Think twice before you sign! An experiment on a cautionary function of contractual formalities.

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Abstract

Legal scholars have long assumed that contractual formalities, such as a formal writing, protect individuals from entering into ill-considered contracts. Recently, it has been questioned whether digital contract formation can adequately fulfill this function. In an incentivized laboratory experiment, I compared four forms of concluding a contract – clicking "OK", typing in one's name, entering a PIN code (which should reflect a qualified e-signature) and handwritten signing. I examined how these different forms of confirming a decision influence a choice between smaller/sooner and larger/later reward. More specifically, I investigated whether handwritten signing indeed leads participants to choose more patiently and opt for a delayed but larger gratification. I found that individuals are more impulsive when clicking on "OK" or typing in one's name than when signing on a paper to confirm their decision. No differences were observed between handwritten signing and entering a PIN code. Further investigation of mechanisms underlying people's reactions towards contractual formalities might provide a basis for designing equivalent online forms of concluding a contract which would fulfill the cautionary function as effective as a written form but would be yet simpler than a qualified e-signature.

I. Introduction

Every day, we provide our consent to a large number of online agreements. The widespread use of the internet not only made already existing goods and services more accessible but also created many new ones. This digital contractual environment poses challenges to both consumers and legal scholars. For instance, it is easier for firms offering their products and services online to distract consumers or to exploit their impatience (Tasker and Pakcyk 2008). These properties of online contracting raise many legal dilemmas (Kim 2013). One very important concern is to which extent, *if at all*, digital contract formation fulfills the cautionary function of acting "as a check against inconsiderate action" (Fuller 1941, p. 800). This purpose has been traditionally believed to be served by contractual formalities such as having a contract in writing with a handwritten signature. In this project, I study whether digital contracts are less effective than the traditional paper form in protecting contractual parties from concluding ill-considered contracts. To this end, I conducted an incentivized laboratory experiment in which I compared the impact of a written paper form and three digital forms (i.e., clicking on an OK-button, typing in one's name with a keyboard, entering a PIN code) on individual intertemporal decision-making. I found that people make less impulsive decisions when they confirm them with a handwritten signature than when they click on an OK-button or type in their name. Interestingly, entering a PIN code does not differ from a handwritten signature regarding its impact on an intertemporal decision.

With contractual formalities, legislators seek to protect individuals from entering into ill-advised agreements by making them think twice before concluding a contract. The conviction that contractual formalities will prevent people from making rash decisions seems widespread and uncontested in the Common Law (Fuller 1941; Hoffman and Eigen 2015) as well as the Civil Law (i.e. Einsele, Münchener Kommentar §126 BGB, sec. 1) jurisdictions. An implicit assumption must be that a careful consideration before entering into a binding agreement would induce people to make better choices. Otherwise, the additional time and effort spent on thinking about a contract would be worthless. The law and economics scholars made this claim explicitly by positing that "formalities may provide an effective response to bounded rationality if their presence triggers some cognitive or institutional process that operates as a safeguard against the specific dysfunctional behavior at issue. […] [T]he extra transaction costs of a formal writing may be justified because they deter impulsive and myopic decision" (Hermalin, Katz, Craswell, 2007). Legal scholars have raised that digital contract formation does not have the same deterrence effect as a traditional paper contract. For instance, the

German legal commentator argued that "both - a mouse click as well as the use of a card reader or a similar device - would not create a psychological barrier equivalent to the one (still) created by a signature" (Einsele *Münchener Kommentar* 2015 § 126a sec. 22-25). It has also been suggested that a handwritten signature provides a different context of a contractual decision than clicking on an "I agree" button (for a short review: Kim 2013, pp. 53-69). More specifically, Moringiello pointed out that "when we are asked to sign something, we are conditioned to think that we are doing something important" (Moringiello 2005, p. 1316). Similarly, Hillman and Rachlinsky noticed that "[t]he requirement of a signature is nothing less than the law's signal to consumers that the document in front of them is important and that they should be cautious about agreeing to it" (Hillman and Rachlinsky 2002, p. 481).

In my study, I test these propositions by examining whether a formal writing prevents individuals from impulsive decisions more effectively than digital contract formation. An impulsive decision might be understood in manifold ways – as "inability to wait, a tendency to act without a forethought" or "an inability to inhibit inappropriate behavior" (Reynolds 2006, p. 306). For the purpose of the current investigation I adopted a definition of an "impulsive decision" as a choice of a smaller/sooner reward over a larger/later one.[1] This kind of choices when individuals are asked to decide between options with consequences at different points in time are called "intertemporal choices" (Berns et al., 2007). We face them in everyday life and they range from the minor (e.g. deciding whether to buy a TV set today on credit or rather to save money and buy it later) to more crucial once (e.g. investments, savings or retirement plan choices). These are also decisions for which some legislators still require either a qualified e-signature or a written paper form.[2]

Legal scholars' claims regarding the differences between traditional formal writing and digital contract formation seem intuitively appealing. It is however unclear whether the two – digital and paper – forms of contract indeed differently influence people's intertemporal choices. According to the standard economic theory individual preferences, also for intertemporal choices, are stable (Loewenstein and Thaler 1989). It means that a person preferring 10€ now over 15€ in a month should also choose 100€ immediately instead of 150€ in a month. This person should also prefer 10€ now over 15€ in a month irrespective of how she confirms her decision – on a paper with a handwritten signature or with a mouse click on an "OK" button. The context of a decision, i.e. the magnitude of reward or the form of confirmation, should

[1] Similarly to Lempert and Phelps (2016).
[2] See for instance German provisions on consumer credits: §492 BGB.

