year’s resolutions. The treatment period started mid February. The 18 weeks before roughly correspond to the period mid August–December. In the pre-treatment period the survey-goal is met on average once every four weeks. There is not much difference between the high-cost and the low-cost treatment (22% and 24%). Note that we assume that subjects have the same goal on average in the period before treatment, or at least that there are no systematic differences between the two groups before treatment. With the (higher) goal as stated in the survey goal realization goes up during the twelve weeks of the treatment period to 27%, and dips in the twelve weeks following treatment. There are no big differences between the high-cost and the low-cost treatment in realizing the goal from the survey.

When we take a closer look at the differences between subjects that took up treatment and those who declined, we see more variation. For subjects who took up treatment in both

treatments the mean goal realization is higher compared to the treatment defiers, but this could be due to (slightly) lower goal statements in the survey. Even though comparisons of treatment takers and treatment defiers are not proper— due to self-selection— we do not find within group habit formation for the treatment takers. This is in line with other studies that find that treatment effects typically do not last after treatment (e.g. Leslie et al., 2011 in the context of weight loss).

We estimate an intent-to-treatment effect and compare all high-cost subjects with all low-cost subjects. The number of individuals is low, but we have a long time-series available for the individuals. We estimate the following linear probability model:

$$dGoal_{iw} = \alpha_i + \beta_w dTreat_w + \delta_w dAfter_w + \gamma_w dTreat_w \times dHigh_i + \mu_w dAfter_w \times dHigh_i + \tau_w + \epsilon_{iw}. \quad (1)$$

The explanatory variable $dGoal_{iw}$ is a dummy variable whether subject i meets her goal in week w . α_i is an individual fixed effect, $dTreat$ is the treatment period, $dAfter$ is the 12 weeks after the treatment period. The 18 weeks before the treatment is the reference period. Estimates of the effect of the high-cost treatment are on the interaction effects. Controls for the weeks of the year are included (τ_w) and robust standard errors are clustered at the level of the individual. One problem is that we do not observe a goal chosen for the subjects that declined treatment. For the intent-to-treatment effect we need to make assumptions on the goal that subjects would have set if they would have taken up treatment. In Table 3 we make the assumption that defiers of treatment at most set the (higher) goal from the survey. An alternative is to be agnostic about the goal set in case of take-up and estimate a model with sample selection. We do that in section ??.

Table 4 gives the results—logit and OLS estimates without an individual fixed effect have qualitatively similar results. The first two columns use the goal as stated in the survey. Although none of the coefficients is statistically significantly different from zero, assignment to the high-cost treatment group has a positive effect on goal realization. The last two columns use the goal set by the subjects that took up treatment, and the survey goal for the treatment defiers. The coefficient on the interaction term $dTreat \times dHigh$ has a

p-value of 0.116. Assignment to the high-cost group increases the probability of reaching the goal by 7.3%, but this effect disappears after the treatment is over. There are no habit formation effects as found in Charness and Gneezy (2009).

Another outcome variable is the number of visits in a week. Table 5 gives the results. Comparing the high-cost and the low-cost treatment (columns (A) and (B)) shows a positive, but insignificant effect of being assigned to the high-cost treatment. Tobit models and models for count data give qualitatively the same results. In columns (C), (D) and (E) we add the placebo-group to the sample. The placebo group has the same observable characteristics at the time of recruitment as the group that was recruited. In column (D) can be seen that both the high-cost and the low-cost go more often to the gym during the treatment period, this effect vanishes after treatment. In column (E) we see that the only treatment effect is on the high-cost group, though there is an increase in attendance by the low-cost group (although not statistically significant). The differences between the high-cost and the low cost treatments in column (E) is the same as column (B). Inclusion of the placebo-group reveals that there is a positive and significant effect of the treatment on attendance of the high-cost group. However, there also is a treatment effect on the low-cost group. The difference-in-difference effect is large compared to the mean number of visits, but not measured precisely enough to be significant. This is most likely due to the small sample sizes. Of course the underlying assumption for this observation is that the placebo-group does not differ from the experimental group on unobservable characteristics. Another way of looking at this finding is the following. Assume that the total effect of the high-cost treatment can be decomposed as the effect of the low-cost treatment plus another effect. The two treatments have the attention effect in common, since subjects in both treatments walk by the frontdesk to say goodbye. The added effect in the high-cost group can be ascribed to the deposit treatment, this is the monetary effect. If this linear decomposition in two effects is valid, then we can conclude that the combined monetary plus attention effect increases attendance— if we compare the high-cost group to the placebo-group. However, the monetary effect of the deposit treatment cannot be separated

from the attention effect by comparing the high-cost and the low-cost treatment. Another way of stating this is that the low cost treatment of saying goodbye is as effective as the potentially more costly deposit treatment.

Other outcome variables are the body mass index, body fat percentage and self-rated happiness (on a scale from 0 – 10). Although not statistically significant, the low-cost group performs better on body measures than the high-cost group during the treatment.

Finding 3: Less take-up by present-biased

One complicated issue is that for the subjects that decline treatment we only observe the (higher) goal as stated in the survey. The main conclusion from the previous paragraph is that subjects set a lower goal, conditional on taking up *either* treatment. The decision to take-up the treatment and the subsequent goal are clearly related. We now turn to study the take-up decision in more detail (similar to Royer et al., 2012). We again estimate the treatment effect on goal realization and attempt to control for self-selection on observable characteristics.

Table 7 shows for the entire group – not only the subset of goal-setters – the correlation between take-up and observable characteristics. A higher average attendance in the six months before the experiment is associated with lower probability of take-up, although never significant. Being assigned to the high-cost treatment decreases the probability of take-up with 56.9% in the baseline and 61.1% in the specification with all covariates included. The question on the planning horizon is a strong predictor for take-up, but has a different sign than expected. Respondents with a shorter time horizon are less likely to take up treatment. It is interesting that this variable is a strong and significant predictor of take-up. The question is about the time horizon for monetary budgeting, and not necessarily for gym attendance. We take the answers to this question as a proxy for short time horizon/present-bias. Being overweight, having saved money last year (as a proxy for liquidity constraints) or which goal is stated in the survey are all not significant

predictors of take-up. The factor variables created from the psychological questions have the expected sign, but only the factor “chaotic” is significant – an increase of one standard deviation in the factor increases the probability of take-up with 21.8%. The factor mainly associated with the statement “I have a hard time breaking bad habits” (see questionnaire in appendix) is negatively correlated with take-up–this effect disappears in the long specification.

