# Peer Effects and Students' Self-Control

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*Abstract*

We conducted a multi-wave field experiment to study the interaction of peer effects and self-control among undergraduate students. We use a behavioral measure of self-control based on whether students achieve study related goals they have set for themselves.

We find that both self-control and the number of talented friends increase students' performance. We then set out to test the theoretical prediction of Battaglini, Bénabou and Tirole (2005) that (only) sufficiently self-controlled individuals profit from interactions with peers. We find that peers with high self-control are more likely to connect to others, have a higher overall number of friends and have a higher number of talented friends. Moreover, positive news about self-controlled behavior of their peers increases students' own perseverance. Hence, our findings are consistent with the model of Battaglini, Bénabou and Tirole. In addition, we find that female students are more likely to have high self-control, but do not outperform male students. One reason for this is that female students have a lower number of talented friends than their male counterparts, thereby profiting less from positive peer effects.

*Keywords:*     Self-control; Peer Influence; Social Networks; Goals; Time preferences; Procrastination; Willpower; School Performance; Experiment

*JEL-Classification:*    C93; D85; I21; J24

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# 1    Introduction

Successful performance, be it in school or at university, at the job or in leisure activities, depends both on persistence in what one is doing and on knowledge about how it is to be done. Persistence requires self-control, i.e., the ability to resist temptations to procrastinate; while knowledge of how to best achieve a goal can be acquired from more advanced peers. How self-control – or the lack thereof – can influence behavior and finally performance is studied by the literature on present-biased preferences[1]; whereas a mostly empirical literature on peer effects investigates how an individual's achievement depends on her relation to her peers.[2] We contribute to both strands of the literature by providing the first experimental study on how peer effects in social networks interact with individual self-control. Combining a field experiment with surveys, we show that more self-controlled students are better connected to their peers, have better access to highly talented peers and write better exam grades than students with low self-control.

Present-biased preferences lead to self-control problems that affect performance: For instance, a student might want to study hard in the evening in order to be well prepared for class the next day. However, when evening actually arrives, the now immediate psychological costs from studying become much more salient than the still relatively far-away benefit from being well prepared, and the student is severely tempted to go out instead. More generally, if a disproportionally high weight is attached to whatever costs or benefits would accrue immediately, then plans implying that investments precede benefits will be likely to fail due to the temptation to avoid immediate costs. Since performance plans typically are of this kind, a present bias can impede performance.

But performance also depends on the interaction with peers: Peers with high levels of human capital can improve the performance of their friends in multiple ways, for instance, by intentionally or unintentionally providing them with important information or acting as a role model. Importantly, individual self-control might mediate the access to peers with high levels of human capital. For instance, if connecting to peers and maintaining these links in the long run requires self-control, or if only sufficiently self-controlled individuals can profit from

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[1] For theoretical contributions see, e.g., Strotz (1955), Thaler and Shefrin (1981), Ainslie and Haslam (1992), Laibson (1997), O'Donoghue and Rabin (1999), Gul and Pesendorfer (2001), Bénabou and Pycia (2002), and Fudenberg and Levine (2006). Recent experimental contributions on time preferences include Ariely and Wertenbroch (2002), Andersen et al. (2008), Benhabib, Bisin and Schotter (2008) and Andreoni and Sprenger (2012).
[2] See, e.g. Hoxby (2000), Hoxby and Weingarth (2005), Zimmerman (2003), Falk and Ichino (2006), Mas and Moretti (2009), and Calvo-Armengol, Patacchini and Zenou (2009). The latter combines theory and empirics to investigate peer effects in an educational setting.

friends with high levels of human capital, then self-control will not only have a direct but also an indirect effect on performance that is mediated by peer effects.

Despite this rather obvious possibility, the literatures on self-control and peer effects have hitherto remained separated. One notable exception is the contribution of Battaglini, Bénabou and Tirole (2005). Their theory of peer effects on self-control provides us with our main hypotheses. In their model, individuals have imperfect knowledge about their own self-control, but know that levels of self-control are positively correlated within their peer group. Hence, observing how peers react to temptations provides individuals with additional information about their own level of self-control. This, in turn, affects their self-confidence and consequently the degree to which they themselves exhibit self-controlled behavior in the future. Intuitively, observing how peers can handle similar challenges to their willpower can be encouraging or discouraging ("if he can do it, then so can I" or "if not even he can do it, then I do not even have to try"). The theory of Battaglini, Bénabou and Tirole (2005) can explain the existence and workings of self-help groups, but also applies more broadly, including our context of students' learning groups. In our field experiment, we elicit both the individual self-control and the social network of our students and provide them with information about the self-control of some of their peers. Our findings are consistent with the theory provided by Battaglini, Bénabou and Tirole (2005). In particular, we find evidence for their prediction that individuals with low self-control remain unconnected to their peers while individuals with sufficiently high self-control connect to them. In addition, we find that connectedness improves performance, which is in line with both the theory and the empirical results of Calvó-Armengol, Patacchini and Zenou (2009). Specifically, we find that it is connectedness to *talented* friends that matters in improving performance.

The existing empirical and experimental literature on self-control has so far mainly studied the – direct – relation between self-control and performance. In a field experiment with students, Wong (2008) finds that time-consistent behavior in midterm preparation is positively correlated with students' performance. Bucciol, Houser and Piovesan (2011) find that consumption temptations are detrimental for the performance of younger children but leaves the performance of older children unchanged. Empirical evidence for negative effects of self-control problems on various important outcomes is provided by DellaVigna and Malmendier (2006), Ashraf, Karlan and Yin (2006) and Ameriks et al. (2007). We contribute to this literature in two ways. First, we confirm its general finding that self-control enhances performance. Second, and more importantly, we provide evidence for an indirect relation between self-control and performance which is mediated by connectedness to talented peers.

Our paper is also related to a literature that has studied whether commitment devices can help overcome self-control problems. Ariely and Wertenbroch (2002) study the effect of self-imposed and externally-imposed deadlines on performance in another field experiment. They show that both (evenly-spaced) externally-imposed and self-imposed deadlines have a positive effect on performance. However, as Burger, Charness and Lynham (2011) find in a related field experiment, externally-imposed deadlines do not always increase performance. Houser et al. (2010) conducted a laboratory experiment to elicit individuals' willingness to pay for commitment in a game in which the participants repeatedly face temptations. The authors find that the average willingness to pay is positive and the choice of whether or not to buy commitment depends on the costs of the commitment device in question. Our contribution to this literature is mainly methodological and consists in the way we construct our behavioral measure of self-control: We categorize those individuals as possessing high levels of self-control who stick to their self-imposed deadlines and who, after buying costly partial commitment, do not violate it afterwards. In particular, students are classified as exhibiting low self-control if they do not manage to hand in their midterm homework before a non-binding deadline they had chosen at the beginning of the semester, or if they missed out a micro workshop in which they had previously enrolled. To our knowledge, we are the first to combine within one study the experimental measurement of self-control with the measurement of subjects' social network.

The empirical literature on peer effects has proposed different methods to solve the standard identification problems as outlined by Manski (1993). Possible approaches to overcome these problems include random assignment to a group or to a treatment, the use of non-linear models or network models. All approaches incorporate the assumption that an individual's outcome is determined by the mean outcome and characteristics of her peers.[3] Recent studies that find a positive relation between being observed by peers and individual performance are, e.g., Falk and Ichino (2006) and Mas and Moretti (2009). By contrast, our focus is not on how observability by peers affects performance. Rather, we study how observing peers, in particular their self-control, affects individual goal-setting.[4] We find that goals are increasing in observed self-control of peers.

While our main focus is on self-control and peer effects, we also contribute to the experimental literature on gender differences. Surprisingly, we find that women profit less

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[3] Three notable exceptions are the empirical study of Calvó-Armengol, Patacchini and Zenou (2009), the field experiment by Falk and Ichino (2006) and the natural experiment by Sacerdote (2001).
[4] For a theoretical approach on how commitment or goals can improve self-control, see, e.g., Bryan, Karlan and Nelson (2010), Koch and Nafziger (2011), Suvorov and Van de Ven (2008) and Noor (2011).

from positive peer effects than men with comparable levels of human capital: Although women have more self-control than men, they do not outperform the latter.

The remainder of this paper is structured as follows. In section 2, we derive our hypotheses, mainly referring to the theory provided by Battaglini, Bénabou and Tirole (2005). Section 3 reports our experimental design and section 4 our main results, including our findings on the relation between the social network characteristics of (male and female) students and peer effects on performance. In section 5, we first describe our experimental intervention by which we inform students about highly self-controlled behavior of their peers and then report the results. We discuss our findings and conclude in section 6.

## 2  Hypotheses

Individuals who achieve their goals are typically more self-controlled than those who set the same goals but fail to achieve them. We use this insight to implement a behavioral measure of self-control in our experiment. In theory, individuals learn from their experience and adjust their goal-setting behavior to their perceived level of self-control.[5] Consequently, a behavioral measure of self-control can best be obtained from goal achievement at early stages of this learning process, i.e., from observing how well individuals not yet fully informed about their own self-control relate to their early goals. Hence, we (behaviorally) equate high self-control with a high level of early goal achievement.

We are now in a position to formulate our first two hypotheses:

> *H1*    *Performance increases in self-control, i.e., in early goal achievement.*
>
> *H2*    *Individuals with high self-control invest more effort into achieving their goals than individuals with low self-control.*

Our main question is how self-control interacts with one's position in a social network and thereby with standard peer effects. The only existing theory that addresses this question is provided by Battaglini, Bénabou and Tirole (2005), henceforth BBT. Their results show that only sufficiently self-controlled individuals profit from the interaction with peers; but they profit more from peers who are similar to them in terms of self-control. When individuals can anticipate the benefits that arise from forming connections (cf. Jackson and Wolinsky, 1996), two testable predictions of the BBT model are, first, that only sufficiently self-controlled

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[5] For a theory on learning self-control in a dynamic setting, see Ali (2011).

individuals have a strictly positive number of links to others, and, second, that self-control is correlated among direct friends.

The BBT model does not account for human capital. However, it is easy to see how an extended reasoning along its lines can be used to bridge the gap between the literature on self-control and the literature on how human capital of peers can affect achievement: Since self-controlled people tend to persist in their performance plans, they tend to acquire more human capital. Consequently, they become more valuable peers with regard to the peer effects on achievement that can be expected from them. If indeed only sufficiently self-controlled individuals connect with others, as the BBT model suggests, then only sufficiently self-controlled individuals will enjoy positive peer effects on their performance. Hence, we hypothesize:

> **H3**   *Performance increases in the number of talented friends.*
>
> **H4**   *People with high self-control (a) are more likely to connect to others, (b) have a higher overall number of friends, and (c) have a higher number of talented friends.*

If we look deeper into the BBT model, an even subtler way emerges in which individual self-control and connections to peers affect each other: Not only does self-control affect the individuals' social network (and thereby their access to positive peer effects on performance); but it does so because peers also affect self-control itself. Individuals profit from good news about the self-control of their peers: By increasing their prior about their own ability to retain self-control, observable self-controlled behavior of their peers increases individuals' effort to resist temptations. By contrast, bad news about their peers' self-control harms individuals by decreasing their confidence in their own ability to resist temptations, making them more likely to give in. For ethical reasons, we can only test the good-news prediction. In particular, we hypothesize that effort is increasing in the revealed effort of peers. Besides actual effort, also planned effort can be considered since goal-setting is one way to invest into self-control. Thus, we additionally conjecture that good news about the self-control of one's peers increases self-set goals while bad news lowers them. Our last hypothesis is:

> **H5**   *Planned effort (a self-set goal) and actual effort both increase in revealed effort of peers.*

# 3    Experimental Design and Implementation

## 3.1 Experimental Procedure

We conducted our experiment in an undergraduate microeconomics course at the University of Hamburg in the summer semester of 2013.[6] In total, 117 first-year students regularly participated in the lecture and the tutorials.

Our experiment was conducted in the following five waves:

1. Survey on aspired course grades and current study time
2. Survey on intermediate goals and partial communication of others' study time per week
3. Measurement of intermediate goal achievement
4. Elicitation of students' social network and preferences
5. Exam

In the first two waves, we conducted surveys and implemented one experimental intervention in the tutorial classes. In the fourth wave, we conducted a paper-and-pencil experiment and the final survey in the lecture class. Students could never anticipate upcoming waves, and they were not told before the beginning of the fourth wave that they were part of an experiment. Rather, they were told that some faculty wanted to analyze students' learning conditions and study behavior. Moreover, the experimenters who actually entered classes were not involved in teaching the lecture or tutorial courses.[7] The teaching assistants were informed about who would enter their classes on which days and were told that the interventions they witnessed were part of a study on student behavior.[8] They have never been informed about the fourth wave of the experiment or about the purpose of the first three waves before the end of the semester. Furthermore, they were instructed not to provide possible interpretations of our study to the students. Apparently students accepted our

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[6] In Hamburg, like in most German cities, courses in the summer semester are taught from beginning of April to mid July.

[7] The experimental team that actually entered the classes to conduct the experiment consisted of two of the three authors of this paper. The third author, Lydia Mechtenberg, committed both not to act as an experimenter in class and not to receive the data set in a non-anonymized form, since she was the lecturer of the microeconomics course. Exams were graded by the teaching assistants who did not know the purpose of the study and never received access to the data set.

[8] In the second wave, they announced the modalities of handing in the mid-term problem set as a natural part of their teaching job. These modalities were designed for experimental purposes about which, however, the teaching assistants were not informed.

explanation of the interventions in their classes and never approached an experimenter or teaching assistant on this issue. All material used for the experimental interventions and surveys is collected in Appendix B.[9]

**The first wave**     In the first wave, we conducted a survey in each tutorial, asking which grades students aspired to and how many minutes they on average studied per week for this specific course.

**The second wave**     The second wave was mainly dedicated to induce students to set goals for themselves at a relatively early stage of the course, since their behavior with respect to these goals allows us to measure students' self-control at a later point in time. This wave consists of three steps which were conducted in the tutorials. Each teaching assistant announced that several organizational issues were to be settled within the ongoing session of the tutorial course.

*$1^{st}$ step: Planned effort*     We confronted students with a signal about the maximal time a peer in their tutorial has studied (the details of this intervention are described in section 5.1) and asked in a survey how much students planned to study per week for this course in the future. Hence, we elicited individual self-set goals.

*$2^{nd}$ step: Intermediate goal with partial commitment*     Next, a senior student who was not informed about the purpose or content of our study entered the tutorial course and truthfully explained to the students that they could enroll in a non-compulsory one-day micro workshop. Moreover, he mentioned that enrolment was not obligatory for participants but that each student who, though enrolled, would not show up for the workshop would have to pay a fee of 3 EUR. By contrast, participation, both with and without enrolment, was free of charge. It was also made clear that payment of the fee would be asserted.[10] Hence, students were offered a pre-designed goal (participating in the workshop) together with a commitment device (the fee). Then, the senior student distributed enrolment forms that again mentioned the fee and provided the link to a website where online enrolment for the workshop was possible. Finally, he collected the enrolment forms and left the class.

*$3^{rd}$ step: Intermediate goal without commitment*     The teaching assistant truthfully explained to his students that they had to submit a compulsory midterm assignment in order to be eligible for the final exam. This assignment – a standard problem set – was identical for all students. The quality of the solution was not decisive for students' admission to the final

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[9] The material was originally written in German. In Appendix B, we collect the English translations. Format and design of the original material are preserved.

[10] In fact, teaching assistants and the experimental team collected the fee within the three weeks after the workshop and, if necessary, immediately after the exam.

exam; but their solution had to fulfill the minimum requirement of being a recognizable attempt to solve all problems of the problem set. The teaching assistant explained to his students that they had to choose between two submission deadlines, an early and a late one, which were neutrally framed. He distributed forms on which the two deadlines were specified and the students were asked to individually choose their preferred deadline. Hence, students were offered the possibility of regulating their own future learning behavior by choosing the goal of submitting early. Students were told that their choice was not binding but helpful for organizational purposes. They were also told that assignments handed in after the late deadline would not be considered and excluded the students from the possibility of taking the exam. This information was provided online, too, and was repeated several times in the lecture to make sure that all students enrolled would understand it. To provide a (weak) incentive for students to choose the early deadline, online feedback about the quality of their solution of the midterm assignment was promised to students who submitted prior to the early deadline. No feedback was provided to students who submitted prior to the late but after the early deadline. However, any category of students always had the opportunity to approach their teaching assistant after the tutorials or during the office hours to get any information about any exercise they needed help with. In addition, we instructed the teaching assistants not to provide the correct solutions of the midterm assignments in their online feedback. The online feedback did not provide any real advantage to the students who received it.