not change this person's preferences. Thus, according to the standard economic theory people choices over entering into a contract should not differ depending on its form. There is however a growing body of economic and psychology research showing that people tendency to make impulsive choices is susceptible to the context of a decision such as the magnitude of reward (Thaler 1981), available options (Loewenstein and Prelec 1993), or whether the options are presented as gains or losses (Loewenstein 1988).[3] Some of the observed behavioral regularities in intertemporal choices can be explained by dual-process models.[4] These theories focus either specifically on intertemporal decisions (Thaler and Shefrin 1981) or address more broadly judgment and decision making in different contexts (e.g., Strack and Deutsch 2004, Loewenstein et al. 2015). A joint proposition of these models is that people evaluate information and make decisions in two different types of modes: an intuitive, automatic, and impulsive (Type 1) or deliberative, reflective and thoughtful (Type 2). The decision-making process cannot be classified as being strictly either of one or the other type. It is rather a mixture of both with features of a certain type being stronger or weaker when a given decision is made. According to some of the dual-process theories, Type 1 if the default mode of judgment and decision making. Type 2 engages in decision making to a certain extent, depending on situational and individual features. Regarding intertemporal choices specifically, it has been claimed that Type 1 process would be responsible for a choice of an immediate gratification, whereas Type 2 would consider both – immediate and delayed rewards giving the same weights to both (Loewenstein et al. 2015). The final choice would depend on which system – Type 1 or Type 2 – is prevalent in the decision-making process. It has been suggested that decision features such as importance, finality or accountability can activate Type 2 processes leading people to make their decisions in a more deliberative and thoughtful mode (Strack, Werth and Deutsch 2006). This would indicate that a person who perceives a given decision as important or final would be more likely to pick the larger/later than the immediate/smaller payoff option than when a decision is perceived as irrelevant or revocable.

A contract form could potentially deter impulsive decision-making if it changes the context of a decision by implying its importance or irrevocability. Research on contract formation provides evidence that people might indeed perceive a decision differently when they sign a formal writing compared to a digital contract. More specifically, it has been revealed that people attach a special meaning to a moment of signing a written document. In a vignette

[3] For a review: Frederick et al. 2002, Berns et al. 2007, Lempert and Phelps 2016.
[4] For an overview see: Evans 2008, Alos-Ferrer and Strack 2014, Evans and Stanovich 2013.

study, Wilkinson-Ryan and Hoffman (2015) presented participants with two scenarios describing different steps of a transaction such as a decision to enter a contract, verbal communication of assent, the signing of a contract, mailing a signed contract or paying the price. In both scenarios, most of participants identified a moment of signing as the point of entering into a binding contract. In yet another scenario, there was no paper contract at all. The contractual parties first exchanged emails with an offer and acceptance. Next, the price was paid and the good was delivered. Interestingly, in this scenario most participants believed that a contract was concluded first when the price was paid. This suggests that an informal electronic communication (i.e., exchange of emails) does not seem to have the same symbolic meaning as signing on the dotted line. A vignette study conducted by Wilkinson-Ryan (2015) provided further evidence on a distinct perception of paper contracts. The results revealed that less people declare to be willing to breach a contract if it was signed on paper than if it was concluded only verbally. Hoffman (2016) has observed a different effect of a paper contract. He has found that participants presented with a scenario in which a contract was signed on a paper were equally likely to perceive it as a valid agreement as participants who read that a contract was signed on a digital pad. Importantly, Hoffman (2016) has also showed that more participants perceived a contract as unenforceable if it was concluded only verbally compared to a situation when a transaction was made online. None of this research has provided a direct comparison of a decision context created by a traditional paper and a digital contract form such as clicking on an OK-button. Nevertheless, the existing results suggest that the signing of a paper contract has a symbolic meaning and seems to form "a key part of a contract schema" (Wilkinson-Ryan and Hoffman 2015, p.1290). Given this symbolic meaning, it is likely that a decision confirmed on paper with a handwritten signature will be perceived as final and/or more important compared to clicking an OK-button, typing in one's name or entering a PIN code. Therefore, people will deliberate more and, thus, be more likely to choose later/larger option when signing a paper contract than when concluding a digital contract.

In the current project, I provide an experimental test on how contractual formalities influence peoples' decision-making about entering into a contract. In a controlled laboratory experiment, I compared how confirming a decision (by clicking on an OK-button, typing in one's name, entering a PIN code or handwritten signing) influences an intertemporal choice between receiving 10€ now or 12.50€ in a month. The results revealed that more individuals decide for a later/larger option when they confirm their decision with a handwritten signature or a PIN-code than when they only type in their name or click on an OK-button. Further

investigation is required to determine what drives the observed behavior. In particular, it is necessary to examine whether a handwritten signature and a PIN-code indeed activate the more deliberative mode of thinking. Additionally, it is crucial to investigate whether people perceive differently the importance or finality of their decision depending on how it is confirmed.

II. Methods

1. Design and participants

Ninety-six participants (age: M = 21.9, SD = 3.8, 59% female) were randomly assigned to one of four conditions in a between-subjects design (twenty-four per condition). Participants were recruited from the BonnEconLab subject pool consisting of students with heterogeneous fields of studies.[5] Each session lasted about 45 minutes. Participants total payments in the main part of the experiment[6] ranged from 10 to 12.50€. The experiment was programmed using z-Tree (Fischbacher 2007).

