The Impact of Education Subsidies on Student Outcomes[*]

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February 1, 2013

DRAFT, PLEASE DO NOT CITE

Abstract

Education is heavily subsidized around the world. These subsidies can affect both enrollment (extensive margin) and student effort (intensive margin). In this paper we will address the intensive margin by looking at the impact of education subsidies on student outcomes. We run a field experiment in which we randomly subsidize students who have signed up for extra-curricular tutorial sessions. Treated participants receive an unexpected discount. If paying more increases motivation we should observe that participants who paid more value the tutorial sessions more and/or want to get more out of these sessions.

1 Introduction

Education is heavily subsidized around the world. These subsidies can affect both enrollment (extensive margin) and student effort (intensive margin). A large literature studies the effect of tuition and financial aid on (college) enrollment (among others Van Der Klaauw (2002), Kane (2003) and Dynarski (2002)). In this paper we will address the intensive margin by looking at the impact of education subsidies on student outcomes. We run a field experiment in which we randomly subsidize students who have signed up for extra-curricular tutorial sessions. When participants come to pay, the treated participants receive an unexpected discount. As a result treated and control participants have, on

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average, the same willingness to pay, but pay different amounts. The size of the discount is determined by random picking a closed envelope, so participants have no reason to believe that the size of the discount is related to the quality of the course. If paying more indeed increases motivation we should observe that participants who paid more value the tutorial sessions more and/or want to get more out of these sessions. We observe the participants' attendance in each session,their appreciation for and perceived benefit of the sessions and their result on the relevant exam.

Education subsidies can have an impact on student effort both through affecting incentives or by relaxing financial constraints. The latter is mainly relevant in a U.S. context where financial constraints can limit the possibility to continue studying and/or complete a study program. Studies on the effect of subsidies on student effort in this context therefore mainly focus on this element (Dynarski (2003, 2008), Scott-Clayton (2011)). Our field experiment takes place in a European context, characterized by a highly subsidized education system. Credit constraints are therefore less likely to be an issue. In our set-up credit constraints are even completely irrelevant as all participants commit to pay the full amount before knowing the size of the subsidy. Therefore we can study the incentive effect of education subsidies in isolation.

Another strand of literature focusses on the effect of financial rewards on student effort (Angrist et al. (2009), Leuven et al. (2010)). Financial rewards are a very direct way of motivating students. In this study we look at a more subtle motivational factor for student effort: sunk cost effects. Cheaper education can demotivate students because of the sunk cost fallacy, the idea that the amount of money invested in something affects its value or justifies putting additional money or effort into it. Standard economic textbooks teach that sunk costs should not be taken into account in decision making, once costs are unrecoverable, rational agents should ignore these costs. However, ample anecdotal evidence suggests that people do not ignore sunk costs, and commit the sunk cost fallacy. People speak of "getting their money's worth" and in both business and politics decisions makers regularly justify continuing apparently failing projects by stressing how much has already been invested. The sunk cost fallacy is a classic example of bounded rationality. Thaler (1980) gave it a prominent place in behavioral economics when he included the sunk cost fallacy in the list of the behavioral regularities explained by his proposed "positive theory of consumer choice". Numerous phenomena are attributed to the sunk cost effect, from differences in the playing time of basketball players (Staw and Hoang (1995) and Camerer and Weber (1999)) to the collapse of ancient societies (Janssen and Scheffer (2004)) and the failure of companies to innovate (Chandy and Tellis (1998)).

The sunk cost fallacy appear plausible and provides a provides a pertinent argument to let students pay for their own education as a means to motivate them[1]. However, despite its popularity, there is only limited evidence for of

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[1]More subtly the sunk cost fallacy could perhaps also be used to "nudge" students to value their education more without increasing the net costs. This can be achieved by raising tuition

the sunk cost fallacy and this evidence is not unambiguous. Psychologists have studied the sunk cost fallacy for a long time under the name of "escalating commitment" (see Staw (1997) for a review), and they have proposed different explanations, particularly self justification (Festinger (1957)), illusion of control (Langer (1975)) and loss aversion (Kahneman and Tversky (1979)). Nevertheless the psychological evidence is not unequivocal, for example, McCain (1986) shows that repeated negative feedback leads to deescalation rather than escalation of commitment. Escalating commitment is also not always the same as a sunk cost fallacy, because the decision to devote further resources after negative feedback is not necessarily suboptimal (Bowen (1987)). Furthermore, much of the psychological evidence in favor of escalating commitment relies on non-incentivized questionnaires, and is therefore often considered to be less convincing by economists.