**The third wave** The organizing team of the workshop collected the data about students' enrolments and their actual participation and passed them on to the experimental team. The workshop took place on a weekend day after the third wave of the experiment. In its course, additional exercises related to the content of the micro course and prepared by the organizing team were discussed. The teaching assistants collected all data about students' choices of a submission deadline and registered whether students' actually submitted before the chosen deadline. Again, all data were passed on to the experimental team.

**The fourth wave** The main purpose of the fourth wave was to elicit students' networks. We conducted a final survey in which students were asked to name the peers with whom they had joined to prepare themselves for the exam (outside the official lectures and tutorials). These lists of names allow us to reconstruct the social network of learning relationships within class.[11] For each of the listed friends some further survey questions

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[11] Literally, the social network is directed because some students are mentioned by others who do not mention them. However, it seems more reasonable to consider learning relations as bilateral and to believe that two students have learned together even if only one of them reports this, e.g., because the other learning partner was absent on the day on which we conducted the final survey.

specified the kind of relationship, e.g., since when they know each other. We also asked how they perceived their own, their peers', and other students' degree of self-control.[12] Moreover, we elicited their risk preferences for different contexts (among others finance, job, leisure) using the risk module initially implemented in the German Socio-Economic Panel (SOEP) in 2004 (see Wagner, Frick and Schupp 2007). Before the survey, students participated in a paper-and-pencil experiment in which we elicited their time preferences in a context of choices between small short-term payoffs and larger payoffs that would be paid out at more far-away points in the future. To this purpose, we used ten incentivized decisions following the non-parametric method recently introduced by Takeuchi (2011). All payoffs were paid out by online delivery of Amazon vouchers.

**The fifth wave**    Students wrote the final exam either at the beginning or at the end of the semester break. Thereby they could score between 0 and 90 points.[13]

## 3.2  Key Measures

**Measuring performance, talent and effort**    We use the score in the final exam to measure performance, since it fully determines the overall course grades. We also obtained the scores (and grades) from a previous math course as a control variable for talent since a proficiency in math was important both for solving the preparatory problem sets and for doing well in the exam. To account for effort, we use self-reported study times both from the first and the fourth wave.

**Measuring self-control**    We constructed an indicator variable, *self control,* that measures whether a student behaved in a time-consistent way, i.e., achieved his own intermediate goals. A student's two intermediate goals are to submit the midterm assignment prior to the deadline that she herself had previously chosen and to participate in the workshop in case that she had registered for participation. Among the 63 students who signed up for the micro workshop, a share of 73% (46 students) attended it. Early midterm assignment was planned by 107 students, but only a share of 73% (78 students) actually delivered early. The binary variable *self control* becomes one if the student both submitted prior to her self-chosen deadline and did not fail to attend the workshop if enrolled. This variable captures self-control well since it assigns low self-control to students who cannot resist the temptation to procrastinate when preparing the midterm assignment or the temptation to spend their week-

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[12] Students reported their perceived degree of self-control on a scale between 0 and 10.
[13] Students who failed to pass at the early date were automatically eligible to write a new version of the exam at the end of the semester break.

end in a more agreeable way than by attending a workshop that they had planned to attend.[14] The basic assumption underlying the construction of the indicator variable is that, as implied by economic theory, the economic concept of self-control can be equated with time-consistent behavior.

In order to test whether time-consistency is stable across different contexts, we used the method introduced by Takeuchi (2011) to construct a second self-control variable which measures individual time-preferences in the monetary context of our paper-and-pencil experiment (fourth wave).

**Measuring students' social network position** We created two different variables: *friends* and *degree*. The binary variable *friends* takes the value one if the student is at all connected to others, i.e., is part of a study group, and zero otherwise. The variable *degree* counts the student's direct links to others, i.e. the number of learning partners.[15] We computed both variables from the undirected social network. In order to check for robustness of our results we also use variables derived from the directed network.

**Differentiation of peers** To further substantiate friends' peer effects we categorize them as talented or untalented according to their math score. The count variable *talented friends* counts the number of links to fellow students who have a math score weakly above 58 points, while the count variable *untalented friends* counts the number of links to fellow students who have a math score weakly below 55 points. The chosen threshold makes use of the fact that no student achieved a math score between 55 and 58; and it splits all friends in two categories of equal size.

Descriptive statistics of our most important variables are provided in Table 1.

# 4  Main Results

## 4.1  Determinants of Performance

Table 2 displays the results on how individual characteristics, including self-control, general connectedness to other students and specific connectedness to highly talented students affect performance. In all models, we tested for the presence of omitted variables with a specification-error test as well as for multicollinearity and rejected both. Moreover, ordinary least square (OLS) estimates were calculated with robust standard errors. We additionally

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[14] In principle, we can also construct two separate indicator variables for time-consistent behavior concerning each of the two intermediate goals. While many of our results are qualitatively unaffected, there is simply less variation in these two measures.

[15] Further network statistics, such as measures of centrality, are difficult to interpret since the network is quite sparse, consisting of many isolates and small components.

used a two-step FGLS (feasible generalized least square) method to account for heteroskedasticity and thus to gain efficiency.

**Self-control and talent**     Both individual self-control and talent have a positive effect on performance. Pairwise correlation of the dependent variable and these regressor variables yields a correlation coefficient of 0.66 (with a p-value smaller than 0.001) for talent and performance, while the correlation coefficient of self-control and performance is 0.30 (with a p-value of 0.003). The effect of talent is significant at the 1% level across all model specifications. Self-control is statistically significant, albeit to a lesser degree. Being highly self-controlled is associated roughly with an eight points higher micro score, which is substantial since the maximal score is 90 and the median score is 58. The standard deviation of *math score* is 21 (reported in Table 1); an increase of one standard deviation in *math score* leads to a rise of 12 points in the micro score.

These results fully support our hypothesis H1 that self-control positively affects performance. One important alternative suggestion would be that *self control* captures an advantage in human capital of those students who attended the workshop and received feedback after an early submission of their midterm assignment. To test whether this is true, we conducted a Wilcoxon rank-sum test comparing the performance of those who attended the workshop and received the feedback with those who did not. The result is displayed in Table 3. There is no evidence that workshop attendance and feedback affected performance. Hence, we can be confident that the positive coefficient of the variable *self control* in Table 2 does indeed measure a positive effect of actual self-control on performance.

**Self-control and peer effects**     The number of friends in general, measured by *degree*, has no significant effect on performance when controlling for talent and self-control (see columns 2 and 3 in Table 2). However, increasing the number of *talented* friends, i.e., friends with a high math score, significantly improves performance, which is fully in line with our hypothesis H3. If we control for the number of talented friends, the effect of self-control becomes weaker. Within the OLS regression the effect of self-control is of the same dimension but insignificant. In the FGLS model, the effect of self-control remains significant when controlling for the number of talented friends. Since overall model diagnostic statistics favor the FGLS model, we conclude that both self-control and being connected to many talented peers significantly improve performance. Overall, we find strong evidence in support of our hypotheses H1 and H3.

**Self-control and effort**     One channel through which self-control might affect performance is effort. However, performance does not seem to be affected by early

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effort, i.e., by the average number of minutes studied per week, as reported in the first wave of our experiment. On the other hand, late effort, i.e., the average number of minutes studied in the last week prior to the exam, seems to positively affect performance to some extent.[16] However, this result is not robust to controlling for other covariates, like talent.[17] Hence, we conclude that we do not find strong evidence for a positive relationship between effort and performance. This might be due to the fact that effort and talent can be substitutes as well as complements, which might vary across students. Alternatively, learning methods, e.g., how the material is structured and whether students acquire problem-solving skills rather than memorize prespecified results, might matter more than the pure amount of time spent studying.

Our hypothesis H2 predicts that effort is increasing in self-control such that more self-controlled students would study more than their peers. On average, early effort of students with low self-control amounts to 57 minutes per week, while students with high self-control study 78 minutes per week. However, this difference is not significant.[18] By contrast, highly self-controlled students invest significantly more effort in the week prior to the exam. Figure 2 displays kernel density estimates for late effort per level of self-control, i.e. students' effort one week prior to the microeconomics exam, separated according to the level of self-control. Indeed, highly self-controlled students seem to work harder in the week prior to the exam than their less self-controlled counterparts. Specifically, median effort for highly (lowly) self-controlled students is 240 (80) minutes per week; and average effort for highly (lowly) self-controlled students is 290 (210) minutes per week. A Wilcoxon test rejects the hypothesis that both groups are not statistically different with regard to late effort with a p-value of 0.078. In sum, we find only weak support for our hypothesis H2.

**Self-control and monetary time-preferences**        Considering the students' monetary time preferences, we do not find any effect on performance or on any other behavioral variable such as effort or goal-setting behavior. Importantly, we also do not find any correlation between these time-preferences and our behavioral self-control measure. Similarly to the data reported by Takeuchi (2011) whose method we adopted, most participants appear to be future-biased in the monetary context, while only few seem to have a present bias or to be time-consistent. At least in our setting, time preferences do not seem to be correlated across the monetary context and the context of studying.

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[16] Results on the relationship between effort and performance are not reported in the tables.
[17] Controlling for other covariates creates heteroskedasticity. We control for heteroskedasticity by applying the bootstrapped method using 400 resamples.
[18] This result is not reported in the tables.

## 4.2  The Interaction of Self-Control and Peer Effects

**Self-control and students' social network**        Figure 1 displays the social network of our students and provides a first impression of the relationship between self-control and connectedness. Importantly, most students who have at least one friend also have a high level of self-control, whereas the majority of those who are unconnected to any friends also exhibit low self-control. To be more precise, only 39% of the many isolates have a high level of self-control. In contrast, 71% of the students who have at least one friend also exhibit high self-control. This observation already suggests that network formation among students could well be fully in line with the BBT model, i.e., that only sufficiently self-controlled individuals profit from teaming up with similarly self-controlled peers.

Figure 1: Students' learning network and their self-control. Light-green (dark-red) stands for a high (low) level of self-control. Circle (box) indicates a female (male) student.
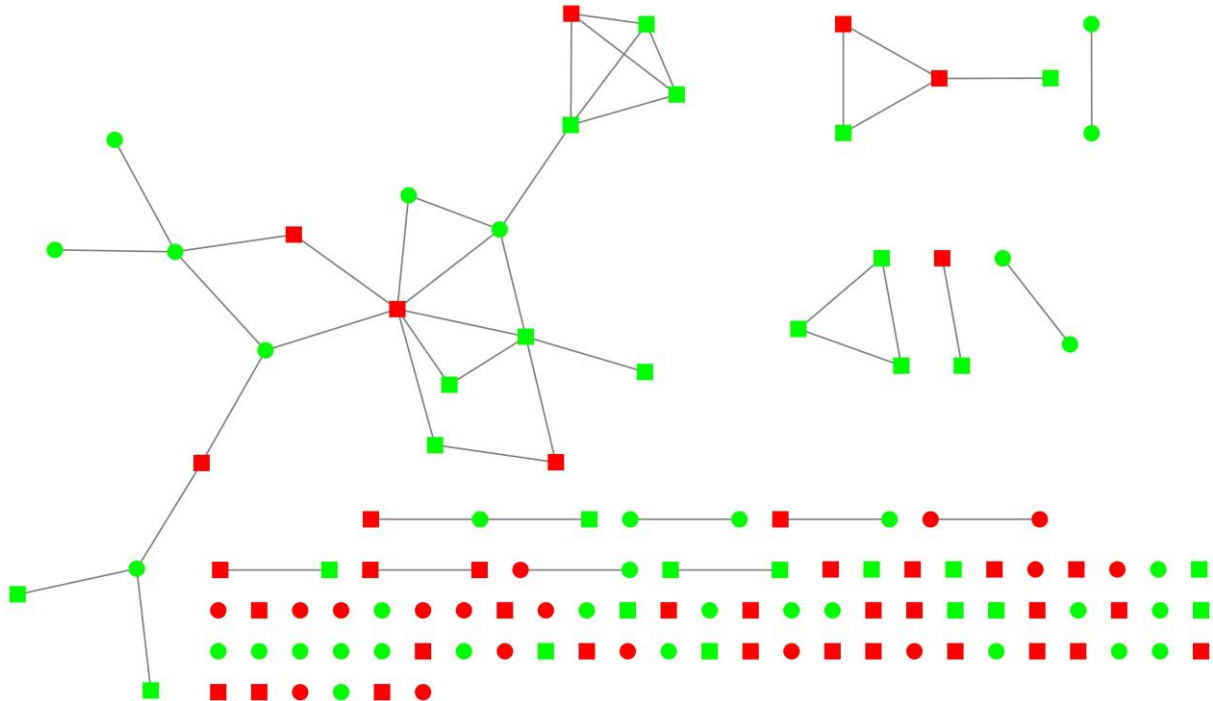


To test this hypothesis we first consider the variable *friends*, i.e., the binary variable measuring whether a student is connected to any friends at all (friends = 1). Indeed, students with high self-control are much more likely to have connections to peers (Pearson Chi$^2$ = 12.159 with p-value $< 0.001$ and Fisher's exact test yields p-value $= 0.001$).[19] To control for other individual characteristics, we run a probit regression with *friends* as a dependent variable, using self-control and further individual characteristics as covariates. A Hosmer-

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[19] This result is not reported in the tables.

Lemeshow specification test shows that all the models are well specified. Table 4 displays the results. Self-control and talent both have a statistically significant positive impact on the likelihood of being connected in different model specifications. Indeed, the predicted probability of being connected is 21% higher for individuals with high self-control than for those with low self-control, holding all other covariates constant.

We also tested whether self-control tends to increase the number of friends a student is connected to. Since the dependent variable *degree*, the number of friends, is a nonnegative integer, we use Poisson and negative binomial models. Results are shown in Table 5. Since overdispersion is present, negative binomial models provide the best fit. Our results support our findings from the previous binary outcome model. Highly self-controlled students have a higher number of friends; and this effect is significant at the 5% level in both models. Specifically, a discrete change from having low self-control to having high self-control is associated with 0.64 additional friends. To check for robustness, we use the directed network and estimate the effect of self-control on outdegree and indegree, i.e. the number of friends a student nominated in the survey, respectively how often the student was nominated. Both measures from the directed network show a significant effect of similar size.[20] Overall, our estimates consistently show that highly self-controlled students are more likely to have friends and also tend to have more friends than students with low self-control. This is clear evidence for parts (a) and (b) of our hypothesis H4.

To test whether highly self-controlled students are also more likely to have highly talented friends, we ran two Poisson regressions with *talented friends* and *untalented friends* as response variables. Since the equidispersion property is not violated, models fitting the Poisson distribution are used. Results are reported in column 1 of Table 6. On average, the number of highly talented friends is increasing in self-control. This effect is positive and statistically significant, which supports part (c) of our hypothesis H4. The size of the effect is also substantial: Being highly self-controlled is associated with 0.35 additional talented friends.

We also tested whether self-control affects the number of lowly talented friends, i.e., the number of friends with a low math score. As can be seen from the second column of Table 6, we do not find any effect of self-control on the number of lowly talented friends. Hence, while a highly self-controlled student is more likely than a student with low self-control to have friends at all, the former also seems to be more selective in choosing his or her friends than the latter. Since students with more talented friends perform better in the exam, these

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[20] These results are not reported in the tables.

results imply that self-control facilitates positive peer effects on performance: More self-controlled students have better access to highly talented peers and thereby accomplish more than their less well-connected peers. This is another channel through which self-control affects performance. Overall, we conclude that there is supportive evidence for all parts of our hypothesis H4 showing a strong link between a student's connectedness and her self-control. By contrast, we do not find any evidence in favor of our hypothesis H5, i.e., that self-control is correlated among direct friends. This, however, seems due to the fact that testing this hypothesis requires a dramatic reduction in sample size since a significant part of our students does not have any friends at all. Hence, we conclude that our results are sufficiently in line with the BBT model to provide support for it.

Note that a very specific prediction of the BBT model is the claim that only sufficiently self-controlled individuals profit from connecting to others *at all*. This prediction could not be generated by a theory of homophile network formation, other than the prediction that self-control be correlated among friends. Hence, since we validate the former claim, we provide evidence in support of the BBT model.

## 4.3 Gender Differences in Self-Control and Peer Effects

Since we conducted our field study in an educational setting where gender differences typically play an important role, we also investigate whether and how female students differ from male students in self-control, peer effects and performance.

Table 7 and Figure 3 display the results regarding self-control. Female students are significantly more self-controlled than their male counterparts: females' likelihood of being highly self-controlled is 37,5 % higher than males', holding the other covariates constant. Moreover, comparing the probabilities of being highly self-controlled between female and male students for different levels of talent, as we do in Figure 3, reveals, first, that the predicted values of being highly self-controlled are higher for female students for all levels of talent. Second, men's fitted probability of being highly self-controlled increases much more strongly in talent than women's, i.e. the men's slope is steeper. One possible explanation could be that women partly use self-control as a substitute for talent while men's self-control and talent are complements.