In each condition participants first performed a real effort task. Each participant earned 10€ for this task. Subsequently, participants were asked to make an intertemporal decision by choosing between receiving 10€ on the day of the experiment in cash or up to 12.50€ in a month via a bank transfer. Depending on the condition participants confirmed their decision differently. The modes of confirming a decision were designed to reflect four most common ways of concluding a contract (clicking on OK-button, typing in one's name, entering a PIN-code, handwritten signing).

2. Materials and procedures

The experiment consisted of two parts. Separate instructions were displayed on computer screens immediately preceding each part of the experiment. Before starting the first part participants were prompted to fill in a form with their names and bank account details. Participants were notified in an invitation to the experiment that they will be asked to provide bank account data. Participants were instructed that some or all payments in the experiment will be done via bank transfer. They were informed that the bank transfers will be conducted by the administration of the Max Planck Institute for Research on Collective Goods[7] in Bonn

[5] Participants were recruited using an online recruitment tool hroot (Bock, Nicklisch and Baetge, 2012).
[6] After the main experiment an additional independent experiment was conducted. The main experiment lasted about 25 minutes. At the beginning of the experimental session, participants were instructed that the whole experiment consists of a few parts which are independent from each other.
[7] Max Planck Institute is a highly-regarded research institution in Germany.

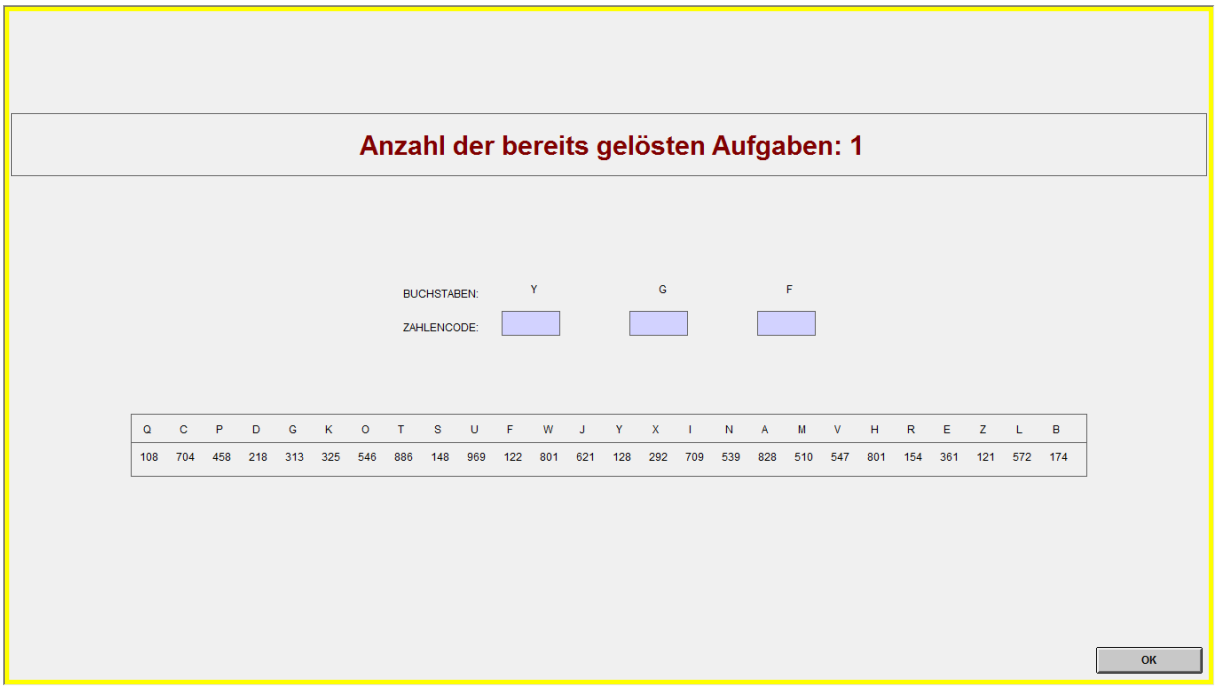
and that the data will be stored only for the purpose of this experiment.[8] They were also given an information sheet with contact details to the experimenter and a person responsible for transfers. This experimental procedure was introduced for three reasons: First, it should ensure that participants are confident about later payments when making an intertemporal choice.[9] Second, it should prevent a situation in which participants are deciding for an immediate payment, because they want to avoid sharing bank account details. Third, since anonymity of decision making is by design excluded in three treatments (participants must confirm the decision with their own name and a PIN-code is also personalized), this procedure makes sure that participants identity is revealed in all treatments equally from the very beginning.

In the first part of the experiment, participants performed a word encryption task (Benndorf et al. 2014, Erkal et al. 2011), for which they were rewarded with 10€. Previous experiments have shown that people make different risky and intertemporal choices depending on the source of the income. In particular, they tend to be more patient when they decide about hard earned money than when a decision concerns windfall gains (Hvide and Lee 2015). Thus, to increase external validity the decision made in the current experiment concerned money earned in a real effort task to resemble everyday decisions about spending money when concluding contracts.

In the real effort task participants were presented on a screen with a table of 26 letters of the alphabet in a random order (Figure 1). Each letter was randomly assigned a three digits' number. Additionally, participants saw three randomly selected letters from the alphabet. Their task was to encode these letters, i.e. to find in a table a three-digit-code assigned to each of the letters and enter the appropriate code into a blank field.

[8] Please see the experimental instructions (Appendix 1) for the exact wording.
[9] Similar procedure was introduced by Kuhn et al. (2014). Although it cannot be fully excluded, it is rather unlikely that participants would be distrustful about later payments.