Various laboratory experiments with financial incentives have been carried out to study the sunk cost fallacy. Phillips et al. (1991) report that some participants exhibit the sunk cost fallacy when they value lottery tickets, while others experience the reverse effect. Friedman et al. (2007) find a small effect of sunk costs in a search task, but the results are very sensitive to the details of the task.[2] Other laboratory experiments test the sunk cost fallacy more indirectly. Offerman and Potters (2006) show that higher entry fees facilitate cooperation and Meyer (1993) that higher entree fees increase bids in an auction. Sunk cost effects have also been examined in field experiments. In an early experiment, Arkes and Blumer (1985) demonstrate the sunk cost effect by randomly providing theater patrons with a discount. Participants who received a discount visited the theater significantly less often than the ones who received no discount. These results are, however, only present for the first half of the theater season; in the second half differences between the discount and the no-discount group are no longer significant. Both Ashraf et al. (2010) and Cohen and Dupas (2010) fail to find a sunk cost effect in their experiments in developing economies.

Overall there appears to be little evidence in favor of the sunk cost effect in incentivized experiments. However, many studies have small samples and the stakes are fairly low. Low stakes may make it less likely that people commit the sunk cost fallacy because Garland and Newport (1991) find that for hypothetical amounts the sunk cost fallacy increases as the amounts increase. To give the sunk cost effect the best possible chance both the sample size (n=373) and the stakes are larger (up to €75.-) in our experiment than in most other studies. We also apply a conspicuously random discount to prevent changing participants' believes about quality. Because our experiment is carried out with students who have signed up for additional tutorial sessions we can not only address the sunk cost effect in general, but we directly test the effect of payment differences on student motivation.

The remainder of this paper is structured as follows, section 2 discusses the

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fees while offsetting the extra costs through higher scholarships.

[2]They also test the impact of two drivers of the sunk cost fallacy suggested in the psychological literature, but do not find consistent effects for both loss aversion and self-justification.

setting and design of the experiment, while section 3 describes the data gathered. Section 5 specifies the hypotheses and presents the results. A discussion of the implications of the results is found in section 5.

2 Experiment

2.1 Experimental setting

The field experiment concerns students participating in additional tutorial sessions for various courses at four Dutch universities. These sessions are offered by *De Bijlespartner*, a company that offers additional tutorial sessions to students in cooperation with several local study associations. The company provides study materials and recruits teachers, who are usually students from more senior years who performed well on the course they teach. A tutorial group consists of eight to 13 students. Tutorial sessions are always connected to a course offered in the regular curriculum of the targeted students and run concurrently with that course.[3] Courses at Dutch universities typically last seven or eight weeks, the tutorial sessions take place during the last four or five of these weeks.[4] Each week there is one tutorial session of two or three hours. Students register online through their study association's website for the tutorial sessions. At the start of the first session, participants pay for the full set of four or five sessions. The listed price for a set of tutorial sessions is either €60, €65 or €75. This price is not affected by our experiment, De Bijlespartner offers similar tutorials for this same price at other times during this academic year.

The experiment was carried out in five different study programs at four universities: business administration and psychology at the VU University Amsterdam, economics and business at the University of Amsterdam, social sciences at Utrecht University, and psychology at the University of Groningen.[5] For each study program we carried out the experiment only during one block of courses to prevent that students would expect to get a discount. During that block we included all available tutorial sessions in the experiment. All courses are offered under the name of the relevant study association (not under the name of De Bijlespartner) which ensures that students will not expect a discount if they might hear about the discounts in other study programs. The courses for which the tutorials are offered were mainly statistics or math courses as students find these courses particularly difficult.

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[3]De Bijlespartner also offers other types of course such as specific exam preparation but these are not part of our experiment.

[4]The tutorials start a couple of weeks later than the connected course to allow students to decide whether they need extra tutorials or not.

[5]Appendix A lists for each study program the courses for which tutorials were offered and the number of students that participated.

