

# Content Matters: The Effects of Commitment Requests on Truth-Telling

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August 23, 2019

## Abstract

This paper uses a laboratory experiment to test how the request to sign a no-cheating declaration affects truth-telling. We find that the effects strongly depend on the declaration's content. Signing a no-cheating declaration increases truth-telling if it is morally charged, does not affect behavior if it is morally neutral, and reduces truth-telling if it is morally neutral and threatens to punish. The latter effect is driven by subjects with particularly high values on Hong's Psychological Reactance Scale. These are subjects with a tendency to push back if their freedom of choice is restricted.

**Keywords:** *cheating; lying; truth-telling; compliance; commitment; no-cheating rule; no-cheating declaration; commitment request; reactance*

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# 1 Introduction

In many contexts, agents face incentives to misreport private information. Examples include employees overstating their working hours, businesses not disclosing all characteristics of their products, and households and firms understating their income or profit when reporting to the tax authorities. Given that misreporting affects important economic outcomes in all these situations, it is crucial to understand which types of countermeasures can be used to induce truth-telling.

The standard measure to curb cheating is, of course, deterrence, and a large body of empirical literature since [Becker \(1968\)](#) has shown that deterrence works.<sup>1</sup> But how can we induce truthful reporting in settings where implementing deterring tools (such as third-party reporting or close monitoring) is too costly or simply impossible? A widely used instrument in such contexts is requesting the agent to sign a declaration of compliance with a specific set of rules. For example, many universities require students to sign an honor code that spells out the principles of academic integrity.<sup>2</sup> Similarly, when individuals and firms report tax-relevant information, the tax administration commonly requests them to sign a declaration confirming the truthfulness of the submitted information.<sup>3</sup> Furthermore, all of the Fortune Global 500 corporations have a code of conduct, that newly hired staff have to sign. These codes frequently include declarations of compliance.<sup>4</sup>

One can think of various channels through which the act of commitment to a no-cheating rule could induce more truthful behavior. For example, many agents' reporting behavior is shaped by an intrinsic disutility of cheating (see, e.g., [Gneezy, 2005](#); [Erat and Gneezy, 2012](#)). In this spirit, commitment may increase the perceived disutility of cheating, shifting the tradeoff between truth-telling and misreporting towards more honesty. One potential reason for such a shift is that committing to a no-cheating rule can focus subjects' attention on their moral standards ([Mazar et al., 2008](#)). Likewise, commitments could reduce cheating due to the disutility of breaking a promise ([Ellingsen and Johannesson, 2004](#); [Charness and](#)

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<sup>1</sup>For example, police reduce crime ([Levitt, 1997, 2002](#); [Di Tella and Schargrodsky, 2004](#)), auditing, and third-party information reporting limit tax evasion ([Kleven et al., 2011](#); [Kleven, 2014](#); [Pomeranz, 2015](#)), and close monitoring curbs the mismanagement of publicly funded institutions ([Reinikka and Svensson, 2005](#); [Olken, 2007](#); [Ferraz and Finan, 2008, 2011](#); [Bjorkman and Svensson, 2010](#)).

<sup>2</sup>All the top 10 U.S. universities according to the *U.S. News & World Report 2019* have an honor code or code of conduct that explicitly refers to academic integrity, and four out of the ten require undergraduate students to sign or pledge adherence to this code.

<sup>3</sup>One exemplary country that made use of such a commitment request is Sweden. Before 2002, the Swedish income-tax-return form included the following statement that individuals had to sign: "I promise in honor that the submitted figures are correct and truthful."

<sup>4</sup>For details, see the compliance database of the University of Houston [Link](#).

Dufwenberg, 2006), or they could remind subjects of an existing honesty norm and thereby trigger more compliant behavior. However, there are also reasons to believe that requesting commitment could negatively affect truthful reporting. A well-known example of such a channel is psychological reactance. Going back to Brehm (1966), the theory of reactance states that individuals have a fundamental need for behavioral freedom. This need is activated whenever individuals feel a restriction put on their options or actions, leading them to an emotional state characterized by the wish to regain their freedoms through engaging in the restricted activity. In this vein, commitment requests that impose behavioral restrictions could lead individuals to deliberately choose the type of behavior that the request marks as (socially) undesirable. While reactance has not been studied in the context of commitment requests, the relevance of this concept in other domains is well established (see, e.g., the reviews of Miron and Brehm, 2006; Rains, 2013; Steindl *et al.*, 2015).

With competing conceptual frameworks predicting very different effects of commitment requests, it is unclear *a priori* whether requesting commitment, in general, induces more or less truthful reporting. Furthermore, different commitment requests might affect behavior differently, depending on the degree to which the specific type of request triggers reactance or increases the intrinsic disutility of cheating. The literature on moral reminders and commitment (which we discuss later) has, in fact, found ambiguous effects of commitment requests and, as a result, offers little guidance on how to design commitment requests in order to balance the honesty-dishonesty tradeoff towards more truth-telling. This observation sets the stage for our study.

This paper presents experimental laboratory evidence on how different forms of commitment affect misreporting behavior. Using a simple cheating game in line with the experimental paradigm introduced by Fischbacher and Föllmi-Heusi (2013), we test the effectiveness of three different commitment requests that either make ethics more salient or aim at shifting the degree of reactance. Our first treatment features a morally charged commitment. The treatment requests subjects to sign a no-cheating declaration referring to the “principles of ethically sound behavior.” This treatment follows the idea that an effective no-cheating declaration has two central properties. On the one hand, it makes ethics salient or increases cheating costs through one of the other previously discussed channels. On the other hand, the treatment is not communicating behavioral restrictions that could trigger reactance. The second treatment requests individuals to sign a morally neutral no-cheating declaration that does not refer to any ethically loaded norm but formulates a specific behavioral restriction. Relative to the morally charged treatment, we expect this declaration

to make ethics less salient and to be a weaker reminder of the norm not to cheat. The goal of the third treatment is to trigger reactance: It combines the neutral no-cheating declaration with a threat that non-compliance will be sanctioned and hence conveys a very direct message that the behavioral freedom of subjects is restricted. We designed this declaration following the notion that reactance tends to increase in the severity of the threat (Miron and Brehm, 2006; Steindl *et al.*, 2015).

We compare our treatments to a control group without commitment and find that only the morally charged commitment request reduces cheating. As for the morally neutral commitment request, we observe no significant difference relative to the control group. By contrast, the treatment adding a strong reactance trigger to the neutral commitment request significantly increases cheating relative to the control group. We conclude that, when requesting commitment, content matters. In order to avoid that commitments backfire, practitioners should avoid no-cheating declarations that include direct threats.