Given that we have many observable characteristics as well as behavioral measures, we can try to model self-selection on observables. We estimate take-up and goal realization simultaneously with a bivariate probit model (Tobit type-2):

$$\begin{aligned} dTakeup &= 1(X'\beta + \mu > 0) \\ dGoal &= 1(Z'\gamma + \epsilon > 0) \end{aligned} \tag{2}$$

The second equation can also be estimated by ordinary least squares, in which case we have the Heckman-type of selection correction. We assume the following structure of the errors:

$$\begin{bmatrix} \mu \\ \epsilon \end{bmatrix} \sim N \begin{bmatrix} 0, & 1 & \rho \\ 0, & \rho & 1 \end{bmatrix}$$

In the take-up decision we include all the covariates from the column (H) in Table 7, except for the mean and standard deviation of visits in the fall. We do not include weekdummies, since the bivariate probit model has computational problems solving. The inclusion of week-dummies does not change the results for the simple probit model and the Heckman-type models. The first column in Table 8 is the simple probit on the dependent variable whether subjects realize the goal that they set for the treatment. Since we do not observe this goal for the treatment defiers, the dependent variable for these subjects is zero. We include all respondents to the survey, not only the subset of goal-setters. Marginal effects are reported in the second column and at the bottom the p-value is reported of the test that all high-cost dummies together are zero. The results from the simple probit show that being assigned to the High-cost treatment has a negative effect on reaching your goal, but there is no significant effect during or after treatment. The third column shows the results of the bivariate probit model of equation (2). The results of the take-up decision

are not reported, but are very similar to the results in column (H) in Table 7. The last two columns report the models with the Heckman selection correction, and the last column includes the long list of covariates in both X and Z in terms of equation (2). The results are quite comparable. After correcting for selection on observables, the probability that subjects assigned to the high-cost treatment realize their goal during treatment is between 23.6% – 31.0%. This effect is highly significant, but does not last after the treatment is over. A few caveats are to be kept in mind. The first is that this conclusion is not necessarily true if there is self-selection on unobservables. The assignment to the High-cost treatment is included in both equations of (2). Assignment to the high-cost treatment can be assumed random in the first equation, but not in the second equation of goal-realization. Second: even if there is higher goal-realization, this is the lower goal set conditional on take-up, not the higher goal stated in the survey. The issue of goal-shading is still present. The effect of the time horizon question is interesting. People who report having a short time horizon are less likely to take-up treatment. However, having a short time horizon is positively associated with reaching your goal in the last selection equation.

Interpretation of the Findings

We use the framework of Koch and Nafziger (2011) to interpret our findings: a low take-up, the positive correlation of time horizon and take-up, and goal-shading. They combine hyperbolic discounting and loss aversion to explain why people set goals as a means of self-regulation. There could be several reasons why people do not take up the treatments. The first reason is that people do not have a time-inconsistency problem. Though we cannot exclude the possibility that some respondents do not experience time-inconsistency problems in gym attendance, we believe on basis of the survey that most of them do. For example, most respondents report wanting to more often and express a higher attendance goal than current behavior. Our recruitment material was deliberately framed to appeal to people that had a desire to go more often to the gym and could use some help. Moreover,

we can conclude by the fact that people signed up that self-regulation was not a feasible strategy.

The findings of low take-up and the positive correlation of take-up and time horizon together fit well in the framework of Koch and Nafziger. People need to be aware of their time-inconsistency in order to search for a commitment device. If some people are partially naive or completely naive, both findings together are explained. Even if everybody is sophisticated, Koch and Nafziger show that there is an important condition for people to set goals: the gain in (instrumental) utility of goal setting needs to be large enough. People in both treatments already go often to the gym, but apparently wish to increase their gym attendance. It is not unreasonable to assume that there are diminishing returns to gym attendance. The utility gain from going twice a week to three times a week is smaller compared to the gain of never-going to going once a week. Given the current gym attendance of our population this could explain why there is lower take-up in both treatments, even though one of them is (almost) costless. Given that goal setting itself is a painful disciplining device, people in both treatments will not set a goal if the utility gain is small.

Koch and Nafziger show that even in the case of small instrumental utility gains there is some scope for goal setting. Here loss-aversion plays a crucial role. People take up treatment and set a goal if the present bias is not too severe. On the one hand the goal needed to induce gym attendance should be not too severe that the loss of not reaching it outweighs the benefits of goal setting. On the other hand the goal required to induce effort need not be so small that opting out of treatment and setting no goal is a better alternative (Koch and Nafziger, 2011, p. 222). This explains why subjects with a longer time horizon are more likely to take up treatment in general. This can also explain the difference in take-up between the two treatments. In the high-cost treatment the potential losses of not reaching a goal are higher. For a subject assigned to the high-cost group there could be two reasons not to take-up in this framework. The goal required in order to make take-up meaningful does not induce a large enough gain in instrumental utility, or the losses associated with not meeting the goal are too high. The first argument is the same

for high-cost and low-cost treatment. The second argument can explain the difference in take-up between the high-cost and the low-cost treatment. The bottom line is that there is a correlation between take-up and goal setting. Subjects are to some extent forward looking and take into account the goal they need to set in order to commit themselves, which feeds back into the decision to take up either treatment. A novel finding is that both the monetary costs and the psychological costs of goal-setting need to be taken into account.

Goal-shading is not a prediction of the model of Koch and Nafziger. In their model there is a unique goal given the shape of the utility function and the parameters of loss aversion and present bias. Our subjects state a higher goal in the survey compared to the goal they set upon take-up. The finding of goal-shading in both the high-cost and the low-cost treatment indicates the importance of models that take into account monetary losses as well as psychological losses, like models of loss aversion.

Conclusion

In a framed field experiment we find that people set lower goals when the outcome is incentivized. A little surprising is that people also set lower goals in the treatment where costs are close to zero. We interpret this as evidence for models of loss-aversion, where there is a utility loss of not reaching targets. We also find the same low take-up rates for our commitment device comparable with other studies. An interesting avenue for further research is that goal setting and take-up of commitment devices are related and appears to be a joint decision process. This is probably not an issue with binary outcomes, e.g. quitting smoking or not. It is an issue in settings like ours where the outcome variable can take more values: subjects want to go more often to the gym. This is an interesting policy question in a more broader context. How should a commitment contract look like for people that want to increase desired behavior? For example, Volpp et al. (2008) find that a deposit contract helps severely overweight people (mean BMI of 34.9) lose weight.

Is a commitment device feasible for people who are less overweight? Another avenue of interesting research could be the issue of strategic goal-setting in intra-personal games is, especially in the context of designing commitment devices.