Figure 1 A screenshot of the experiment depicting the word encryption task



If at least one of the numbers entered did not correspond to the assigned code, an error message appeared and a participant was prompted to enter all three numbers anew.

Participants were informed that they receive 10€ for completing 20 blocks of the task correctly. The order of letters, the codes, as well as three letters presented to encode, changed in each block.

In the second part of the experiment, participants decided whether they would like to receive 10€ they earned in a real effort task on the day of the experiment in cash. Alternatively, they could decide to receive nothing or only part of the money on the day of the experiment.[10] Participants could choose an integer number from 0 to 10€. The rest of the money which has not been withdrawn on the day of the experiment was invested and this amount together with 25% interest rate was transferred to participants' bank accounts in a month (maximum 12.50€). To help to calculate the respective amounts which will be transferred to a bank account, participants were provided with a table (Table 1) displaying the amount received in a month (*in einem Monat*) depending on how much money a participant decided to receive today (*Heute*):

[10] Importantly, none of the options were presented as a default. Participants choice task was described in the following way: "You can either receive the money you earned for performing the task (10 Euro) today in cash or decide to invest it for a month. You can also split this amount - receive some of it today and invest the remaining amount." For the exact wording of the instructions see Appendix 1.

Table 1 A table from the experiment displaying amounts received in cash on the day of the experiment and respective payments in a month

Heute	0€	1€	2€	3€	4€	5€	6€	7€	8€	9€	10€
In einem Monat	12.50€	11.25€	10€	8.75€	7.50€	6.25€	5.00€	3.75€	2.50€	1.25€	0€

Participants were asked to declare how much money they would like to receive in cash on the day of the experiment by filling in a statement: "I declare that I would like to receive … € today in cash."[11]

Once a participant filled in a declaration, he/she was given a paper-and-pencil questionnaire. When distributing the questionnaire, the experimenter collected the forms from participants in the treatment in which a decision was confirmed by a handwritten signature. In the first question, participants were asked how satisfy they are about the decision they have just made. The question was answered on a seven-points-Likert-scale with higher scores representing higher satisfaction with the decision. The remaining of the questionnaire was designed to collect information about participants' current financial situation[12] as well as to elicit their time preferences. The questions implemented to elicit participants' time preferences were adopted from Falk et al. (2016) and consisted of a qualitative and quantitative part. Falk et al. (2016) have shown that a questionnaire consisting of these two parts performs very well in predicting intertemporal choices in different experimental tasks. In a qualitative part participants answered one self-assessment question: *In comparison to others, are you a person who is generally willing to give up something today in order to benefit from that in the future or are you not willing to do so?* The question was answered on a ten-points-Likert-scale whereas 1 meant *completely unwilling to give up something today* and 10 – *very willing to give up something today.* The quantitative part included 25 hypothetical choices between 100€ today or a larger amount in 12 months. The delayed amount increases with each choice. The questionnaire was conducted to make sure that participants did not differ between the treatments with respect to their financial situation and time preferences.

3. Treatments

Confirmation of a decision on how much money participants would like to receive in cash on the day of the experiment differed across treatments.

[11] For the English translation of the German instructions please see Appendix 1.

[12] Participants where asked 3 questions: (1) *Would you say, that you are at the moment short of money?* (1-7 scale, 1 – rather yes, 7 – rather no), (2) *Do you have debts?* (no, very little, to a manageable degree, a lot), (3) *Do you need cash at the moment?* (1-7 scale, 1 – rather yes, 7 – rather no).

Treatment	Confirmation of a decision
OK-BUTTON	The decision was made by entering a number and clicking on an OK-button.
TYPED NAME	The decision was made by entering a number, typing in one's name and clicking on an OK-button.
PIN CODE	The decision was made by entering a number, typing in a PIN Code and clicking on an OK-button. PIN Code was provided on a plastic card in a closed envelope with participant's name on it. The envelopes were distributed directly before the second part of the experiment.
HANDWRITTEN SIGNATURE	The decision was made by entering a number on a paper and confirming with a handwritten signature. The paper forms were distributed directly before the second part of the experiment.

III. Behavioral predictions

According to the standard economic theory, no differences should be observed between the treatments regarding the amounts of money participants choose to receive on the day of the experiment. Assuming similar distribution of participants' time preferences across treatments, one should observe the same share of participants making a patient decision (i.e. opting for 0 € on the day of the experiment) in each of the treatments.

However, there is a large body of research showing that intertemporal choices are susceptible to the context of a decision. Dual-process models predict that individuals make decisions in two modes – impulsive (Type 1) and deliberative (Type 2). An impulsive decision mode is usually related to a choice of an immediate gratification, whereas a deliberative mode weighs each – the immediate and the delayed – option equally and chooses the delayed option if the interest rate is sufficiently high to overcome individual discount rate. In the current experimental design, Type 1 decision mode should be concerned only with the immediate payment (10€ on the day of the experiment) whereas Type 2 should consider both – 10€ on the day of the experiment and 12.50€ in a month and pick the 10€ today only if an individual monthly discount rate is equal or higher than 25%.

Specific features of a decision, such as its importance, irrevocability or finality, have been suggested to trigger a more deliberative mode of decision-making. Additionally, research has revealed that a traditional paper form with a handwritten signature is perceived by people in a

special way. In contrast to verbal or electronic forms, a signed contract is seen as a moment of entering into a binding agreement. This suggests that a decision in a HANDWRITTEN SIGNATURE treatment might be perceived as a more important and final one compared to all other treatments. It would indicate that individuals in a HANDWRITTEN SIGNATURE treatment are more likely to make their decision in a more deliberative mode than participants in other treatments. As a result, they will more often choose the patient option that is 12.50€ in a month. Based on this, I formulated the following hypothesis:

Individuals in HANDWRITTEN SIGNATURE treatment will choose to receive less money on the day of the experiment than individuals in the OK-BUTTON, TYPED NAME and PIN CODE treatments.