Having established that commitment requests can have vastly different effects, we also study reactance as a channel through which commitment can affect cheating. Our motivation for further exploring the adverse effect of commitment is that, given its unintended nature, exploring why and when such effects occur is particularly important. Our research design is as follows: We collected survey data to elicit whether subjects are of a more or less reactant type. For classification purposes, we use Hong's Psychological Reactance Scale (Hong, 1992; De las Cuevas *et al.*, 2014). We then contrast the treatment response of subjects who are particularly prone to "pushing back" if their freedom of choice is restricted to the response of subjects who are less likely to do so. The main finding from this exercise is that only reactance-prone subjects cheat more in response to a commitment request containing a strong reactance trigger. This result suggests that reactance is indeed the reason why we observe more cheating after having signed such a commitment request.

Our study extends the literature studying how individuals respond to moral reminders, oaths, or no-cheating declarations. As stated before, this literature has found ambiguous results. For example, Mazar *et al.* (2008) demonstrate that individuals who sign a reminder stating that "the study falls under the university's honor system" cheat less in laboratory experiments.<sup>5</sup> The results of Shu *et al.* (2012) indicate that signing a no-cheating declaration at the beginning rather than at the end of an insurance self-report increases honesty. Furthermore, Jacquemet *et al.*

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<sup>5</sup>The literature also tested the effects of other types of moral reminders. For example, one study reports that reminders of the Ten Commandments decrease cheating (Mazar *et al.*, 2008, Experiment 1). However, Verschuere *et al.* (2018) failed to replicate this result in a large-scale replication exercise ( $N = 4674$ ).

(2018) show that individuals who voluntarily sign a solemn truth-telling oath are more committed to sincere behavior. The effects are stronger in a loaded environment in which a “lie is labeled a lie”. Other studies report adverse or no effects of signatures. For example, the [Behavioural Insights Team \(2012\)](#) reported that moving a no-cheating declaration from the bottom to the top of a form to apply for a tax discount may have increased fraud, [Koretke \(2017\)](#) finds no significant effects of a declaration of honesty in a simple cheating game, and [Cagala et al. \(2019\)](#) demonstrate that asking students sign a no-cheating declaration before an exam increases plagiarism. In summary, the mixed evidence suggests that oaths and no-cheating declarations are tools that need to be designed very cautiously. Our paper is the first to substantiate this notion systematically: It uses a controlled environment to demonstrate that even small changes in the content of declarations can have the intended, but also unintended effects on cheating.<sup>6</sup>

Our paper also extends the literature demonstrating that restrictions can trigger so-called “boomerang effects”. For example, banning certain consumption goods can lead to higher demand for the restricted goods ([Mazis et al., 1973](#); [Faith et al., 2004](#)), prohibiting a specific activity tends to induce agents to engage in that activity ([Pennebaker and Sanders, 1976](#); [Reich and Robertson, 1979](#)), and policies against discrimination can induce negative attitudes towards the minority ([Vrugt, 1992](#)). While [Jacquemet et al. \(2018\)](#) mention reactance as a possible response to commitment requests, we are, however, not aware of any prior attempt to analyze if commitment requests can actively trigger reactance.

The structure of the paper is as follows. Section 2 introduces a conceptual framework, Section 3 describes the experimental design, Section 4 discusses the results, and Section 5 concludes.

## 2 Conceptual Framework

To structure the discussion of potential effects of commitments, we build on the simple conceptual framework for understanding cheating and lying behavior originally suggested by [Kajackaite and Gneezy \(2017\)](#). Particularly, we extend their framework to nest all the previously discussed explanations for negative and positive commitment effects. To that end, we first describe the utility function of an agent who faces a cheating decision and discuss how this function relates to the experimental design and our hypotheses.

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<sup>6</sup>We do not claim that the design of the no-cheating declaration explains the entire observed effect heterogeneity in the literature. For example, the effects of declarations might also vary across contexts.

Suppose an agent faces a binary decision to either cheat or not. She observes the state of nature  $t$  and then self-reports the state. The agent has two options. She can either report the true state  $t$  or report a false state  $t'$ . The monetary payoff from stating  $t$  is  $m_t$  and from reporting  $t'$  is  $m_{t'}$ . This results in a monetary benefit of cheating of  $m_{t'} - m_t > 0$ . With  $p(m_{t'}, m_t)$  denoting the perceived probability of punishment and  $s(m_{t'}, m_t)$  denoting the perceived sanction in case of detection, we capture the extrinsic cost of cheating by the expected sanction  $S[p(m_{t'}, m_t), s(m_{t'}, m_t)]$ . Comparing only the monetary payoff and the extrinsic cost of cheating, the agent will cheat whenever  $m_{t'} - m_t > S[p(m_{t'}, m_t), s(m_{t'}, m_t)]$ . This inequality illustrates the fundamental trade-off from [Becker's \(1968\)](#) model on the economics of crime: An agent cheats if the benefits of dishonesty outweigh the expected costs.

As previously discussed, the agent's decision may additionally depend on her intrinsic disutility of cheating. For example, a person might have a bad conscience if she realizes that she did not comply with her moral standards. We capture the disutility from not reporting truthfully by adding an intrinsic (psychological) cost of cheating  $0 \leq C_i \leq \infty$  to the agent's decision problem. Following [Kajackaite and Gneezy \(2017\)](#), we make the simplifying assumption that  $C_i$  is a fixed cost (i.e., it does not depend on the extent of cheating denoted by  $t' - t$  and  $m_{t'} - m_t$ ).

Finally, we extend the framework such that it incorporates psychological reactance. Assume the agent faces a situation in which an external request to report truthfully is activated, indicated by  $r = 1$ ; if such a request is not made, then  $r = 0$ . In the case of an external request, a reactant agent obtains an additional fixed intrinsic utility of cheating  $0 \leq R_i \leq \infty$ .<sup>7</sup> As discussed in the introduction, reactance makes cheating more attractive and reflects the psychological benefit of regaining one's freedom of choice by not reporting truthfully under a request to tell the truth. Note that we allow for heterogeneity in  $C_i$  and  $R_i$ . Putting the extrinsic and intrinsic costs and benefits of cheating together, the agent will not report truthfully if

$$m_{t'} - m_t - S[p(m_{t'}, m_t), s(m_{t'}, m_t)] - C_i + R_i \cdot 1\{r = 1\} > 0, \quad (1)$$

where  $1\{\cdot\}$  is an indicator function.