To test whether this notable advantage over their male peers gives female students a head-start in the exam, we conducted a Wilcoxon rank-sum test which is displayed in Table 3. Moreover, we controlled for gender when examining determinants of students' performance (see all model specifications in Table 2). As can be seen from both tables, our findings do not

indicate that women outperform men. If anything, men perform better than women. Hence, we conclude that the advantage of female students in terms of self-control must be counterbalanced by some disadvantage either in other determinants of performance or in the way in which self-control is used to increase performance. A second Wilcoxon rank-sum test which is displayed in Table 3 reveals that women seem to scribe somewhat lower math scores than men, but this is not significant. Hence, we cannot conclude that women have a disadvantage in talent. Regarding their social network, neither are female students significantly less likely to have friends, nor do numbers of friends differ significantly between the sexes, as can be seen from Tables 4 and 5. This is already an interesting observation, since one could expect the (more self-controlled) female students to be more likely than the male students to be connected to friends at all, given that self-control turned out to be an important determinant of connectedness. However, if we look deeper into the way in which female and male students form their social network, an interesting gender difference emerges that possibly counteracts the women's advantage in self-control: We find a compositional difference in how female and male students have formed their network. Female students seem less selective than male students in choosing their friends since there is a strong negative impact of being female on the number of talented friends which is significant at the 1% level (cf. Table 6). In particular, female students have 0.4 fewer highly talented friends compared to male students.

Hence, female students, although more self-controlled on average than male students, seem to use their self-control less efficiently to get access to highly talented peers and hence profit less from positive peer effects on performance.[21] This might be at least one possible reason why women, albeit more self-controlled than men, do not outperform the latter in the exam.[22]

# 5  Self-Control and "Good News" about Peers

## 5.1  Experimental Intervention

In the BBT model, a specific mechanism makes sufficiently self-controlled individuals want to team up with peers who have similar levels of self-control. This mechanism is part of the

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[21] This finding seems to be very much in line with the empirical results of Lalanne and Seabright (2013) and the experimental findings of Friebel et al. (2013). Lalanne and Seabright (2013) find that the presence of influential individuals in a cohort of employees improves men's wages much more strongly than women's. Friebel et al. find that men's network formation is more reactive to short-term benefits (i.e., payoffs) than women's.

[22] Obviously, there are other possible explanations, for example that women perform worse than equally talented men in competitive environments (see, e.g., Gneezy, Niederle and Rustichini (2003), Niederle and Vesterlund, (2007), and Jurajda and Münich (2011)).

so-called "good news" equilibrium: Individuals correctly expect to learn more often than not that their peers have resisted temptations. This increases their confidence in their own self-control and finally enhances their future resistance against temptations. To address the question whether a similar cognitive mechanism makes our students appreciate highly self-controlled peers, we implemented an experimental intervention in the second wave of our study, where we communicate "good news" about their peers' self-control.

In each tutorial group, we informed the students about the current study time (elicited in wave 1) of the most hard-working peers within their tutorial. Since students with low ambitions might not respond to information about the effort of extremely ambitious students, we communicated two signals in each tutorial: the current study time of the most hard-working non-ambitious peer (low stimulus) and the current study time of the most hard-working ambitious peer (high stimulus), where students are categorized as ambitious if they aspired to a grade better or equal to 2.3.[23] Thus, the variable *stimulus* assigns to each student the maximal early effort of the peer in the tutorial with the same ambition, which in each tutorial is lower for non-ambitious students than for ambitious students.

After receiving the stimulus, all students in the tutorial group were required to define how many minutes per week (on average) they planned to study from then on until the exam.[24] We used this survey to test whether students' goal setting behavior (their planned effort) and their actual late effort depended on the stimulus. Those students whose early effort was used as stimulus are excluded from the analysis.

To see how this relates to theory, note that the stimulus provided to our students was "good news" about an anonymous peer in their group who studied harder than they did while exhibiting a similar ambition. Hence, the stimulus suggested that this peer was better than the others in the group in resisting the usual temptations that divert students from work. According to the BBT model, this good news should enhance a student's confidence in her own self-control and thereby her willingness to persevere. Hence, we conjectured that late effort increases in the stimulus, i.e., that students studied harder in the week prior to the exam if the student of their tutorial group whose early effort was used as stimulus had studied hard in the early weeks of the course. Moreover, note that according to Koch and Nafziger (2011), setting oneself a goal works as partial commitment since it creates psychological costs of falling short of the goal. Hence, the more confident a student is that she has self-control, the higher the goals are that she can optimally set for herself. Therefore, we also conjectured that

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[23] The grade 2.3 in the German grading system corresponds to an A- in the US grading system.
[24] This was two months before students reported on how many time they really invested one week before the exam.

planned effort increases in the effort that we revealed as stimulus. Taken together, our conjectures are equivalent to our hypothesis H5.

## *5.2 Empirical Strategy*

A peer effect is prevalent if a students' current effort affects the goal setting behavior of the other students in her tutorial group. The clean and causal identification of peer effects on individual behavior is subject to numerous challenges. In his seminal contribution, Manski (1993) mentions two effects that cannot easily be separated from the true (endogenous) peer effect: contextual (exogenous) effects and correlated effects. In our setting, contextual effects would occur if a student's planned effort varied with the exogenous characteristics of her tutorial group, e.g., with characteristics of the tutor or the time when the tutorial was scheduled. By contrast, a correlated effect would be present if students' effort plans were more strongly correlated within a tutorial group than within the whole sample, because students with similar characteristics, such as talent or ambition, selected themselves into the same tutorial group. Both the contextual and the correlated effects differ from the true peer effects with respect to causality: Individual behavior is directly influenced by a peer's behavior if the relationship between the two is a peer effect, but not if it is a contextual or correlated effect.

Note that by our experimental design, the relationship between the stimulus and planned effort is directed: While students reacted to the stimulus when reporting their planned effort, the students whose early effort was used as stimulus had no information about the future effort plans of other students in her group when reporting her current effort. Hence, if the relation between the stimulus and individual planned effort can be interpreted as causal, the plausible interpretation is that the stimulus had a causal impact on planned effort, rather than vice versa.

Consider now the distinction between a peer effect, on the one hand, and a contextual or correlated effect, on the other hand. Our stimulus variable measures individual effort of one student rather than average group effort. Hence, the stimulus variable does not directly capture group characteristics. Still, the stimulus might vary with group characteristics. For instance, the current effort used as stimulus might be higher in tutorials with charismatic tutors or less talented students. In this case, the effect of the stimulus on students' planned effort could be confounded with the effect of group characteristics on both the stimulus and planned effort. To empirically isolate the (endogenous) peer effect, we introduce cluster fixed effects with a cluster dummy variables model as described in Cameron and Trivedi (2005).

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The model, estimated via OLS, includes a tutorial-specific fixed effect and allows for correlations between the responses of students in the same tutorial.

Moreover, we test whether students self-selected into tutorial groups based on effort or talent. Simple bivariate distribution plots do not reveal any initial self-selection, neither with regard to effort, not with regard to talent.[25] Students with higher current study time or with a higher level of talent do not seem to have selected themselves into a particular tutorial group. We confirm these preliminary indications with a Kruskal-Wallis equality-of population rank test and simultaneously test the equality of the early effort (respectively math) distribution across all tutorials. The null hypothesis that effort (math) is equal across all tutorials cannot be rejected. Overall, we are confident that we are able to separate peer effects from contextual and correlated effects.

### 5.3 Results

Table 8 reports the results from OLS regressions with included tutorial dummies. Our estimates are robust to five different outlier measures: dfits based on Welsch and Kuh (1977), a less restrictive dfits to exclude less extreme outliers, leverage, Cook's D influence statistic and studentized (jackknifed) residuals. The minimum number of outliers removed is three, the maximum is seven. The effect of the stimulus is highly significant and positively affects student's planned effort regardless of the calculated outlier statistic. These results indicate that students indeed adapt their goals upward in reaction to "good news" about the self-control of their peers. However, although tutorial dummies are jointly significant only when the jackknifed residual statistic is used (column 6), tutorial dependencies exist because standard errors are smaller in regressions when tutorial dummies are excluded. Hence, we find both peer effects and correlated effects on planned effort.

## 6 Discussion

We have conducted a field study to shed light on the interaction between self-control and peer effects. Our main contribution is to show that there exists a significant and sizable relation between connectedness to peers and self-controlled behavior. More self-controlled students are more likely to be connected and tend to have both more friends in total and more highly talented friends than their less self-controlled counterparts. Moreover, the connection to highly talented peers is an additional channel through which self-control positively affects performance. We also find gender differences: Female students are more self-controlled than

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[25] Bivariate distribution plots are not displayed.

their male counterparts, but do not outperform the latter although they seem to be equally talented. One possible reason is that female students seem to be less selective in their connections to peers. Although they have roughly the same number of friends as male students, they have fewer highly talented friends.

Our main finding of a positive relation between connectedness to peers and self-controlled behavior is in line with the theory provided by Battaglini, Bénabou and Tirole (2005). This theory predicts that only individuals with a sufficiently high prior probability of being self-controlled profit from teaming up with each other. This is because teaming up is helpful only if "good news" about the level of self-control of the other team members is sufficiently likely. Hence, if social network formation is endogenous and individuals link strategically (cf. Jackson and Wolinski, 1996), then the individuals with higher levels of prior self-control will choose to team up with each other whereas those with low levels of prior self-control will stay alone. Our findings are fully consistent with this prediction.

However, it remains an open question whether the theory provided by Battaglini, Bénabou and Tirole (2005) is the unique explanation of our results. Within the framework of our current study, we cannot identify the direction of causality between having friends and being highly self-controlled. Put differently, we cannot be sure that the social network of our experimental subjects is indeed endogenous and affected by individual levels of self-control. One possible alternative interpretation would be that students' social network (which might be exogenous) affects the degree to which students behave in a self-controlled manner. For instance, having friends with whom study activities are coordinated might serve as a commitment device that helps students to exhibit self-controlled behavior. In that view, it is rather the fact of being observed by peers than observing them that affects self-control. The results of our intervention which confronted the students with self-controlled behavior of their peers show that an effect of the former type (observing) is present, without excluding the possibility of the latter effect (being observed). In order to finally identify the direction of causality between having friends and being highly self-controlled, we would need an independent measure of students' time preferences that correlates with observed behavior. We did not find any correlation between monetary time preferences and observed behavior of our students, but this does not imply that such an independent measure does not exist. We leave it to future research to address this question.

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# Appendix A

Table 1: Summary Statistics

| Variable | # of obs. | # of obs. if var =1 | Mean | Std. dev. | p50 | Min | Max |
|---|---|---|---|---|---|---|---|
| micro score (performance) | 96 | - | 56.59 | 20.70 | 58 | 0 | 88 |
| math score (talent) | 100 | - | 48.19 | 20.80 | 51 | 0 | 82 |
| effort (minutes per week) | 70 | - | 70.28 | 67.20 | 60 | 0 | 360 |
| self control (1=yes) | 117 | 63 | 0.54 | 0.50 | 1 | 0 | 1 |
| gender (1=female) | 117 | 52 | 0.44 | 0.50 | 0 | 0 | 1 |
| friends (1= at least one friend) | 117 | 55 | 0.47 | 0.50 | 0 | 0 | 1 |
| degree | 117 | 23 | 0.94 | 1.33 | 0 | 0 | 7 |

Notes: Calculation based on data collected in spring and summer 2013. Sample includes first year economics students. Variables *micro score*, *math score* and *effort* are metric. The construction of *self control* is described in detail in section 3.2. The variable *gender* is binary and 44% of the students are female. The variable *friends* is binary as well. 55 students reported to have studied with at least one friend for the micro course. The count variable *degree* gives the number of friends a student has.

Table 2: Self control, Talented Peers and Performance

| | (1) OLS micro score | (2) OLS micro score | (3) FGLS micro score | (4) OLS micro score | (5) FGLS micro score |
|---|---|---|---|---|---|
| self control (1=yes) | 8.896* | 8.553* | 7.974** | 7.125 | 6.831* |
| | (4.737) | (4.932) | (3.734) | (4.854) | (3.760) |
| math score | 0.580*** | 0.579*** | 0.578*** | 0.580*** | 0.580*** |
| | (0.110) | (0.111) | (0.086) | (0.105) | (0.084) |
| gender (1=female) | -4.251 | -4.008 | -4.089 | -2.111 | -2.230 |
| | (4.413) | (4.484) | (3.300) | (4.426) | (3.376) |
| degree | | 0.574 | 1.097 | | |
| | | (1.194) | (1.126) | | |
| talented friends | | | | 4.340** | 4.067** |
| | | | | (1.938) | (1.962) |
| constant | 23.805*** | 23.300*** | 23.142*** | 21.807*** | 22.188*** |
| | (6.385) | (6.471) | (5.489) | (6.225) | (5.337) |
| Observations | 88 | 88 | 88 | 88 | 88 |
| adj. $R^2$ | 0.422 | 0.417 | 0.436 | 0.441 | 0.460 |
| F-statistic | 22.743 | 17.276 | 17.836 | 18.837 | 19.540 |
| p value F-statistic | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Notes: Dependant variable is the score obtained in microeconomics I exam. Robust standard errors are reported in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% level. Feasible generalized least square (FGLS) is calculated with a skedasticity function that includes math score and self control.

Table 3: Wilcoxon Rank-Sum (Mann-Whitney) Tests

| performance by gender | observations | rank sum | expected |
|---|---|---|---|
| male | 55 | 2915.5 | 2667.5 |
| female | 41 | 1740.5 | 1988.5 |
| combined | 96 | 4656 | 4656 |
| z value | 1.838 | | |
| p value of z | 0.0661 | | |
| talent by gender | | | |
| male | 61 | 3310.5 | 3080.5 |
| female | 39 | 1739.5 | 1969.5 |
| combined | 100 | 5050 | 5050 |
| z value | 1.626 | | |
| p value of z | 0.1040 | | |
| performance by early submission+ workshop attendance | | | |
| yes (both criteria fulfilled) | 31 | 1980 | 1829 |
| no (only one or none criterion fulfilled) | 86 | 4923 | 5074 |
| combined | 117 | 6903 | 6903 |
| z value | -0.933 | | |
| p value of z | 0.3509 | | |

Notes: Performance is measured with the score obtained in Microeconomics I exam. Talent is measured with score obtained in Math exam. Results on performance and talent indicate, if anything, higher levels for men. There is no difference in performance with regard to workshop attendance+early submission of midterm assignment.
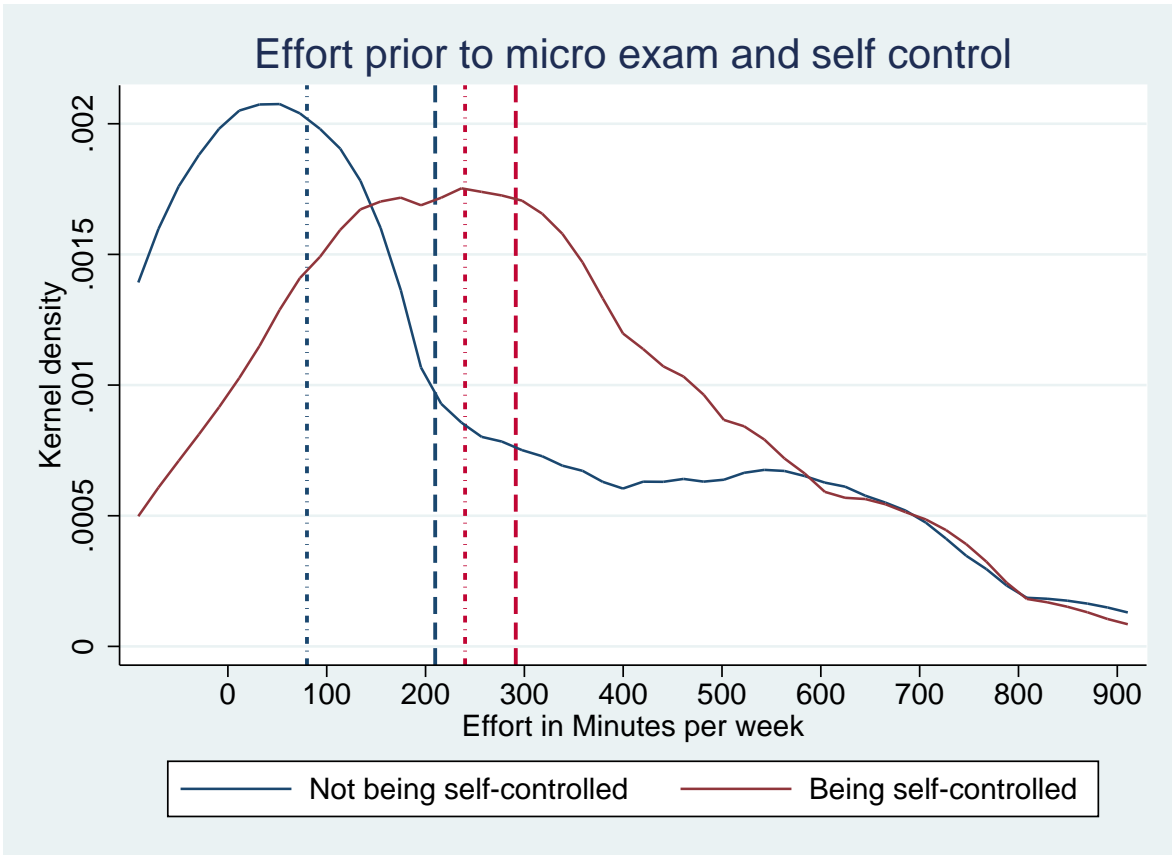
Figure 2: Effort (week before exam) and Self control

