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The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment

Esther Duflo
Massachusetts Institute of Technology and NBER

Emmanuel Saez
University of California—Berkeley, Harvard University, and NBER

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Abstract

This paper analyzes a randomized experiment to shed light on the role of information and social interactions in the decision to enroll in a Tax Deferred Account (TDA) retirement plan within a large university. The experiment encouraged a random sample of employees in a subset of departments to attend a benefits information fair organized by the university, by promising a monetary reward for attendance. The experiment more than tripled the attendance rate of these treated individuals (relative to controls), and doubled that of untreated individuals within departments where some individuals were treated. TDA enrollment 5 and 11 months after the fair is significantly higher in departments where some individuals were treated than in departments where nobody was treated. However, the effect on TDA enrollment is almost as large for individuals in treated departments who did not receive the encouragement than for those who did. We provide three interpretations, differential treatment effects, social network effects, and motivational reward effect, to account for these results. Responses from a follow-up questionnaire show that fair participants are more confident about their knowledge of retirement benefits but are no more likely to answer accurately precise questions on these benefits.

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1 Introduction

Low levels of savings in the United States have generated substantial interest in the question of what determines savings decisions. A vast literature has studied the impact of Tax Deferred Accounts (hereafter, TDA), such as Individual Retirement Accounts (IRAs) and 401(k)s, on retirement savings decisions,[1] and, concurrently, the impact of these plans' features on enrollment and contribution rates. A number of recent studies emphasize the role of non-economic factors, such as social interactions, financial education, and inertia. Duflo and Saez (2000) study how individual participation in a TDA plan within a large university is affected by average participation in one's department. They obtain suggestive and consistent evidence that peer effects in the decision to enroll in TDA plans are strong. Madrian and Shea (2001) show that default rules have an enormous impact on employees' participation, contribution, and asset allocation. When they are enrolled by default in a TDA, very few employees opt out. Further, most employees do not change the default contribution rate or the default allocation of assets. Bernheim and Garett (1996) and Bayer, Bernheim, and Scholz (1996) study the role of financial education. They present evidence that financial education tends to be remedial[2] but that it increases participation in the plan, suggesting that employees may not be able to gather the necessary information on their own. This evidence, though highly suggestive, does not provide a fully convincing proof that information and financial education can have a strong impact on TDA participation decisions because employers' decision to provide this information is endogenous. The goal of this paper is to analyze the evidence from a random experiment to shed light on both the role of information and social interactions on the employees' decision to enroll in the employer sponsored TDA plan of a large university. Our analysis improves upon the studies discussed above because the source of

[1] See Poterba, Venti and Wise (1996) and Engen, Gale and Scholz (1996) in a special issue of the *Journal of Economic Perspectives* for a lively and controversial debate summarizing the literature.

[2] Employers resort to it when they fail discrimination testing because the contribution rates of the not highly compensated employees are too low.

identification comes directly from the randomized experiment. This allows us to overcome some of the very difficult identification problems in the presence of peer effects described in Manski (1993, 1995).[3]

Each year, the university organizes and invites all its employees to a benefits fair in order to provide information on its benefits. In particular, a stated goal of the fair is to increase the enrollment rate in the TDA which the university administration feels is too low (around 30%). Obviously, comparing the decision to enroll in the TDA of individuals who went to the fair and those who did not, would not provide convincing evidence of a causal effect of fair attendance on TDA enrollment because the decision to attend the fair is endogenous.[4] To circumvent this selection problem, we have devised the following experiment. We have selected a random sample of employees (not yet enrolled in the TDA) and sent them an invitation letter promising them a $20 reward for attending the fair. This type of experiment is a classical encouragement design commonly used in medical science, where treatments are proposed to a random group of patients who then decide whether or not to take the treatment.[5] Encouragement designs are rare in economics. An example is the study by Powers and Swinton (1984) who analyze the effect of hours of study on test scores using random mailing of test preparation material as an

[3]In spite of these difficulties, there is a growing empirical literature on peer effects using observational analysis which essentially focuses on social behavior, and the adoption of new technologies. For example, Case and Katz (1991) and Evans, Oates and Schwab (1992) on teenagers' behavior, Bertrand, Mullainathan and Luttner (1998) on welfare participation, Munshi (2000a) on contraception, and Besley and Case (1994), Foster and Rosenzweig (1995) and Munshi (2000b) on technology adoption in developing countries. Sorensen (2001) analyzes peer effects within departments of a University in the choice of Employer sponsored Health Plans using a methodology related to Duflo and Saez (2000).

[4]Individuals interested in enrolling in the TDA might look for information and thus may be more likely to attend the fair.

[5]For example, Permutt and Hebel (1989) study the effect on maternal smoking on birth weight using randomly assigned smoker's counseling as an encouragement to quit smoking. Imbens et al. (2000) analyze of the effect of flu shots (proposed but not imposed) to a random subset of patients on flu outcomes.

encouragement to study.

The second objective of our study is to analyze peer effects within departments. Therefore, we designed our experiment so as to be able to estimate these social interaction effects. Namely, "treated" individuals who were sent the invitation letter have been selected only within a (random) subset of departments (the "treated" departments). A number of recent studies have also used experimental or quasi-experimental situations to study social interaction effects. Kremer and Miguel (2001) is perhaps the most closely related to our study. They analyze an experiment design to evaluate own and external effects of a medical treatment against intestinal worms for children in schools in Kenya, and obtain evidence of spillover effects. They show that children in treated schools who did not get the medicine were positively affected. However, in their case, treatment within a school was not randomized but occurred because some children were not present on treatment day, creating potentially a selection issue. Katz et al. (2001) use random assignment to a housing voucher program for households living in high poverty public housing projects in the Boston area and find improvement of treated families in safety, health, and exposure to crime.[6] Sacerdote (2001) uses random assignment of freshmen in Dartmouth college dorms and finds strong peer effects in determining levels of academic effort and in decisions to join social groups. These later two studies on social interactions differ from ours mainly in the fact that they study how assigning individuals to alternative peer groups affects their outcomes whereas peer groups, namely the departments, are fixed in our study and we analyze how introducing an exogenous change in the information set of individuals within departments affects the outcomes of their peers.

The first stage of our study analyzes the effect of the invitation letter on fair attendance. We show that treatment individuals are three times as likely to attend the fair than control individuals demonstrating that our inducement strategy was successful. Interestingly, control individuals in treated departments are twice as likely to attend the

[6]Following our previous discussion, the voucher program can be seen as an encouragement design to leave public housing projects.

fair than control individuals in non-treated departments. This shows that the invitation letters not only increased the fair attendance rate for individuals who received them but had also a spill-over social effect on their colleagues within departments. The direct effect of the letter on attendance (purged from the peer effects) can also be estimated by comparing the attendance rates of treated and control individuals within treated departments only.

The second stage of the study tries to estimate the causal effect of fair attendance and social effects on the decision to enroll in the TDA. We show that, 5 and 11 months after the fair, individuals in treated departments are significantly more likely to have started contributing to the TDA than control individuals. This shows that our experiment was successful in increasing TDA enrollment. However, there is no significant difference in TDA enrollment between those who actually received our encouragement letter and those in the same departments who did not. We interpret these results in three ways (not necessarily mutually exclusive). First, this might be evidence of differential treatment effects of fair attendance on TDA enrollment. Employees who come to the fair only because of the financial reward are different from those who decide to come of the fair because of their colleagues, and it is plausible to think that the treatment effect is larger for the latter group than for the former. Second, there might be social network effects within departments, fair attendants might be able to spread the relevant information they obtained in their departments. Third, our results might also be explained by motivational reward effects. Namely, paying individuals to attend the fair might affect their subjective motivation and therefore the value or quality of the information they obtain at the fair. Such effects have been documented in the social psychology literature. Unfortunately, our experiment does not allow us to identify separately these three effects.

The last part of the study analyzes the responses to a follow-up questionnaire that we sent subsequently to a random sample of employees in order to assess the effects of the fair on knowledge and attitudes. Consistently with our previous results, we find that individuals who received our encouraging letter report less often lacking information

about the TDA benefit than their colleagues in the same departments who did not receive the letter. This suggests that the fair appeared useful to attendees. However, treated individuals are not more likely than controls in the same departments to answer accurately simple questions about their retirement benefits current choices. This suggests that those who attended the fair because they were induced by the financial reward did not get as much real information as those who came because of their colleagues.

The remainder of the paper is organized as follows. Section 2 describes the benefits fair and the design of our experiment. Section 3 discusses the reduced form evidence. Section 4 develops a simple structural model to guide the subsequent interpretation of our results. Section 5 analyzes the results of the follow-up questionnaire. Finally, Section 6 offers a brief conclusion.

2 Context and Experiment Design

2.1 Benefits and Benefits Fair

The university we study has approximately 12,500 employees. About a quarter of the employees are faculty members. Our study will be limited to non-faculty employees only.[7] The university provides retirement benefits to its employees through a traditional pension plan and a complementary Tax Deferred Account (TDA) plan. Part of the traditional pension plan is a Defined Contribution (DC) plan where a 3.5% of an employee's salary is put into an individual mutual fund account.[8] Employees can also voluntary contribute to a TDA 403(b) plan.[9] Every employee can contribute to the 403(b) plan any percentage of their salary up to the IRS limit ($10,500 per year for each individual in 2001). The university does not match contributions. In both the DC and the TDA plans, employees

[7] Duflo and Saez (2000) present suggestive evidence that staff employees TDA choices are not influenced by Faculty choices and vice-versa.