Equation (1) summarizes our discussion on the channels through which commitment requests can affect cheating. On the one hand, commitment requests may increase the intrinsic disutility of cheating  $C_i$ . On the other hand, reactant agents derive additional intrinsic utility from cheating  $R_i$ , if they are requested to commit

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<sup>7</sup>As we discuss in Section 4, the specification with two separate variables,  $C_i$  and  $R_i$ , is supported by the data. In particular, the data suggest that the intrinsic cost of cheating is uncorrelated with the subjects' reactance type.

to truthful reporting. Different forms of commitment requests can thus lead to more or less cheating, depending on how sharply  $C_i$  and  $R_i$  are shifted.<sup>8</sup>

## 3 Experimental Design

### 3.1 The Basic Cheating Game

We implemented a simple cheating game (a) to examine whether we can replicate the result that commitment requests can increase honesty and (b) to test whether freedom-restricting forms of commitment requests backfire. Before we introduce our treatments, we first present the basic cheating game that follows the computerized experiment of [Abeler et al. \(2019\)](#).<sup>9</sup>

The design was as follows ( $N = 303$ ): After subjects entered the laboratory, the experimenter informed them that the session consisted of two parts: a survey and a short experiment. In the first part, subjects received a payoff of € 4 for answering a 15-minute survey on the German inheritance tax schedule.<sup>10</sup> We added this part to the experiment for two reasons. First, by placing other elements before the cheating decision, we followed the standard experimental protocol in the literature (see, e.g., [Fischbacher and Föllmi-Heusi, 2013](#); [Kajackaite and Gneezy, 2017](#)). Second, and more importantly, we included this survey to introduce our commitment requests more naturally and mitigate experimenter demand effects. The experimenter placed the form to be signed by the subjects at the subjects' workplaces before they entered the laboratory and reminded them to sign the "declaration concerning the behavioral rules in the laboratory" right at the beginning of the session. We therefore connected the commitment to the entire session rather than to the cheating experiment.

At the beginning of the session's second part, the participants read instructions presented on the computer screen (see the Appendix). The instructions informed subjects that the experiment would start with a computerized random draw of a number between one and six that they would have to self-report. Subjects also

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<sup>8</sup>Conditional on the setting and the specific form of the declaration of compliance, commitment requests might also change the expected sanction  $S[\cdot]$ . We discuss this issue when introducing the experimental design.

<sup>9</sup>We would like to thank [Abeler et al. \(2019\)](#) for providing code to replicate the computerized draw in their experiment. The experiment took place between May and December 2017 in the Laboratory for Experimental Research, Nuremberg. The Sessions lasted 45 minutes, including time for the subjects' payment. The average participants earned € 11.6, including the show-up fee. We programmed the experiment with z-Tree ([Fischbacher, 2007](#)) and recruited subjects with ORSEE ([Greiner, 2015](#)).

<sup>10</sup>See [Glogowsky \(2018\)](#) for a detailed description of the questions.



learned from the instructions that their additional payoff (i.e., the payoff in addition to the fixed payment for participating in the survey) would be € 5 if they reported a 5 and zero if they reported a number from the set {0, 1, 2, 3, 4, 6}.

The computerized random draw simulated the process of drawing a chip from an envelope. Subjects first saw an envelope containing six chips numbered between one and six on their screen (see the Appendix for screenshots). Subjects then clicked a button to start the draw. The chips were shuffled for a few seconds, and one randomly selected chip fell out of the envelope. On the next screen, subjects were asked to report their draw by entering the number into a field on the screen.<sup>11</sup> After subjects had reported their number, the experimenter called the participants by their computer number and paid them anonymously for all parts of the session.

The fact that we computerized the random draw makes cheating observable at an individual level. This design element comes with the benefit of a much higher statistical power compared to approaches that identify cheating by evaluating the empirical distribution of self-reports against the expected distribution under truthful reporting (see, e.g., [Fischbacher and Föllmi-Heusi, 2013](#)). If individuals believed that the instructions correctly described the experimental conditions, the expected (immediate) monetary sanction should nevertheless be zero. That is because we neither included a monetary punishment for cheating nor communicated a positive probability of such a punishment. Instead, the instructions highlighted that a subject's payoff depended exclusively on the reported number.

We complemented the experimental data with survey data to elicit psychological reactance as a fundamental human trait. The survey-based standard measure for a subject's reactance type, which we also use in this paper, is Hong's Psychological Reactance Scale ([Hong, 1992](#); [De las Cuevas et al., 2014](#)). The scale consists of 14 statements that approximate the degree to which one person shows reactance. For instance, one statement is "regulations trigger a sense of resistance in me", and another one reads "when someone forces me to do something, I feel like doing the opposite".<sup>12</sup> To record the answers, we used a 5-point Likert Scale with higher (lower) values indicating stronger agreement (disagreement).

Importantly, to avoid spillovers between survey responses and behavior, we collected the survey data several days before the experiment. The procedure of survey data collection was as follows. Six days before a session, the subjects who had registered for the experiment also received an invitation to take part in an online survey. Participants had 48 hours to answer the questionnaire, and we reminded subjects

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<sup>11</sup>Before reporting their draw, subjects could also click a button to show the instructions and the payoff structure again. They could also click a button to display the result of the random draw again.

<sup>12</sup>See the Appendix for full list of statements.



who had not completed the survey a few hours before the deadline. Answering the online survey took about five minutes. Participants received a fixed payoff of €2 for taking part.<sup>13</sup>

### 3.2 Commitment Treatments and Hypotheses

We use the basic cheating game as a CONTROL condition. The treatment conditions differed from the CONTROL condition in that subjects signed a declaration right after they entered the laboratory and took their seats. The paper with the declaration displayed a short preamble highlighting that experiments at the Laboratory for Experimental Research Nuremberg are subject to certain behavioral standards and/or rules. Below the preamble, the paper included a brief declaration. As described in the following, we experimentally varied the content of the declaration and evaluated the impact of this variation on cheating behavior. One of the declarations was morally loaded. Others had a more restrictive character and varied the degree to which reactance was expected to be activated. A common feature of the different declarations was that, by signing, subjects expressed commitment that they would behave in a certain way during the experiment.

We call our first treatment the ETHICAL STANDARD condition. This treatment followed the idea that an effective no-cheating declaration has two central properties. On the one hand, the treatment makes ethics salient (Mazar *et al.*, 2008; Shu *et al.*, 2011) or increases cheating costs through one of the other previously discussed channels (Ellingsen and Johannesson, 2004; Gneezy, 2005; Charness and Dufwenberg, 2006). On the other hand, the treatment is not communicating behavioral restrictions that could trigger reactance. In this vein, in the ETHICAL STANDARD treatment, the declaration that followed the preamble<sup>14</sup> highlighted the general principle of ethically sound behavior without explicitly restricting the subjects' behavior. It read: "*I hereby acknowledge the principles of ethically sound behavior.*" Assuming that this declaration fulfills the two central properties of an effective commitment request, our first hypothesis is:

**Hypothesis 1.** *Signing a non-restricting declaration to behave ethically sound decreases cheating.*

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<sup>13</sup>91.4% of the invited students did complete the survey in time. The participation rate was balanced across treatment groups.

<sup>14</sup>The preamble read "The Laboratory for Economic Research Nuremberg (LERN) adheres to the ethical standards that were defined, e.g., by the German Research Foundation. One of the principles of ethically sound behavior is that data and findings must not be falsified. Today's experiment is subject to the stated standards."