Notes: The figure gives kernel density estimates for effort (minutes studied per week one week before the exam took place) for the self-controlled and not self-controlled cohorts. One outlier is excluded. The bandwidth is 90. Dashed vertical lines give the average effort, dotted lines give the median effort. A Wilcoxon test *rejects* the hypothesis that both groups are *not statistically different* with regard to effort with a p-value of 0.078.

| | (1) | (2) | (3) |
|---|---|---|---|
| | probit | probit | probit |
| | friends (1=yes) | friends (1=yes) | friends (1=yes) |
| math score | 0.020*** | 0.020*** | 0.018* |
| | (0.007) | (0.007) | (0.009) |
| gender (1=female) | -0.077 | 0.081 | -0.333 |
| | (0.310) | (0.535) | (0.728) |
| self control (1=yes) | 0.593* | 0.673* | 0.602** |
| | (0.303) | (0.357) | (0.306) |
| gender x self control | | -0.243 | |
| | | (0.632) | |
| gender x talent | | | 0.005 |
| | | | (0.014) |
| constant | -1.143*** | -1.173*** | -1.038** |
| | (0.395) | (0.409) | (0.491) |
| $\eta_{math}$ | 0.0067*** | | |
| | (0.002) | | |
| $\eta_{sc}$ | 0.215** | | |
| | (0.109) | | |
| Observations | 100 | 100 | 100 |
| pseudo $R^2$ | 0.131 | 0.132 | 0.132 |
| F-statistic | 15.368 | 15.429 | 15.893 |
| p value F-statistic | 0.0015 | 0.0039 | 0.0032 |
| loglikelihood | -59.9514 | -59.8717 | -59.8730 |
| AIC | 127.9028 | 129.7434 | 129.7459 |
| BIC | 138.3235 | 142.7692 | 142.7718 |

Table 4: Self-Control on General Connectedness

Notes: Dependant variable friends is binary and equal to 1 if the student named at least one learning partner; zero otherwise. Robust standard errors in parentheses. $\eta_{math}/\eta_{sc}$: average marginal effect of friends w.r.t. math score/ self control. *, **, *** indicate significance at the 10%, 5% and 1% level.

Table 5: Self-Control on General Connectedness

| | (1) poisson degree | (2) negative binomial degree | (3) negative binomial degree |
|---|---|---|---|
| math score | 0.006 | 0.006 | 0.006 |
| | (0.008) | (0.007) | (0.008) |
| gender (1=female) | -0.286 | -0.318 | -0.318 |
| | (0.264) | (0.279) | (0.272) |
| self control (1=yes) | 0.627** | 0.641** | 0.641** |
| | (0.271) | (0.296) | (0.270) |
| constant | -0.539 | -0.517 | -0.517 |
| | (0.561) | (0.366) | (0.589) |
| | (0.395) | (0.409) | (0.491) |
| $\eta_{sc}$ | | | 0.639** |
| | | | (0.255) |
| Observations | 100 | 100 | 100 |
| Wald-statistic | 8.307 | 8.209 | 9.036 |
| p value Wald-statistic | 0.040 | 0.042 | 0.029 |
| dispersion parameter $\alpha$ | | 0.526 | |
| p value $\alpha$ | | 0.0014 | |
| loglikelihood | -143.9276 | -138.8002 | -138.8002 |
| AIC | 295.8553 | 287.6004 | 287.6004 |
| BIC | 306.2760 | 300.6263 | 300.6263 |

Notes: Dependant count variable degree is defined as number of friends.Robust standard errors are in parentheses for the first and third model. The second model was calculated without robust standard errors to retrieve the dispersion parameter $\alpha$. Overdispersion is present. $\eta_{sc}$: average marginal effect of degree with respect to self control. *, **, *** indicate significance at the 10%, 5% and 1% level.

Table 6: Self-Control and (Un-)talented friends

| | (1) poisson talented friends | (2) poisson untalented friends |
|---|---|---|
| math score | 0.005 | 0.007 |
| | (0.008) | (0.011) |
| gender (1=female) | -0.941*** | 0.131 |
| | (0.337) | (0.357) |
| self control (1=yes) | 0.864** | 0.341 |
| | (0.360) | (0.346) |
| constant | -1.279** | -1.272 |
| | (0.550) | (0.775) |
| $\eta_{gender}$ | -0.391*** | |
| | (0.136) | |
| $\eta_{sc}$ | 0.375*** | |
| | (0.141) | |
| Observations | 100 | 100 |
| Wald-statistic | 15.911 | 1.547 |
| p value Wald-statistic | 0.001 | 0.671 |
| loglikelihood | -85.142 | -99.701 |
| AIC | 178.284 | 207.403 |
| BIC | 188.704 | 217.823 |

Notes: Dependant variable is the number of (un-)talented friends and is a count variable. Talented friends are friends that have a math score weakly above the median of the cohort, untalented friends have a math score below the median of the cohort. Robust standard errors in parentheses. Overdispersion is not present and both models are fitted using Poisson distribution. $\eta_{gender}$ / $\eta_{sc}$: average marginal effect of dependent variables w.r.t. gender and self control. *, **, *** indicate significance at the 10%, 5% and 1% level.

Table 7: Gender and Self-Control

|  | (1) probit self control (1=yes) | (2) probit self control (1=yes) | (3) probit self control (1=yes) |
|---|---|---|---|
| math score |  | 0.024*** | 0.026*** |
|  |  | (0.008) | (0.010) |
| gender (1=female) | 0.623*** | 1.154*** | 1.397* |
|  | (0.240) | (0.320) | (0.796) |
| gender x talent |  |  | -0.006 |
|  |  |  | (0.017) |
| constant | -0.174 | -1.391*** | -1.498*** |
|  | (0.157) | (0.461) | (0.571) |
| $\eta_{math}$ |  | 0.0078*** |  |
|  |  | (0.002) |  |
| $\eta_{gender}$ |  | 0.375*** |  |
|  |  | (0.085) |  |
| Observations | 117 | 100 | 100 |
| F-statistic | 6.754 | 15.663 | 16.439 |
| p value F-statistic | 0.0094 | 0.0004 | 0.0009 |
| loglikelihood | -77.2923 | -56.3700 | -56.2932 |
| AIC | 158.5847 | 118.7400 | 120.5863 |
| BIC | 164.1090 | 126.5555 | 131.0070 |

Notes: Dependant variable self control is binary and equal to 1 if the student behaved in a time consistent manner concerning early goal achievement; zero otherwise. Calculation based on data collected in spring and summer 2013. Sample includes first year economics students. Robust standard errors in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% level. $\eta_{math}$/ $\eta_{gender}$: average marginal effect of self control w.r.t. math score and gender.
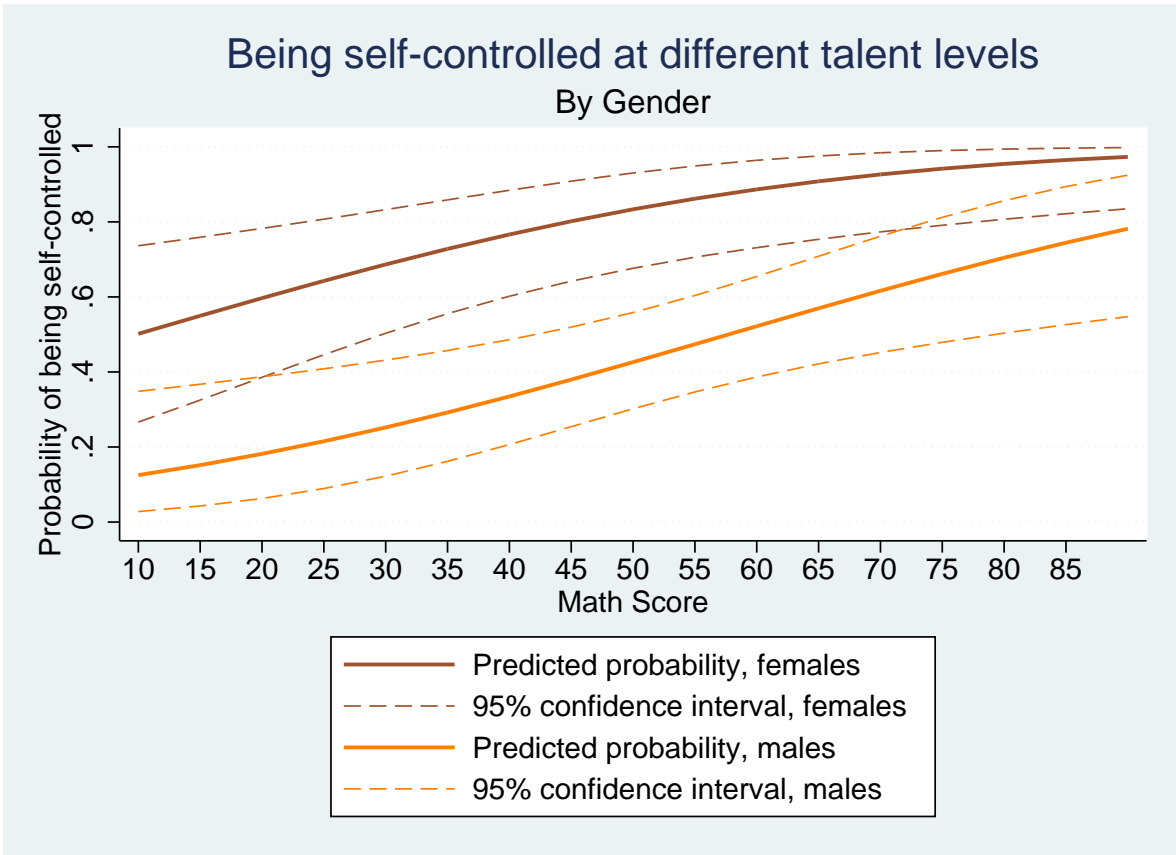
Figure 3: Self-control by gender

Table 8: Peer effect and Goal Setting

| | (1) (OLS ) planned effort | (2) (OLS) dfits I planned effort | (3) ( OLS) dfits II planned effort | (4) (OLS) leverage planned effort | (5) (OLS) cook's dist planned effort | (6) (OLS) stud. resid planned effort |
|---|---|---|---|---|---|---|
| Stimulus (max peer) | 0.190** | 0.226*** | 0.242*** | 0.264*** | 0.226*** | 0.205*** |
| | (0.088) | (0.080) | (0.080) | (0.079) | (0.080) | (0.074) |
| initial effort | 0.480*** | 0.519*** | 0.411*** | 0.513** | 0.519*** | 0.439*** |
| | (0.160) | (0.163) | (0.135) | (0.201) | (0.163) | (0.123) |
| gender (1=female) | 15.062 | 4.859 | 14.405 | 19.463 | 4.859 | 16.840 |
| | (20.368) | (16.843) | (19.514) | (20.244) | (16.843) | (16.924) |
| math score | -0.402 | -1.009** | -0.668 | -0.686 | -1.009** | -0.839* |
| | (0.524) | (0.382) | (0.445) | (0.464) | (0.382) | (0.431) |
| tutorial dummies | yes | yes | yes | yes | yes | yes |
| | (five) | (four) | (four) | (four) | (four) | (five) |
| constant | 47.528* | 71.481*** | 50.355** | 37.577 | 71.481*** | 61.934*** |
| | (26.789) | (21.715) | (24.233) | (25.311) | (21.715) | (21.776) |
| Observations | 54 | 47 | 51 | 48 | 47 | 51 |
| adj. $R^2$ | 0.221 | 0.363 | 0.253 | 0.167 | 0.363 | 0.395 |
| F-statistic | 3.613 | 5.456 | 5.617 | 4.569 | 5.456 | 5.690 |
| p value F-statistic | 0.0025 | 0.0002 | 0.0001 | 0.0008 | 0.0002 | 0.0001 |
| p-value (all tutorial dummies=0) | 0.1239 | 0.8472 | 0.3022 | 0.2407 | 0.8472 | 0.0516 |

Notes: Dependant variable is planned effort (in minutes per week) the student intends to study after he receives the signal, i.e. the current study time of the most hard-working (non-)ambitious peer. Following outlier statistics are calculated: dfits based on Welsch and Kuh (1977) in column 2, a less restrictive dfits statistics in column 3, data points that are high in leverage in column 4, Cook's distance that combines leverage and residual in column 5, and studentized (jackknifed) residuals in column 6. Robust standard errors are reported in parentheses. *, **, *** indicate significance at the 10%, 5% and 1% level.

# Appendix B

## *Instructions and Additional Material*

Wave 1

- current study time and aspired grades

Wave 2

- Step 1: goals and stimulus

- Step 2: workshop registration

- Step 3: midterm assignment

Wave 4

- Part 1: paper-and-pencil-experiment

- Part 2: social network

- Part 3: preferences

The English translations are followed by the original German documents.

Dear student,

the teacher, Prof. Dr. Dr. Lydia Mechtenberg, has given me the permission to conduct a short survey on the overall study situation in the Bachelor's program in economics. I kindly ask you to take **3 minutes** time to participate in this part of the **survey**. I will later completely anonymize your data; until then they will be treated strictly confidential.

A1. Name: _____

A2. Student ID: _____

A3. How often did you attend this tutorial (or another tutorial for this course) so far?
          □ *almost always*          □ *sometimes*          □ *almost never*

A4. How often did you attend the lecture (Microeconomics I) so far?
          □ *almost always*          □ *sometimes*          □ *almost never*

A5. Apart from the lecture and the official tutorials, how much time per week did you on average study for this course (Microeconomics I) so far?
          _____ *minutes*

A6. Do you have any engagements besides your study program that take a substantial part of your time, e.g. occupation, volunteer work, care, parenting?

          *If yes, please state how many hours per week on average you devote to these engagements:_____*

Cordial thanks for your participation!          Dr. Berno Büchel

Dear student,

the teacher, Prof. Dr. Dr. Lydia Mechtenberg, has given me the permission to conduct a short survey on the overall study situation in the Bachelor's program in economics. I kindly ask you to take **3 minutes** time to participate in this part of the **survey**. I will later completely anonymize your data; until then they will be treated strictly confidential.

B1. Name: _____

B2. Student ID: _____

B3. When do you plan to write the exam of this course (Microeconomics I)?
      □ *at the first date*      □ *at the second date*      □ *not at all*

If you plan to take the exam, please answer the following question:

B4. Which grade do you aspire in this course (Microeconomics I)?
      □ *1.0 - 1.3*          □ *1.7 - 2.3*          □ *2.7 - 3.3*          □ *3.7 - 4.0*

Cordial thanks for your participation!        Dr. Berno Büchel

Dear student,

the teacher, Prof. Dr. Dr. Lydia Mechtenberg, has given me the permission to conduct a short survey on the overall study situation in the Bachelor's program in economics. I kindly ask you to take **3 minutes** time to participate in this part of the **survey**. I will later completely anonymize your data; until then they will be treated strictly confidential.


C1. Name: _____

C2. Student ID: _____

C3. Please state now your goal: How often do you want to attend this tutorial (or another tutorial for this course) <u>in the course of the ongoing semester</u>?

         □ *almost always*      □ *sometimes*      □ *almost never*

C4. Please state now your goal: How often do you want to attend the lecture (Microeconomics I) <u>in the course of the ongoing semester</u>?

         □ *almost always*      □ *sometimes*      □ *almost never*

C5. Please state now your goal: Apart from the lecture and the official tutorials, how much time per week do you want to study for this course (Microeconomics I) on average <u>in the course of the ongoing semester</u>?