2.2 Experimental design

In order to test whether education subsidies affect the intensive margin of studying in isolation from the enrollment decision and credit constraints you need students with the same willingness to pay who actually pay different amounts. This is accomplished by randomly providing students that already made the enrollment decision with an unexpected discount. Furthermore, it should be transparent that the discount is provided randomly such that it does not affect the willingness to pay. In our field experiment, we have four possible discounts: a full discount (treatment "Free"), a discount of the full price minus €10 (treatment "High discount (HD)"), a discount of €10 (treatment "Small Discount (SD)) and no discount at all (treatment "Pay all"). All students have an equal probability to receive each level of discount.

For the experiment we took control over the payment process for the tutorial sessions. When students registered for a set of tutorial sessions, they were informed that they had to pay in cash at the start of the first session. When students arrived we asked them if they wanted to participate in a study on study behavior and that if they did they could get a discount. They were told that four different discounts were possible and that the level of their discount would be determined randomly with an equal chance to receive each level of discount. Students were not informed about the goal of the study and were not told why randomly different discounts were offered. [6] Students gave permission to use their information for this study by filling out a questionnaire. The questionnaire asked, for example, about study habits, maximum willingness to pay and how much they thought the tutorial would help them to pass the relevant exam. An English translation of the complete questionnaire can be found in appendix B.

After completing the questionnaire students entered a classroom one at a time to determine their discount by choosing a closed envelope and to pay the remainder of the price. Before the arrival of the students we prepared envelopes with discount tickets, including an equal amount of envelopes for each of the four possible discounts. When a student picked an envelope, this envelope was not replaced. Students were asked not to reveal their discount when leaving the room in order to prevent other students from updating the probabilities for specific discounts. The number of envelopes prepared was the smallest number which ensured that the final student could draw from at least four envelopes. This procedure made it very clear to the participants that the discount is randomly determined and unrelated to the quality of the tutorial sessions.

During each tutorial session the teacher recorded students' attendance as being present, partly absent or absent. Partly absent was defined as missing a substantial part of the session. At the last tutoring session students filled out an evaluation form. This was the usual evaluation form always used by De Bijlespartner, but we added some questions. These questions included a control question to check whether students remembered their discount, their opinion on

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[6]Only two out of 377 students refused to participate and they paid the full price. Students who did not show up for the first session or registered for the tutorial session after the official deadline were not allowed to participate in the experiment.

the discount and hypothetical sunk cost questions.[7] An English translation of the complete questionnaire can be found in appendix B. If students were not present during the last session we phoned them to answer the evaluation form over the phone or to ask them to fill it out through email. The final response rate was 94%. After the exam we obtained participants' grades from the university administrations, but only for the courses connected to the tutorial sessions.

We use the information from the two questionnaires to define subgroups, which might respond differently to the discounts. In the first questionnaire we ask students whether they paid for the tutorial sessions themselves or if they received additional money for this from, for example, their parents. As such we can test whether the sunk cost effect is only present if students paid for the tutoring course themselves. In the final questionnaire we asked students how they would act in a hypothetical sunk cost situation (following Ashraf et al. (2010)). We test the presence of the sunk-cost effect separately for students who commit and do not commit the sunk-cost fallacy in the hypothetical situation. The final questionnaire also contains questions on possible personality traits. There are two questions from the Rosenberg's Self-Esteem Scale (Festinger (1965)) and two questions from the Rational-Experiential Inventory (Cacioppo and Petty (1982)). The idea is that people display the sunk cost fallacy because of their need for self-justification (Brockner, 1992). People with low self esteem and people who tend to think less rationally are thought to have a greater need for self-justification. Therefore, they may be expected to exhibit a stronger sunk cost fallacy.

3 Data

In total, 373 students enrolled before the official deadline for a tutoring course and showed up at the first meeting. Some students took two or three sets of tutorial sessions at the same time and were able to get a discount at each of these occasions. The sample of 373 observations consists of 342 unique participants. These observations are divided over four universities, 14 different subjects and 39 different groups. The result of our randomization is that the observations are fairly equally divided over the discount groups (24.4%, 23.9%, 25.2% and 26.5% for treatments Free, HD, SD and Pay All respectively).