[8] Non-faculty employees have an additional Defined Benefits plan in addition to the DC plan.

[9] 403(b) plans are very similar to the better known 401(k) plans but their use is restricted to not-for-profits firms.

can choose where to invest their contributions from any number of four different vendors.

Each year, the University organizes a Benefits fair where all employees are invited to come and learn about all Benefits (such as Health Benefits, Retirement Benefits, etc...) provided by the University. The purpose of this study is to analyze whether the fair has a causal effect on the decision to participate to the TDA plan; and whether we observe peer effects in the decision to attend the fair and start contributing to the TDA.

The fair is held over two consecutive days in early November in two different locations, each one of these being close to the two separate main University campuses. About one week before the fair, every employee receives through the university mail a letter inviting her to attend the fair. This letter also provides a brief description of the fair event. At the same time, but separately, every employee receives a packet describing in detail the University benefits along with enrollment forms. November is the open enrollment month where each employee has the possibility to change her benefits choices by sending back the enrollment form. If the employee does not send back the form, her benefits choices are automatically carried over to the next year. However, employees are free to enroll into the TDA or change their contribution level or investment decision at any month during the year.

In both locations, the fair is held in a large hotel reception room. There are a large number of stands representing the University Benefits Office, and the various health and retirement benefits service providers. The University Benefits Office offers information on all benefits through direct conversation with benefits office staff present at the fair, and through a number of information pamphlets freely available at their stand. The benefits office also provides information on how the other stands at the fair are organized. These other stands are held by each of the specialized service providers. For example, each of the mutual fund vendors has a stand where they provide information about the TDA plan and the specific services they are offering within that plan. They also propose each participant to use computer softwares to analyze her specific situation. Employees are free to come anytime during the three and a half hours during which the fair is held, and

visit any number of stands they want.

2.2 Experiment Design

The university organizes this annual fair in order to disseminate information about the benefits and thus improve the decision of its employees regarding their benefits choices. A stated goal is also to increase the participation to the TDA, which is low in the university (around 35% for non-faculty employees) and which the benefits office feels may be due to a lack of information.

A simple comparison between the benefits choices of those who attend the fair and those who do not does not provide an unbiased estimate of the effect of the fair. Clearly, those who plan to change their benefits choices may be more likely to attend the fair to gather the necessary information. Therefore, in order to to identify the causal effect of fair attendance on TDA enrollment, we set up an encouragement design consisting in promising a random subset of employees a small amount of money for attending the fair. In previous work (Duflo and Saez, 2000), we had shown that the decisions to participate into the TDA are very correlated among individuals within departments which suggested the existence of social effects in enrollment decisions. Therefore, in order to cast light on these social effects within departments, the random sample of employees who received the reward promise were not selected across all departments but only within a random group of departments.

We used a cross-section of administrative data provided by the university on all its employees on August 2000. We restricted the sample to all staff employees (i.e. non-faculty employees) aged less than 65 and eligible to participate in the TDA.[10] Out of the 9,700 employees meeting these criteria, around 3,500 were enrolled in the TDA by August 2000. From now on, we refer to these individuals as the pre-enrolled individuals. The remaining 6,200 individuals were not enrolled in the TDA by August 2000. As very few

[10]Part time employees working less than 20 hours per week are not eligible for the TDA. Most of these employees are students of the university.

employees stop contributing to the TDA once they are enrolled,[11] we focus on the decision to start participating into the TDA. Thus the sample of 6,200 non-enrolled individuals is our sample of primary interest.

In the first step, we randomly selected two thirds of the departments of the university (220 out of a total of 330) as follows. In order to maximize the power of the experiment (in a context where we know there are strong department effects), we first matched departments according to their size (i.e. number of employees) and the participation rate in the TDA before the fair. We separated department into deciles of participation rates among the staff. Each decile is formed of 33 departments. We ranked them by size within each decile. We then formed groups of three departments by putting three consecutive departments on these lists in the same triplets. Within each of these triplets, we randomly selected two departments to be part of the group of treated departments. From now on, we refer to the treated departments as the T departments and to the control departments as the 0 departments.

In the second step, within each of the treated departments, each individual had a probability 0.5 to be selected but this randomization was made only on the sample of employees not enrolled in the TDA by August 2000. This treatment group is composed of 2,039 individuals. This group is from now on referred to as the Treated individuals and denoted by $T1$ (T for Treated department and 1 for being selected). The group formed by the employees in the same T departments as the treatment group but that were not selected contains 2,129 individuals and is denoted by $T0$ (T for Treated department and 0 for not being selected). In total, there are 4,168 individuals in the treated departments. The second control group is formed by employees in the control departments where no treatments were selected; it contains 2,043 individuals and is denoted by 0.

One week before the fair, we sent a letter via university mail to the 2,039 employees

[11] Only 80 of the 3,500 employees enrolled in the TDA stopped contributing during the one year period we examine. More than five times as many employees started contributing to the TDA during the same period.

in the treatment group $T1$. The letter reminded them of the fair event and announced them that they would receive a check for \$20 from us if they were to come to the fair and register at our desk. This letter is reproduced in facsimile in appendix.

At the fair, we set up a stand where the employees who received our invitation letter would come and register their name. It was unfortunately impossible to record the names of the fair participants who did not receive our letter. However, we recorded their total number: a student stood at the fair entrance and distributed a coupon to each person who entered the hall. The coupons had different colors according to the status of the participant (active or retired), which allowed us to count the number of active employees who attended the fair. Everybody had to pass through that narrow entrance to get into the fair, and the few people who refused the coupon were carefully counted. We are thus confident that we accurately recorded the number of participants. In order to collect information on the TDA status and the department affiliation of all the fair participants, we organized a raffle. The coupons that were distributed at the entrance of the fair had two parts, with a number written twice. Each fair attendant who wanted to participate in the raffle gave us half of the coupon. We asked all the raffle participants their department affiliation and whether they were currently enrolled in the TDA. The raffle was held every 30 minutes, and the prize was a \$50 Macy's gift certificate. A total of 1,617 active employees attended the fair. 573 of them had received our letter. Out of the remaining 1,044 employees, 766 (i.e., about three quarters) came to play the raffle and registered their department affiliation and TDA enrollment status. An important issue that arises is whether there was selection by T versus 0 departments in who decided to play the raffle (and hence provide their department affiliation and TDA status). We do not believe this was the case as almost all fair attendees came at some point before our stand and about one out of five did not want to play the raffle (for lack of time or interest). Therefore, we assume that fair attendants who did not register their department affiliation are distributed between T and 0 departments as those who did register. In what follows,

we scale up the attendance recorded in each department by a factor of $1,044/766$.[12]

In order to assess the effects of the experiment and the fair on TDA participation, the university gave us three waves of data. The first wave was obtained in September 2000, just before the fair. The second wave was from March 2001, i.e. 4.5 months after the fair and the third wave from October 2001, i.e. 11 months after the fair.

3 Results: Summary statistics and Reduced form differences

In the presence of social interactions, employees who work in departments where some people received the letter can be affected by the experiment even if they did not receive the letter themselves. They may be more likely to come to the fair themselves, because they are reminded by others of the event, or because employees come to the fair in groups.[13] They may also be more likely to enroll in the TDA even if they do not come to the fair themselves, either because they are directly influenced by the action of those who went to the fair, or because these individuals share the information they gathered at the fair. Thus, employees are potentially subjected to two kinds of treatments: they can receive the invitation letter themselves (group $T1$), and they can be in a group where some employees received the letter (departments T). Those who receive the letter are, obviously, subject to both treatments.

The summary statistics are displayed in Table 1, broken down into 4 groups. In columns (1) to (3), we present the statistics for individuals who belong to Treated departments T. Column (1) has the statistics for the entire group (group T), column (2) has the statistics for the group of treated individuals (group $T1$), and column (3) has the statistics for the untreated individuals in treated departments (group $T0$ or in-controls).

[12]We present in Section 5 evidence consistent with our non-selection hypothesis. However, we will discuss how modifying this assumption would affect our result.

[13]This is something we observed at the fair.

In column (4), we present the statistics for individuals who belong to the untreated departments (group 0). It is important to note that all these statistics (except the first row of Panel A and the second row of Panel B) focus only on individuals not enrolled in the TDA on September 2000 before the fair. In Table 2, we present differences in the same variables across groups. All the differences are obtained in a regression, where we control for the triplet to which the department belongs.[14] The standard errors are corrected for auto-correlation of the errors at the department level. Columns (1), (2), (3), and (4) present the differences between group T and group 0, group $T1$ and group $T0$, group $T0$ and group 0, group $T1$ and group 0 respectively.

In Panel A, we present background characteristics. In the first wave (on September 2000 before the fair), a very small proportion of employees have started contributing to the TDA (the first wave is from September 2000 and we had used information from August 2000 to construct the randomization), and there is no apparent difference across groups in these proportions. Since we are interested in changes caused by the fair, we focus in the remaining of the analysis on individuals who were still not enrolled in the first wave (i.e. by September 2000). Since the groups were chosen randomly, the mean of observable characteristics such as sex, years of service, annual salary, and age, are very similar across groups. As expected, none of the differences is significant.