IV. Results

1. Intertemporal choice

A decision on how much money to receive on the day of the experiment in cash is the main dependent variable measured in the experiment. Participants could choose an integer value from 0€ to 10€. The more money a participant decided to receive immediately the lower was his/her overall profit. Participants who decided to receive 0€ on the day of the experiment, received 12.50€ in a month. The ones who decided for the opposite option (10€ on the day of the experiment) received nothing in a month.

Sixty-two percent of all participants decided to wait and to receive all money transferred to their account in a month.[13] The second most frequent decision (20% of all participants) was to receive all money – 10€ – on the day of the experiment in cash. Only 18% of the participants chose to split the money between a present and future payment. Figure 2 displays the share of participants deciding for one of the three options (12.50€ in a month, 10€ on the day of the experiment or split) separately for each treatment. Importantly, whereas only 54.3% and 50% of the participants decided for 12.50€ in the OK-Button and TYPED NAME treatments respectively, 79.2% of the participants chose this option in the PIN CODE and 78.3% in HANDWRITTEN SIGNATURE treatment.[14]

To test whether participants in each of the treatments decided more impulsively than in the HANDWRITTEN SIGNATURE treatment, I conducted a Wilcoxon rank-sum test comparing the amounts of money received on the day of the experiment in each of the treatments to the

[13] One participant was excluded from all analyses since he did not have a European bank account and was not able to provide all the details necessary for a bank transfer outside of the European Union.
[14] The exact distribution of decisions is displayed in Figure 5 in Appendix 2.

amounts in the HANDWRITTEN SIGNATURE treatment (see Figure 3). In the TYPED NAME treatment participants chose more money in cash on the day of the experiment (M = 4.58, SD = 4.87) than in the HANDWRITTEN SIGNATURE treatment (M = 1.52, SD = 3.43), z = 2.183, p = .029. The difference between the amounts of money received by participants in the OK-BUTTON treatment (M = 3.20, SD = 4.17) and the HANDWRITTEN SIGNATURE treatment was marginally significant, z = 1.657, p =.097. The comparison between PIN CODE treatment (M = 1.58, SD = 3.29) and HANDWRITTEN SIGNATURE treatment revealed no statistically significant difference (z = -0.060, p = .952).

Figure 2 Percentage of participants deciding either to receive 12.50€ in a month, 10€ on the day of the experiment or to split the amount in each treatment

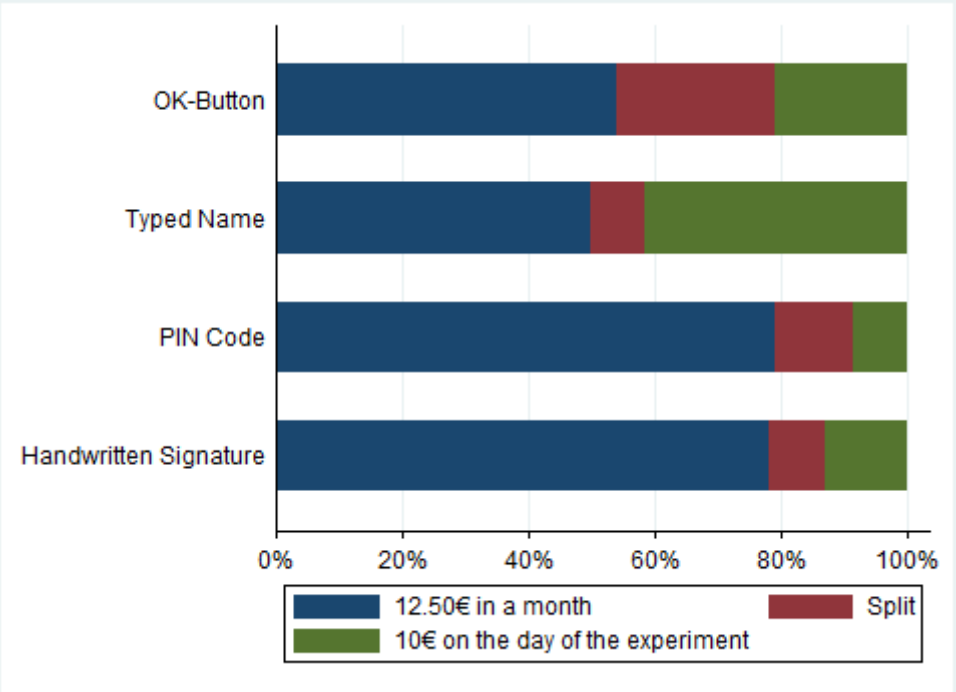
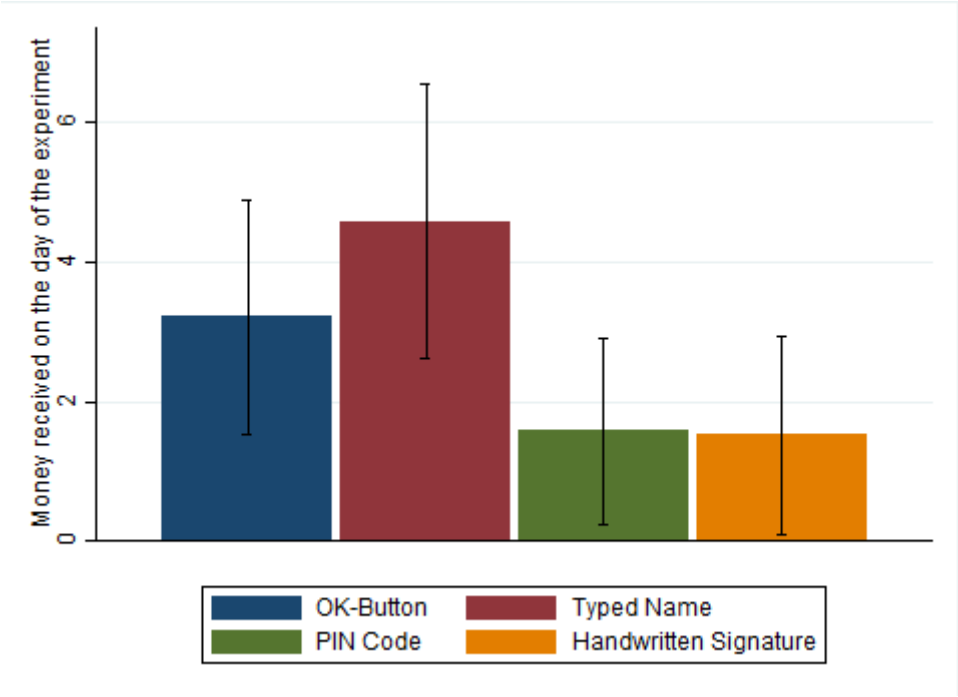