Cordial thanks for your participation!      Dr. Berno Büchel

A first glance at the data suggests the following <u>for your tutorial group</u>:

- Those of you who aim at a grade between 1.0 and 2.3 have studied up to 5 hours a week until now for this course. (Tutorial and lecture are not included.)
- Those of you who aim at a grade between 2.7 and 4.0 have studied up to 30 minutes until now for this course. (Tutorial and lecture are not included.)
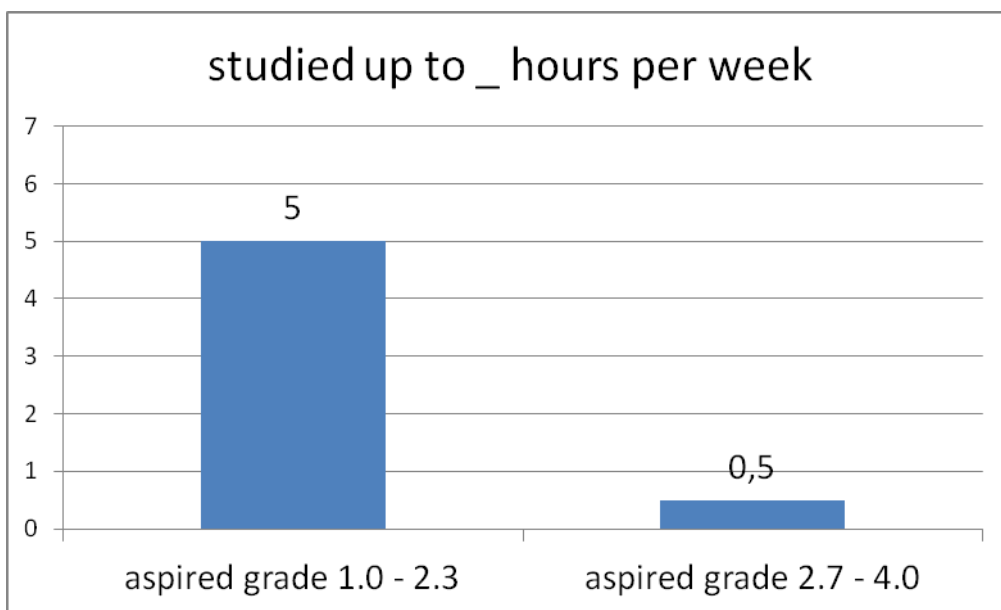
PRELIMINARY INTERIM RESULTS SURVEY PART A AND B

A first glance at the data suggests the following <u>for your tutorial group</u>:

- Those of you who aim at a grade between 1.0 and 2.3 have studied up to 3 hours a week until now for this course. (Tutorial and lecture are not included.)
- Those of you who aim at a grade between 2.7 and 4.0 have studied up to 90 minutes until now for this course. (Tutorial and lecture are not included.)

**studied up to _ hours per week**

| | |
|---|---|
| 3 | 1,5 |
| aspired grade 1.0 - 2.3 | aspired grade 2.7 - 4.0 |

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG
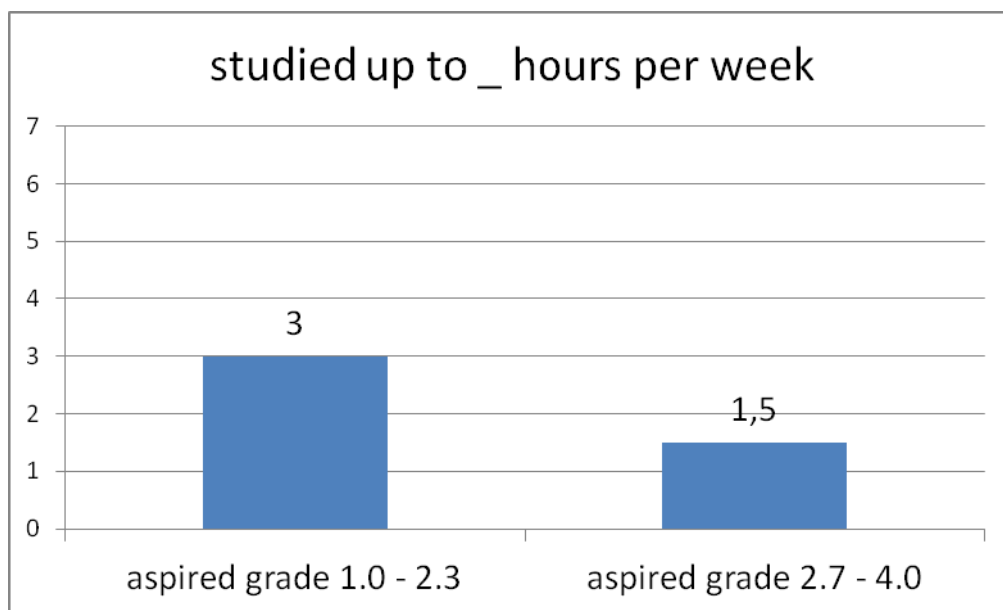
# Registration

Hereby I register **bindingly** for a **workshop supplementing Microeconomics I** on **June 15, 2013**. I confirm to pay 3 EURO compensation for the organizational costs incurred in case of non-appearance or cancellation.


Name: _____     Student ID: _____

Date: _____     Signature: _____


**If you do not want to decide yet**: Binding online registration is possible until June 14, 2013 on https://www.wisocommsy.uni-hamburg.de/, following the link "Workshop Mikroökonomie (VWL)."

I,

Name: _____

Student ID: _____

Registered in tutorial: _____


plan (without any obligation) to submit the midterm assignment

Please tick!

in the week of 28 to 30 May (early submission with feedback):
| |
|---|

in the week of 11 to 13 June (late submission without feedback):
| |
|---|

Dear student,

I kindly ask you to participate in the following survey. Of course, your data will be completely anonymized and treated strictly confidential. On the following pages you will find the instructions for further reading and we will also explain them verbally to you.

## Instructions

### Part 1: Decisions

In the first part of the experiment, you will have to make decisions between two alternatives. Your decision affects how much money you will win in form of an amazon-voucher. (Amazon offers a wide range of products; amongst others books, electronics, clothes, apps, cosmetics, music files and software for immediate download. Amazon vouchers are valid for three years.) The voucher will be sent to you via email and it will be immediately valid. Therefore your e-mail address is needed.

*The date of receipt* of your voucher and the voucher's *amount* depend on your decisions.

### Task

Now you have to answer a set of 10 questions concerning the following situation:

A voucher of A€ will be given to you online at the end of the experiment. Alternatively, if you are willing to wait X days (from today onwards), then we will send you a voucher of B€, which is greater than the amount A, i.e. **B€ > A€.** Consider the **longest acceptable delay X** for which you would be willing to wait to receive the larger amount B instead of A.

Answer the question by filling out the blank below:

> **F**: To me, receiving **A€ today** is equally as good as receiving **B€ in __ days**.

Note that **receiving A€ today,** respectively **B€ in X days,** means that you receive the voucher with an amount of A€ today by email, respectively an amount of B€ in X days by email.

In order to receive the larger amount B, you must accept some delay in any case. Decide what length of delay makes the two options the same to you, and fill in the number of days. **Attention**: There is no right or wrong answer – any preference is possible. However, it is important that you provide your true preference. We will explain below why this is also optimal for you.

**Payment mechanism**

After each one of you answers all 10 questions, the computer will randomly select one of the questions. All ten questions are equally likely to be selected. Your actual payment will be based on your answer to the selected question.

To determine which of A€ or B€ you will receive the computer randomly chooses again a number. It will be generated independently of your answers to the questions. This random number specifies the actual delay of B€, measured in days, in case you are not eligible to receive A€.
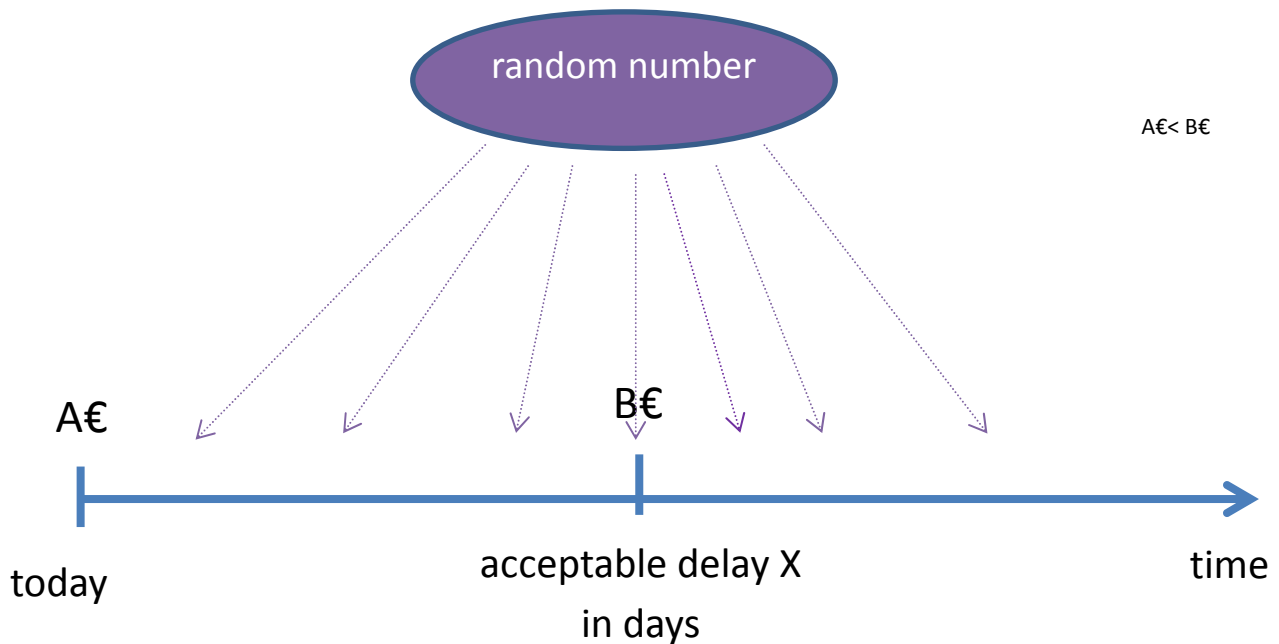


If the random number is **greater** than your longest acceptable delay, you will get A€ **today** (this refers to all arrows to the right of 'accepted delay').

If the random number is **smaller** than or equal to your longest acceptable (this refers to all arrows between 'today' and 'accepted delay X in days'), you will get **B€** according to the **randomly chosen number of the computer**, i.e. at the latest the day you specified as longest acceptable delay.

**Example**:

Suppose that you were asked the following question:

> **F**: To me, **receiving A€ today** is equally as good as **receiving B€ in X days**.

> You respond to a question by inserting X. In other words and with regard to the chart below, you put your 'accepted delay' on the position at the timeline that matches your true preferences. Then, the computer generates a random number, say Z. If Z is greater than X days, you will get **A€ today**. If Z is smaller than X days, you will get **B€ in Z days**.
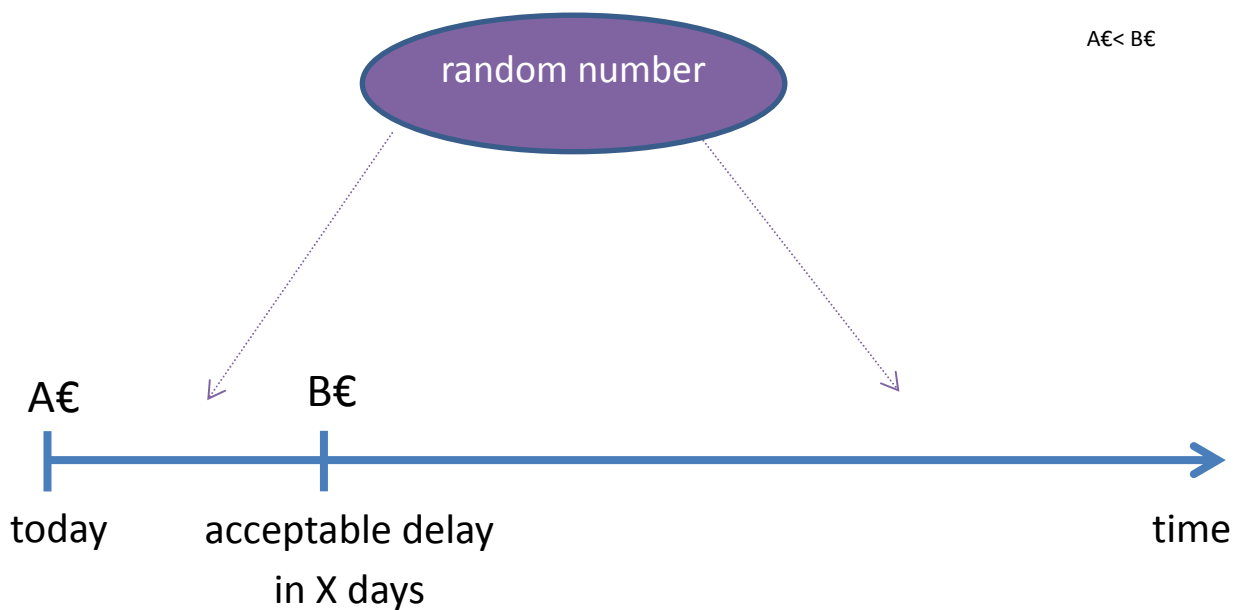
**Your optimal strategy**

Note that this procedure is designed such that your best response is **to truthfully write down the longest delay** for which you are willing to wait in order to get the larger amount B€. We will now show you why truthful reporting is the best strategy for you.

Misreporting means that you either under-report or over-report the longest acceptable delay. We will show that in either case you might be worse off compared to telling the truth, but never better off.

**Under-reporting**

Suppose you did not respond truthfully and stated that that your longest acceptable delay was only X-ε days, even though your true acceptable delay was X days.
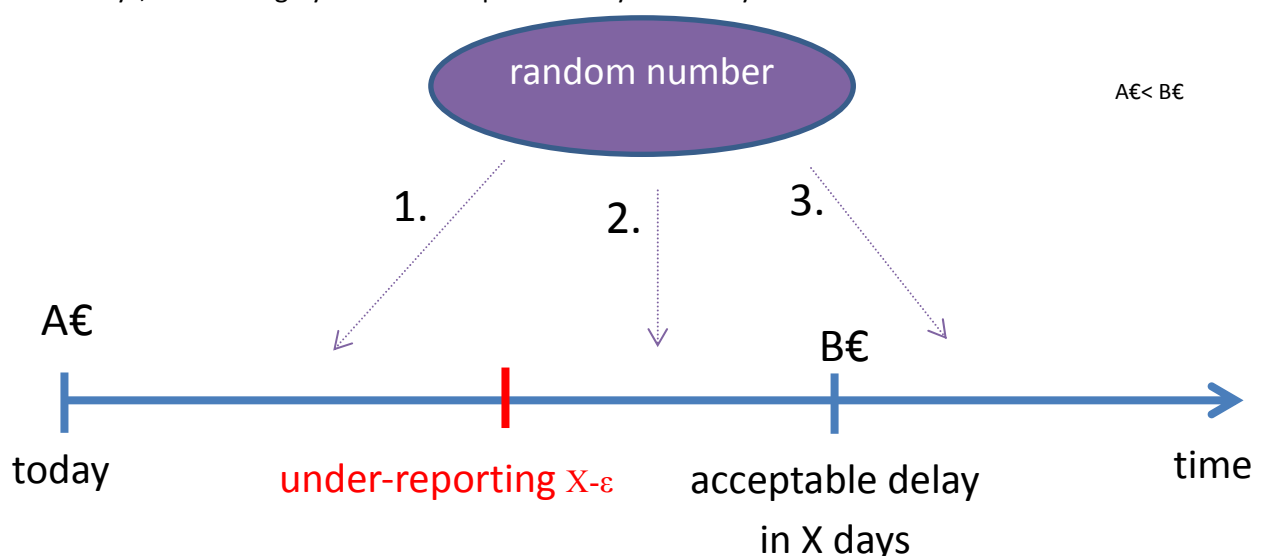


The computer randomly chooses a number, Z, the proposed delay. We distinguish between three cases:

1. If the random number lies within the interval [today; under-reporting X-ε], you get B€ in Z days. That would have also happened if you had truly reported X days. Thus, under-reporting does not make you better off than a true response.

2. If the random number lies within the interval (under-reporting X-ε; accepted delay X in days), you will get A€ today. Under-reporting makes you worse off. Why? Actually, you are willing to wait X days and hence you would also be willing to wait the Z days generated by the computer to get the higher amount B€.

3. If the random number was higher than the accepted delay X in days, you would get A€ today. The same would happen if you truly reported X days. Thus, under-reporting does not make you better off than a true response.