In panel B, we can see that our inducement strategy had a strong effect on the probability of attending the fair: in treated departments, as much as 21.4% of individuals attended the fair. In control departments, less than 5% of individuals attended the fair. The difference, 16.5%, is highly significant (Table 2, column (1)). Comparing treated individuals versus controls in the treated departments in columns (2) and (3) of Table 1 shows that social effects account for a large part of the effect of our experiment on fair attendance. The fair attendance rate of those who received our letter is 28% and is 15.1%

[14] As it is visible from inspecting Table 1, this does not affect the point estimates of the differences. However, it reduces the standard errors, by absorbing some unexplained differences across departments of similar sizes and pre-fair TDA enrollment rates.

for those who did not receive the letter in the treated departments. Thus, the direct effect of receiving the letter (taking out any social effect, which are common across the in-control individuals and the treated individuals) displayed on column (2) of Table 2 is 13.8%. But the difference in attendance rate between the $T0$ group and the 0 (which is solely due to social effects) is almost as high, at 10.2%, and highly significant (see column (3) of Table 2).[15]

In Panel C, we look at TDA participation. After 4.5 months, relatively few people have enrolled. However, employees in treated departments are already significantly more likely to be enrolled than employees in control departments (4.9% versus 4%). There is no significant difference between groups $T1$ and $T0$, however. [16] The difference between groups $T0$ and 0 is 1.26% and significant. After 11 months, more people have enrolled and the difference between treated departments and control departments is large (1.4%) and significant as well. The difference between groups $T1$ and $T0$ is now positive, but still very small and insignificant. The difference between group $T0$ and group 0 is positive, and significant at the 10% level. Obtaining significant differences between these randomly chosen groups means that our experiment did have an impact on TDA enrollment. This impact is large in relative terms (an increase of 20% in the likelihood of enrollment after 11 months), but small in absolute terms (an increase of only 1.5% points of enrollment).

In summary, the results we present in tables 1 and 2 suggest that the incentive scheme has had a large effect on fair participation of treated departments (due to a combination of a direct effect and the multiplier effect of social interactions), as well as a significant (statistically and economically) effect on TDA participation. However, within treated

[15]This result is of course sensitive to the assumption we made about department affiliation of fair attendants who did not register at our desk. If we make the extreme assumption that all non registered individuals come from 0 departments, the fair participation rates for groups $T0$ would be reduced down to 11% but still higher than for group 0 (which would go up to 9%). We show below that a large difference in fair attendance for groups $T0$ and 0 is fully (and indeed required) to explain our results on TDA enrollment.

[16]The point estimate in table 2 is even slightly negative, with a t-statistic of about 1.

departments, there is no difference in TDA enrollment between those who received the letter and those who did not. Next section presents simple structural models to discuss and interpret these results.

4 Interpretation

4.1 Fair attendance

Let us first analyze the decision to attend the fair. As we have seen, receiving our invitation letter with its promise of a \$20 reward presumably increases the probability of attending the fair. Let us assume that this increase in the probability of attending the fair (everything else being equal) is given by δ. As we have seen, there are peer effects in the decision to attend the fair because $T0$ individuals are more likely to attend than 0 individuals. A simple way to capture these two effects is to posit the simple following reduced form specification:

$$f^i = \delta L^i + \mu D^i + \epsilon^i, \tag{1}$$

where f^i is the dummy for attending the fair for individual i, ϵ^i is the random individual effect, L^i is a dummy indicator for receiving the inducement letter, and D^i a dummy indicator for being in a treated department.[17] Column (1) of Table 3 presents the estimation of (1). Taking the difference of the averages of equation (1) across groups $T1$ and $T0$ shows that $\delta = \bar{f}_{T1} - \bar{f}_{T0}$ where $\bar{f}_{Ti}$ denotes average fair attendance among individuals in group Ti, $i = 0, 1$. Similarly, taking the difference of the averages of equation (1) across groups $T0$ and 0 shows that $\mu = \bar{f}_{T0} - \bar{f}_0$.[18]

[17] As f^i is a 0-1 variable, equation (1) cannot be rigorously true. The left-hand-side should be replaced by the *probability* of attending the fair for individual i and restrictions imposed on the parameters and the distribution of ϵ^i to ensure that this number is always between 0 and 1. These technicalities can be taken care of easily and thus are ignored in order to keep the presentation simple and transparent.

[18] These two statistics have been estimated in the reduced form results presented in Table 2.

Peer effects in the decision to attend the fair can take two forms. First, if an individual in a given department decides to go to the fair, she might talk to her colleagues about the fair, give them information about the details, or ask them to join her, and thus increase the probability of her colleagues attending the fair. Second, it is also conceivable that an employee who receives the letter, even if she does not go herself to the fair, might talk about the letter she received to her colleagues, and thus also affect their attendance rate through this channel. We model these peer effects by assuming that the average fair attendance rate and the average letter rate (defined as the number of employees who received the letter over the number of employees in the department) in each department influence the individual fair attendance decision.

Let us denote by $\bar{f}$ the average attendance rate in the department of individual i, and by $\bar{L}$ the letter rate in the department of individual i. The invitation letter effect, and the peer effects on fair participation can be captured by the simple following linear model (see e.g. Manski (1993))

$$f^i = \delta L^i + \bar{\delta}\bar{L} + \beta_1 \bar{f} + v^i, \tag{2}$$

where v^i is the random individual effect, and $\beta_1 < 1$, and $\bar{\delta}$ are the peer effect coefficients. This equation states that getting the letter increases the own probability of attending the fair by δ, and the probability of everybody in the department of attending by $\bar{\delta}/N$ (N being the number of employees in the department), and that an exogenous direct increase in fair attendance of 1 percent translates into a final increased fair attendance of $1/(1-\beta_1)$ percent through the multiplier peer effect.

Being in a T versus 0 department is fully exogenous, as this randomization was done unconditionally. However, the individuals who received the invitation letter were selected only among those individuals who were *not* enrolled in the TDA by August 2000. Therefore, receiving the letter within a T department is exogenous only for the subsample of individuals not enrolled in the TDA by August 2001.

Obviously, our experiment does not allow us to identify all three parameters δ, $\bar{\delta}$, and

β_1 because we have only two instruments: receiving the letter L^i and the dummy indicator D^i for being in a T (versus 0) department. However, the following semi-reduced form of equation is identified,

$$f^i = \delta L^i + \delta^R \bar{L} + v'^i, \tag{3}$$

Equation (3) can be easily derived from (2) by first averaging equation (2) by department to obtain an expression for $\bar{f}$, and then plugging this expression for $\bar{f}$ in (2). Routine computations show that $\delta^R = -\delta + (\bar{\delta} + \delta)/(1 - \beta_1)$. The parameters δ and δ^R of equation (3) are identified with our experiment[19] and can be estimated with an IV regression using L^i and D^i as instruments.[20] Column (2) of Table 3 presents the estimate of equation (3). The coefficient of the average number of letters is 0.28, and is significant: an increase in 10% in the proportion of people who received a letter in the department would have led to an increase of 2.8% in participation of those who did not themselves receive the letter.

It is perhaps reasonable to impose the additional restriction on equation (2) that $\bar{\delta} = 0$, i.e., a person receiving a letter can influence her colleagues fair attendance only if she decides to go to the fair. In that case, equation (2) is identified and β_1 estimated by running the IV regression (2) on the sample of individuals not enrolled in the TDA by September 2000, using L^i and D^i as instruments. The results are reported on column (3) of Table 3. The estimate we obtain for β_1 is large and precisely estimated: and increase in 10% in attendance leads to an increase of 7.5% in the probability that an individual attend the fair. Put another way, the multiplier peer effect is $1/(1 - \beta_1) = 4$, that is, an additional person induced to go to the fair because of the letter will induce, through a trickle-down effect, on average four additional individuals to attend the fair.

[19] This specification is similar to that of Acemoglu and Angrist (1999), who seek to estimate human capital externalities on earnings.

[20] The average $\bar{L}$ is not exogenous because it is computed over all employees (enrolled or not in the TDA by September 2000).

4.2 TDA Participation

4.2.1 The Model

We showed in Section 3 that individuals in group $T1$ are more likely to attend the fair than individuals in group $T0$ but only equally likely to enroll in the TDA after the fair. Individuals in groups $T1$ and $T0$ are in the same departments and thus share all network effects at the department level. The only difference between the $T1$ and $T0$ groups is that $T1$ individual received the inducement letter and hence are more likely to have attended the fair. This suggests that the direct fair effect is zero for those who attend the fair just because of the \$20 promise. Reduced form evidence from Section 3 also showed that individuals in group $T0$ are more likely than individuals in group 0 both to attend the fair and to enroll in the TDA afterward. Three phenomena can explain these results.

First, as individuals in group $T0$ are more likely to attend the fair than group 0 individuals, it is plausible to think that for this group, attending the fair has had a positive effect on TDA enrollment. It is important to note that this positive treatment effect for group $T0$ individuals (compared to group 0 individuals) is not necessarily contradictory with the zero treatment effect for group $T1$ individuals (compared to group $T0$ individuals) because these treatment effects are not measured for the same population. The latter effect is the treatment effect of the fair for those individuals who come just because of the inducement letter while the former effect is the treatment effect of the fair for those individuals who are induced to come the fair because they have been influenced to attend by their colleagues. It is plausible to think that individuals who attend the fair just for the \$20 might not be very interested by the content of the fair and thus do not get much out of it. In contrast, individuals induced to come by their colleagues (with no financial reward) are likely to be more interested by the event and thus end up being more influenced by what they learn at the fair. We will develop and formalize this differential treatment effect below using the theory of Local Average Treatment Effects (LATE) developed by Imbens and Angrist (1994), and Angrist, Imbens, and Rubin (1996).