Table 1 provides descriptive statistics, both for the full sample and separately for each treatment group. Around 60% of the participants are female and their average age is 21.5 years. The mean monthly income of participants in our sample is about 630 euro, and it is higher in the treatment groups with a lower discount. About 60% of the participants are economics students, and,

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[7]For the hypothetical sunk question we follow Ashraf et al. (2010). We ask participants the question "suppose you bought a bottle of juice for €2. When you start to drink it, you realize you don't really like the taste. Would you finish drinking it?". Participants were able to answer yes or no. Next, we asked two similar follow-up questions, for €5 and €1, of the form "Now suppose you bought exactly the same bottle of juice for €.. (...) Would you finish drinking it?". A participant is considered to be 'sunk-cost prone' if the answers are 'yes, yes, yes', 'yes, yes, no' or 'no, yes, no'.

Table 1: Descriptive statistics

	obs	All treatments	Free	HD	SD	Pay all
				Treatment		
Personal characteristics						
Female	373	0.59	0.60	0.55	0.63	0.59
Age	372	21.5	21.1	21.9	21.2	21.8
Monthly income (in euros)	366	629	548	604	631	723
Study characteristics (background)						
Economics or Business student	373	0.61	0.59	0.63	0.63	0.59
Time spend on study (per week)	372	26.8	27.1	27.7	27.3	25.4
Time spend on subject (predicted)	371	13.0	14.3	12.6	12.6	12.6
First attempt for exam	371	0.68	0.65	0.67	0.64	0.75
Tutorial course						
Max. willingness to pay (fraction of price)	363	1.12	1.13	1.11	1.10	1.12
Predicted prob. passing without tutorial	372	0.46	0.46	0.44	0.44	0.49
Predicted prob. passing with tutorial	372	0.73	0.74	0.72	0.71	0.75
Course payed by parents	373	0.47	0.49	0.42	0.52	0.43
Final questionnaire						
Quality of the course (scale 1-10)	342	7.24	7.32	7.42	7.11	7.10
Probability of passing exam	345	0.63	0.63	0.63	0.63	0.63
Sunk costs prone	331	0.44	0.48	0.43	0.46	0.41
Study Outcome						
Fraction of classes missed	373	0.11	0.13	0.095	0.11	0.12
Present at exam	274	0.86	0.85	0.89	0.89	0.81
Passed exam	274	0.43	0.51	0.52	0.35	0.36
Grade (conditional on presence)	218	5.38	5.63	5.14	5.22	5.50

Note: The self-reported outcome variables are taken from the evaluation forms distributed in the final session. Recall that the response rate to these evaluation forms was 94%.

Table 2: Non-parametric test of inequality of treatments

	F ≠ HD,SD,PA	F,HD ≠ SD,PA	F,HD,SD ≠ PA	Any diff.
Frac. missed	0.356	0.814	0.657	0.730
Passed	0.124	0.009***	0.141	0.163
Grade	0.172	0.525	0.772	0.461
Appreciation	0.346	0.125	0.370	0.536
Hours	0.827	0.516	0.643	0.576
Prob of passing	0.956	0.515	0.176	0.553

Note: Each cell in this table represents one regression. The cells in the first three columns report p-values of a two-sample Wilcoxon rank-sum test. The cells in the final column present the p-value of a Kruskal-Wallis equality-of-populations rank test for the different outcome variables.

∗ p<0.10,∗∗ p<0.05,∗∗∗ p<0.01

on average, students devote almost 27 hours per week to studying and 13 hours to the course connected to the tutorial sessions. Before the start of the tutorial sessions, some students already made (several) attempts to pass the course but for others the tutorial sessions are preventive as they have not made the exam of the subject yet. Students reported that they were willing to pay on average 12% more than the full price of the tutorials and believe that the tutorials will raise the likelihood to pass the exam by 27 percentage points. Quite a large fraction of the participants (45%) do not pay for the tutorials using their own income, but report that they received (additional) money from their parents to participate in the tutorial sessions.

4 Results

4.1 Non-parametric tests

As mentioned before, the four treatments in the experiment are Free (F), High Discount (HD), Small Discount (SD) and Pay All (PA). Because we have four different treatments we can not only test whether sunk costs matter but also whether this effect is affected by the size of the sunk costs. We focus on two main outcome variables: attendance at the tutorial sessions and whether the student passed the course connected to the tutorial sessions. Conditional on attending the exam, we can also look at obtained grades. Finally, we observe subjective measures of the student's appreciation of the tutorial sessions, the amount of hours spent on studying and the perceived effectiveness of the tutorial sessions.