In the second treatment condition, called NEUTRAL, the declaration that followed the preamble<sup>15</sup> read: *“I hereby declare that I will not violate the rules described in the instructions.”* In contrast to the ETHICAL STANDARD condition, the declaration was neutral in the sense that it did not refer to any ethically loaded norm. We, therefore, expect this treatment to make ethics less salient and to be a weaker reminder of the norm not to cheat. Consequently, we hypothesize that the NEUTRAL treatment reduces cheating less than the ETHICAL STANDARD treatment. At the same time, the declaration contained an explicit restriction and requested a commitment to behave according to a given set of rules. Given that the instructions required subjects to “enter the drawn number into the field provided for this purpose”, the treatment explicitly asked subjects to report a specific number honestly. Because of the more restrictive nature of this declaration, we expect that the NEUTRAL treatment more likely provokes psychological reactance. The second hypothesis is:

**Hypothesis 2.** *Signing a declaration to behave in accordance with an ethically neutral rule will not decrease cheating.*

The third treatment condition was SANCTION.<sup>16</sup> Subjects signed a declaration that read: *“I hereby declare that I will not violate the rules described in the instructions. Violating the rules can lead to exclusion from future experiments.”* Hence, this declaration included one additional sentence relative to the NEUTRAL treatment, highlighting the potential sanction in the case of non-compliance. We designed the declaration following the fact that reactance is believed to increase with the severity of the threat (Pennebaker and Sanders, 1976; Brehm and Brehm, 1981; Miron and Brehm, 2006; Steindl et al., 2015). That is because, by increasing the threat level, it becomes more salient that the freedom to choose is at risk. According to the theory of psychological reactance, harsher threats also make people feel uncomfortable, hostile, and angry, motivating them to exhibit the restricted behavior or force the threatening party to remove the threat (Brehm, 1966; Brehm and Brehm, 1981; Dillard and Shen, 2005; Rains, 2013).

One potential side effect of such a declaration is that it might also have altered how subjects interpreted the content of the instructions regarding a possible sanc-

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<sup>15</sup>The preamble read “At the Laboratory for Economic Research Nuremberg (LERN), subjects participating in experiments have to adhere to certain rules. One of the rules requires subjects to follow the behavioral guidelines provided in the instructions for the experiment. Please sign the following declaration referring to this rule.”

<sup>16</sup>The preamble was identical to the one in the NEUTRAL treatment.

tion for giving a false report of the drawn number.<sup>17</sup> Importantly, as long as the expected sanction increased, this works against the identification of a reactance effect. In summary, we expect the commitment in the SANCTION treatment to trigger a strong reactance response. Our third hypothesis, therefore, is:

**Hypothesis 3.** *Under the threat of being sanctioned, signing a declaration to behave in accordance with an ethically neutral rule will increase cheating.*

## 4 Results

We discuss the results of the laboratory experiment in two steps. First, we report how our treatments affect cheating. Second, we discuss the treatment-effect heterogeneity in the subjects' reactance type.

### 4.1 Average Treatment Effects

Figure 1 displays the percent of cheaters per treatment group. The figure is based on all the subjects who did not draw a five and hence were able to cheat.<sup>18</sup> Column (1) in Table A1 presents the results for the corresponding regressions (see the Appendix). In the CONTROL group, 27.7 percent of the individuals who could cheat did so by falsely reporting a five. Because we did not implement any form of commitment in the CONTROL group, this value approximates the share of cheaters in the absence of commitment effects. As one can see in the figure, the subjects' behavior in the treatment groups was substantially different from the behavior of CONTROL-group subjects. A comparison of the first two bars in the figure further shows that commitment to an ethically charged norm reduced cheating. In our setting, the ETHICAL STANDARD treatment reduced the share of cheaters to 11.6 percent, a decrease of 16.1 percentage points (or 58 percent) relative to the CONTROL group ( $p$ -value = 0.032, OLS regression with heteroscedasticity robust standard errors). Thus, our experimental data support Hypothesis 1, hypothesizing that signing a declaration to behave ethically decreases cheating.

<sup>17</sup>As discussed earlier, the instructions clearly stated that subjects would receive the additional payoff if reporting a five. Hence, the instructions did not entail any signal that giving a false report would trigger monetary punishments. However, we cannot preclude that the SANCTION treatment triggered a higher perceived risk of exclusion from future experiments in case of a false report.

<sup>18</sup>The share of participants who drew a five was equal to 16.5 percent and balanced across treatments.

The remaining treatment differences displayed in Figure 1 are very different from the effect of the ETHICAL STANDARD treatment. Turning to the NEUTRAL commitment, the share of cheaters was 36.5 percent, more than three times the share in the ETHICAL STANDARD conditions. The share of cheaters who signed a NEUTRAL commitment is not statistically different compared to the CONTROL group, however ( $p$ -value = 0.269). We thus find support for Hypothesis 2, stating that signing a declaration to behave in accordance with an ethically neutral rule does not decrease cheating.

Finally, the rightmost bar in Figure 1 demonstrates that the share of cheaters in the SANCTION treatment was 46.5 percent; i.e., 18.8 percentage points or 67.9 percent higher than in the CONTROL group ( $p$ -value = 0.022). This finding is in line with Hypothesis 3, stating that under the threat of being sanctioned, signing a neutral no-cheating declaration increases cheating. We conclude that the content of a commitment request matters: Although subjects in all the treatment groups express their commitment by signing a declaration of compliance, the effects differ. While an ethically charged form of commitment decreases cheating, commitment to a no-cheating declaration that threatens to punish triggers more cheating.

The reported findings are robust to several controls such as age, gender, nationality, student status, familiarity with similar games, and personal experience with similar games. Table A1 in the Appendix presents the results. Regressing an indicator for cheating on treatment indicators and control variables, the effect of the ETHICAL STANDARD treatment relative to CONTROL group stays unaffected (effect size = 0.161;  $p$ -value = 0.036). The effect of the NEUTRAL treatment increases slightly from 0.088 (without controls) to 0.095 (with controls), but it remains statistically insignificant ( $p$ -value = 0.229). The impact of the SANCTION treatment increases from 0.188 to 0.227 and becomes even more significant ( $p$ -value < 0.01). The results are also robust to using Probit models or Mann-Whitney-U-Tests.