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Tables and Figures

Figure 1: Flow of study participants

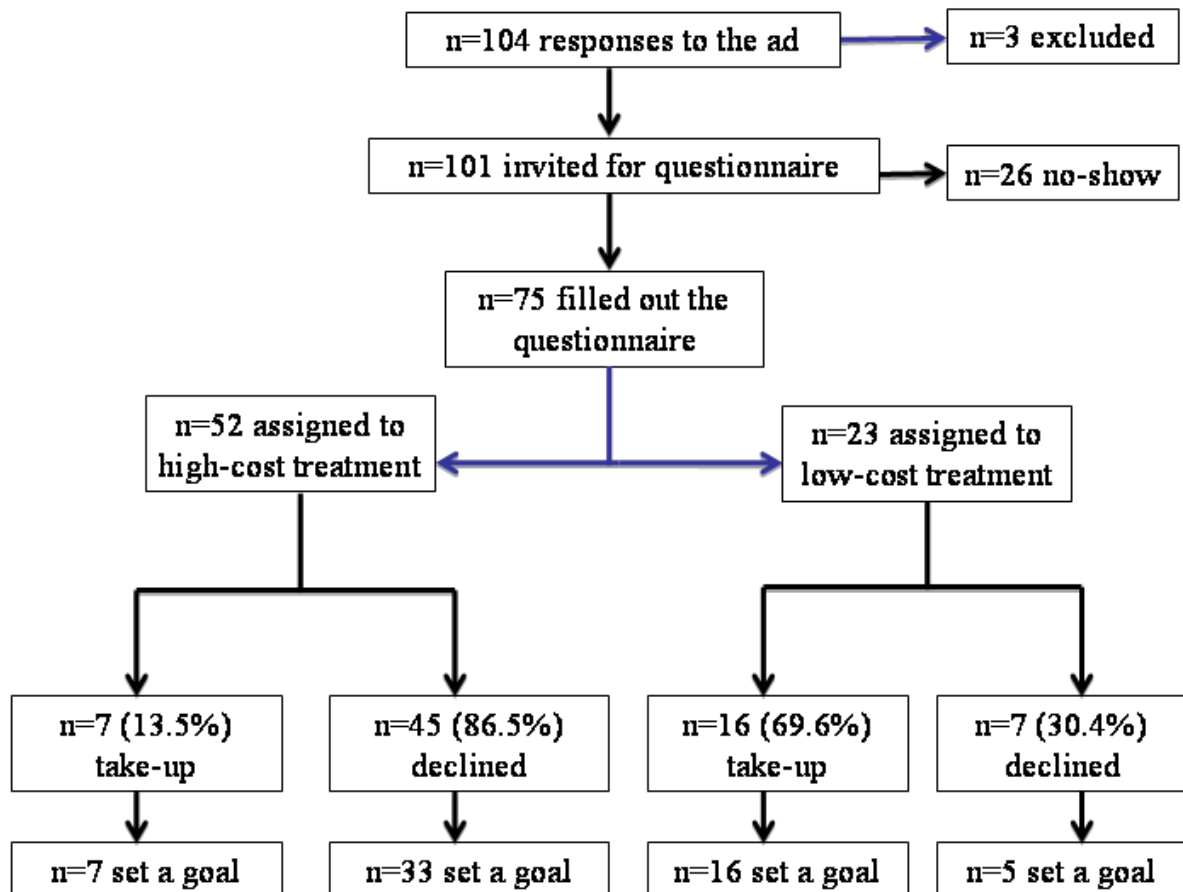


Table 1: Characteristics all gym members

	All				Response	No Response	
	mean	sd	min	max	mean	mean	
Subscription: only fitness	0.341	0.47	0	1	0.340	0.341	
Subscription: only indoor sports	0.148	0.35	0	1	0.184	0.147	
Subscription: fitness and indoor sports	0.330	0.47	0	1	0.350	0.329	
Other subscriptions	0.181	0.39	0	1	0.126	0.183	
Unlimited weekly access	0.841	0.37	0	1	0.874	0.840	
1 year or less visiting	0.326	0.47	0	1	0.311	0.326	
2 years or less visiting	0.256	0.44	0	1	0.320	0.255	
More than 2 years visiting	0.418	0.49	0	1	0.369	0.419	
Female	0.541	0.50	0	1	0.738	0.537	***
Gender missing	0.006	0.07	0	1	0.000	0.006	
Age	43.605	12.28	18	86	46.406	43.512	**
Age 18 – 24	0.046	0.21	0	1	0.029	0.046	
Age 25 – 29	0.056	0.23	0	1	0.087	0.055	
Age 30 – 34	0.071	0.26	0	1	0.068	0.071	
Age 35 – 39	0.104	0.31	0	1	0.117	0.104	
Age 40 – 44	0.131	0.34	0	1	0.107	0.131	
Age 45 – 49	0.119	0.32	0	1	0.136	0.119	
Age 50 – 54	0.098	0.30	0	1	0.214	0.095	***
Age 55 – 59	0.053	0.22	0	1	0.097	0.052	**
Age 60 – 64	0.035	0.18	0	1	0.078	0.034	***
Age 65 and over	0.042	0.20	0	1	0.049	0.041	
Age missing	0.246	0.43	0	1	0.019	0.251	***
Avg. 0 – 1 weekly visits fall 2009	0.507	0.50	0	1	0.340	0.511	***
Avg. 1 – 2 weekly visits fall 2009	0.278	0.45	0	1	0.311	0.277	
Avg. 2 – 3 weekly visits fall 2009	0.115	0.32	0	1	0.184	0.114	**
Avg. > 3 weekly visits fall 2009	0.051	0.22	0	1	0.087	0.050	*
Mean weekly visits spring 2009	1.377	0.97	0	7	1.599	1.371	**
Mean weekly visits fall 2009	1.180	0.92	0	7	1.520	1.172	***
Median weekly visits spring 2009	1.361	1.13	0	7	1.608	1.354	**
Median weekly visits fall 2009	1.116	1.12	0	7	1.468	1.108	***
St. dev. weekly visits spring 2009	0.891	0.37	0	3	0.985	0.888	**
St. dev. weekly visits fall 2009	0.872	0.39	0	3	1.003	0.869	***
<i>N</i>	4,184				103	4,081	

*/**/*** correspond to 10%/5%/1%.