The second reason why group $T0$ individuals are more likely to enroll in the TDA than group 0 individuals is because T departments are different from 0 departments because of our experiment, and this might influence individuals through social network effects. Peer effects within departments could influence TDA enrollment through two channels. First, individuals who attend the fair might share the information obtained on the TDA with their colleagues and thus increase the enrollment rate in their department.[21] Second, an individual who decides to enroll in the TDA might also discuss her decision with colleagues, and induce some of them to enroll as well.

Third and more subtle, it is conceivable that, for a given individual who would have come to the fair with no external inducement, receiving the letter with the $20 reward modifies his psychological motivation for attending the fair. Because the individual is now paid to attend the fair, he might convince himself that he is coming just for the $20 and thus that he is not really interested in the content of the fair. This type of effect is not standard in economic modelling but there is substantial evidence in the psychology literature on the motivational consequences of reward. This literature is summarized in Ross and Nisbett (1991) (pp. 65-67). Festinger and al. (1959) and Cooper et al. (1978) showed that providing people with small financial incentives for acting as if they hold a given belief promotes greater change in the "rewarded" direction than providing them with large incentives. Perhaps most closely related to our setting, Lepper et al. (1973) showed that school children who are rewarded to play with magic markers are less likely to enjoy it than children who are not, as if "play" had been subjectively turned into "work". These results generated a substantial amount of interest because they go against the conventional reinforcement theory that would appear more intuitive.

These three effects, namely the *differential treatment effect*, the *social network effect*,

[21] We assume, however, that only fair attendees who are not enrolled in the TDA, can induce their colleagues to start enrolling in the TDA. Individuals already enrolled in the TDA presumably influence their colleagues directly through the second channel and not through the information collected at the fair.

and the *motivational reward effect* can be captured in a simple linear model as follows.[22] Let us assume that fair attendance increases the probability of TDA participation of individual i by γ^i. Let us denote by y^i the dummy for individual participation in the TDA. We posit the following specification

$$y^i = \gamma^i f^i + \bar{\gamma}\bar{f} + u^i. \tag{4}$$

The fact that γ^i can vary from individual to individual captures the potentially differential treatment effect, the social network effect is captured by the average fair participation rate $\bar{f}$ in the department. Finally, the motivational reward effect can be captured by assuming that the treatment effect γ^i is potentially (negatively) correlated with the letter treatment L^i. In order to simplify the presentation, let us assume that γ^i takes to following simple form

$$\gamma^i = \gamma^i_S - \nu L^i, \tag{5}$$

where γ^i_S is independent of L^i (this is the standard treatment effect component), and ν represents the motivational reward effect. Assuming no motivational reward effect amounts to simply assuming that $\nu = 0$ and thus that γ^i is independent of L^i.

Each individual belongs to one of the groups $T1$, $T0$, or 0. In order to define treatment effects of fair attendance on TDA enrollment, it is useful to introduce the notion of potential outcomes for fair attendance. For each individual, we denote by $f^i(T1)$, $f^i(T0)$, and $f^i(0)$ the fair attendance decision of individual i, had be been in group $T1$, $T0$, or 0. Obviously, for each individual i, we observe only one of the three potential outcomes for fair attendance. For example, consider an individual (say i) in group $T0$, i.e., an individual in a Treated department but who did not receive an inducement letter. Then $f^i(T1)$ would be individual's i decision to attend to fair if he had received the letter (keeping fixed the number of letters sent to his department). $f^i(0)$ would be individual's i decision

[22] It would be possible to develop a more general non-linear model but this would not change our estimation strategy and interpretation. Therefore, we consider only the simple linear framework.

to attend to fair if no letters had been sent to his department (i.e., if his department had been selected has a control department instead of a treatment). The potential outcomes for individuals in groups $T1$ or 0 can be described in a similar way. As the literature on differential treatment effects has recognized (see Imbens and Angrist (1994)), in order to be able to identify parameters of interest, we need to make the following assumption:

Assumption 1 *Monotonicity Assumption: for each individual i, $f^i(T1) \geq f^i(T0) \geq f^i(0)$.*

This assumption states that receiving the letter can only encourage individuals to attend the fair (and in no case deter them), and that having one's colleagues receive the letter can also only encourage an individual to attend the fair (relative to the situation where no colleagues receive the letter). This assumption sounds very plausible in the situation we analyze. The Monotonicity assumption implies that the population can be partitioned into four different types.

First, the never takers are individuals such that $f^i(T1) = f^i(T0) = f^i(0) = 0$. These individuals do not attend the fair and would not attend whatever group they belong to. Second, we define the *financial reward compliers* type as individuals such that $f^i(T1) = 1 > f^i(T0) = f^i(0) = 0$. These individuals attend the fair only if they receive the letter with the financial reward promise. Third, we define the *social interaction compliers* as individuals such that $f^i(T1) = f^i(T0) = 1 > f^i(0) = 0$. These individuals would not attend the fair if nobody in their department receives the letter, but attend the fair if they are in a treated department (whether or not they themselves receive the letter). Finally, we define the always takers as individuals such that $f^i(T1) = f^i(T0) = f^i(0) = 1$. These individuals attend the fair whatever group they belong to.

As only one of the three potential outcomes is observed for each individual, in general, it is not possible to determine unambiguously empirically to which of the four types an individual is belonging to. Moreover, as by definition, there is no variation in fair attendance for always takers and never takers, it will not be possible to estimate treatment

effects for these groups. Thus we can hope at best to identify average treatment effects for compliers groups only.

We make the following additional assumption.

Assumption 2 *Exclusion restriction assumption.* u^i *is independent of* L^i

The fact that the error term u^i is independent of the letter assignment status L^i means that the letter inviting the employee to the fair has no direct effect on TDA participation decision of those who do not attend the fair (beyond its effect on individual and departmental fair attendance). The letter we sent did not mention TDA but only benefits in general, and did not contain any mention of the employee's TDA status (see the facsimile in appendix). In Section 5, we will present evidence that a much more targeted mailing does not seem to affect fair participation. This assumption seems therefore to be justified. However, the letter can affect the TDA status of those who attended the fair, by reducing its effectiveness (through the motivational reward effect).

- **Comparing group $T1$ to group $T0$**

Individuals in group $T1$ and individuals in group $T0$ belong to the same departments and thus are subject to the same departmental social network effects (namely, the departmental variable $\bar{f}$ is common to both groups). Thus comparing individuals $T1$ and individuals and $T0$ provides an estimate of the sum of the direct treatment effect and the motivational reward effect. More precisely, taking the average of equation (4) over groups $T1$ and $T0$, and taking the difference, we obtain

$$\bar{y}_{T1} - \bar{y}_{T0} = E[y^i|T1] - E[y^i|T0] = E[\gamma_S^i f^i - \nu f^i + \bar{\gamma}\bar{f} + u^i|T1] - E[\gamma_S^i f^i + \bar{\gamma}\bar{f} + u^i|T0].$$

Using the exclusion assumption stating that u^i is independent of L^i, we have

$$\bar{y}_{T1} - \bar{y}_{T0} = E[\gamma_S^i(f^i(T1) - f^i(T0))] - \nu E[f^i|T1].$$

Using the monotonicity assumption, we then obtain

$$\bar{y}_{T1} - \bar{y}_{T0} = E[\gamma_S^i|f^i(T1) - f^i(T0) = 1] \cdot P(f^i(T1) - f^i(T0) = 1) - \nu P(f^i(T1) = 1)$$

As $P(f^i(T1) = 1) = \bar{f}_{T1}$ and $P(f^i(T1) - f^i(T0) = 1) = \bar{f}_{T1} - \bar{f}_{T0}$, we finally obtain

$$\frac{\bar{y}_{T1} - \bar{y}_{T0}}{\bar{f}_{T1} - \bar{f}_{T0}} = E[\gamma_S^i | f^i(T1) - f^i(T0) = 1] - \nu \cdot \frac{\bar{f}_{T1}}{\bar{f}_{T1} - \bar{f}_{T0}}. \tag{6}$$

Therefore, an IV regression of TDA enrollment on fair attendance using L^i as instrument in the sample of individuals in T departments estimates the parameter displayed in equation (6) which is the sum of two effects. First, there is the causal treatment effect for the population of financial reward compliers, namely individuals who went to the fair because of the inducement letter ($f^i(T1) = 1$) but who would not have gone had not they been sent the letter ($f^i(T0) = 0$). Second, there is the motivation reward effect. It is important to note that the social network effects ($\bar{\gamma} \neq 0$) cancel out in the comparison of groups $T1$ and $T0$.

Comparing group $T0$ to group 0

Individuals in group $T0$ and individuals in group 0 do not receive the inducement letter but some of the peers of individuals $T0$ do receive the letter. As we have seen in Section 3, because of network effects, individuals $T0$ are more likely to attend the fair than individuals $T0$. As none of the individuals in groups $T0$ and 0 receive the letter, there is no motivational reward effect involved in this comparison. More precisely, taking the average of equation (4) over groups $T0$ and 0, and taking the difference, we have

$$\bar{y}_{T0} - \bar{y}_0 = E[y^i|T0] - E[y^i|0] = E[\gamma^i(f^i(T0) - f^i(0))] + \bar{\gamma}[\bar{f}_T - \bar{f}_0].$$

Hence, we finally obtain

$$\frac{\bar{y}_{T0} - \bar{y}_0}{\bar{f}_{T0} - \bar{f}_0} = E(\gamma^i | f^i(T0) - f^i(0) = 1] + \bar{\gamma} \cdot \frac{\bar{f}_T - \bar{f}_0}{\bar{f}_{T0} - \bar{f}_0}. \tag{7}$$

Therefore, an IV regression of y^i on f^i using D^i as an instrument on the sample of $T0$ and 0 individuals generates an estimate that is a sum of two components. First, there is the average treatment effect for social interaction compliers, namely those individuals who decide to come to the fair because of social effects in fair attendance but who would

not have attended if they had been in a control department. Second, there is a social network effect.