## 4.2 Heterogeneity in Individuals' Reactance Type

Given the previous evidence in the literature that reactance is a crucial psychological force shaping individuals' choice behavior, reactance is a plausible candidate to explain why commitment backfires.<sup>19</sup> Our strategy to gather evidence on whether

<sup>19</sup>Of course, one could also think of different explanations. One prominent alternative is motivational crowding out along the lines of Deci (1971), which can be interpreted as a decrease in an individual's intrinsic cost of cheating  $C_i$ . Under motivational crowding, an extrinsic motivator (e.g., the declaration) undermines an individual's intrinsic motivation to behave honestly. In terms of our conceptual framework, the psychological cost of cheating is reduced, possibly because an individual feels that her intrinsic motivation to report honestly is not acknowledged. Compared to psychologi-

psychological reactance is a relevant channel through which commitment affects cheating behavior is to measure a subject’s general reactance type and to evaluate the effects of our treatments conditional on the magnitude of this personal trait. If reactance explains the individuals’ cheating behavior, we expect stronger adverse effect for individuals who are particularly prone to “pushing back” if their freedom of choice is restricted.

Figure 2 presents the findings. The Panels A1 to A4 consider each treatment separately and show how the subjects’ cheating behavior is related to an index measuring reactant behavior (higher scores indicate more reactant types; see De las Cuevas *et al.*, 2014).<sup>20</sup> Each panel contains the results of the following linear probability model that regresses an indicator for lying  $L_i$  on a third-order polynomial of the reactance score  $\phi_i$ :<sup>21</sup>

$$L_i = \sum_{j=0}^3 \beta_j \cdot (\phi_i)^j + u_i. \quad (2)$$

The graphs in the Panels A1 to A4 display the empirical fraction of cheaters (bubbles) and the fraction of cheaters predicted by the model (red lines) for each realized score value. They also show the 95% confidence bands.

We note that the models fit the data well and that there are obvious patterns. Three observations stand out. First, the graph for the CONTROL group (Panel A1) shows that in the absence of a commitment, the cheating behavior did not correlate with the reactance score: Subjects with high reactance scores showed a cheating behavior that was similar to the cheating behavior of subjects with low scores. Hence, to the extent that differences in the cheating behavior between subjects reflect heterogeneity in the intrinsic cost of cheating  $C_i$ , Panel A1 suggests that the intrinsic cheating costs were uncorrelated with the subjects’ reactance type. This observation supports the previously made theoretical assumption that the intrinsic utility of cheating due to reactance (captured by  $R_i$ ) and the intrinsic cheating costs (captured by  $C_i$ ) are independent terms in the utility function (see Subsection 2). Second, Panel A2 demonstrates that the cheating behavior under the ethically charged

cal reactance, individuals do not perceive that their freedom (to cheat) is restricted or that a policy aims at restricting it.

<sup>20</sup>Given that the laboratory experiment captured cheating behavior, we focus on an index measuring reactant *behavior*. To calculate the score, we followed the factor analysis of De las Cuevas *et al.* (2014) and averaged over the subjects’ answers to eight of the fourteen statements that are part of the survey. The Appendix includes a list of all fourteen statements and indicates which statements we used to calculate the reactance score. Figure A1 in the Appendix also provides a summary of the main results for an index that uses all fourteen statements. This robustness check confirms our findings.

<sup>21</sup>Changing the order of the polynomial does not affect our results qualitatively. For example, Figure A2 in the Appendix presents the results for a second-order polynomial regression.

commitment was also unrelated to the subjects' reactance type. Third, in both the NEUTRAL and SANCTION treatment, we observe a markedly different pattern pointing to a positive correlation between lying and the subjects' reactance score (Panels A3 and A4). We find indications that under commitment to a neutral norm, reactance *did* matter for truthful reporting. Also note that in the SANCTION treatment, the share of cheaters among subjects at the top of the distribution of the reactance score was close to 100 percent.

The Panels B1 to B3 in Figure 2 show how the reported treatment-specific heterogeneity also translates into heterogeneous treatment effects. To this end, we compare each of the treatments to the CONTROL group separately. The corresponding linear probability model is:

$$L_i = \sum_{j=0}^3 \beta_j \cdot (\phi_i)^j + \sum_{j=0}^3 \gamma_j \cdot (\phi_i)^j \times T_i + u_i, \quad (3)$$

where  $T_i$  is an indicator for the ETHICAL STANDARD, the NEUTRAL, or the SANCTION treatment.<sup>22</sup>

Panel B1 highlights the impact of the ETHICAL STANDARD treatment as a function of the reactance score. We do not find any discernible heterogeneity in the treatment effect. Thus, how commitment to an ethically charged norm affects a subject's cheating behavior is not systematically related to her reactance type. By contrast, the Panels B2 and B3 document a systematic form of heterogeneity. The NEUTRAL treatment (Panel B2) did not affect the cheating behavior of subjects with low or moderately high reactance scores; however, for subjects with very high reactance levels, a neutral commitment sharply increases probability of lying. At the top of the reactance score distribution, our estimate of the treatment effect is in the range of 50 percentage points. Turning to the impact of the SANCTION treatment (Panel B3), we find a similar but even more pronounced pattern. The effects for the most reactant types are also more extreme: At the top of the reactance score distribution, a neutral commitment that points subjects to a sanction increases the probability of lying by more than 50 percentage points. Given that the average share of cheaters was less than 30 percent in the CONTROL group, this is a substantial upward shift in subjects' probability of cheating.

Taken together, the Figures 1 and 2 establish the following set of findings. First,

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<sup>22</sup>The treatment-effect heterogeneity would show a causal mechanism (working via reactance) if the direct effect of commitment on cheating (i.e., the impact not running via reactance) was independent of a subject's reactance type. See the causal mechanism literature for a discussion of this assumption (e.g., Baron and Kenny, 1986; Imai *et al.*, 2011). Because this assumption cannot be tested, we interpret our results as suggestive evidence.

using the ETHICAL STANDARD treatment, we demonstrate that an ethically charged form of requesting commitment can strongly reduce cheating. Second, we show that, on average, commitment to an ethically neutral norm does not reduce cheating. Third, combining a commitment to a neutral norm with an additional stronger reactance trigger results in more cheating relative to the CONTROL group with no commitment. Fourth, the adverse effect of the SANCTION treatment on truthful reporting is driven by the subgroup of subjects with high reactance scores. While the evidence from our laboratory experiment does not provide ultimate proof for a causal mechanism, the patterns in the data strongly suggest that the differences in how subjects responded to the treatments are in fact due to psychological reactance.

## 5 Conclusion

Universities, firms, and public institutions frequently require individuals to commit to truthful reporting. A common implementation of such commitment requests is to let individuals sign a no-cheating declaration. In this paper, we use a laboratory experiment to test how different types of commitment requests affect truthful reporting. The requests we study range from a morally charged declaration of compliance to a morally neutral declaration highlighting restrictions on the signers' behavioral freedom.

The evidence from our experiment demonstrates that commitment requests can have vastly diverging effects. While a commitment to a morally charged declaration decreases misreporting, a commitment to a neutral declaration that threatens to punish backfires and leads to more cheating. One potential explanation why commitment backfires is psychological reactance, which predicts that individuals tend to engage in restricted activities to regain their behavioral freedom ([Brehm, 1966](#)). In this vein, we also present evidence of reactance as a channel through which commitment affects cheating. Particularly, we demonstrate that the adverse effect of a commitment request is driven by subjects whom we classify as being highly reactant. While this piece of evidence is not an ultimate test of causality, the patterns in the data strongly suggest that reactance indeed explains why commitment backfires.