Figure 3 Money received on the day of the experiment by participants in each treatment



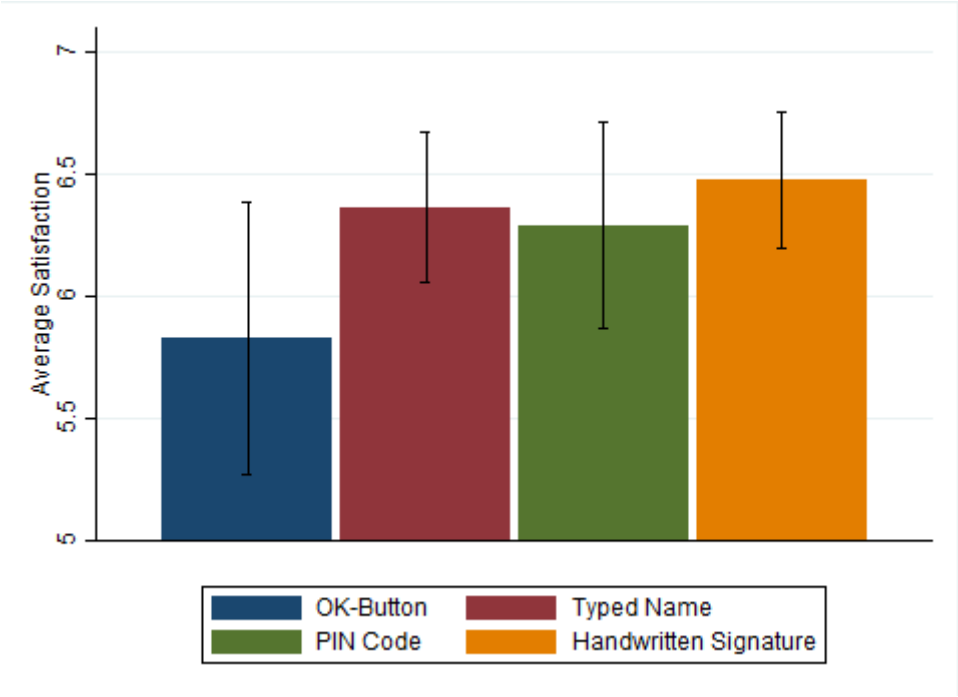
Note: Average amounts of money received by participants on the day of the experiment in cash separately in each treatment. Spikes represents 95% confidence intervals.

2. Satisfaction

After making the intertemporal choice participants were asked how satisfy they are with their decision (on a scale from 1 to 7, 1 represents "not satisfied" and 7 "very satisfied"), see Figure 4.

No difference was observed comparing TYPED NAME and PIN-CODE with the HANDWRITTEN SIGNATURE treatment (z = -0.561, p = .574; z = -0.299, p = .764, respectively). Participants in the OK-BUTTON treatment were less satisfied with their decisions than participants in the HANDWRITTEN SIGNATURE treatment (z = -1.824, p = 0.068).

Figure 4 Satisfaction with the decision in each treatment



Note: Average responses to the question about satisfaction with the intertemporal decision separately in each treatment. Spikes represents 95% confidence intervals.

3. Financial situation and time preferences

The questionnaire conducted after the experiment included also three questions asking about participants' financial situation and further questions eliciting participants' time preferences (one self-assessment question and 25 hypothetical intertemporal choices).[15]

I calculated Kruskal-Wallis tests to determine whether participants' responses to the questions on the financial situation differed between the four treatments. None of the tests was significant across the treatments (Question regarding cash: $\chi^2(3) = 2.683$, $p = 0.443$; Question regarding shortage of money: $\chi^2(3) = 3.366$, $p = 0.338$; Question regarding debts: $\chi^2(3) = 0.562$, $p = 0.905$). Similar results were obtained comparing participants' responses to the self-assessment question regarding time preferences ($\chi^2(3) = 2.172$, $p = 0.537$) as well as a time preferences measure constructed on the basis of 25 intertemporal choices[16] ($\chi^2(3) = 2.480$, $p = 0.478$).