**Over-reporting**

Suppose that you did not respond truthfully and stated that your longest acceptable delay was X+ε days, even though your true acceptable delay was only X days. The computer randomly chooses a number Z. We must distinguish again between three cases:
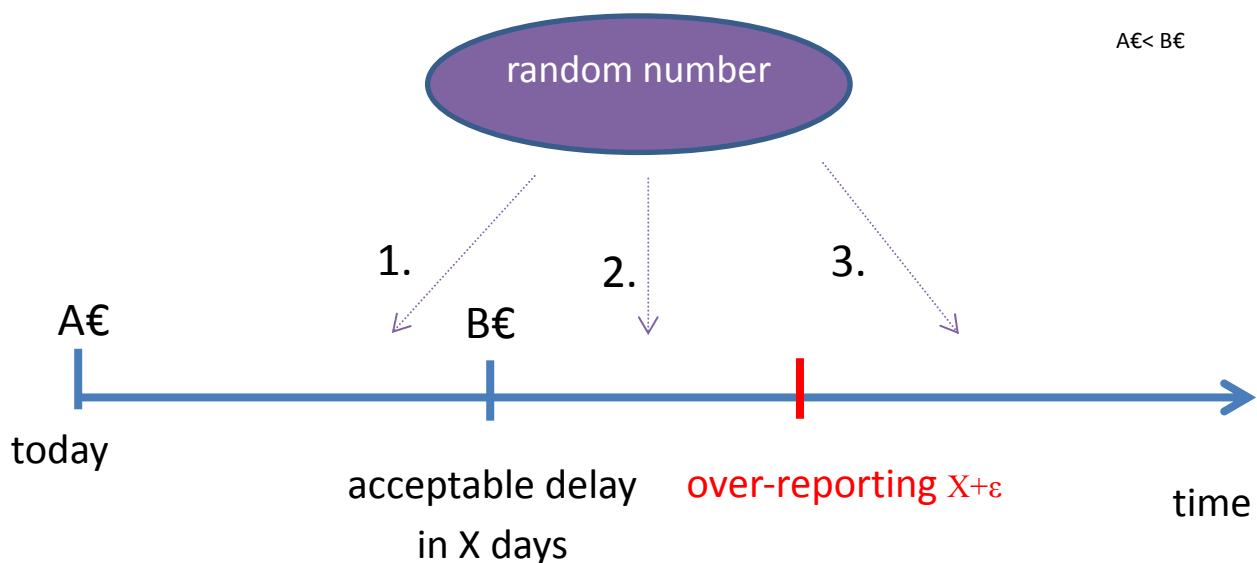


1. Case 1 and 3 are similar to under-reporting: over-reporting does not make you better off than a true response.

2. If the random number lies within the interval (accepted delay X in days; over-reporting X-ε), you will get B€ in Z days. Over-reporting makes you worse off than truthful reporting. Why? Actually, you are willing to wait X days to get B€. Now you have to wait too long for B€ and you regret that you do not receive A€ today. If you had truly answered X days, you would have received A€.

**In sum, your best strategy is always to answer the questions truthfully. Specifically, case 1 and 3 neither make you better off nor worse off than the truth. Case 2 makes you strictly worse off than the truth.**

**Test questions**

**Note: A<B**

1. For Matthias, receiving A€ today is equally as good as receiving B€ in X days. The computer randomly chooses a number Z within the interval (0, X]. Which amount does Matthias receive? When does he receive the amount?
   *[Answer: Matthias receives B€ in Z days.]*

2. Lukas states that his longest acceptable delay for receiving B€ is X days. The generated random number Z is greater than X. Which amount does Lukas receive? When does he receive the amount?
   *[Answer: Lukas receives A€ today.]*

3. Luca's longest acceptable delay for receiving B€ is X days. The generated random number is Z is equal to X. Which amount does Luca receive? When does she receive the amount?
   *[Answer: Luca receives B€ in Z=X days.]*

4. Eva's longest acceptable delay for receiving B€ is X days. Which values must the random number Z take so that Eva is eligible to receive B€? After how many days does Eva receive B€?
   *[Answer: Z has to remain within the interval [today; X]. Eva receives B€ in Z-days.]*

Please answer the ten questions one after the other. Do not use pencils and avoid corrections, otherwise we cannot consider your answers for the payment. You must not interact with your colleagues.

**Thank you!**

**Questions**

Please provide besides your name and Student ID also your email address such that I can send you the corresponding voucher. Of course, your data will be completely anonymized and treated strictly confidential.

Name:_____

Student ID:  _____

Email-address: _____

**Please answer now the following 10 questions one after the other.** Do not use pencils and avoid any corrections, otherwise we cannot consider your answer for the disbursement. It is not allowed to interact with other students (e.g. to copy). Answer one question after the other by filling in the blanks. Finally, exactly one of these answers will be relevant for disbursement.

**F1**: To me receiving **€5 today** is equally as good as receiving **€15 in __ days**.

**F2**: To me receiving **€5 today** is equally as good as receiving **€10 in __ days**.

**F3**: To me receiving **€10 today** is equally as good as receiving **€20 in __ days**.

**F4**: To me receiving **€15 today** is equally as good as receiving **€25 in __ days**.

**F5**: To me receiving **€20 today** is equally as good as receiving **€25 in __ days**.

**F6**: To me receiving **€10 today** is equally as good as receiving **15€ in __ days**.

**F7**: To me receiving **€5 today** is equally as good as receiving **€25 in __ days**.

**F8**: To me receiving **€5 today** is equally as good as receiving **€20 in __ days**.

**F9**: To me receiving **€10 today** is equally as good as receiving **€25 in __ days**.

**F10**: To me receiving **€15 today** is equally as good as receiving **€20 in __ days**.

**Part 2: Survey**

I kindly ask you to participate in the following survey. **Of course, your data will be completely anonymized and treated strictly confidential.**

D1. Name: _____

D2. Student ID:_____

D3. Did you join with fellow students in order to prepare for "Microeconomics I" over the course of the semester?          □  *yes*          □  *no*

If your answer is *yes*, please name the fellow students in question in the first column of the table below (D4). Please answer for each fellow student the following four questions in the table. Please provide an estimate in case you are unable to response.

| D4: name of the fellow student | D5: Since when (approximately) do you know each other in person (month and year)? | D6: How much time do you spend together per month (besides jointly attended courses)? | D7: How much of the time you spend together is dedicated to leisure activities? (in %) | D8: How much of the time you spend together is dedicated to study-related activities? (e.g. studying for this particular or any other course)? (in %) |
|---|---|---|---|---|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

You are asked to give assessments about different groups of students.

- The first group consists of the fellow students you have mentioned and are called "**your learning partners**". If you indicated to have no learning partner in D3, you can skip the questions related to this group.
- The second group consists of all fellow students in the official **tutorial group** you attended most frequently. This group is called "**your tutorial group**". Please state the tutorial you attended most frequently:

  Weekday: _____     Time:_____     Tutor: _____

- The third group consists of all students that attend the **Microeconomics I course**.
- The forth group consists of **students in Germany** in general. Assessments refer to their hypothetical behavior, if they had attended this course.

| Group of students | D9: How large do you think is the share of students who registered non-bindingly for early submission of the mid-term assignment? (in % of the group) | D10: How large do you think is the share of students who delivered the mid-term assignment at the earlier date (and henceforth were eligible to receive feedback?) (in % of the group) | D11: How much time per week do you think did students' study on average for this course (Microeconomics I), apart from the lecture and official tutorial? (in minutes) |
|---|---|---|---|
| your learning partners (if D3: yes) | | | |
| your tutorial group | | | |
| all participants of the Microeconomics I course | | | |
| expected behavior of all students in Germany | | | |

D12. Please provide the grade you obtained in the *Mathematics I exam*:_____

D13. How much time did you spend studying for this course (Microeconomics I) in the last seven days, apart from the lecture and official tutorial: _____ *minutes*

# Instructions

## Part 3: Survey

I kindly ask you to participate in the following survey. Of course, your data will be completely anonymized and treated strictly confidential.

E1. Name: _____

E2. Student ID: _____

E3. How do you see yourself: Are you generally a person who is willing to take risks or do you try to avoid risks?

*Please tick a box on the scale, where the value 0 means: 'not at all willing to take risks' and the value 10 means: 'highly willing to take risks'.* You may grade your answer with values in between.

| Not at all willing to take risks | | | | | | | | | | Highly willing to take risks |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

E4. People can behave differently in different situations. How would you rate your willingness to take risks with respect to the following areas?

*Please tick for each row a box on the scale!*

**How is that…**

| | Not at all willing to take risks | | | | | | | | | | Highly willing to take risks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| while driving ? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| in financial matters? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| during leisure/sports? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| in your professional career? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| with your health? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| with your faith in other people? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

E5. Please consider what you would do in the following situation: Imagine that you had won 100,000 Euros a lottery. Immediately after receiving the amount, you get a financial offer from a reputable bank, the conditions of which are as follows:

There is the chance to **double** the money **within two years.** It is, however, **equally probable to lose half** of the amount invested. You have the opportunity to invest the full amount, part of the amount or reject the offer.

What share of your lottery winnings would you be prepared to invest in the risky, yet lucrative investment?

The full amount of 100.000 Euros ………………………………………………………………………… ☐

The amount of 80.000 Euros ……………………………………………………………………………… ☐

The amount of 60.000 Euros ……………………………………………………………………………… ☐

The amount of 40.000 Euros……………………………………………………………………………… ☐

The amount of 20.000 Euros ……………………………………………………………………………… ☐

Nothing, I would decline the offer ……………………………………………………………………… ☐

E6. To what extent does the following statement apply to you?

**„When I plan to do something, I do it up to the time specified."**

*Please tick a box on the scale, where the value 0 means:* ***'not correct at all'*** *and the value 10 means:* ***'always and absolutely correct'***. You may grade your answer with values in between.

*not correct*                                                                          *always and*
*at all*                                                                                   *absolutely correct*

☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐ -- ☐

0    1    2    3    4    5    6    7    8    9    10

**Cordial thanks for your participation!**

Liebe(r) Studierende(r)

Die Dozentin, Prof. Dr. Dr. Lydia Mechtenberg, hat mir die Erlaubnis gegeben, eine kleine Erhebung zur Studiensituation im Bachelor VWL durchzuführen. Ich bitte Sie, sich

# 3 Minuten Zeit zu nehmen, um an diesem Teil der Umfrage teilzunehmen.

Ich werde Ihre Daten später vollständig anonymisieren und bis dahin streng vertraulich behandeln.

A1. Name: _____

A2. Matrikelnummer: _____

A3. Wie regelmäßig haben Sie bisher diese Übung (oder eine andere Übung zu diesem Kurs) besucht?

□ *fast immer*          □ *manchmal*          □ *fast nie*

A4. Wie regelmäßig haben Sie bisher die Vorlesung (Mikroökonomik I) besucht?

□ *fast immer*          □ *manchmal*          □ *fast nie*

A5. Abgesehen von der Vorlesung und von den offiziellen Übungen, wie viel Zeit pro Woche haben Sie bisher durchschnittlich für diesen Kurs (Mikroökonomik I) gelernt?

_____ *Minuten*

A6. Haben Sie neben dem Studium Verpflichtungen, die einen erheblichen Teil Ihrer Zeit beanspruchen, z. B. Berufstätigkeit, Ehrenamt, Pflegeaufgabe, Erziehungsaufgabe?

*Wenn ja, geben Sie bitte an, um wieviele Stunden pro Woche es sich dabei durchschnittlich handelt:_____*

Herzlichen Dank für Ihre Teilnahme!          Dr. Berno Büchel

Liebe(r) Studierende(r)

Die Dozentin, Prof. Dr. Dr. Lydia Mechtenberg, hat mir die Erlaubnis gegeben, eine kleine Erhebung zur Studiensituation im Bachelor VWL durchzuführen. Ich bitte Sie, sich

# 3 Minuten Zeit zu nehmen, um an diesem Teil der Umfrage teilzunehmen.

Ich werde Ihre Daten später vollständig anonymisieren und bis dahin streng vertraulich behandeln.


B1. Name: _____

B2. Matrikelnummer: _____

B3. Wann planen Sie die Klausur zu diesem Kurs (Mikroökonomik I) zu schreiben?

□ *Zum ersten Termin*     □ *Zum zweiten Termin*     □ *Gar nicht*

Falls Sie an der Klausur teilnehmen, beantworten Sie bitte abschließend die folgende Frage:

B4. Welche Note streben Sie in diesem Kurs (Mikroökonomik I) an?

□ *1.0 - 1.3*     □ *1.7 - 2.3*     □ *2.7 - 3.3*     □ *3.7 - 4.0*


Herzlichen Dank für Ihre Teilnahme!          Dr. Berno Büchel

Liebe(r) Studierende(r)

Die Dozentin, Prof. Dr. Dr. Lydia Mechtenberg, hat mir die Erlaubnis gegeben, eine kleine Erhebung zur Studiensituation im Bachelor VWL durchzuführen. Ich bitte Sie, sich

# 3 Minuten Zeit zu nehmen, um an diesem Teil der Umfrage teilzunehmen.

Ich werde Ihre Daten später vollständig anonymisieren und bis dahin streng vertraulich behandeln.

C1. Name: _____

C2. Matrikelnummer: _____

C3. Bitte nennen Sie nun Ihr Ziel: Wie regelmäßig wollen Sie im weiteren Verlauf des Semesters an dieser Übung (oder an einer anderen Übung zu diesem Kurs) teilnehmen?

      □ *fast immer*      □ *manchmal*      □ *fast nie*

C4. Bitte nennen Sie nun Ihr Ziel: Wie regelmäßig wollen Sie im weiteren Verlauf des Semesters an der Vorlesung Mikroökonomik I teilnehmen?

      □ *fast immer*      □ *manchmal*      □ *fast nie*

C5. Bitte nennen Sie nun Ihr Ziel:  Abgesehen von der Vorlesung und von den offiziellen Übungen, wie viel Zeit pro Woche wollen Sie im weiteren Verlauf des Semesters für diesen Kurs (Mikroökonomik I) lernen? _____*Minuten*

Herzlichen Dank für Ihre Teilnahme!          Dr. Berno Büchel

VORLÄUFIGE ZWISCHENERGEBNISSE DER UMFRAGE TEILE A UND B

Nach einem ersten Blick in die Daten zeigt sich folgende Situation für Ihre Übungsgruppe:

- Diejenigen von Ihnen, die eine Note zwischen 1,0 und 2,3 anstreben, haben bisher bis zu 5 Stunden pro Woche für diesen Kurs gelernt. (Die Übung und Vorlesung selbst sind nicht eingerechnet.)
- Diejenigen von Ihnen, die eine Note zwischen 2,7 und 4,0 anstreben, haben bisher bis zu 30 Minuten pro Woche für diesen Kurs gelernt. (Die Übung und Vorlesung selbst sind nicht eingerechnet.)

## gelernt bis zu _ Stunden pro Woche

| | |
|---|---|
| angestrebte Note 1,0 - 2,3 | 5 |
| angestrebte Note 2,7 - 4,0 | 0,5 |
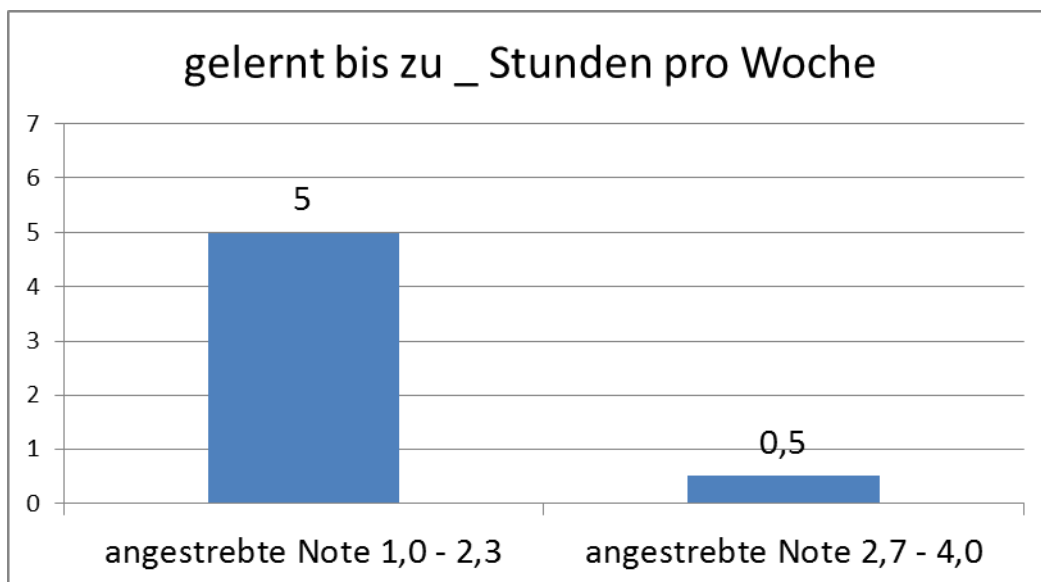
VORLÄUFIGE ZWISCHENERGEBNISSE DER UMFRAGE TEILE A UND B

Nach einem ersten Blick in die Daten zeigt sich folgende Situation für Ihre
Übungsgruppe:

- Diejenigen von Ihnen, die eine Note zwischen 1,0 und 2,3 anstreben,
  haben bisher bis zu 3 Stunden pro Woche für diesen Kurs gelernt. (Die
  Übung und Vorlesung selbst sind nicht eingerechnet.)
- Diejenigen von Ihnen, die eine Note zwischen 2,7 und 4,0 anstreben,
  haben bisher bis zu 90 Minuten pro Woche für diesen Kurs gelernt. (Die
  Übung und Vorlesung selbst sind nicht eingerechnet.)