In a nutshell, our findings show that commitment requests can have beneficial but also quite damaging effects on people's honesty. Whether firms and institutions can improve truth-telling by requesting commitment depends on thoughtful implementation of the request. Most importantly, when designing no-cheating declarations, practitioners should carefully avoid including direct threats that might trigger deliberate non-compliance with the rules in question.



## References

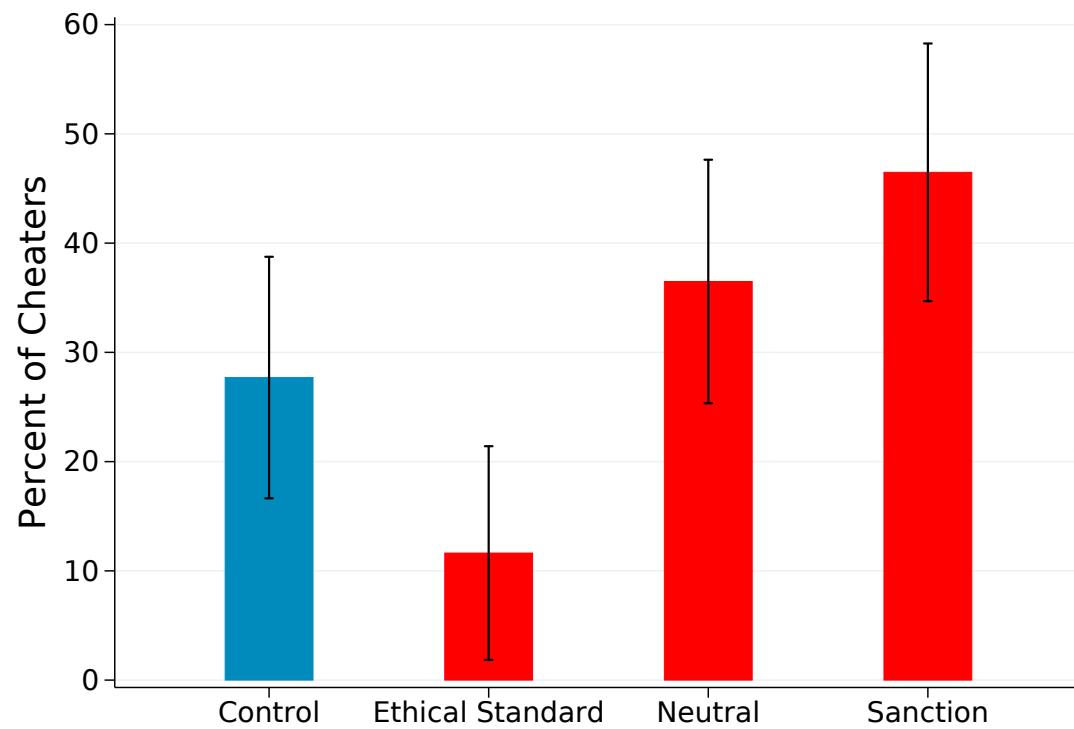
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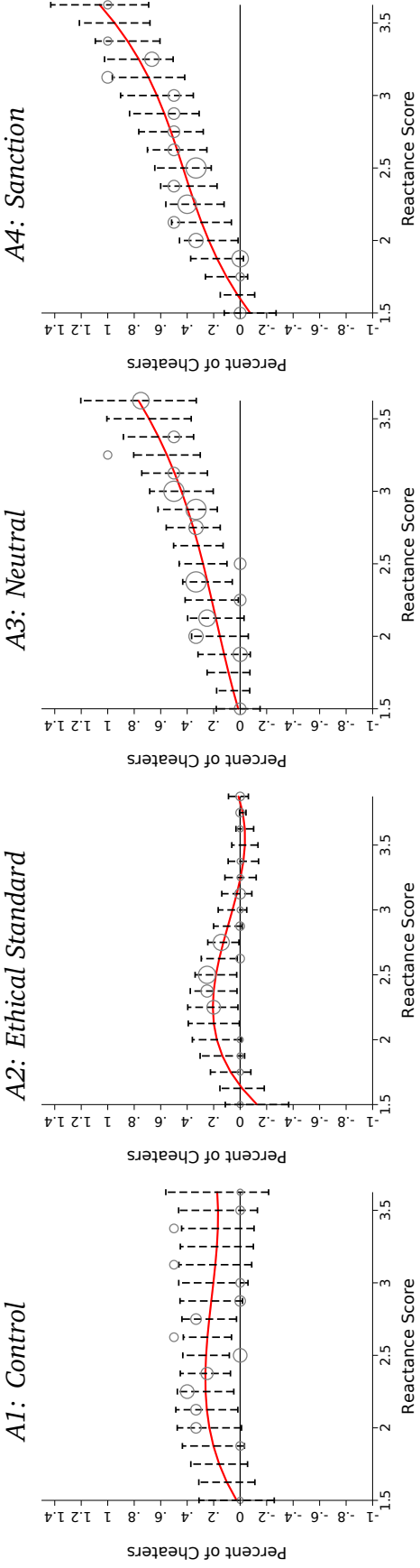
Figure 1: Cheating Behavior by Treatment



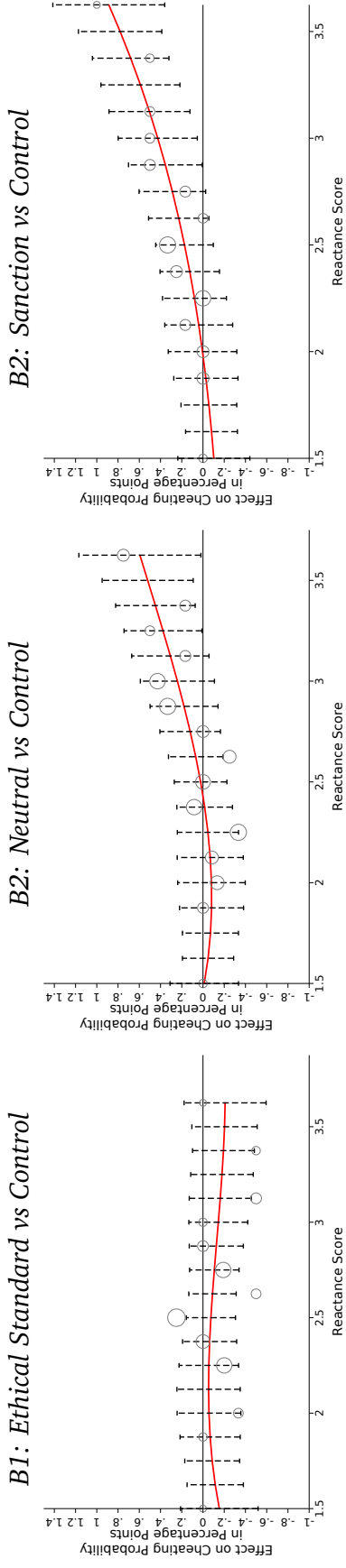
**Notes:** This figure shows the percent of individuals who cheat in the ETHICAL STANDARD treatment ( $N = 43$ ), the CONTROL group ( $N = 65$ ), the NEUTRAL treatment ( $N = 74$ ), and the SANCTION treatment ( $N = 71$ ). We focus on individuals who did not draw a five and hence could cheat. The figure also includes 95% confidence intervals for a linear probability model with robust standard errors.