Our analysis has shown that there are four parameters of interest in the model: the two average treatment effects for financial reward compliers and social interaction compliers respectively, the social network effect parameter $\bar{\gamma}$, and the motivational reward effect ν. Our experiment provides us with only two instruments L^i and D^i, thus it is clear that we cannot identify all four parameters together. More precisely, we need to make additional assumptions about two of these four parameters in order to be able to estimate the remaining two parameters. In the next subsection, we discuss three alternative assumptions under which the remaining parameters of the model could be estimated. The objective of the section is not to claim that any of these sets of assumption is correct, but rather to explore their consequences.

4.2.2 Interpretation under Alternative Identification Assumptions

- **No motivational reward and social network effects**

In that situation, both parameters $\bar{\gamma}$ and ν are equal to zero, and we can identify both average treatment effects for financial reward compliers and social interaction compliers. Specializing equations (6) and (7) to that situation, we see that

$$\frac{\bar{y}_{T1} - \bar{y}_{T0}}{\bar{f}_{T1} - \bar{f}_{T0}} = E[\gamma^i | f^i(T1) - f^i(T0) = 1], \qquad \frac{\bar{y}_{T0} - \bar{y}_0}{\bar{f}_{T0} - \bar{f}_0} = E[\gamma^i | f^i(T0) - f^i(0) = 1]. \quad (8)$$

Thus, the average treatment effect for financial reward compliers can be obtained by a simple IV regression of TDA enrollment on fair attendance on the sample of individuals in treated departments using L^i as an instrument. Similarly, the average treatment effect for social interaction compliers can be obtained by an IV regression of TDA enrollment on fair attendance on the sample of individuals in $T0$ or 0 groups using D^i as an instrument. Column (2) and (3) in Table 4 present these IV estimates, for TDA enrollment after 4.5 months and after 11 months. Consistent with the reduced form evidence, the IV estimates

suggest a positive effect on the social interaction compliers, and no effect on the financial reward compliers.

It should be noted that the estimate of the effect of the fair based on the comparison of groups $T1$ and $T0$ is not contaminated by the presence of a social interaction effect. In the presence of a negative motivational reward effect, the IV regression estimates the parameter in equation (6), and is therefore a lower bound of the effect of the fair on financial reward compliers. However, the estimate clearly indicates that inducing individuals to attend the fair with a financial reward who would otherwise not have gone has no direct effect. Either these people are not affected by the fair, or any effect of the fair on them is compensated by the reduction in the effect for those who would have chosen to go on their own or because of their friends, and now go "for the reward". However, the encouragement design has an indirect effect: it affects their colleagues, either just by inducing them to go to the fair as well (as in the case analyzed here), or by directly affecting their TDA participation (as in the case analyzed below).

- **Constant Treatment Effects with no motivational reward effect**

In the case where there is no motivational reward effect ($\nu = 0$) and the standard treatment effect γ^i is the same across individuals and equal to γ, both parameters γ, and $\bar{\gamma}$ of the structural equation (4) are identified using L^i and D^i as instruments. Therefore, these estimates can be obtained with an IV regression of y^i on a constant, f^i, and $\bar{f}$ using L^i and D^i as instruments on the sample of individuals not enrolled in the TDA by September 2000. In that case, equation (6) specializes to

$$\gamma = \frac{\bar{y}_{T1} - \bar{y}_{T0}}{\bar{f}_{T1} - \bar{f}_{T0}}. \tag{9}$$

This ratio is the IV estimate presented in column (2) in table 4, which we discuss above. Therefore, under these restrictive assumptions, we can conclude that the direct effect of the fair is zero *for everyone*. Taking the average of equation (4) over departments 0 and T, we obtain

$$\bar{y}_0 = (\gamma + \bar{\gamma})\bar{f}_0 + \bar{u}, \quad \bar{y}_T = (\gamma + \bar{\gamma})\bar{f}_T + \bar{u}. \tag{10}$$

Therefore the overall effect of fair attendance on TDA participation, taking into account all the social effects, is the ratio

$$\frac{\bar{y}_T - \bar{y}_0}{\bar{f}_T - \bar{f}_0} = \gamma + \bar{\gamma}. \tag{11}$$

This overall effect of one additional person attending the fair on TDA participation is the sum of the direct causal effect γ of the fair, and the social effects $\bar{\gamma}$ from equation (4). These estimates (for participation after 4.5 months and after 11 months) are presented in column (1) in table 4. In both cases, the overall effect of the fair is positive and significant. Note that this is main the parameter of interest for the benefits office, when it considers the cost and benefits of inducing employees to attend the fair. Under the assumptions made here, the difference of columns (1) and (2) gives an estimate of the social effect parameter. The implied estimates of $\bar{\gamma}$ are 10.14% and 6.7%, respectively.[23]

The fact that the direct effect γ is zero rules out that the underlying model is one with a "social multiplier", where TDA participation is affected only by average TDA participation. Since the exogenous effect of the fair on TDA participation is 0, this would not have started the "snowballing" effect. The data we presented so far is compatible with two alternative models.

- **Constant Treatment Effects and no social network effects**

In this case, the constant standard treatment effect γ_S can be obtained using (7), since $\bar{\gamma} = 0$. In turn, equation (6), with the first term set to γ, can be used to recover ν. Using the estimates of $\bar{f}_{T1}$, and $\bar{f}_{T0}$ from table 2, we obtain an estimate of nu of 0.0927 after 4.5 months, and 0.0620 after 11 months. Under these assumptions, receiving the letter reduces the treatment effect by 61% for TDA participation after 4.5 months, and 42% for

[23]Estimates of the direct and social effects parameters (and their standard errors) can also be directly obtained by an IV estimation of equation (4) (where $\gamma^i = \gamma$), using D_i and L_i as instruments.

TDA participation after 11 months.

Even though the distinction between differential treatment effects and motivational reward effects is clear conceptually, devising an experiment to tell them apart would be difficult. A possibility would be to offer heterogeneous rewards. If bigger rewards reduce TDA enrollment relative to smaller rewards, then this would be positive evidence that motivational rewards effects are present.[24]

4.3 Additional evidence: Effects of the experiment in various sub-groups

Disentangling which of these assumptions holds in practice is not possible. It is likely that none of the alternative set of assumptions we propose is actually verified. However, looking at the effect of the experiment on fair attendance and TDA participation sheds interesting light on the results.

Using the second set of assumptions (constant treatment effect and no motivational reward), we arrived at the conclusion that the direct effect of the fair is zero, while the social effect of average fair attendance is positive and significant. This would be compatible with two alternative models.

Under the first model, the fair conveys useful information, but any information obtained by a fair participant is completely diffused to the entire department. This would explain why group $T1$ does not participate in the TDA any more than group $T0$ ($\gamma = 0$), which in turn participates more than group 0 ($\bar{\gamma} > 0$). This model has an additional testable implication: the effect of being in a treated department is entirely due to the increase in the probability that at least one member of the department attends the fair. Indeed, according to the registration data we collected at the fair, the probability that at least one department member attends the fair is much larger in treated departments (93%) than in untreated departments (55%). An implication of the model is thus that

[24]However, because of social network effects, finding the reverse empirical result does not allow to conclude that motivational reward effects are absent.

if, as one would expect, the difference in the probability that at least one member of the department attends the fair is larger in larger departments than in smaller departments, the difference in TDA participation after 4.5 or 11 months between treated and control departments should also be larger within the smaller departments. Indeed, the difference between treated and untreated departments in the probability that at least one person attends the fair is 59% in the department of 81 employees or more (department size for the median employee), and 16% in the departments smaller than 81 employees. However, as we show in panel A of table 5, the reduced form differences after 4.5 and 11 months are virtually identical in the two groups. This rejects the hypothesis of complete diffusion of information.

Under the second model, the fair itself has no effect on participation, but when individuals see more people attending the fair (or receiving a letter inviting others about the fair), they are prompted into action about their TDA. We have no direct data to reject this hypothesis, but it seems somewhat implausible that individuals would be more affected by learning that other people attend the fair than by directly hearing about the benefits (and seeing many other people at the fair in the process of thinking about their benefit choices).

In summary, while we cannot reject a model with constant treatment effect where all the effects are triggered through social interactions, this does not seem a very plausible explanation of the data. Note, however, that under all explanations, it is social effects in fair attendance that allowed our experiment to ultimately have an effect on TDA enrollment.

In the remainder of Table 5, we explore various observable characteristics which may lead to variation in the effect of the treatment. Column (1) reports average fair participation in each subgroup, among those who received the letter (we know the identity of those who attended the fair only for this group). Fair participation was larger in small departments than in large departments, and for women than for men. In column (2) and (3), we show the difference in TDA enrollement between treated and control departments

after 4.5 and 11 months, respectively. After 4.5 months, the treatment effect seems somewhat larger in departments where the participation rate before the experiment was high (panel B) and the salary is high (panel D). However, after 11 months, this difference has shrunk (in panel B) or disappeared (in panel D). This suggests that it takes more time for those in departments with low initial participation and those with lower salaries to adjust their TDA participation. Panel C shows that the effects are the same for men and women. Overall, there is no evidence that treatment effects are widely different across groups (especially after 11 months), and it thus seems unlikely that differential treatment effects can explain all the results by themselves.