Table 2: Groups on observable characteristics

	All Respondents			Respondents with Goal > 0			Placebo Sample	
	All (A)	HC (B)	LC (C)	All (D)	HC (E)	LC (F)	All (G)	(D - G)
Female	0.65	0.65	0.65	0.67	0.68	0.67	0.73	
Age	47.17	47.37	46.74	46.66	47.33	45.38	45.84	
Signed up after the reminder	0.32	0.29	0.39	0.33	0.30	0.38		
Single	0.34	0.35	0.30	0.38 *	0.41	0.33		
College education or higher	0.58	0.63	0.48	0.58	0.64	0.48		
Paid work	0.74	0.78	0.65	0.77	0.82	0.67		
Disposable income less than 40,000	0.43	0.46	0.37	0.46	0.50	0.39		
Household saved money last year	0.78	0.79	0.77	0.77	0.78	0.75		
Children present in the household	0.34	0.35	0.30	0.32	0.31	0.33		
Good or excellent health	0.87	0.85	0.91	0.85	0.83	0.90		
Smokes	0.09	0.08	0.13	0.10	0.08	0.14		
On average one or more drinks a week	0.75	0.81	0.61	0.77 *	0.85	0.62	**	
Body mass index first measurement	24.78	24.54	25.31	24.76	24.47	25.33		
Body fat percentage first measurement	29.19	28.77	30.13	29.28	28.58	30.62		
Overweight (bmi > 25)	0.47	0.44	0.52	0.46	0.43	0.52		
Planning horizon is a year or less	0.44	0.40	0.52	0.44	0.39	0.53		
Happiness (std.) ^a	0.00	-0.16	0.35	-0.02 **	-0.21	0.37	**	
Sloppiness (std.) ^a	0.00	0.01	-0.02	0.02	0.02	0.01		
Preciseness (std.) ^a	0.00	0.02	-0.05	0.03	0.03	0.04		
Has bad habits (std.) ^a	0.00	0.04	-0.09	-0.02	0.06	-0.18		
Works efficiently towards goals (std.) ^a	0.00	0.00	0.01	-0.03	-0.04	-0.03	**	
Subscription price for 12 weeks	136.77	133.05	145.57	135.20	127.88	149.85	**	
Exercises > 3 days a week last year ^b	0.26	0.26	0.26	0.22 *	0.23	0.19		
Has fixed days in the week to exercise	0.70	0.70	0.70	0.65 *	0.62	0.71		
Wants to exercise more ^b	0.53	0.50	0.61	0.65 ***	0.64	0.67	**	
Does other sports next to gym	0.64	0.69	0.52	0.66	0.75	0.48	**	
Unlimited weekly access	0.85	0.83	0.91	0.82 *	0.78	0.90		0.83
Avg. 0 - 1 weekly visits fall 2009	0.39	0.40	0.35	0.43	0.45	0.38		0.39
Avg. 1 - 2 weekly visits fall 2009	0.29	0.31	0.26	0.31	0.33	0.29		0.32
Avg. 2 - 3 weekly visits fall 2009	0.16	0.17	0.13	0.10 ***	0.10	0.10		0.19 *
Avg. more than 3 weekly visits fall 2009	0.11	0.06	0.22	0.10 **	0.05	0.19 *		0.08
Mean weekly gym visits spring 2009	1.56	1.45	1.81	1.47 *	1.31	1.78	**	1.53
Mean weekly gym visits fall 2009	1.49	1.37	1.75	1.35 **	1.23	1.59	**	1.41
N	75	52	23	61	40	21		200

a: variables based on factor analysis and standardized. b: self-reported, question is framed as exercise in general, not only going to the gym. HC is the high-cost group and LC is the low-cost group. The placebo group is a stratified random draw from all other members of the gym. */**/** correspond to 10%/5%/1%.

Table 3: **Setting goals and realization**

	Goal		Mean fraction goal realized			<i>N</i>
	source	mean	wk 7 – 24 before	wk 1 – 12 treatment	wk 13 – 24 after	
All	survey	2.81	0.23	0.28	0.19	59
	take-up ^a	2.59	0.30	0.37	0.26	
<u>High-cost</u>						
All	survey	2.68	0.22	0.27	0.18	38
	take-up ^a	2.55	0.25	0.34	0.22	
Take-up	survey	2.57	0.26	0.44	0.19	7
	take-up	1.86	0.44	0.81	0.40	
Decline	survey	2.71	0.21	0.23	0.18	31
<u>Low-cost</u>						
All	survey	3.05	0.24	0.28	0.20	21
	take-up ^a	2.67	0.38	0.43	0.34	
Take-up	survey	3.00	0.25	0.30	0.23	16
	take-up	2.50	0.43	0.49	0.43	
Decline	survey	3.20	0.22	0.23	0.08	5

a: the ex-ante goal from the survey is used for subjects who declined treatment. The six weeks before the treatment period are dropped. Two subjects who declined the high-cost treatment could not be matched to the data with gym visits.

Table 4: **Intent-to-treatment on goal realization**

	Goal questionnaire		Goal take-up ^a	
	(A)	(B)	(C)	(D)
Treatment period	0.096 (0.29)	0.045 (0.27)	-0.503 (0.30)	-0.561* (0.28)
After treatment period	-0.008 (0.13)	-0.056 (0.13)	-0.648*** (0.17)	-0.685*** (0.17)
High-cost x treatment		0.060 (0.04)		0.073 (0.05)
High-cost x after treatment		0.056 (0.06)		0.042 (0.08)
R ²	0.048	0.050	0.054	0.055
Mean dependent variable	0.231	0.231	0.309	0.309
N	2660	2660	2660	2660

Linear probability model on meeting the attendance goal. An individual fixed effect is included. The first six weeks before the experiment are omitted. Week 7 – 24 before the treatment is the reference period. Week effects are included. The first two columns have the (usually higher) goal as stated in the survey. The last two columns have the (usually lower) goal for the subjects that took up the treatment, and have the survey goals for the treatment defiers. Robust standard errors are presented in brackets. */**/** correspond to 10%/5%/1%.

Table 5: **Weekly attendance**

	Only goal-setters		Goal-setters and placebo-group		
	(A)	(B)	(C)	(D)	(E)
Treatment period	-0.599 (0.94)	-0.699 (0.93)	-0.084 (0.70)	-0.220 (0.70)	-0.221 (0.69)
After treatment period	-0.468 (0.65)	-0.477 (0.68)	-0.006 (0.36)	0.019 (0.36)	0.019 (0.36)
High-cost x treatment		0.140 (0.14)			0.258** (0.10)
High-cost x after treatment		0.001 (0.22)			0.018 (0.11)
Low-cost x treatment					0.120 (0.12)
Low-cost x after treatment					0.020 (0.21)
(HC and LC) x treatment				0.210** (0.09)	
(HC and LC) x after treatment				0.019 (0.11)	
R ²	0.059	0.060	0.036	0.037	0.037
Mean dependent variable	1.390	1.390	1.391	1.391	1.391
N	2660	2660	10695	10695	10695

OLS regressions on weekly gym attendance. The first six weeks before the experiment are omitted. Weeks 7 – 24 before the treatment are the reference period. The first three columns contain the group that has an attendance goal. In the last two columns the placebo group is added. Week fixed effects are included. Robust standard errors are clustered at the individual level and are presented in brackets. */**/** correspond to 10%/5%/1%.

Table 6: **Other outcome measures**

	Body mass index			Bodyfat percentage			Happiness			<i>N</i>
	before	after	change	before	after	change	before	after	change	
All	24.8	24.7	-0.1	29.4	29.0	-0.4	7.5	7.7	0.2	41
<u>High-cost</u>										
All	24.6	24.5	-0.1	28.0	27.8	-0.2	7.2	7.6	0.4	25
Take-up	25.8	26.0	0.2	29.3	28.7	-0.6	8.0	8.1	0.1	7
Decline	24.2	24.0	-0.2	27.5	27.4	-0.1	6.8	7.3	0.5	18
<u>Low-cost</u>										
All	25.1	24.8	-0.2	31.6	30.9	-0.7	8.1	8.0	-0.1	16
Take-up	25.0	24.9	-0.1	31.7	30.8	-0.9	8.1	8.0	-0.1	14
Decline	25.3	24.5	-0.8	31.0	32.0	1.0	7.5	8.0	1.0	2

*/**/** correspond to 10%/5%/1%.