Figure 2: Cheating Behavior and Psychological Reactance

### A: Treatment-Specific Cheating Behavior



### B: Heterogeneous Treatment Effects



**Notes:** This figure shows how cheating behavior relates to subjects' reactance score. Panels A1-A4 show the empirical fraction of cheaters (bubbles) and the predicted fraction of cheaters (red lines) by group, conditional on the reactance score. The underlying linear probability model is  $L_i = \sum_{j=0}^3 \beta_j \cdot (\phi_i)^j + u_i$ , where  $L_i$  is an indicator for lying, and  $\phi_i$  is a subject's reactance score. The Panels B1-B3 display heterogeneous treatment effects (relative to the control group) for the ETHICAL STANDARD, the NEUTRAL, and the SANCTION treatment, respectively. The bubbles represent empirical differences between treatments, and the red lines indicate the treatment effects obtained from the linear probability model  $L_i = \sum_{j=0}^3 \beta_j \cdot (\phi_i)^j + \sum_{j=0}^3 \gamma_j \cdot T_i \times (\phi_i)^j + u_i$ , where  $T_i$  is an indicator for the respective treatment. The spikes indicate 95% confidence bands (Huber-White standard errors).

# **Online Appendix**

**(not for publication)**



Table A1: Effects of the Commitment Treatments on Cheating

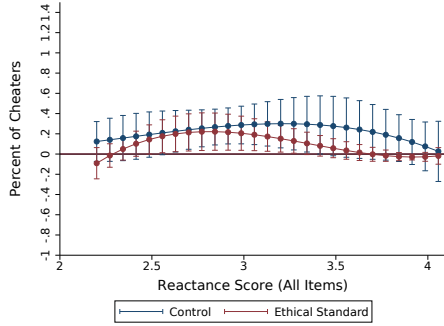
	Dependent Variable: Indicator for Cheating				(5) Mann-Whitney U-Test
	(1) OLS Estimates	(2) OLS Estimates	(3) Probit Estimates	(4) Probit Estimates	
Ethical Standard	−0.161 [0.032]	−0.161 [0.036]	−0.205 [0.041]	−0.208 [0.038]	[0.047]
Neutral	0.088 [0.269]	0.095 [0.229]	0.084 [0.266]	0.086 [0.241]	[0.271]
Sanction	0.188 [0.022]	0.227 [0.004]	0.172 [0.020]	0.207 [0.003]	[0.024]
Controls		✓		✓	
Share of Cheaters in Control Group			0.277		
Number of Obs. in Regressions			253		

**Notes:** This table reports the effects of the ETHICAL STANDARD (Row 1), NEUTRAL (Row 2), and SANCTION treatment (Row 3) relative to the CONTROL group. We derive these estimates by regressing an indicator for cheating on all three treatment dummies. Columns 1 and 2 report the coefficients of OLS models; Columns 3 and 4 report marginal effects for Probit models. Columns 2 and 4 also include the following control variables: gender dummy, age, German-nationality dummy, student dummy, dummy for participants who reported that they know the game, dummy for participants who reported that they played a cheating game in the past. We report heteroscedasticity-robust  $p$ -values in [brackets]. Column 3 also reports  $p$ -values for Mann-Whitney-U-Tests.

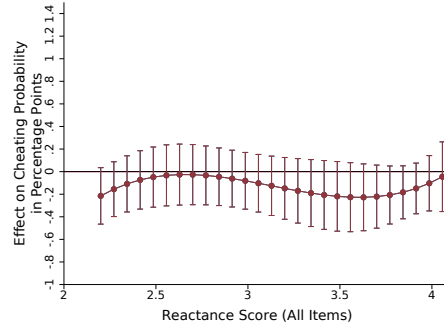
Figure A1: Cheating Behavior and Reactance (Score Includes All Items)