4.4 Direct and Overall effects of the fair: comparisons with naive estimates

The model developed in Section 4 clarifies the errors that can be done when ignoring social effects in experimental data. The data also allows us to compare experimental results with observational results. Table 6 presents alternative estimates of the effect of the fair.

Columns (1) and (2) are, respectively, the IV and the OLS estimates of the direct effect on TDA participation of attending the fair after 11 months (after taking out social effects); they are therefore limited to employees in T departments.[25] The OLS estimate is 0.052 and significant. As we explained above, the direct effect of the fair can be estimated by running an IV regressions of the TDA participation on attendance to the fair in treated departments, using the dummy for receiving the letter as instrument. Given the lack of precision of the IV estimate, the two estimates are statistically indistinguishable, but the OLS estimate is more than three times as large as the IV estimate. This is not surprising, given that one would expect those who are more interested in benefits to be more likely

[25]Since we do not know the identity of those who came to the fair except for those who received the invitation letter, the OLS estimate is obtained in the sample of those who received the letter.

to attend the fair.[26]

Columns (3) and (4) present alternative IV estimates of the overall effect of the fair on TDA participation using the full sample (treated and control departments) of employees not enrolled in the TDA by September 2000. In column (3), we estimate the overall effect of the fair by an IV regression of TDA participation on average fair participation in each department, using the dummy for whether the department is treated as an instrument for average participation. The coefficients are 0.057 and 0.082 after 4.5 and 11 months and are significant. In column (4), we present the "naive", IV estimate that uses the letter dummy as instrument, in the complete sample. This estimate lies between the estimate of the overall effect and the effect based on the $T1$ versus $T0$ comparison. Thus, the naive estimate would underestimate the overall effect of the fair (since part of the "control" group is actually treated, due to the social interaction effect in the decision to attend the fair) and overestimate the direct letter effect (since individuals in the treatment group are also subject to social interaction effects). Ignoring the analysis we have developed in this paper would lead to a misguided causal interpretation of the effect of the fair on TDA enrollment.

5 Additional evidence: follow-up letter

We have so far assumed that the effect of the invitation letter on TDA participation was entirely due to its inducement to attend the fair. Since the letter did not mention the TDA, this seems plausible. It is however possible that a letter reminding the employees that they are not enrolled in the TDA has a direct effect on participation. This question is of independent interest, since large scale mailing can be done in a relatively inexpensive way. For example, Social Security administration has started in 1999 sending to all covered

[26]For example, as we noted earlier, the fraction of TDA participants is much higher among the sample of fair attendees who did not receive the letter than among all employees (above 50% versus around 30%). This shows that TDA participants are more likely to attend the fair, probably because they are more interested in benefits information on average than non TDA participants.

workers a letter detailing their past contributions to social security and their predicted social security retirement benefits.

In order to investigate this question, we have sent a short questionnaire (reproduced in the appendix) to 917 employees in April 2001. The questionnaire was designed to assess the intentions and evaluate the knowledge of employees about the retirement benefits. An additional goal of sending out the questionnaire was to remind those that were not yet enrolled of their TDA status, and thus potentially to give them a cue to think about enrolling in the TDA.

In the questionnaire, we asked employees whether they were enrolled in the TDA, why they were not enrolled, whether they saved for retirement through other means, and whether they had attended the fair. In order to induce employees to send back the questionnaire, we promised a $10 Macy's gift certificate to any employee who would send back the questionnaire within 6 weeks. We sent the questionnaire to 917 employees selected as follows. First, we restricted the sample to those who were not enrolled in the TDA by March 2001. Second, one third of employees (301) were selected among the 573 fair participants who did receive the invitation letter. The second third (311) of employees were selected among the 1,499 employees who received the invitation letter but did not come to the fair. The last third (305) were selected among our control group (those who did not receive the invitation letter).[27] We did not intentionally leave out any departments, but since the number of questionnaires was not very large, there are a number of departments where we did not send any questionnaire.[28] As shown in panel D of Table 1, 45% of individuals responded to the letter in treated departments (those where we had sent out invitation letters to the fair), but only 35% responded in the untreated departments.

We present in Table 7 estimates of the effect of sending the additional questionnaire on participation 6 months after receiving the questionnaire. Since the sample is stratified into

[27] Out of these 305 individuals, 160 are from the $T0$ control group and 145 are from the 0 control group.

[28] These departments tend to be smaller, but once we control for the dummy indicating in which group the department belongs, the difference in size is small.

three groups, all our statistics are computed using the appropriate weights to obtain the balanced population average. There is no significant difference in TDA participation after 6 months between departments where we sent the questionnaire and departments where we did not (the point estimate is negative). Within departments where the questionnaire was sent, those who actually received it are somewhat more likely to contribute to the TDA, but the difference is not statistically significant either: the questionnaire did not seem to affect very much individuals' participation to the TDA.

Studying the responses to the questionnaire and, in particular, investigating whether attending the fair affects the responses to these questions is of independent interest. In particular, we introduced in the questionnaire two questions designed to measure the employees' knowledge of the retirement benefits system in the university. Other questions try to get at the alternative options available to the employees to save for retirement, or at measuring the extent of procrastination.

There is an additional difficulty in the analysis. The response rate to the questionnaire is less than 50%. Clearly, people who respond form a selected group: for example, people who respond to the questionnaires are 8 percentage points more likely to enroll in the TDA after 6 months than those who got it, but did not respond (the standard error is 0.017). Moreover, and consistently with our results from Table 7, those who got the questionnaire and did not respond are less likely to enroll in the TDA after 6 months than those who did not get the questionnaire. In addition, the selection seems different in treated versus control departments. The response rate in treated departments is 45% (Table 1, panel D), while it is only 35% in control departments. It would thus not be very informative to compare the responses across those samples. On the other hand, network effects within departments seem to have played an important role here too: the response rates among treated and untreated individuals within treated departments are essentially identical. A plausible explanation is that those who had received the fair invitation letter were able to tell their colleagues that we had delivered on our promise of sending the reward. Since the response rates are the same, the assumption that the selection process is the same is

reasonable. Thus, we can compare the response among treated and untreated individuals within treated department. These responses are not representative of the population in general, but representative of the part of the population who tends to respond to this type of questionnaires.

The results are presented in Table 8. People who answered the questionnaire are more likely to have attended the fair than people who did not in the same group: in the treated group, 43% of the respondents to the questionnaire have attended (while 28% of the entire treated population has attended), and in the control group, 29% of the respondents have attended (against 15.1%). The difference in attendance (14%) is similar to the difference in fair attendance between the two groups as a whole (13.1%), which we had recorded at the fair.[29] Respondents report very high satisfaction rates. Yet, the satisfaction is significantly higher for the control group than for the treatment group (95% against 85%). This difference is almost as large as the difference in fair attendance in this sample: it suggests either that the marginal fair participant induced by our reward was less likely to find the fair useful (thus supporting the hypothesis of differential treatment effects), or that fair satisfaction was reduced by the fact of having received the letter (supporting the motivational reward effect hypothesis).

In panel B, we report the response to the question "why are you not enrolled in the TDA?", for those who report that they are not enrolled (none of them are actually enrolled). They could check as many answers as applied. Individuals in the treatment group are less likely to report that they lack information (20% versus 30%). The difference is significant at the 10% level. They are also more likely to say that they want to enroll, but have not found the time yet (45% versus 36%), although the t-statistic is just 1.3. Incidentally, the reason "plan to enroll soon" is the single most often cited reason for not contributing in both groups. This indicates that the level of inertia and procrastination is important (it is in line with the results of Madrian and Shea (2001), for example). All

[29]This similarity suggests that there was no systematic bias in the way we recorded departments at the fair–even though we recorded them for only 75% of the participants.

the other reasons for not contributing are mentioned equally often in both groups.

Panel C shows the answer to the question "where do you obtain information about the TDA?". Not surprisingly, those in the treatment group are more likely to say that they obtain it from the fair (and the difference, 11%, is close to the 14% difference in fair attendance). However, they are *less* likely to obtain information from the benefits fair information packet (77% versus 93%). Those two sources of information thus appear to be substitute. The other sources of information seem to be used equally by both groups.

Panel D reports answers to the knowledge questions. The first question is whether the employee is or not enrolled in the TDA (when we sent the letter, none of them were). Second, we asked them whether they know the number of vendors with whom their Defined Contribution (DC) benefits are invested. Employees are automatically enrolled in the DC plan and can choose to invest their contributions with four different vendors. Many employees have more than one vendor. If they do not make a choice, the benefits office randomly allocates them to one vendor.

Treatment and control groups are about as likely to know the number of vendors with whom they are contributing: 74% and 71%, respectively, ventured to answer the question, and, in total 60% of each group gave the right answer.[30] However, those who received the letter are significantly less likely to report knowing their TDA status (94% versus 99%), and less likely to give the correct answer (89% versus 94%). This could reflect some over-confidence on their part, since this letter was sent only to those who were not contributing. This lends some support to the motivational reward hypothesis: in this group where the participation to the fair was high, the treated group has less knowledge than the group that was not directly treated.

In summary, participation to the fair did not seem to have a large impact on the employees' information set: they seem to have substituted fair attendance for individual research. In fact, they are more likely to be unsure about their actual TDA status, and to wrongly report themselves as contributing even though they are not. However, they

[30]Those who did not answer are counted as having given the wrong answer.

are less likely to think they they suffer from a lack of information, and more likely to plan to enroll soon.

6 Conclusion

This paper has made an attempt at identifying the effects of information on the decision to enroll in an employer sponsored Tax Deferred Account retirement plan, and social effects between colleagues that might arise in that context.