Table 7: **Take-up of treatment**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Mean visit fall 2009	-0.022 (0.09)	-0.101 (0.07)	-0.023 (0.09)	-0.015 (0.09)	-0.026 (0.09)	-0.012 (0.09)	0.001 (0.09)	-0.017 (0.08)
St. dev. visit fall 2009	0.107 (0.29)	0.218 (0.22)	0.108 (0.30)	-0.022 (0.30)	0.099 (0.29)	0.162 (0.30)	0.012 (0.30)	-0.118 (0.27)
Female	-0.028 (0.13)	-0.037 (0.11)	-0.027 (0.13)	-0.083 (0.14)	-0.046 (0.13)	-0.038 (0.13)	-0.120 (0.13)	-0.344** (0.12)
Age (bottom quartile)	-0.097 (0.13)	-0.154 (0.12)	-0.096 (0.13)	-0.018 (0.14)	-0.073 (0.14)	-0.104 (0.14)	-0.132 (0.15)	-0.039 (0.14)
Children	0.112 (0.13)	0.091 (0.10)	0.112 (0.14)	0.099 (0.14)	0.119 (0.14)	0.123 (0.14)	0.076 (0.14)	0.010 (0.12)
College or higher	-0.134 (0.12)	-0.025 (0.10)	-0.135 (0.12)	-0.097 (0.14)	-0.150 (0.13)	-0.156 (0.13)	-0.111 (0.13)	0.046 (0.10)
High-cost treatment		-0.569*** (0.11)						-0.611*** (0.11)
Overweight (BMI > 25)			0.005 (0.12)					-0.213 (0.12)
Planning horizon ≤ 1 year ^a				-0.163 (0.12)				-0.362** (0.10)
Saved money last year					0.034 (0.14)			-0.186 (0.14)
No goal questionnaire ^b						-0.111 (0.14)		-0.069 (0.10)
Goal 1x a week ^b						-0.002 (0.32)		-0.179 (0.32)
Goal 2x a week ^b						0.058 (0.18)		0.176 (0.13)
Factor chaotic							0.135 (0.08)	0.218** (0.08)
Factor preciseness							0.026 (0.08)	-0.012 (0.08)
Factor hard time breaking bad habits							-0.124* (0.06)	-0.123 (0.07)
Factor able to work toward long-term goals							-0.023 (0.07)	-0.072 (0.07)
Constant	0.320 (0.26)	0.678** (0.24)	0.316 (0.29)	0.511 (0.29)	0.324 (0.30)	0.286 (0.28)	0.454 (0.29)	1.495*** (0.39)
Adjusted R ²	0.040	0.336	0.040	0.058	0.041	0.053	0.125	0.546
N	70	70	70	66	69	70	69	66

Linear probability model on take-up of treatment. Robust standard errors are presented in brackets. a: question asks specifically for the planning horizon for budgeting. b: visit goals as answered in the questionnaire. Not everybody who took up one of the treatments has answered this question. Wanting to go to the gym 3 or more times a week is the baseline. Numbers of respondents differ because of missing answers on certain items. */**/** correspond to 10%/5%/1%.

Table 8: Goal realization with correction for self-selection

	Probit	marg. eff.	Bivariate probit ^a	marg. eff.	Heckman ^a	Heckman ^a
Treatment period	0.170*		0.161		0.063	0.068
	(0.09)		(0.11)		(0.04)	(0.04)
After treatment period	-0.028		-0.078		-0.030	-0.034
	(0.20)		(0.23)		(0.09)	(0.09)
High-cost	-0.989***	-0.202***	-0.036	-0.013	-0.014	-0.087
	(0.30)	(0.05)	(0.38)	(0.14)	(0.15)	(0.14)
High-cost x treatment	0.186	0.038	0.879***	0.323***	0.311***	0.323***
	(0.15)	(0.03)	(0.28)	(0.09)	(0.10)	(0.10)
High-cost x after treatment	-0.009	-0.002	-0.015	-0.006	-0.007	0.012
	(0.22)	(0.44)	(0.32)	(0.12)	(0.12)	(0.12)
Female	-0.128		-0.128		-0.050	0.017
	(0.30)		(0.33)		(0.13)	(0.07)
Age (bottom quartile)	-0.313		-0.004		0.004	-0.091
	(0.31)		(0.33)		(0.13)	(0.16)
Children present						0.132**
						(0.06)
College or higher						0.288***
						(0.08)
Overweight (BMI > 25)						0.023
						(0.12)
Planning horizon ≤ 1 year ^b						0.426**
						(0.16)
Saved money last year						0.565***
						(0.13)
No goal questionnaire ^c						-0.075
						(0.10)
Goal 1x a week ^c						0.354
						(0.31)
Goal 2x a week ^c						0.135
						(0.10)
Factor chaotic						0.014
						(0.05)
Factor preciseness						-0.113***
						(0.04)
Factor hard time breaking bad habits						0.090
						(0.09)
Factor able to work toward long-term goals						-0.046
						(0.06)
Constant	-0.404		-0.145		0.442***	-0.324*
	(0.29)		(0.33)		(0.13)	(0.18)
ρ			0.171		0.134	-0.387***
			(0.23)		(0.18)	(0.10)
λ					0.065	-0.172***
					(0.09)	(0.04)
Loglikelihood	-1139		-1251		-1283	-1177
p-value ^d		0.006		0.001	0.001	0.000

The dependent variable is one if the treatment-takers meet the goal they set on take-up and zero for all other survey completers. There are 3,070 person-week observations. a: the explanatory variables in the take-up decision are “High-cost” up to variable “Factor able toward long-term goal” as listed in Table 7. b: question asks specifically for the planning horizon for budgeting. c: visit goals as answered in the questionnaire. Not everybody who took up one of the treatments has answered this question. Wanting to visit the gym 3 or 4 times a week is the baseline. Robust standard errors are clustered at the individual level and presented in brackets. d: p-value that High-cost=High-cost \times treatment=High-cost \times after treatment= 0. No controls for the weeks included. */**/** correspond to 10%/5%/1%.