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG
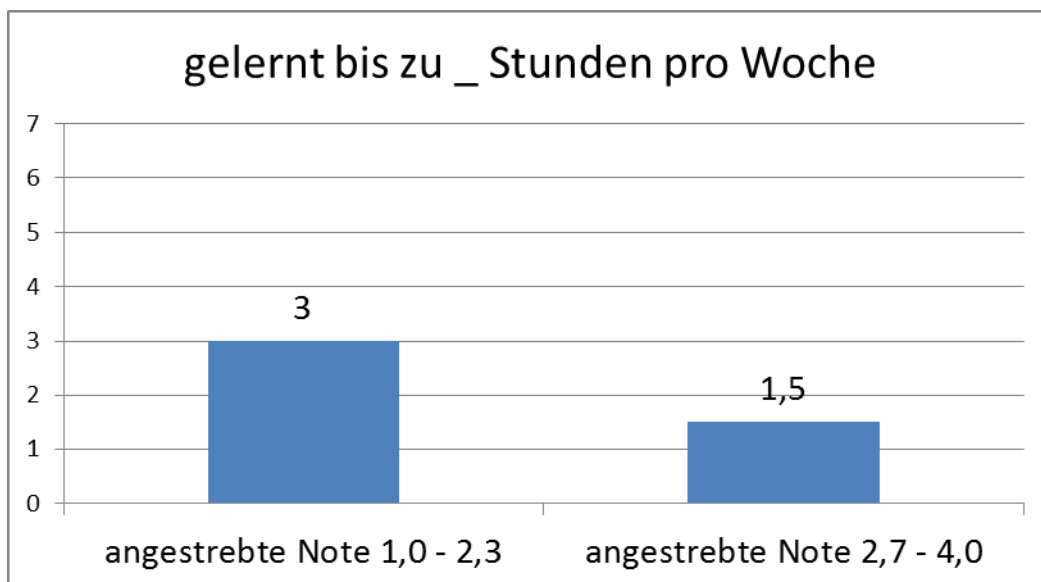
# Anmeldung

Hiermit melde ich mich **verbindlich** zum **studienbegleitenden Workshop in Mikro I** am **15. Juni 2013** an. Ich bestätige, dass ich im Falle meines Nichterscheinens oder Rücktritts 3 Euro als Entschädigung für die entstandenen Planungskosten entrichten werde.

Name _____     Matrikel-Nr. _____

Datum: _____     Unterschrift: _____

**Wenn Sie sich jetzt noch nicht entscheiden wollen**: Eine verbindliche Online-Anmeldung ist bis zum 14. Juni 2013 möglich über https://www.wisocommsy.uni-hamburg.de/, unter "Workshop Mikroökonomie (VWL)".

Ich,

Name: _____

Matrikelnummer: _____

Angemeldet in Übungsgruppe: _____


plane (unverbindlich), die Abgabe meiner Studienleistung

Bitte ankreuzen!

in der Woche vom 28.-30. Mai (frühe Abgabe mit Feedback):  ☐

in der Woche vom 11.-13. Juni (späte Abgabe ohne Feedback):  ☐

**Umfrage**

Liebe(r) Studierende(r),

ich möchte Sie bitten, an der folgenden Umfrage teilzunehmen. Selbstverständlich werde ich Ihre Daten vollständig anonymisieren und streng vertraulich behandeln. Auf den nächsten Seiten finden Sie die Instruktionen zum Nachlesen, die wir Ihnen aber auch verbal erklären werden.

**Instruktionen**

**Teil 1: Entscheidungen**

In diesem Teil des Experiments treffen Sie Entscheidungen zwischen jeweils zwei Alternativen. Ihre Entscheidung hat Einfluss darauf, wie viel Geld Sie in Form eines Amazongutscheines gewinnen werden. (Amazon bietet eine breite Produktpalette an; u.a. Bücher, Elektronik, Kleidung, Apps, Kosmetika, Musikfiles und Software, die man sofort herunterladen kann. Amazongutscheine verfallen nach drei Jahren.) Der Gutschein wird Ihnen online zugeschickt und ist sofort nach Empfang einlösbar. Deswegen fragen wir Sie auch nach Ihrer Email-Adresse.

*Wann* Sie den Gutschein empfangen und *wie hoch* Ihr Guthaben auf dem Gutschein sein wird, hängt von Ihren Entscheidungen ab.

**Aufgabe**

Nun müssen Sie zehn Fragen beantworten, die sich alle auf folgende Situation beziehen:

Nach dieser Vorlesung können Sie online einen Gutschein in Höhe von A€ erhalten. Sollten Sie jedoch bereit sein, auf Ihre Auszahlung X Tage zu warten, schicken wir Ihnen stattdessen nach X Tagen (von heute an gezählt) einen Gutschein in Höhe von B€ zu, wobei der Betrag B größer als der Betrag A ist, d.h. **B€ > A€.** Überlegen Sie sich die **längste von Ihnen akzeptierte Verzögerung X**, die Sie in Kauf nehmen würden, um den höheren Betrag B anstelle von A zu erhalten.

Beantworten Sie die Frage, indem Sie die Lücke ausfüllen.

**F**: Für mich wäre **A€ heute zu bekommen** genauso gut, wie **B€ in __ Tagen zu erhalten**.

Beachten Sie, dass **A€ heute zu bekommen** bzw. **B€ in X Tagen bekommen** bedeutet, dass Sie den Gutschein mit einem Guthaben in Höhe von A€ bzw. B€ heute bzw. in X Tagen per Email erhalten.

Um den höheren Betrag B zu bekommen, müssen Sie in jedem Fall eine Verzögerung hinnehmen. Entscheiden Sie sich, wie viele Tage Sie bereit wären zu warten, damit beide Alternativen **gleich gut** für Sie sind, und tragen Sie diese Anzahl von Tagen ein. **Achtung**: Es gibt hier keine korrekte oder fehlerhafte Antwort – jede Präferenz ist zulässig. Wichtig ist jedoch, dass Sie Ihre wahren Präferenzen angeben; warum das auch für Sie am besten ist, erklären wir Ihnen weiter unten.

**Auszahlungsmechanismus**

Alle Beteiligten beantworten die 10 Fragen auf dem Fragebogen, der im Anschluss ausgeteilt wird. Danach wählt der Computer, den wir vorne am Pult aufgebaut haben, zufällig eine der 10 Fragen aus. Dabei sind alle 10 Fragen gleich wahrscheinlich. Die Antwort auf die ausgewählte Frage bestimmt Ihre tatsächliche Auszahlung.

Nun wählt der Computer zufällig eine weitere Zahl, um zu bestimmen, ob Sie Betrag A€ oder B€ aus der ausgewählten Frage erhalten werden. Diese Zufallszahl wird unabhängig von Ihren Antworten generiert und gibt die tatsächliche Anzahl der Tage an, mit deren Verzögerung der Betrag B€ versendet wird, falls Sie nicht A€ erhalten.

mit A€< B€
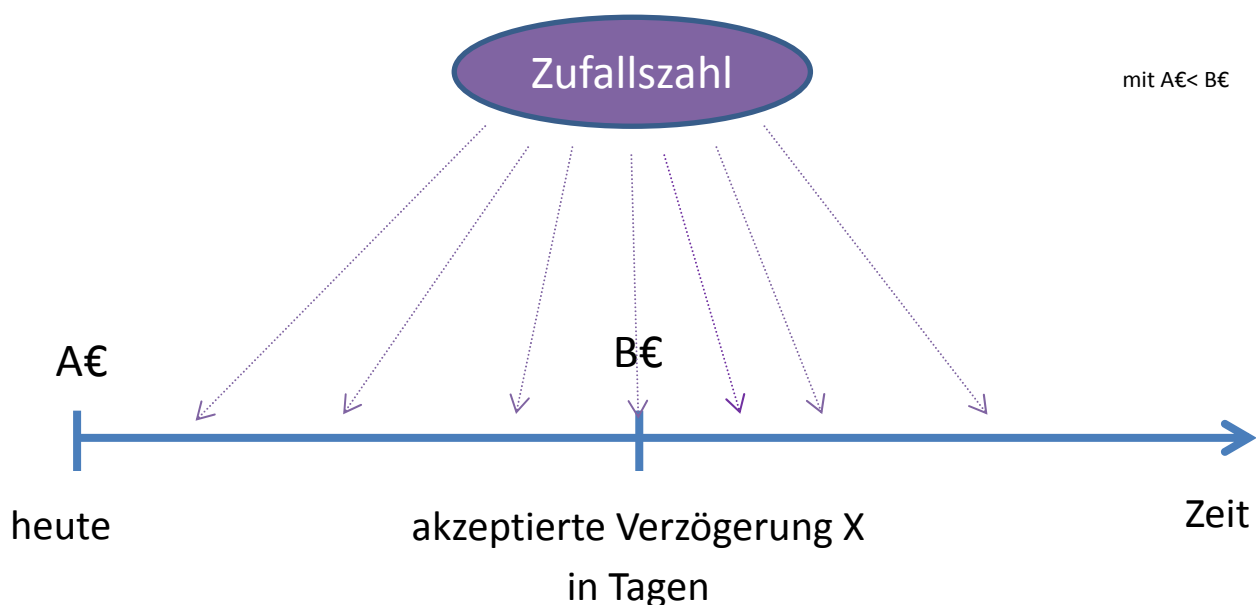
Hat die Zufallszahl einen **größeren** Wert als die von Ihnen angegebene längste akzeptierte Verzögerung (dies betrifft alle Pfeile rechts von ‚akzeptierte Verzögerung'), erhalten Sie den Betrag **A€**, und zwar **heute**.

Sollte hingegen die Zufallszahl **kleiner** sein die von Ihnen angegebene Verzögerung oder im Grenzfall **gleich** der von Ihnen angegebenen Verzögerung (dies betrifft alle Pfeile zwischen ‚heute' und ‚akzeptierte Verzögerung X in Tagen'), so erhalten Sie den Betrag **B€**, und zwar **gemäß der vom Computer gewählten Zufallszahl,** d.h. **spätestens** an dem Tag, an dem das Ende der von Ihnen vorgeschlagenen Frist erreicht ist.

**Ein Beispiel**:

Stellen Sie sich vor, Sie werden Folgendes gefragt:

> **F**: Für mich ist **A€ heute zu bekommen** genauso gut wie **B€ in X Tagen zu erhalten.**
>
> Sie beantworten die Frage, indem Sie Ihr X setzen. In anderen Worten und mit Blick auf die unten stehende Grafik, setzen Sie Ihre ‚akzeptierte Verzögerung' auf diejenige Position der

Zeitachse, die Ihren wahren Präferenzen entspricht. Danach generiert der Computer die **Zufallszahl,** nennen wir Sie Z. Ist Z größer als X Tage, erhalten Sie den Betrag **A€ heute.** Ist Z keiner als X Tage, erhalten Sie den Betrag **B€ nach Z Tagen.**
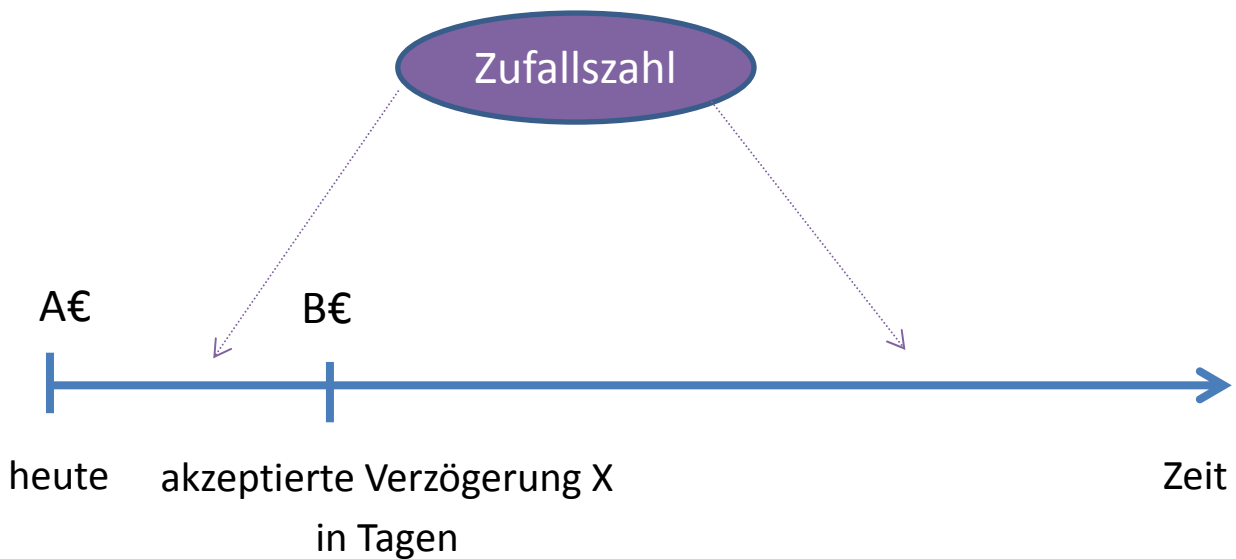


### Ihre optimale Strategie

Das Vorgehen ist bewusst so gestaltet, **dass es für Sie am besten ist, ehrlich die größte Anzahl von Tagen anzugeben**, die Sie gerade noch zu warten bereit sind, um den höheren Betrag von B€ zu erhalten. Warum dies so ist, werden wir Ihnen im Folgenden erklären.

Nicht die Wahrheit zu sagen, bedeutet, dass Sie Ihre Bereitschaft auf den höheren Betrag zu warten, entweder über- oder untertreiben. Die beiden folgenden Beispiele verdeutlichen, dass Sie mit beiden Varianten schlechter, aber niemals besser gestellt sind, als wenn Sie die Wahrheit sagen würden.

### Untertreiben

Nehmen Sie an, dass Sie die Frage nicht wahrheitsgemäß beantwortet haben, sondern angegeben haben, dass Sie bereit wären nur X-ε Tage zu warten, obwohl Sie in Wahrheit bereit gewesen wären, X Tage zu warten.
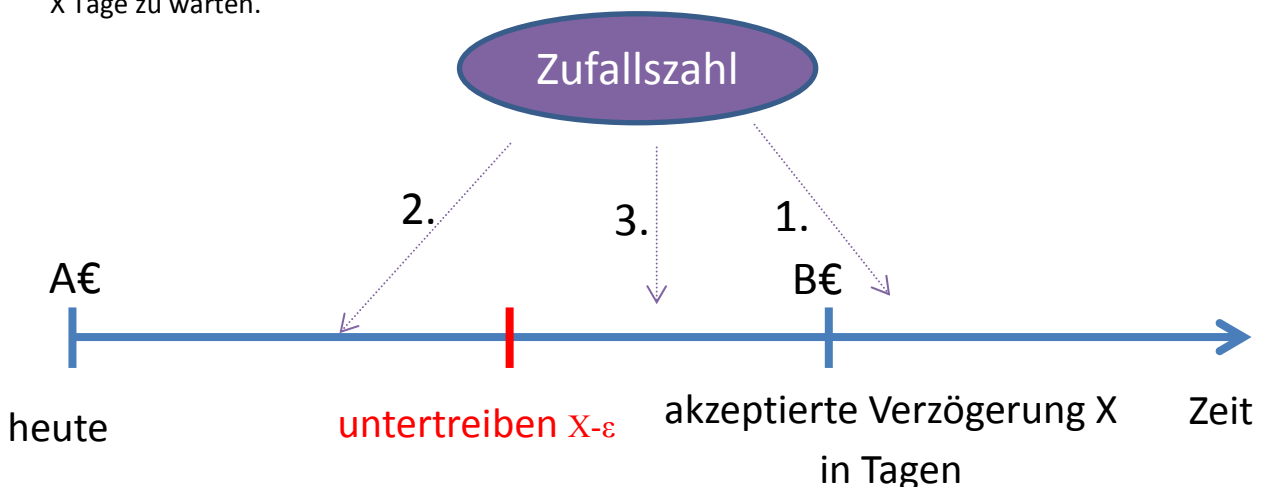
Der Computer wählt nun zufällig eine Zahl, um eine Verzögerung Z vorzuschlagen. Wir müssen zwischen drei Fällen unterscheiden:

1. Liegt die Zufallszahl im Intervall [heute; untertreiben $X-\varepsilon$], erhalten Sie den Betrag B€ in Z Tagen. Dasselbe wäre aber auch passiert, wenn Sie wahrheitsgemäß X Tage angegeben hätten. Untertreiben stellt Sie also nicht besser als eine wahre Antwort.