Our encouragement design was very successful in inducing treated employees to attend the benefits fair. We were also able to show that there are very strong peer effects within departments in the decision to attend the benefits fair. In the second stage of the study, we obtained evidence that individuals affected by the experiment are indeed more likely to start enrolling in the TDA some time after the fair. The direct causal effect of individual fair attendance seems however to be very small, at least for individuals induced to attend the fair solely because of the financial reward. We have proposed three different interpretations, namely differential treatment effects, social network effects, and motivational reward effect, to account for these findings. Our experiment does not allow us to distinguish unambiguously between these interpretations, and shows how the analysis of a simple experiment in an social and economic context turns out to be substantially more complicated than expected.

Our analysis and results have several important implications. First, they contribute to the literature on the determinants of retirement savings. The work of Bayer, Bernheim, and Scholz (1996) and Bernheim and Garett (1996) on financial education, Duflo and Saez (2000) on peer effects, and Madrian and Shea (2001) on default rules has shown that economic incentives are not the only determinants of savings decisions. This paper adds to these studies by proving with experimental evidence that social interactions are a powerful mechanism for sharing information. Individuals do not instantly learn about economic opportunities, and their environment is a strong determinant of their economic decisions.

Low levels of savings by American households have been a source of preoccupation for academics and policy makers alike. Recognizing that savings decisions are influenced by peer's savings decisions could be an important element to improve our understanding of these issues.

Second, these results provide a possible rationale for organizing 401(k)s around the workplace. In the case of tax deferred accounts which individuals can access on their own and outside the workplace (such as IRAs), people have no obvious peer group with which to discuss their choices. The strong decline in participation in IRAs following the Tax Reform Act of 1986 has been considered as evidence that advertisement and information are one of the key elements driving participation rates (see Bernheim (1999)). When the TDA is organized by employers such as in the case of 401(k) plans, co-workers become a natural group with which to discuss it as the benefits package is common to employees, and therefore a likely conversation topic. Offering savings options organized around the workplace may therefore increase the overall level of savings.

Third, this study has shown that it is relatively simple and inexpensive to carry out a true experiment within a large firm to study important economic research questions. Moreover, organizations divided in departments provide an excellent set-up to study social interaction effects within the work place. We hope that our attempt will foster this research approach and induce more economists to try and tackle questions in labor economics using this experimental approach. In particular, our analysis has raised more questions than it actually was able to answer. Using the current experiment and analysis as a first step, one could think of several experimental designs to try and identify the various effects we have described.

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Table 1: Descriptive Statistics, by groups

	Treated departments			Untreated
	All (group T)	Treated (group T1)	Untreated (group T0)	Departments (group 0)
	(1)	(2)	(3)	(4)
PANEL A: BACKGROUND CHARACTERISTICS				
TDA participation	0.010	0.009	0.011	0.012
before the fair (Sept. 2000)	(.0015)	(.0021)	(.0022)	(.0024)
Number of observations	4168	2039	2129	2043
Sex (% male)	0.398	0.400	0.396	0.418
	(.0076)	(.0109)	(.0107)	(.011)
Years of Service	5.898	5.864	5.930	6.008
	(.114)	(.161)	(.16)	(.157)
Salary	38547	38807	38297	38213
	(304)	(438)	(422)	(416)
Age	38.3	38.4	38.2	38.7
	(.17)	(.24)	(.24)	(.24)
Number of observations	4126	2020	2106	2018
PANEL B: FAIR ATTENDANCE (REGISTRATION DATA)				
Fair attendance	0.214	0.280	0.151	0.049
among non-TDA enrollees	(.0064)	(.01)	(.0078)	(.0048)
Number of observations	4126	2020	2106	2018
Fair attendance	0.192			0.063
for all staff employes	(.0132)			(.0103)
Number of observations	6687			3311
PANEL C: TDA PARTICIPATION (ADMINISTRATIVE DATA)				
TDA participation after	0.049	0.045	0.053	0.040
4.5 months	(.0035)	(.0049)	(.0051)	(.0045)
Number of observations	3726	1832	1894	1861
TDA participation after	0.088	0.089	0.088	0.075
11 months	(.005)	(.0071)	(.007)	(.0065)
Number of observations	3246	1608	1638	1633
PANEL D: RESPONSE RATE TO THE ADDITIONAL QUESTIONNAIRE				
Response rate	0.452	0.440	0.464	0.352
	(.018)	(.0201)	(.0405)	(.0402)
Number of observations	765	612	153	142

Notes:
1-Standard errors in parentheses.
2-The first part of Panel B includes all individuals not enrolled in the TDA by sept. 2000. The second part includes all employes (enrolled or not in the TDA)
3-The average participation in the non-treated department was obtained from the registration information collected at the fair. We collected department and TDA participation. Since only 75% of the participants registered, the participation was adjusted by a proportionality factor.
4-Demographic information and TDA participation are all obtained from administrative data

Table 2: Differences in background characteristics, fair attendance and TDA participation, by treatment status

	Treated depts. vs untreated depts.	Treated vs Untreated in treated depts.	Untreated in treated depts. vs untreated depts.	Treated vs untreated depts.
	X_T-X_0	X_{T1}-X_{T0}	X_{T0}-X_0	X_{T1}-X_0
	(1)	(2)	(3)	(4)
PANEL A- BACKGROUND CHARACTERISTICS				
Sex (% male)	-0.023	0.003	-0.027	-0.017
	(.024)	(.015)	(.022)	(.025)
Years of Service	-0.169	-0.061	-0.089	-0.205
	(.386)	(.252)	(.384)	(.362)
Salary	524	369	208	760
	(964)	(561)	(847)	(1002)
Age	-0.56	0.16	-0.52	-0.48
	(.53)	(.33)	(.52)	(.49)
Number of observations	6144	4126	4124	4038
PANEL B: FAIR ATTENDANCE				
Fair attendance	0.158	0.138	0.090	0.231
	(.021)	(.019)	(.02)	(.022)
Number of observations	6144	4126	4124	4038
PANEL C: TDA PARTICIPATION				
TDA participation after	0.0097	-0.0068	0.0126	0.0075
4.5 months	(.0043)	(.0063)	(.0053)	(.0048)
Number of observations	5587	3726	3755	3693
TDA participation after	0.0141	0.0023	0.0133	0.0153
11 months	(.0063)	(.0103)	(.0082)	(.007)
Number of observations	4879	3246	3271	3241
PANEL D: RESPONSE TO THE QUESTIONNAIRE				
response rate to the questionnaire	0.1516	0.0070	0.1655	0.1465
	(.0366)	(.0519)	(.0521)	(.0376)
Number of observations	907	765	295	754

Notes:
1-Regression adjusted differences in means: department were matched according to size and participation, and triplets of departments of similar contribution rate and size were formed. One department of each triplet was selected. The regressions control for the triplet to which the department belongs.
2-Standard errors (reported in paretheses below the coefficient) corrected for clustering at the department level
3-The average participation in the non-treated department was obtained from the registration information collected at the fair. We collected department and TDA participation. Since only 75% of the participants registered, the participation was adjusted by a proportionality factor.
4-Demographic information and TDA participation are all obtained from administrative data
5-The sample is restricted to individuals who were not enrolled in the TDA before the fair.

Table 3: Individual and social effects on fair attendance

	Attended the fair		
	OLS	IV	IV
	(1)	(2)	(3)
Dummy for received letter	0.138	0.132	0.133
	(.019)	(.019)	(.019)
Dummy for treated department	0.090		
	(.022)		
Average number of letters in the department		0.285	
		(.072)	
Average participation to the fair in the department			0.753
			(.094)
Observations	6144	6144	6144

Notes:
1- All regressions control for the triplet to which the department belongs
2-Standard errors (reported in parentheses) control for clustering at the department level
3-In the IV regressions, the instrument sets is made of the dummy for whether the department is treated, the dummy for whether the individual received the letters, and the triplet to which the department belongs.

Table 4: IV regressions: Effect of fair attendance on TDA participation

	T depts. vs 0 depts.	Letter vs non-letter in T depts.	Non-letter in T depts. vs 0 depts.	Letter indiv. vs 0 depts.
	$(y_T-y_0)/(f_T-f_0)$	$(y_{T1}-y_{T0})/(f_{T1}-f_{T0})$	$(y_{T0}-y_0)/(f_{T0}-f_0)$	$(y_{T1}-y_0)/(f_{T1}-f_0)$
	(1)	(2)	(3)	(4)
TDA participation after	0.0568	-0.0446	0.1348	0.0300
4.5 months	(.0257)	(.0402)	(.0625)	(.0195)
Number of observations	5587	3726	3755	3693
TDA participation after	0.0817	0.0142	0.1488	0.0599
11 months	(.0399)	(.0641)	(.102)	(.029)
Number of observations	4879	3246	3271	3241
Sample	T1, T0, 0	T1,T0	T0,0	T1,0
Instruments	Treated department	Received letter	Treated department	Received letter

Notes:
1- Dependent variables are individual enrollment in the TDA 4.5 months and 11months after the fair
2- Independent variable is individual fair attendance
3- All regressions control for the triplet of the department
4- Standard errors (in parentheses) corrected for clustering at the department level