Table 9: Not intended for publication: groups on observable characteristics

	All Respondents				High-Cost			Low-Cost		
	All	No-show	HC	LC	Take-Up	Decline	Take-Up	Decline	Take-Up	Decline
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Female	0.74	1.00	0.65	0.65	0.57	0.67	0.69	0.57	0.69	0.57
Age	46.26	43.42	47.37	46.74	51.71	46.69	48.13	43.57	48.13	43.57
Signed up after the reminder	0.33	0.36	0.29	0.39	0.29	0.29	0.38	0.43	0.38	0.43
Single	0.34		0.35	0.30	0.14	0.39	0.38	0.14	0.38	0.14
College education or higher	0.58		0.63	0.48	0.71	0.61	0.44	0.57	0.44	0.57
Paid work	0.74		0.78	0.65	0.71	0.80	0.63	0.71	0.63	0.71
Disposable income less than 40,000	0.43		0.46	0.37	0.57	0.44	0.36	0.40	0.36	0.40
Household saved money last year	0.78		0.79	0.77	1.00	0.76	0.69	1.00	0.69	1.00
Children present in the household	0.34		0.35	0.30	0.29	0.36	0.44	0.00	0.44	0.00
Good or excellent health	0.87		0.85	0.91	0.86	0.84	0.94	0.86	0.94	0.86
Smokes	0.09		0.08	0.13	0.14	0.07	0.19	0.00	0.19	0.00
On average one or more drinks a week	0.75		0.81	0.61	1.00	0.78	0.69	0.43	0.69	0.43
Body mass index first measurement	24.78		24.54	25.31	25.78	24.35	25.13	25.73	25.13	25.73
Body fat percentage first measurement	29.19		28.77	30.13	29.29	28.69	31.00	28.14	31.00	28.14
Overweight (bmi > 25)	0.47		0.44	0.52	0.57	0.42	0.44	0.71	0.44	0.71
Planning horizon is a year or less	0.44		0.40	0.52	0.00	0.47	0.40	0.83	0.40	0.83
Happiness (std.) ^a	0.00		-0.16	0.35	0.25	-0.22	0.45	0.13	0.45	0.13
Sloppiness (std.) ^a	0.00		0.01	-0.02	0.48	-0.07	0.07	-0.25	0.07	-0.25
Preciseness (std.) ^a	0.00		0.02	-0.05	-0.48	0.10	0.03	-0.27	0.03	-0.27
Has bad habits (std.) ^a	0.00		0.04	-0.09	-0.37	0.10	-0.12	0.01	-0.12	0.01
Works efficiently towards goals (std.) ^a	0.00		0.00	0.01	0.11	-0.02	-0.09	0.26	-0.09	0.26
Subscription price for 12 weeks	137.40	139.26	133.05	145.57	139.17	132.10	149.57	137.01	149.57	137.01
Exercises > 3 days a week last year ^b	0.26		0.26	0.26	0.29	0.26	0.25	0.29	0.25	0.29
Has fixed days in the week to exercise	0.70		0.70	0.70	0.43	0.74	0.75	0.57	0.75	0.57
Wants to exercise more ^b	0.53		0.50	0.61	0.57	0.49	0.56	0.71	0.56	0.71
Does other sports next to gym	0.64		0.69	0.52	1.00	0.64	0.50	0.57	0.50	0.57
Unlimited weekly access	0.87	0.92	0.83	0.91	0.86	0.82	0.88	1.00	0.88	1.00
Avg. 0 - 1 weekly visits fall 2009	0.34	0.20	0.40	0.35	0.57	0.38	0.31	0.43	0.31	0.43
Avg. 1 - 2 weekly visits fall 2009	0.32	0.40	0.31	0.26	0.29	0.31	0.31	0.14	0.31	0.14
Avg. 2 - 3 weekly visits fall 2009	0.18	0.24	0.17	0.13	0.14	0.18	0.13	0.14	0.13	0.14
Avg. more than 3 weekly visits fall 2009	0.09	0.04	0.06	0.22	0.00	0.07	0.19	0.29	0.19	0.29
Mean weekly gym visits spring 2009	1.61	1.78	1.45	1.81	1.20	1.49	1.91	1.64	1.91	1.64
Mean weekly gym visits fall 2009	1.53	1.65	1.37	1.75	1.13	1.41	1.67	1.92	1.67	1.92
N	100	25	52	23	7	45	16	7	16	7

a: variables based on factor analysis and standardized. b: self-reported, question is framed as exercise in general, not only going to the gym. HC is the high-cost group and LC is the low-cost group. */**/** correspond to 10%/5%/1%.

Not Intended for Publication: Construction Dataset

The data come from two different sources. The attendance data are from the gym administration. The gym uses an electronic fingerprint reader and records the date, time and room entered – but not the details of exit. We use the years 2008 – 2010 and aggregate the number of visits by the calendar week. One problem is that the gym recycles its identifiers. Without additional information it is not easy to distinguish whether a spell with many zero visits can be attributed to different members, or belongs to one member. A cut-off of 26 weeks with zero visits seem to work well. In this dataset there is also information available on gender and the type of membership. The gym offers many types of membership, and we categorize them along two dimensions: limited or unlimited access, and access to the fitness rooms, the indoor group sports (e.g. zumba), both and a rest category of other types like company memberships. For all members in January 2010 we also have the date of birth. Other information the gym provided is the price a member paid for a subscription (including discounts). This price is calculated into a equivalent for 12 weeks. Prices paid are only made available for members that signed up for the experiment.

The second source is the survey. Many questions are taken from the Dutch Household Survey, as administered by CentERdata, including the first ten items of the question on self-control (question 34). The last eleven items are taken from Tangney et al. (2004). With factor analysis four factors are constructed from those 21 items. The response rate was 74.3% and the answers are quite complete overall. For example, many respondents took time to answer the open questions as well. Answers are imputed on three items of the psychological questions for two respondents (where we use the median response) and for two respondents on the question whether the household saved money last year. The survey could be linked to the administrative data by merging on birthdate and gender. The linkage rate is very high: only three out of a hundred respondents could not be linked to the visiting data. One person did not show up for the questionnaire, two declined the high-cost treatment. A placebo group is drawn from the administrative data. We randomly sample 200 members, where we oversample members with the same observable characteristics as the respondent group. The variables for selection are gender, age 50 – 64, and whether the mean weekly visit in the fall of the previous year was on average more than one weekly visit, and being a visiting member for a year or more.

Goal setting is identified by the answers to the question: “How often a month would you like to go to the gym?”. Five treatment takers (one high-cost and four low-cost) did not answer this survey question. For them the survey goal and the take-up goal is the same. The question in the survey asks for the number of visits per month in categories. For certain categories the equivalent number of weekly visits is stated as well. Since we are interested in weekly gym attendance, we transform the answers into a weekly goal. Some respondents chose answers that involved are in between numbers of weekly visits (e.g. in between 2 and 3 weekly visits). In those cases we choose to be on the conservative side and picked the lower attendance goal.

Not Intended for Publication: Content Recruiting

Would you like to exercise more often?¹
But is it not happening?