Without making parametric assumptions, we will first test three main hypotheses without making any distributional assumptions. The hypotheses we will test are:

- Hypothesis I (Paying matters): Paying nothing reduced attendance, grades, appreciation and perceived effectiveness of the course (treatment F vs treatment HD, SD and PA)

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- Hypothesis II (Amount matters): Receiving a substantial discount reduced attendance, grades, appreciation and perceived effectiveness of the course (treatment F and HD vs treatment SD and PA)

- Hypothesis III (Discount matters): Receiving any discount reduces attendance, grades, appreciation and perceived effectiveness of the course (treatment F, HD and SD vs treatment PA)

The first three columns of table 2 present the results of two-sample Wilcoxon rank-sum tests in order to test the three mentioned hypotheses. The final column (labeled 'any difference') presents results of a Kruskal-Wallis equality-of-populations rank test. When this test leads to significant results this implies that at least one of the treatments is different from the other treatments.

In the first three columns we see that hypothesis I and hypothesis III are never supported. Hypothesis II (Amount matters) is only supported by one of the six outcome variables. Furthermore, the final column shows that alternative hypotheses, based on a different breakdown of the treatments, will not have explanative power as none of the treatments is significantly different from the other treatments.

4.2 Main regressions

Even though we have a randomized design table 1 showed that there are some observed differences between the treatment groups. Therefore we will next test whether there are differences between the four treatments in a regression. We include controls for gender, age, income, maximum willingness to pay, whether the course is payed by someone else, time spent on study, whether it is the first attempt for the exam and the estimated probability to pass the exam without taking a tutorial. Furthermore, all regression control for session fixed effects[8]. Table 3 presents the results for the full sample. Just as in the non-parametric case, we see no apparent differences between the four treatments.

Table 4 repeats this exercise but now we only look at the sample of participants that were labeled as 'sunk-cost prone'. These students committed to the sunk-cost fallacy in a hypothetical sunk-cost situation and might therefore also be more likely to display a sunk-cost effect in the field. Table 4 shows that this is not the case: the results are very similar to those in table 3.

Finally we take the treatment as a continuous variable. The dependent variable is the fraction of the total price that a participant paid. Results are listed in table 5. Only the effect on one out of the six outcome variables is significantly different from zero. The effect runs in an unexpected direction though, as participants that paid more for the course have a lower probability of eventually passing the course.

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[8] In total our experiment consists of 39 sessions

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Table 3: Main results

	Frac. missed	Passed	Grade	Appreciation	Hours	Prob. of passing
Free	0.04	0.09	-0.08	0.04	-0.19	-0.02
	(0.03)	(0.10)	(0.41)	(0.18)	(0.90)	(0.03)
HD	0.01	0.11*	-0.49	0.27	0.22	-0.01
	(0.03)	(0.05)	(0.33)	(0.20)	(0.84)	(0.03)
SD	0.01	-0.02	-0.38	-0.15	-1.11	-0.02
	(0.03)	(0.08)	(0.42)	(0.18)	(0.86)	(0.03)
Observations	350	255	201	328	326	325
Adjusted R^2	0.100	0.203	0.306	0.321	0.316	0.405

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Sample of sunk-cost prone students

	Frac. missed	Passed	Grade	Appreciation	Hours	Prob. of passing
Free	0.05	0.09	-0.10	-0.13	-0.49	-0.02
	(0.04)	(0.19)	(0.76)	(0.38)	(1.96)	(0.04)
HD	0.03	0.14	-0.20	0.12	-0.48	-0.03
	(0.04)	(0.17)	(0.70)	(0.34)	(1.40)	(0.04)
SD	0.05	-0.03	0.12	-0.22	-0.82	-0.03
	(0.05)	(0.18)	(0.77)	(0.38)	(1.69)	(0.04)
Observations	139	91	71	137	137	136
Adjusted R^2	0.147	0.232	0.259	0.255	0.174	0.474

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Fraction paid as a continuous variable

	Frac. missed	Passed	Grade	Appreciation	Hours	Prob. of passing
Frac. paid	-0.02	-0.12*	0.11	-0.23	-0.51	0.01
	(0.02)	(0.06)	(0.29)	(0.18)	(0.56)	(0.02)
Observations	350	255	201	328	326	325
Adjusted R^2	0.103	0.209	0.302	0.318	0.316	0.407

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.3   Sensitivity analysis

Exclude students that enrolled for multiple courses (table 6)