[15] Questionnaires from two participants from the first experimental session are missing, since participants' computer cabins' numbers were not noted on the paper with a questionnaire and could not be matched with their responses in the experiment.

[16] The number of a choice in which a participant switched from an earlier to a later option was adopted as a measure of time preferences. For example, if a participant in first 5 choices decided for an earlier option and switched to a later option in the sixth choice, than 6 was adopted as his/her measure of time preferences. If a participant switched more than once then a mean of switching numbers was taken.

V. Discussion and future directions

One of the reasons for introducing contractual formalities (such as a legal requirement of some contracts to be concluded in writing or with a qualified e-signature) is to protect individuals from entering into ill-considered contracts. A paper contract together with a handwritten signature is assumed to prevent people from making impulsive or myopic decisions when an immediate gain is chosen over a higher but distant payoff. Additionally, it has been raised that digital contract formation does not fulfill this function equally effective as a traditional paper form. The current study provides an empirical test of these propositions. In the experiment, I compared four forms of concluding a contract - two 'simplest' ways (clicking on OK-button and typing in one's name) with two more 'complex' forms – entering a PIN code (which should reflect a qualified e-signature) and handwritten signing. The results showed that the form with a handwritten signature indeed lead people to choose less impulsively than when a decision is confirmed only by clicking on OK or by typing one's name. No differences were found between traditional written form and the one with a PIN code. Interestingly, people were less satisfied with their decisions made by clicking on OK compared with decisions confirmed by a handwritten signature.

Based on the current experimental design one cannot draw any firm conclusions as to the exact mechanisms leading to more patient choices in HANDWRITTEN SIGNATURE and PIN CODE treatments. It is however possible to exclude one alternative explanation. More specifically, one could argue that people are less impulsive when they confirm their choice with a handwritten signature because a signature serves as a self-identity prime. People primed with their self-identity might be more willing to make choices which are more compatible with their self-image. If a person likes being perceived as patient, she would be more likely to choose the later/larger option when her self-identity is activated. Studies investigating the influence of a signature on consumers' behavior showed that a handwritten signature in contrast to a print name serves as a self-identity prime and results in different shopping decisions and group identification (Kettle and Häubl 2011). Other research revealed that signing one's name at the beginning of a form leads to less fraudulent and cheating behavior than signing at the end of a form (Shu et al. 2012). Chou (2015a, 2015b) observed similar results comparing a handwritten signature (or a signature entered via a mouse cursor) to different forms of e-signatures. In her studies, people showed less dishonest behavior and stronger self-presence when signing with hand (Chou 2015a) as compared to all forms of e-signatures. Additionally, others perceived a contract with a handwritten signature as one

which is less likely to be breached than contracts confirmed with e-signatures (Chou 2015b). Importantly, all these studies focused on the impact of a signature on the later contractual behavior and decisions. Here I examined how the knowledge that a contract will have a form of a paper contract with a handwritten signature or a digital contract influences a decision about entering into a contract. Because of a different sequence of events (first the decision, then signing, clicking on an "OK" button, typing in one's name or entering a PIN code) it is unlikely that a signature will serve as a self-identity prime and have an impact on a decision about entering into a contract. Furthermore, more patient decisions were observed in both the PIN-CODE and the HANDWRITTEN SIGNATURE treatment, although a signature, that could potentially serve as a self-identity prime, was required only in the latter one.

The law and economics scholars argued that the additional transaction costs created by a requirement to conclude a contract in a written form would be justified if they prevent people from impulsive or myopic decisions. The results of this study show that traditional paper form is indeed more effective in preventing people from impulsive decisions than simply clicking on OK or typing in one's name. Yet, the results also suggest that there might exist digital forms of a similar effect as a handwritten signature. Future research could extend the current experimental design by including measures of response times and questionnaires to evaluate the decision processes. Since the deliberative decision-making process has been described as a slower decision mode, the response times should be longer when people are asked to confirm their decision with a signature and with a PIN code. Furthermore, it is important to investigate how exactly a contract form changes the context of a decision. Do people indeed perceive their choice as more important if they are required to confirm it with a signature or a PIN code? Or is it rather the irrevocability of a decision which is indicated by the act of signing or entering a personalized code?

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Appendix 1

„Bank Account Details"

Some of the payments in today's experiment will be transferred to your bank account. Please, enter now your bank account details. Your data will be stored securely. Under no circumstances, your data will be used for advertising or marketing purposes or be disclosed to third parties. The data you will provide will be used only to execute the payments in this experiment. The data analysis, as well as publication of the results, will be anonym.

Bank transfers will be executed by the administration of the Max Planck Institute for Research on Collective Goods. There is an information sheet on your table with contact details to responsible persons from the Institute. Please, take this information sheet with you. Do not hesitate to contact us if you have any questions regarding the payments.