Maybe this is something for you. (*name gym*), the Scientific council for government policy and Tilburg University are conducting a research project. We are looking for gym members that would like to go to the gym at least once a week and who could use a nudge. Participation is of course voluntary.

- For your participation in the research project you get 25 euro.
- You will receive more insight in your behavior
- The research project will cost you little time next to exercising, two hours in total over the entire time period.
- The research project starts February 1, 2010.
- The research project takes three months.
- You have to be or become a paying member of *jname gym*.
- You can participate with all membership types (fitness / cardio / indoor cycling / group sports)

The researchers will of course treat your private details discretely, privately and anonymously.

Would you like to participate? Please register at the front desk before January 31. You can also send an email with your name and phone number to *info(name gym)*

¹This is a translation. Also the lay-out was different. This message was posted on the messageboard of the gym at the entrance. Slightly different versions were posted on the website and sent to the mailing list. All versions contained the same conditions for participation.

Not for Publication: Questionnaire

Research Project (*name gym*)²

Introduction

Welcome at this research project! We are glad that you decided to participate and we are interested in the results of this research project.

On the next pages you will find the research project. It consists of two parts. Part 1 is a questionnaire. Part 2 is on the last page and is a form for taking body measures. Please answer in the following order:

1. Please answer **first** Part 1 - the questionnaire. Filling in takes about half an hour. Please search for a place within the gym where you can sit quietly and are able to answer without being disturbed. We would like to ask you to answer the questions at the gym.
2. **Upon** completing please come to the front desk. An instructor of the gym will help you with Part 2. This is the form for taking your body measures. That will take 15 minutes at most.
3. After finishing this, please put the form in the envelop and close the envelop. Could you **drop** the envelop at the front desk? *name gym* will keep the envelopes in a safe place. Twice a week a researcher from Tilburg University will come and collect the envelopes.
4. The staff member at the front desk will give you a second envelop **right away** with further instructions about the remainder of the research project.
5. The researchers want to **thank** you for your participation!

We are well aware that we ask for personal information. Therefore please put the answers and the form back in the envelop and close the envelop. If you wish you can write your signature on the opening of the closed envelop. The envelopes with answers will go right away to researchers at Tilburg University. Staff members from *name gym* will not see your answers. The researchers are experienced in dealing with private information and will act accordingly.

Part 1: Questionnaire

This section consists of a questionnaire. Please answer the questions as precise as possible. The first set of questions is about a few personal details.

1. What is your date of birth? (dd-mm-yyyy)
2. Gender

²This is a translated version of the survey. Also the lay-out was different.

- Male
- Female

3. What is your marital status?

- Married
- Divorced
- Living together
- Widowed
- Never married

4. What is your highest level of education completed with a degree?

- (continued) special education
- kindergarten/primary education
- VMBO (pre-vocational education)
- HAVO, VWO (pre-university education)
- senior vocational training or training through apprentice system
- vocational colleges
- university education
- other sort of education/training

5. What is your primary occupation?

- employed on a contractual basis
- works in own business
- free profession, freelance, self-employed
- looking for work after having lost job
- looking for first-time work
- student
- works in own household
- retired (pre-retired, AOW, VUT)
- partly disabled
- unpaid work, keeping benefit payments
- works as a volunteer
- other occupation

6. How many people are living with you in the house (including yourself)? ...
7. How many children are living with you in the house? ...

The following questions are about how you experience your health.

8. In general, would you say your health is:
 - excellent
 - good
 - fair
 - not so good
 - poor
9. Compared to one year ago, would you say your health is better now or worse?
 - much better
 - somewhat better
 - about the same
 - somewhat worse
 - much worse
10. Do you suffer from a long illness, disorder, or handicap; or do you suffer from the consequences of an accident?
 - Yes (continue to question 11)
 - No (continue to question 12)
11. Please give a short description ...
12. Do you smoke cigarettes at all?
 - yes, I smoke every now and then (continue to question 13)
 - yes, I smoke every day (continue to question 13)
 - no (continue to question 14)
13. About how many cigarettes do you smoke a day?
 - 1 – 10 cigarettes a day
 - 10 – 20 cigarettes a day
 - more than 20 cigarettes a day
14. About how many alcoholic drinks do you have a week?

- 0
- 1 – 3
- 4 – 6
- 7 or more

15. All in all, to what extent do you consider yourself a happy person? Rate on a scale 0 – 10

The following questions are about the type of membership you have at (name gym).

16. What type of membership do you have at (*name gym*)?

17. What conditions of payment do you use?

- Every 4 weeks
- Every three months
- Once a year

18. Do you use automatic withdrawal for payment?

- Yes
- No

Questions 19 through 23 are about exercising in general. Not only going to the gym, but also other sports, like tennis, football, etc.

19. On average how many times a **week** did you exercise in the past 12 months? ... times

20. Do you exercise the same time(s) each week?

- yes
- no

21. Do you often exercise together with somebody else?

- always
- often
- sometimes
- never

22. Would you like to exercise more often than you are doing currently?

- yes (continue to question 23)

no (continue to question 25)

23. What is the most important reason that you do not exercise more often? ...

24. How often a month WOULD you like to go to the GYM?

0 – 1 times a month

2 – 3 times a month

4 – 5 times a month (that is 1 time a week)

6 – 7 times a month

8 – 9 times a month (that is 2 times a week)

10 – 11 times a month

12 – 13 times a month (that is 3 times a week)

more than 13 times a month

25. Do you do other sports during the year, other than the gym?

no

yes, like: ...

26. Next to your gym membership, are you a member of other sports clubs?

no

yes ...

27. What is the most important reason for you to go the gym?

loose weight

maintain weight

improve condition

maintain condition

get a good figure

nice atmosphere, contact with friends

other, like ...

28. The TOTAL NET INCOME OF YOUR HOUSEHOLD consists of the income of all members of the household, after deduction of taxes and premiums for social insurance policies, over the past 12 months. Into which of the categories mentioned below did the total net income of your household go IN THE PAST 12 MONTHS?

less than 10.000

- between 11.000 and 14.000
- between 14.000 and 22.000
- between 22.000 and 40.000
- between 40.000 and 75.000
- 75.000 or more
- I do not know

29. Do you think it makes sense to save money, considering the current general economic situation?

- yes, certainly
- yes, perhaps
- probably
- certainly not
- I don't know

30. Did your household put any money aside IN THE PAST 12 MONTHS?

- yes
- no

31. About how much money has your household put aside IN THE PAST 12 MONTHS?

- less than 1, 500
- between 1, 500 and 5, 000
- between 5, 000 and 2, 500
- between 12, 500 and 20, 000
- between 20, 000 and 37, 500
- between 37, 500 and 75, 000
- 75, 000 or more
- I don't know

32. Is your household planning to put money aside IN THE NEXT 12 MONTHS?

- yes, certainly
- yes, perhaps
- probably not
- certainly not

I don't know

33. People use different time-horizons when they decide about what part of the income to spend, and what part to save. Which of the time-horizons mentioned below is in your household MOST important with regard to planning expenditures and savings?