Table 6: Students that take multiple courses excluded

	Frac. missed	Passed	Grade	Appreciation	Hours	Prob. of passing
Free	0.03	0.14	0.20	0.07	0.15	-0.03
	(0.03)	(0.11)	(0.44)	(0.22)	(0.85)	(0.03)
HD	0.01	0.12*	-0.39	0.32	0.31	-0.02
	(0.03)	(0.06)	(0.27)	(0.26)	(0.95)	(0.03)
SD	0.00	-0.04	-0.25	-0.29	-0.55	-0.03
	(0.03)	(0.10)	(0.51)	(0.20)	(0.89)	(0.04)
Observations	295	207	165	275	273	272
Adjusted R^2	0.116	0.227	0.290	0.311	0.355	0.392

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Within subject design using students that enrolled in multiple courses (table 7)

Table 7: Within subject analysis: individual fixed effects

	Frac. missed	Passed	Grade	Appreciation	Hours	Prob. of passing
Free	0.03	0.20	0.73	0.64*	1.41	0.07
	(0.08)	(0.28)	(1.69)	(0.37)	(2.81)	(0.05)
HD	-0.08	0.17	0.15	0.77**	-0.27	0.07
	(0.07)	(0.31)	(1.23)	(0.35)	(1.91)	(0.05)
SD	0.13	0.29	1.58	0.74**	2.39	0.02
	(0.10)	(0.32)	(1.09)	(0.33)	(2.74)	(0.07)
Observations	370	271	217	346	343	342
Adjusted R^2	0.170	0.049	0.093	0.163	0.066	0.039

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5   Discussion

We ran a field experiment in order to test the effect of education subsidies on student effort (the intensive margin of studying). Keeping willingness to pay

constant, we find no effect of a reduced payment on different study outcomes, such as attendance, passing the exam and grades. Participants that suffer from the sunk-cost fallacy in a hypothetical sunk-cost situation are also not more likely to display sunk-cost effects in the field. This implies that in the context of education subsidies students do not suffer from sunk cost fallacy.

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Appendix A

Table 8: Courses offered at universities

	Study program	Price (in €)	Nr of classes	Nr of students
Free University Amsterdam (VU)				
Business Mathematics	Economics and Business	75	4	34
Financial Accounting and Bookkeeping	Economics and Business	75	4	17
Quantitative Business Analysis	Economics and Business	75	5	10
Statistics I (premaster)	Economics and Business	75	4	21
Statistics II (premaster)	Economics and Business	75	4	57
Mathematics (premaster)	Economics and Business	75	4	35
Statistics II	Psychology	60	4	16
Meten en Diagnostiek II	Psychology	60	3	13
Utrecht University (UU)				
Methodology and Statistics I	Social Sciences	65	5	34
Methodology and Statistics (premaster)	Social Sciences	65	5	10
University of Amsterdam (UvA)				
Econometrics	Economics and Business	75	4	18
Mathematics and Statistics I	Economics and Business	75	4	35
University of Groningen (RUG)				
Statistics I A (Dutch)	Psychology	65	5	29
Statistics I A (English)	Psychology	65	5	23
Statistics II part II	Psychology	65	5	21

Appendix B

The questionnaires in this appendix assume a price of €65 and 5 sessions. This was adjusted depending on the tutorial sessions in question.

Pre-experimental questionnaire

Dear student,We ask you to take part in a study carried out by the VU and the UvA. In this study you have a 1/4 chance to receive the following discounts on the fee of the tutoring course: €0, €10, €55 or €65 discount. By completely filling out the questionnaire below you participate in the study. Your information will only be used, anonymized, for our research on study behavior. After filling out the questionnaire, or choosing not to, the fee has to be paid and the potential discount will be determined. If you have any questions regarding the study you can ask them at that time.

I Personal information

1. Name: . . . . 2. Student number: . . . .

3. Phone number: 06-. . . . .

4. Email address: . . . .

5. Gender: ☐ Male ☐ Female

6. Age: . . . . years

II Education

7. Since when do you study?

Since 20...

8. Home many hours a week do you spend on your studies, on average?

. . . . hours per week

9. How many hours do you expect to spend on this course, including the hours spend in tutoring courses?

. . . . hours per week

10. Why did you choose to follow tutoring courses for this subject?

. . . .
. . . .