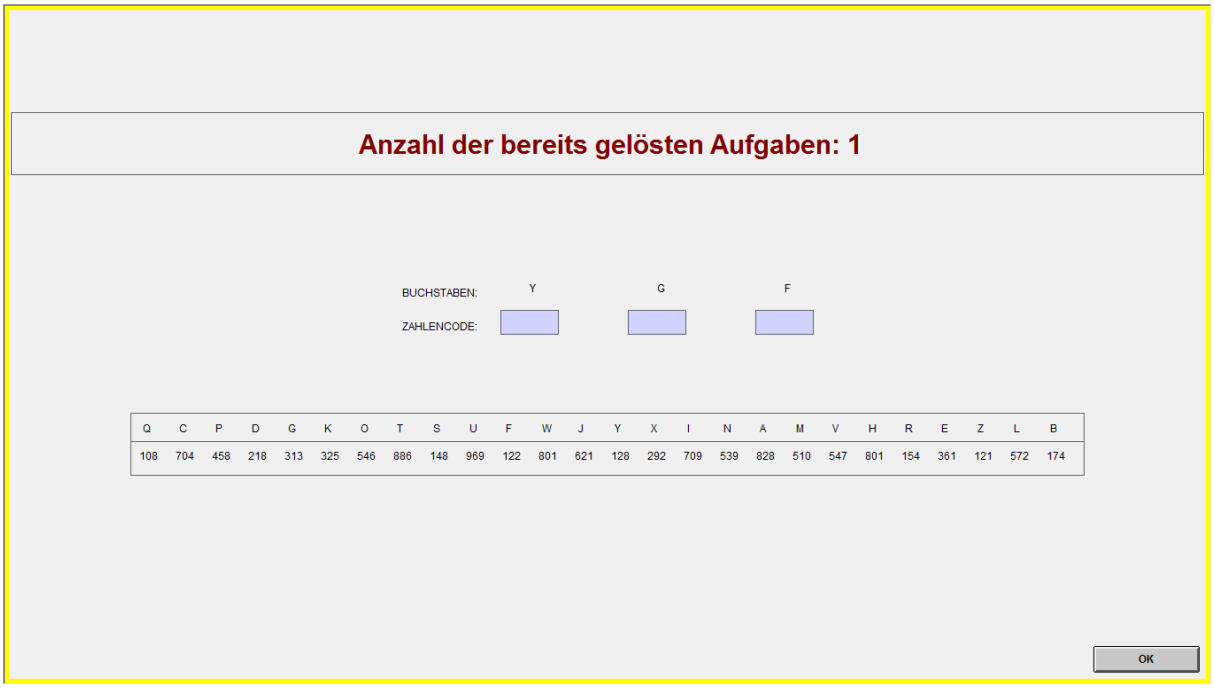
Please, enter your data carefully. Before you click on "Continue", make sure that you entered the data correctly.

General instructions for participants

You are about to take part in an economic experiment. In this experiment, you can earn a significant amount of money depending on your decisions. For this reason, it is essential to read the instructions carefully. The instructions you obtained are for your private use only. Please note that you are not allowed to communicate with other participants during this experiment. Should you have any questions, please ask us for assistance. If you do not comply with the rules we will have to exclude you from the experiment and from all payments. Today's experiment includes several parts. The instructions will be displayed on the computer screen directly preceding each part of the experiment. The payments in this experiment depend on your decisions. All decisions will be made individually – this means that you can let us know as soon as you are done with all parts of the experiment and leave the laboratory.

Part I – Word encryption task

In the first part of the experiment, you are asked to perform several blocks of a task. In each block of a task, you need to translate a combination of letters into a number code. For each letter, you will need to find an appropriate code. A table with letters and assigned number codes will be displayed on a screen in each block of a task. The task will look on a screen in the following way:



At the top of the screen, you see how many blocks of a task you have already performed. In this example, one task has been already solved. In the current task three letters “Y”, “G” and “F” need to be translated into three-number codes. The solution to this task can be found in the table below. “Y” is assigned a code 128. “G” is assigned 313 and “F” is assigned 122. Once all three codes are entered, please click on „OK”. The program will check whether the codes are entered correctly. Only in this case, the task will be counted as solved. Different letters to be solved as well as the different assignment of codes to the letters will be generated in each task. Please note that the table includes 26 letters from the alphabet and the position of each letter can change in each task.

Once a new combination of letters is displayed on the screen, you need to click in the first blank field to enable entering a number. You can proceed to the next task first when you correctly solved the current one. If at least one of the codes is entered incorrectly, all numbers that were entered will be deleted and you will be asked to enter them anew. The table does not change in this case.

Your task is to solve 20 blocks with three letters. As a payment for completing the task, you will receive 10€. Should you have any questions, please raise your hand.

Part II – Intertemporal decision

You can either receive the money you earned for performing the task (10 Euro) today in cash or decide to invest it for a month. You can also split this amount - receive some of it today and invest the remaining amount. Should you decide to invest all or some of the money, you will receive additional 25 Cents for each invested Euro. The total amount will be transferred to your account in a month. In the table below you can find the respective amounts which will be transferred to your account depending on how much money you decide to receive today.

Heute	0€	1€	2€	3€	4€	5€	6€	7€	8€	9€	10€
In einem Monat	12.50€	11.25€	10€	8.75€	7.50€	6.25€	5.00€	3.75€	2.50€	1.25€	0€

Should you have any questions, please raise your hand.

OK-BUTTON treatment:

Please make your decision now. Please enter the respective amount that you would like to receive in cash today below in the blank field. You can enter any number from 0 to 10. To confirm your entry, please click on OK.

TYPED NAME treatment:

Please make your decision now. Please enter the respective amount that you would like to receive in cash today below in the blank field. You can enter any number from 0 to 10. To confirm your entry, please typed in your first and last name in the respective field below. Next, click on OK.

PIN CODE treatment

Please make your decision now. Please enter the respective amount that you would like to receive in cash today below in the blank field. You can enter any number from 0 to 10. To confirm your entry, please enter a PIN code from the plastic card. The card is in the envelope that you have just received. Next, click on OK."

HANDWRITTEN SIGNATURE treatment

Please make your decision now. Please enter the respective amount that you would like to receive in cash today in the form. Please sign the form. Next, click on OK."

Appendix 2

Figure 5 Histogram of the amounts of money participants decided to receive on the day of the experiment