- the next couple of months
- the next year
- the next couple of years
- the next 5 to 10 years
- more than 10 years from now

34. For the following statements on human behavior, please choose the statement which applies most to you. Describe yourself as you are, not as how you want to be. Describe yourself in comparison to other people you know of the same sex and of about the same age.

	not at all				very much
	1	2	3	4	5
I do chores right away	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'll leave my things lying around	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I live my life according to schedules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I neglect my obligations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have an eye for details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am accurate in my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I forget to put things back where they belong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am always well prepared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often make a mess of things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a hard time breaking bad habits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am lazy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have trouble saying no	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I change my mind fairly often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wish I had more self-discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I refuse things that are bad for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get carried away by my feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Im not easily discouraged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have trouble concentrating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sometimes I cant stop myself from doing something, even if I know it is wrong.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am able to work effectively toward long-term goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you! This is the end of Part 1. Please go the front desk for Part 2.

Part 2: Body Measures

An instructor will take the following measures together with you and write them down. In about three months you will receive a notification to collect the same measurements again. You will receive a personalized statement with both measurements after that.

1. Length (in centimeters) ...
2. Hip size (in centimeters) ...
3. Weight (in kilograms without shoes) ...
4. Body fat percentage ...
5. Pulse (30 seconds times two) ...

Thank you very much - this was Part 2 of the research project. Please put the form in the envelop, close the envelop and drop it at the front desk. You will receive a second envelop with further instructions.

Not Intended for Publication: Treatment Instructions

Instructions High-cost treatment group

Again a warm welcome for participating in this research project.

We would like to thank you for filling out the questionnaire. But that is not all! There is more, please take some time to read on.

Would you like to exercise more often? This research project is meant for people that would like to exercise more often. Perhaps you are familiar with this situation. You have the best intentions to do a certain thing, but it is not happening. Or you are exercising already regularly, but would like to go more often. Perhaps you are exercising with a certain goal in mind. Whatever the situation, you could use a nudge to achieve your goal.

Deposit scheme: a nudge

A helping hand, a nudge, sometimes we just need that. Somebody else could give you one. But in the end it is best if you do it yourself. Money could be one possible way to give you the nudge that you need. That is why the researchers and staff members of (*name gym*) give you the opportunity to join the deposit membership.

It works in the following way. You keep your current membership with (*name gym*). Nothing changes. On top of that subscription comes the deposit-part. We chose the amount for you. The research project takes 12 weeks. The amount per week is 15 Euros. The total deposit is $12 \times 15 = 180$ Euros. You set a weekly goal. You choose how often you would like to exercise at (*name gym*). You pay the deposit of 180 euro upfront. For every week that you reach your goal, you get 15 Euros back. When you meet your goal for twelve weeks, you get your entire deposit, but more importantly: you have met your goal for twelve weeks (that is three months)!

This is the same method that three members of (*name gym*) used last year to come more often to the gym. A national television show made a special about this. You can watch this edition online. Don't worry, you will not appear on television. This is scientific research!

Can I just come to the gym?

Sure! The deposit scheme is meant to help you realize your own goals. To summarize: the deposit scheme is hundred eighty Euros for twelve weeks. You pay this money upfront at (*name gym*) when you decide to participate. You also choose how many times a week you would like to go to (*name gym*). When you participate, you can exercise in any way you would like to. Every time you are finished exercising, you walk by the frontdesk and you say goodbye. The staff members at the frontdesk keep track how many times you have been to the gym and whether you meet your goal. After three months you receive a personalized overview. For every week that you have met your goal, you receive 15 euro cash. Please note that it is important to walk by the frontdesk every time you finished exercising. The week starts on Sunday morning and ends Saturday night. It is not possible to skip a week and to go double the week after. For each week there is your goal and for each week is 15

euro available. The only exception is when you freeze your subscription in case of illness or vacation. The usual policy of (*name gym*) applies. In those cases the research project will be extended in May for the number of days you froze your membership (Note that this is not possible with all subscription types). Please let (*name gym*) know when you have vacation plans.

How do I set my weekly goal?

Exercising and workout are important. Regularly exercising and regular workout are even more important. It is better to exercise once a week for a year, than six times a week for three months and zero times the rest of the year. Regularity is key. It is better to choose a realistic goal than to choose an ambitious one. Perhaps you have a goal in mind how often you would like to come. Please fill out that goal on the form.

In case you do not have a specific goal, but you would like to come more often than you do now. You could choose to set a goal that is once a week more than you do now. For example, if you come regularly once a week, and you would like to increase this frequency, than you could set a goal of two times a week. Or once a week. Or seven times. You set your goal how often you would like to come. However, note that you only receive your deposit share of 15 euro a week when you meet your goal.

How many times a week would you like to come in the next three months? Fill in that goal on the form and drop it at the frontdesk. Can you let us know before February 14 whether you would like to join the deposit scheme? We hope that you would like to do so.

We wish you lots of pleasure with exercising.

The first week is week 7 (February 14 until February 20), the twelfth and last week is week 18 (May 2 until May 8). This is a research project of the Scientific council for government policy and Tilburg University. (*name gym*) participates without interest. (*name gym*), the Scientific council for government policy and Tilburg University cannot be held liable.

Instructions Low-cost treatment group

Again a warm welcome for participating in this research project.

We would like to thank you for filling out the questionnaire. But that is not all! There is more, please take time to read on.

Exercising more often?

Would you like to exercise more often? This research project is meant for people that would like to exercise more often. Perhaps you are familiar with this situation. You have the best intentions to do a certain thing, but it is not happening. Or you are exercising already regularly, but would like to go more often. Perhaps you are exercising with a certain goal in mind. Whatever the situation, you could use a nudge to achieve your goal.

How do I set my weekly goal?

Exercising and workout are important. Regularly exercising and regular workout are even more important. It is better to exercise once a week for a year, than six times a week for three months and zero times the rest of the year. Regularity is key. It is better to choose a realistic goal than to choose an ambitious one. Perhaps you have a goal in mind how often you would like to come.

In case you do not have a specific goal, but you would like to come more often than you do now. You could choose to set a goal that is once a week more than you do now. For example, if you come regularly once a week, and you would like to increase this frequency, than you could set a goal of two times a week.

How many times a week would you like to come in the next three months? Fill in that goal on the form and drop it at the frontdesk. You can go to the gym like you are used to.

Every time you are finished exercising, you walk by the frontdesk and you say goodbye. The staff members at the frontdesk keep track how many times you have been to the gym and whether you meet your goal. After three months you receive a personalized overview. The first week is week 7 (February 14 until February 20), the twelfth and last week is week 18 (May 2 until May 8).

We wish you lots of pleasure with exercising.