11. Did you take tutorial courses through [name of the study association] before? If so, for which subject?

☐ Yes for the subject . . . . ☐ No

12. Did you take the exam for this subject before? If so, how often?

☐ Yes, ... time(s) before ☐ No

13. How many of the 5 classes do you intend to follow?

☐ 1 class ☐ 2 classes ☐ 3 classes ☐ 4 classes ☐ 5 classes

14. How large do you estimate the probability that you will pass the exam?

Without taking this tutoring course: .... %

After following this tutoring course: .... %

III Background

15. With which type of math did you graduate high school?

☐ Math A ☐ Math B ☐ Math C ☐ Math D ☐ Other, i.e. .....

16. With what math grade did you graduate high school (In case of a non-Dutch exam, please translate the grade to a comparable Dutch grade)?

....

17. Did you recieve extra money from your parents to pay for this course or did you pay for it out of your regular income?

☐ From regular income ☐ Extra contribution of parents ☐ Other, i.e. ....

18. What is your average monthly income (including student aid and contributions from your parents.)?

€ ....

19. What is the maximum amount you would be willing to pay for these tutoring courses?

€ ....

20. Do you have friends in this tutorial group? If so, what are their names?

☐ Yes

Names friends:

....
....

☐ No

Post-experimental questionnaire

Name: ....

Student number: ....
Teacher:..
Course:...

Day: ....Time: ....

In addition to the usual evaluation questions some questions were added for the study of the UvA and the VU in which most of you participated. The answers to this questionnaire will be treated confidentially and anonymous and will only be used for this study.

General:

The probability I would recommend this tutoring class to a friend is:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Booklet:

The quality of the booklet was:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

The booklet covers all subjects in the course:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

All important subjects in the course were covered with enough assignments:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Teacher:

The teacher was knowledgeable about all important subjects

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

The teacher motivated me to try my best

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

The teacher was good

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Other participants:

Other participants were involved and worked hard during the tutoring classes:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Other participants were well prepared for the tutoring classes:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Final evaluation

In general I assess these tutoring courses with:

(lowest) 1 2 3 4 5 6 7 8 9 10 (highest)

Would you participate in another tutoring course organized by [Name of the study association] in the future? If not, why?

☐ Yes ☐ No, because ..…………….

Attendance

How many and which of the tutoring classes did you miss?

Class 1: ☐ Present ☐ Partly absent ☐ Absent

Class 2: ☐ Present ☐ Partly absent ☐ Absent

Class 3: ☐ Present ☐ Partly absent ☐ Absent

Class 4: ☐ Present ☐ Partly absent ☐ Absent

Class 5: ☐ Present ☐ Partly absent ☐ Absent

If you missed 1 or more classes, what were the reasons for your absence (multiple answers possible)

☐ I was ill ☐ Something else intervened ☐ I didn't think the class would be useful ☐ Other, which is ……..

Course

How many hours did you spent on this course, including the hours spent in tutoring courses

……. hours per week

How large do you estimate the probability that you will pass the exam?

………….. %

Discount

Participants in this tutoring course were able to get a discount. The size of the discount was randomly determined. How large was the discount you received?

€ . . . .

In case you got a discount, what did you do with the money?

☐ I gave it back to my parents

☐ I added it to my regular income

☐ I spent it on something special, which is . . . .

☐ Other, which is . . . .

☐ I didn't get a discount

What did you think of the fact that people could get a discount?
. . . .

Background

Indicate for each of the following statements the extent to which you agree with it.

On the whole, I am satisfied with myself.

(completely disagree) 1 2 3 4 5 6 7 (completely agree)

I certainly feel useless at times.

(completely disagree) 1 2 3 4 5 6 7 (completely agree)

I prefer to something that challenges my thinking skills over something that doesn't require me to think.

(completely disagree) 1 2 3 4 5 6 7 (completely agree)

I trust my initial hunches.

(completely disagree) 1 2 3 4 5 6 7 (completely agree)

Suppose you bought a bottle of juice for €2,-. When you start to drink it, you realize you don't really like the taste.

Would you finish drinking it? ☐ Yes ☐ No

Now suppose you bought exactly the same bottle of juice for €5,-. When you start to drink it, you realize you don't really like the taste.

Would you finish drinking it? ☐ Yes ☐ No

Now suppose you bought exactly the same bottle of juice for €1,-. When you start to drink it, you realize you don't really like the taste.

Would you finish drinking it? ☐ Yes ☐ No

General remarks about the tutoring course

....

....

....