Table 5: Fair attendance and treatment effect in different groups

		Difference Group T-Group 0	
	Fair attendance in T1 (letter recipients)	TDA participation after 4.5 months	TDA participation after 11 months
	(1)	(2)	(3)
PANEL A: DEPARMENT SIZE			
Below median (81)	0.328	0.009	0.013
	(.015)	(.0071)	(.0106)
	985	2797	2403
Above median (81)	0.235	0.009	0.015
	(.0132)	(.0047)	(.0079)
	1035	2790	2476
PANEL B: DEPARTMENT AVERAGE PARTICIPATION IN THE TDA BEFORE THE EXPERIMENT			
Below median (34%)	0.259	0.006	0.013
	(.0134)	(.0059)	(.009)
	1062	2929	2523
Above median (34%)	0.304	0.013	0.016
	(.0149)	(.0064)	(.0094)
	958	2658	2356
PANEL C: GENDER			
Women	0.320	0.012	0.014
	(.0134)	(.0071)	(.0112)
	1213	3298	2843
Men	0.221	0.007	0.011
	(.0146)	(.0071)	(.0086)
	807	2289	2036
PANEL D: SALARY			
Below Median ($34021)	0.269	0.001	0.015
	(.0141)	(.006)	(.0088)
	983	2745	2291
Above Median ($34021)	0.291	0.018	0.015
	(.0141)	(.0065)	(.0104)
	1037	2842	2588

1-The sample in column 1 is composed of individuals in group T1
2-Columns 2 and 3: Regression adjusted differences in means: department were matched according to size and participation, and triplets of departments of similar contribution rate and size were formed.
The regressions control for the triplet to which the department belongs.
3-Standard errors (reported in paretheses below the coefficient) corrected for clustering at the department level

Table 6: Comparison with naive estimates: effect of the fair on TDA enrollment

	Individual effect		Overall effect	
	IV	OLS	IV	"Naïve" IV
	(1)	(2)	(3)	(4)
A. Participation after 4.5 months				
Fair attendance	-0.045	0.016	0.057	0.001
	(.04)	(.011)	(.026)	(.026)
	3726	1832	5587	5587
B. Participation after 11 months				
Fair attendance	0.014	0.052	0.082	0.042
	(.064)	(.018)	(.04)	(.039)
	3246	1608	4879	4879
Sample	Treated departments	individuals who received the letter	Complete sample	Complete sample
Instrument	Received letter	NONE	Treated department	Received letter

Notes:
1- Dependent variables are individual enrollment in the TDA 4.5 months and 11months after the fair
2- Independent variable is individual fair attendance
3- All regressions control for the triplet of the department
4- Standard errors (in parentheses) corrected for clustering at the department level
5- Sample in column (1) limited to individuals (not enrolled in the TDA by Sept. 2000) in Treated departments.
Sample in column (2) limited to individuals who received the letter (not enrolled in the TDA by Sept. 2000)
Sample in column (3) and (4) limited to individuals not enrolled in the TDA by Sept. 2000

Table 7: Effect of the questionnaire on TDA participation

	Dependent variable: TDA participation 6 months after receiving the questionnaire	
	Department with questionnaires vs departments without questionnaires	Individuals with and without questionnaire in departments with questionnaires
	X_T-X_0	X_{T1}-X_{T0}
	OLS	OLS
Independent variable	(1)	(2)
Received questionnaire	-0.001	0.009
	(.013)	(.009)
Observations	4642	4170
Number of questionnaires	917	917
Sample	All	Treated departments

Notes
1-Sample limited to individuals not enrolled in the TDA by April 2001 (time at which questionnaire was sent)
2-All regressions control for the group of the departments
3-Standard errors (in parentheses) control for clustering at the department level
4-All regressions are weighted according to population weight

Table 8: Effect of the fair on attitudes and knowledge

	Treated departments		
	Treament (Received invitation)	Control	Difference
	(1)	(2)	(3)
A. Fair participation and impressions			
Fair participation	0.425	0.286	0.140
	(.029)	(.054)	(.064)
Number of observations	301	70	371
Fair satisfaction (for those who	0.849	0.950	-0.101
attended the fair	(.027)	(.05)	(.047)
B. Response to the question "Why are you currently not enrolled in the TDA?"			
Not enough	0.200	0.306	-0.107
information	(.025)	(.059)	(.063)
Cannot afford	0.328	0.371	-0.043
to save for retirement	(.029)	(.062)	(.075)
Plan to enroll soon,	0.446	0.355	0.091
but no time to do it yet	(.031)	(.061)	(.07)
Other ways to save for	0.220	0.242	-0.022
retirement	(.026)	(.055)	(.063)
	255	62	317
C. Response to the question "where do you obtain information about benefits?"			
Benefits fair	0.370	0.254	0.117
	(.028)	(.052)	(.054)
Benefits information packet	0.771	0.930	-0.158
	(.024)	(.031)	(.039)
Personal visit to the BO	0.123	0.085	0.038
	(.019)	(.033)	(.05)
Other information seminar	0.204	0.211	-0.007
	(.023)	(.049)	(.049)
Colleagues	0.252	0.310	-0.058
	(.025)	(.055)	(.053)
Family or friends	0.265	0.239	0.026
	(.026)	(.051)	(.051)
Administrative officer	0.049	0.014	0.035
	(.012)	(.014)	(.025)
	300	71	371
D. Knowledge about benefits			
Reported that she knew her	0.938	0.986	-0.048
TDA status	(.014)	(.014)	(.022)
Reported that she knew the	0.738	0.714	0.024
number of vendors with which she	(.029)	(.061)	(.058)
Gave the correct	0.887	0.944	-0.056
answer about TDA status	(.018)	(.028)	(.033)
Gave the correct	0.603	0.607	-0.004
answer about the pension plan	(.032)	(.066)	(.069)
	235	56	291

Notes
1-All statistics are weighted by population weight
2-Standard errors of the difference corrected for clustering at the department level
3-Sample is restricted to treated deparments

October 31, 2000

Name
Line 1
Line 2
City state zip

Dear Name:

You have just received your Open Enrollment packet from the Benefits Services Group, inviting you to the Benefits Fair 2001.

The Fair will be held in two locations:

November 7, 11am–2:30pm
ADDRESS ERASED

November 8, 11am – 2:30pm
ADDRESS ERASED

This year, as part of a study (conducted jointly by the Benefits Services Group and economics researchers) to better understand the impact of the Fair on benefits choices, we are offering a reward of **$20** to 2,000 employees, just for attending the Fair. Funding for these rewards was contributed from a research grant. We selected those employees by a simple lottery, and your name was among those drawn.

In order to receive this **$20** reward, all you have to do is to come to the Fair with this letter, and give your name at the registration table that will be located in the main hall. You will receive a check within the two weeks following the Fair.

We hope that you will find the Fair helpful in making your benefits choices. However, we want to emphasize that the reward is completely independent of your benefits decisions.

Make a note of these dates (November 7 or November 8) in your calendar, and we look forward to seeing you there.

Sincerely yours,

Name of the Benefits Office
Associate Director

April 1st, 2001

Name
Line 1
Line 2
City state zip

Dear Name:

We are currently studying whether benefits fairs, along with other way of obtaining information, convey the necessary information to members of the university community.

In the context of our study, we would like to ask you a few questions about your experience in obtaining information on the university retirement plans. If you could take a few minutes to complete the questionnaire attached to this letter, your response would be greatly appreciated. Your responses will be strictly confidential and will not be used for any purpose other than the study. You may mail your responses in the envelope provided.

As a token of our appreciation, we will send you a **$10 Macy's gift certificate** when we receive the completed questionnaire. Please return the questionnaire on or before May 15.

Sincerely,

First name, Last name

Please answer the following 6 simple questions. You can check the "don't know" answer if you are not sure of an answer. Your answers will remain strictly confidential and will be used for no purpose other than this study.

(1) In addition to your Basic Retirement Account, the university makes a monthly contribution of 3.5% of your monthly salary to an Individual Investment Account(s). You decide how this contribution should be invested from a list of four investment companies.

Through how many investment companies are you currently investing this contribution?

-One….
-Two….
-Three…..
-Four……
-Don't know……

(2) The university offers a supplemental retirement plan called the Tax-Deferred Account (TDA) program. Through the TDA program, you can add to your retirement savings by contributing a portion of your salary on a pre-tax basis. You pay no taxes on these savings or the investment income until you withdraw your funds. You decide how much to contribute and the university deducts your contributions from your paycheck. You choose how to invest your savings from a wide range of funds offered by four different vendors

You are *not* automatically enrolled in the TDA program.

Are you currently enrolled in the Tax-Deferred Account (TDA)?

-Yes ….. (go to question 4)
-No …..
-Don't know……..

(3) [To be filled out only if you are not currently enrolled in the TDA]
Why are you currently not enrolled in the TDA (check all answers that apply)?

-You do not have enough information on the TDA: ……
-Right now, you cannot afford to save for your retirement: ……..
-You plan to enroll soon, but did not have the occasion to do it yet: ……
-You save for your retirement through other means: ……

(NEXT PAGE, PLEASE)

First name, last name.

(3b) If you check the last answer, which other means are you using to save for retirement:

-TDA through spouse's employer: ……..
-Individual Retirement Account (IRA): ……
-Employer provided pension plan (own): ……
-Employer provided pension plan (spouse): ……
-Other mutual funds: …….
-Other……

(4) [To be filled out by everybody]
From which of the following sources do you get information about the retirement plans (check all that apply)?

-The benefits information fair: …….
-Benefits information packet: ……
-You came in person to the Benefits office: …….
-You attended an information seminar: ……..
-Colleagues:…….
-Family or friends:……
-The Administrative Officer of your department: ……..
-None……

(5) Did you attend the benefits information fair in the fall?
-Yes: …..
-No: ……

(6) If you did, did you find it useful?
-Yes:……..
-No: ……..