2. Liegt die Zufallszahl im Intervall [ untertreiben $X-\varepsilon$; akzeptierte Verzögerung X in Tagen ), erhalten Sie heute A€. Untertreiben stellt Sie hier schlechter als die wahre Antwort. Warum? In Wahrheit wären Sie bereit gewesen, X Tage zu warten, und hätten daher auch die vom Computer gezogenen Z Tage gewartet, um den höheren Betrag B€ zu erhalten.

3. Ist die Zufallszahl größer als Ihre akzeptierte Verzögerung X in Tagen, erhalten Sie heute A€. Dasselbe wäre aber auch passiert, wenn Sie wahrheitsgemäß X Tage angegeben hätten. Untertreiben stellt Sie also nicht besser als eine wahre Antwort.

**Übertreiben**

Nehmen Sie an, dass Sie die Frage nicht wahrheitsgemäß beantwortet haben, sondern angegeben haben, dass Sie bereit wären $X+\varepsilon$ Tage zu warten, obwohl Sie in Wahrheit bereit gewesen wären, X Tage zu warten.

Der Computer zieht nun zufällig eine Zahl Z. Wir müssen wieder zwischen drei Fällen unterscheiden:
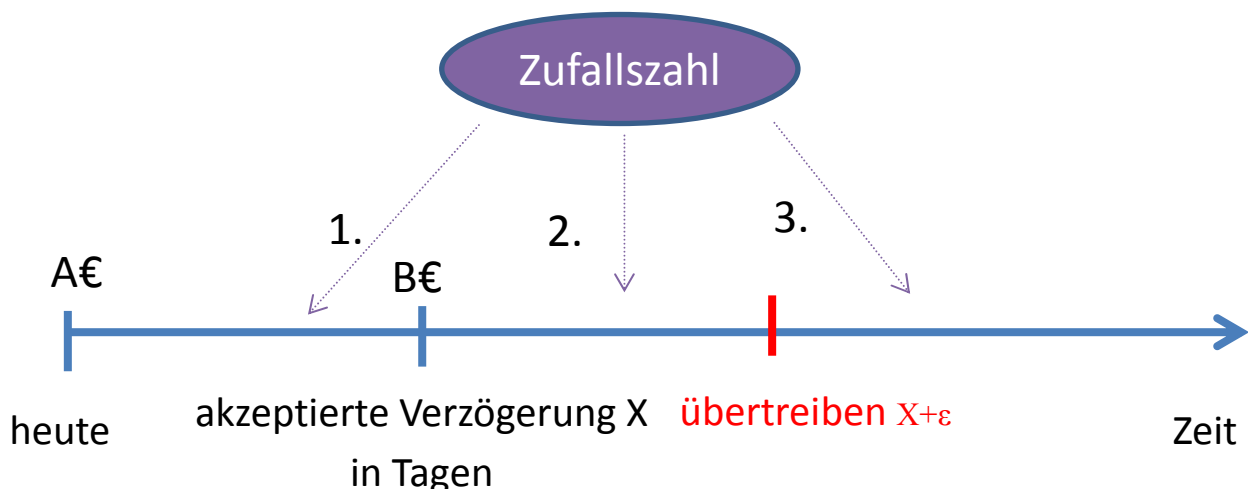


1. In den Fällen 1 und 3 verhält es sich analog zum Fall Untertreiben: Übertreiben stellt Sie nicht besser als eine wahre Antwort.

2. Liegt die Zufallszahl im Intervall ( akzeptierte Verzögerung X in Tagen; übertreiben $X+\varepsilon$ ), erhalten Sie den Betrag B€ in Z Tagen. Übertreiben stellt Sie hier schlechter als die wahre Antwort. Warum? In Wahrheit wären Sie bereit gewesen X Tage zu warten, um Betrag B zu erhalten. Nun müssen Sie zu lange auf B€ warten und bedauern, dass Sie nicht stattdessen heute A€ bekommen. Sie hätten heute A€ bekommen, wenn Sie wahrheitsgemäß X Tage angegeben hätten.

**Zusammenfassend lässt sich sagen, dass es für Sie die beste Strategie ist, die Frage wahrheitsgemäß zu beantworten. Fälle 1 und 3 stellen Sie weder schlechter noch besser als die Wahrheit. Tritt Fall 2 ein, stellt Sie Über- und Untertreiben strikt schlechter als die Wahrheit. Es ist also auf jeden Fall am besten, die Wahrheit zu sagen.**

**Vier Verständnisfragen**

**Beachte: A<B**

1. Für Matthias ist es genauso gut, heute A€ wie in X-Tagen B€ (A€< B€) zu erhalten. Nun zieht der Computer eine Zufallszahl Z, die zwischen 0 und X liegt. *Welchen Betrag* bekommt Matthias ausgezahlt? *Wann* bekommt er den Betrag ausgezahlt?

2. Lukas gibt an, dass er bereit ist, X Tage auf Betrag B€ zu warten. Die danach vom Computer generierte Zufallszahl Z ist größer als X. *Welchen Betrag* bekommt Lukas ausgezahlt? *Wann* bekommt er den Betrag ausgezahlt?

3. Luca gibt an, dass sie bereit ist, X Tage auf Betrag B€ zu warten. Die danach vom Computer generierte Zufallszahl Z ist genauso groß wie X. *Welchen Betrag* bekommt Luca ausgezahlt? *Wann* bekommt sie den Betrag ausgezahlt?

4. Eva gibt an, dass Sie gerade noch X Tage bereit ist zu warten, um B€ zu erhalten. Welche Werte darf die Zufallszahl Z annehmen, damit Eva Betrag B€ erhält? *Nach wie vielen Tagen* erhält Eva Betrag B?

**Bitte füllen Sie anschließend die 10 Fragen nacheinander aus. Benutzen Sie keine Bleistifte und vermeiden Sie Korrekturen, da wir sonst Ihre Antworten nicht für die Auszahlung berücksichtigen können. Ebenso ist es nicht erlaubt, sich mit Kommilitonen in irgendeiner Form auszutauschen (z.B. abzuschreiben).**

**Vielen Dank!**

**Fragen**

Bitte geben Sie hier neben Name und Matrikelnummer auch Ihre Emailadresse an, damit ich den zutreffenden Gutschein an Sie versenden kann. Selbstverständlich werde ich Ihre Daten vollständig anonymisieren und streng vertraulich behandeln.

Name:_____

Matrikelnummer:_____

Email-Adresse: _____

**Bitte füllen Sie nun die folgenden 10 Fragen nacheinander aus.** Benutzen Sie keine Bleistifte und vermeiden Sie Korrekturen, da wir sonst Ihre Antworten nicht für die Auszahlung berücksichtigen können. Ebenso ist es nicht erlaubt, sich mit Kommilitonen in irgendeiner Form auszutauschen (z.B. abschreiben). Beantworten Sie eine Frage nach der anderen, indem Sie jeweils die Lücke ausfüllen. Am Ende wird genau eine Antwort davon auszahlungsrelevant sein.

**F1**: Für mich wäre **5€ heute** zu bekommen genauso gut, wie **15€ in __ Tagen** zu erhalten.

**F2**: Für mich wäre **5€ heute** zu bekommen genauso gut, wie **10€ in __ Tagen** zu erhalten.

**F3**: Für mich wäre **10€ heute** zu bekommen genauso gut, wie **20€ in __ Tagen** zu erhalten.

**F4**: Für mich wäre **15€ heute** zu bekommen genauso gut, wie **25€ in __ Tagen** zu erhalten.

**F5**: Für mich wäre **20€ heute** zu bekommen genauso gut, wie **25€ in __ Tagen** zu erhalten.

**F6**: Für mich wäre **10€ heute** zu bekommen genauso gut, wie **15B€ in __ Tagen** zu erhalten.

**F7**: Für mich wäre **5€ heute** zu bekommen genauso gut, wie **25€ in __ Tagen** zu erhalten.

**F8**: Für mich wäre **5€ heute** zu bekommen genauso gut, wie **20€ in __ Tagen** zu erhalten.

**F9**: Für mich wäre **10€ heute** zu bekommen genauso gut, wie **25€ in __ Tagen** zu erhalten.

**F10**: Für mich wäre **15€ heute** zu bekommen genauso gut, wie **20€ in __ Tagen** zu erhalten.

**Instruktionen**

**Teil 2: Umfrage**

In diesem Teil bitte ich Sie, an folgender Umfrage teilzunehmen. **Selbstverständlich werde ich Ihre Daten vollständig anonymisieren und streng vertraulich behandeln.**

D1. Name: _____

D2. Matrikelnummer: _____

D3. Haben Sie im Verlauf dieses Semesters mit Kommilitonen zusammen für diesen Kurs (Mikroökonomik I) gelernt?     □ *Ja*     □ *Nein*

Lautet Ihre Antwort *Ja*, dann nennen Sie bitte die betreffenden Kommilitonen in der ersten Spalte der folgenden Tabelle (D4). Beantworten Sie bitte für jeden der genannten Kommilitonen die folgenden drei Fragen in der Tabelle. Wenn Sie die Antwort nicht wissen, geben Sie einfach eine Schätzung ab.

| D4: Vorname und Name des Kommilitonen | D5: Seit wann (ungefähr) kennen Sie sich persönlich? (Monat und Jahr) | D6: Wie viel Zeit verbringen Sie im Durchschnitt pro Monat miteinander (außerhalb von gemeinsam besuchten Lehr-veranstaltungen)? | D7: Welcher Anteil der gemeinsamen Zeit aus D6 entfällt auf Freizeitaktivitäten? (in %) | D8: Welcher Anteil der gemeinsamen Zeit aus D6 entfällt auf studiumsbezogene Aktivitäten (z. B. Lernen für diesen oder für andere Kurse)?   (in %) |
|---|---|---|---|---|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Im Folgenden werden Sie um Einschätzungen bezüglich verschiedener Gruppen von Studierenden gebeten.

- Die erste Gruppe sind die von Ihnen genannten Kommilitonen und werden als „**Ihre Lernpartner**" bezeichnet. Falls Sie bei D3 angegeben haben, keine Lernpartner zu haben, dann müssen Sie diese Gruppe bei der folgenden Frage nicht berücksichtigen.
- Die zweite Gruppe besteht aus den Kommilitonen in der offiziellen **Übungsgruppe** (Tutorium), in der sie am häufigsten teilgenommen haben, und wird als „Ihre spateÜbungsgruppe" bezeichnet. Bitte geben Sie hier an, in welcher offiziellen Übungsgruppe (Tutorium) Sie am häufigsten teilgenommen haben?
  Wochentag:_____     Uhrzeit:_____     Tutor:_____
- Die dritte Gruppe umfasst alle Studierenden, die an **diesem Kurs** (Mikroökonomik I) teilnehmen.
- Die vierte Gruppe umfasst **in Deutschland Studierende** ganz allgemein und bezieht sich auf deren hypothetisches Verhalten, wenn sie diesen Kurs besuchen würden.

Bitte geben Sie **eine Einschätzung** zu den folgenden Fragen in der Tabelle für jede Gruppe der Studierenden.

| Gruppe von Studierenden | D9: Wie hoch ist Ihrer Meinung nach der Anteil der Studierenden der jeweiligen Gruppe, die sich unverbindlich dafür angemeldet hatten, die Studienleistung zum früheren Termin abzugeben? (in % der Gruppe) | D10: Wie hoch ist Ihrer Meinung nach der Anteil der Studierenden der jeweiligen Gruppe, die die Studienleistung zum früheren Termin abgegeben haben (und dadurch Feedback erhalten haben)? (in % der Gruppe) | D11: Abgesehen von der Vorlesung und von den offiziellen Übungen, wie viel Zeit pro Woche hat Ihrer Meinung nach die jeweilige Gruppe durchschnittlich für diesen Kurs (Mikroökonomik I) gelernt? (in Minuten) |
|---|---|---|---|
| Ihre Lernpartner (falls D3: Ja) | | | |
| Ihre Übungsgruppe | | | |
| Alle Teilnehmer der Veranstaltung | | | |
| Erwartetes Verhalten aller Studierenden in Deutschland. | | | |

D12: Bitte geben Sie hier die Note an, die Sie für die Klausur *Mathematik für Volkswirtschaftslehre I* erhalten haben:_____     □ *habe nicht teilgenommen*

D13. Abgesehen von der Vorlesung und den offiziellen Übungen, wie viel Zeit lernten Sie in den vergangenen sieben Tagen für diesen Kurs (*Mikroökonomik I*)? _____ *Minuten*

# Instruktionen

## Teil 3: Umfrage

In diesem Teil bitte ich Sie, an folgender Umfrage teilzunehmen. **Selbstverständlich werde ich Ihre Daten vollständig anonymisieren und streng vertraulich behandeln.**

E1. Name: _____

E2. Matrikelnummer: _____

E3. Wie schätzen Sie sich persönlich ein: Sind Sie im Allgemeinen ein risikobereiter Mensch oder versuchen Sie, Risiken zu vermeiden?

*Bitte kreuzen Sie ein Kästchen auf der Skala an, wobei der Wert 0 bedeutet: „gar nicht risikobereit" und der Wert 10: „sehr risikobereit". Mit den Werten dazwischen können Sie Ihre Einschätzung abstufen.*

| **Gar nicht risikobereit** | | | | | | | | | | **sehr risikobereit** |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

E4. Man kann sich in verschiedenen Bereichen ja auch unterschiedlich verhalten. Wie würden Sie Ihre Risikobereitschaft in Bezug auf die folgenden Bereiche einschätzen?
*Bitte kreuzen Sie in jeder Zeile ein Kästchen auf der Skala an!*

**Wie ist das …**

| | **Gar nicht risikobereit** | | | | | | | | | | **sehr risikobereit** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| beim Autofahren? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| bei Geldanlagen? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| bei Freizeit/Sport? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| bei Ihrer beruflichen Karriere? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| bei Ihrer Gesundheit? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| beim Vertrauen in fremde Menschen? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

E5. Stellen Sie sich vor, dass Sie in einer Lotterie 100.000 Euro gewinnen. Unmittelbar nach Erhalt des Gewinns bekommen Sie von einer angesehenen Bank ein Angebot für eine Geldanlage, die Folgendes beinhaltet:

Es gibt eine Chance, das Geld **innerhalb von zwei Jahren zu verdoppeln**. Es gibt aber auch **eine gleich hohe Wahrscheinlichkeit**, **die Hälfte** des eingesetzten Geldes **zu verlieren**. Sie können das Geld ganz oder teilweise in folgender Weise anlegen oder das Angebot ablehnen.

Welchen Teil des Lotteriegewinns würden Sie für die einerseits riskante, andererseits gewinnversprechende Geldanlage einsetzen?

Den ganzen Betrag von 100.000 Euro…………………………………………………………………….. ☐

Den Betrag von 80.000 Euro………………………………………………………………………………… ☐

Den Betrag von 60.000 Euro………………………………………………………………………………… ☐

Den Betrag von 40.000 Euro………………………………………………………………………………… ☐

Den Betrag von 20.000 Euro………………………………………………………………………………… ☐

Überhaupt nichts, würde das Angebot ablehnen……………………………………………......... ☐


E6. Inwiefern trifft folgenden Aussage auf Sie zu? **„Wenn ich mir etwas vornehme, dann mache ich das auch bis zum geplanten Zeitpunkt."**

*Bitte kreuzen Sie ein Kästchen auf der Skala an, wobei der Wert 0 bedeutet: „die Aussage trifft überhaupt nicht zu" und der Wert 10: „die Aussage stimmt absolut und immer". Mit den Werten dazwischen können Sie Ihre Einschätzung abstufen.*

| überhaupt nicht | | | | | | | | | | absolut immer |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |


**Herzlichen Dank für Ihre Teilnahme !**

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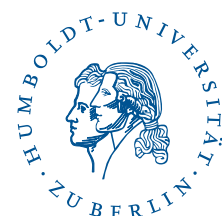
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