**A: Ethical Standard vs Control**

*A1: Predicted Fraction of Cheaters*

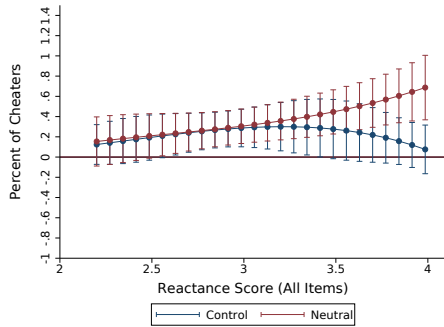


*A2: Treatment Effect*

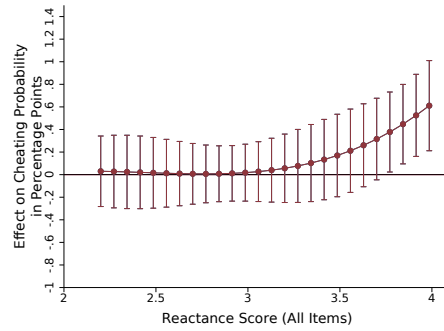


**Neutral vs Control**

*B1: Predicted Fraction of Cheaters*

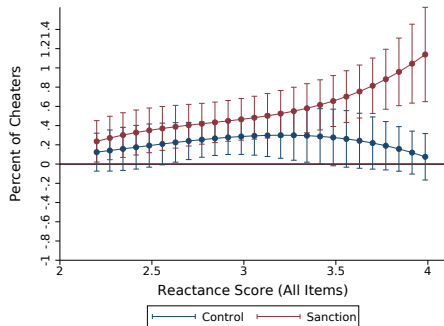


*B2: Treatment Effect*

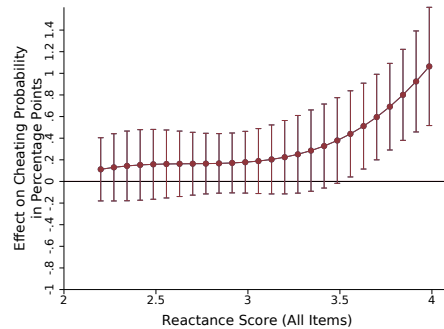


**Sanction vs Control**

*C1: Predicted Fraction of Cheaters*



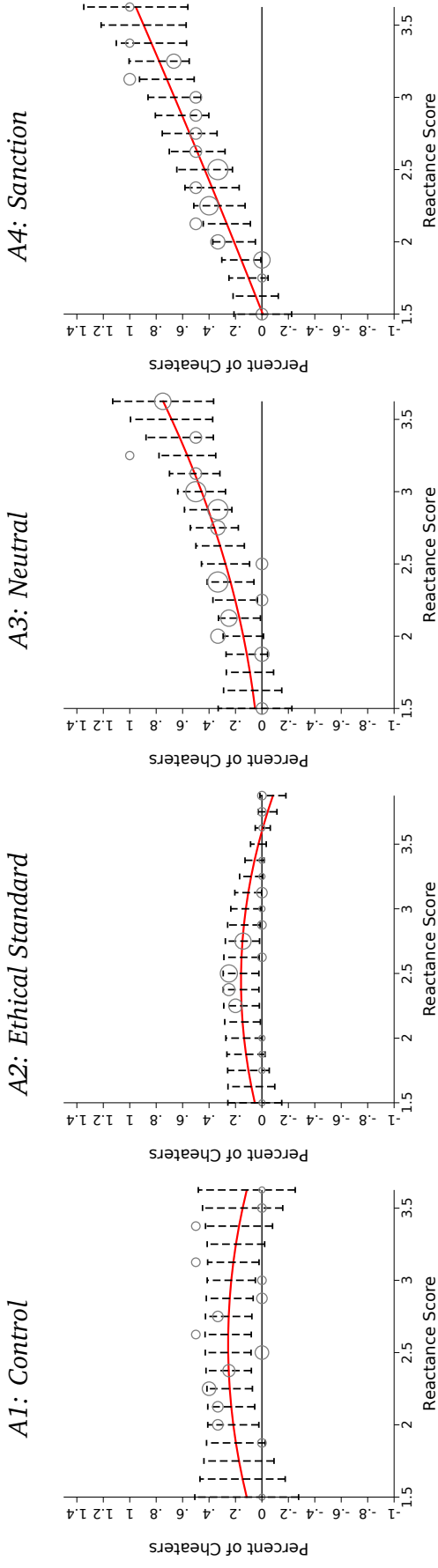
*C2: Treatment Effect*



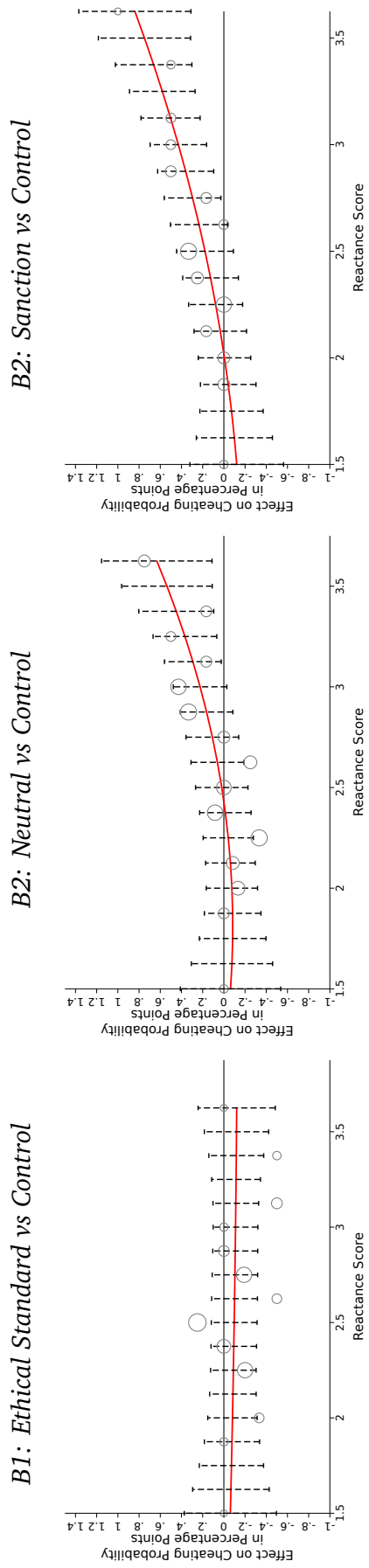
**Notes:** This figure shows how cheating relates to the subjects' reactance score. We calculate the score by averaging over all items of the Hong's Psychological Reactance Scale (Hong, 1992). Panel A compares ETHICAL STANDARD and CONTROL; Panel B contrasts NEUTRAL and CONTROL; Panel C compares SANCTION and CONTROL. The right-hand panels show heterogeneous treatment effects obtained from the linear probability model  $L_i = \sum_{j=0}^3 \beta_j \cdot (\phi_i)^j + \sum_{j=0}^3 \gamma_j \cdot (\phi_i)^j \times T_i + u_i$ .  $L_i$  is an indicator for lying,  $\phi_i$  is a subject's reactance score, and  $T_i$  is an indicator for the respective treatment. The left-hand panels depict the treatment-specific predictions of the same model. The models use Huber-White standard errors and the figure includes 95% confidence bands.

Figure A2: Cheating Behavior and Reactance (2<sup>nd</sup> Order Polynomial)

### A: Treatment-Specific Cheating Behavior



### B: Heterogeneous Treatment Effects



**Notes:** This figure shows how cheating behavior relates to the subjects' reactance score. The Panels A1-A4 show the empirical fraction of cheaters (bubbles) and the predicted fraction of cheaters (red lines) by group, conditional on the reactance score. The underlying linear probability model is  $L_i = \sum_{j=0}^2 \beta_j \cdot (\phi_i)^j + u_i$ , where  $L_i$  is an indicator for lying, and  $\phi_i$  is a subject's reactance score. The Panels B1-B3 display heterogeneous treatment effects (relative to the control group) for the ETHICAL STANDARD, the NEUTRAL, and the SANCTION treatment, respectively. The bubbles represent empirical differences between treatments, and the red lines indicate the treatment effects obtained from the linear probability model  $L_i = \sum_{j=0}^2 \beta_j \cdot (\phi_i)^j + \sum_{j=0}^2 \gamma_j \cdot (\phi_i)^j \times T_i + u_i$ , where  $T_i$  is an indicator for the respective treatment. The models use Huber-White standard errors and the figure includes 95% confidence bands.

## Instructions (Screen 1)

Thank you for participating in today's experiment!

Please read the instructions carefully. For completing the online survey, you will receive 2 Euro. The show-up fee is 4 Euro. For answering the questionnaire, you will receive 5 Euro (first part of today's session). There is a possibility to earn another 5 Euro in the following experiment (second part of today's session).

Your entire earnings will be paid to you in cash at the end of the second part of the experiment. Also note that this is a computer-based experiment. The data will be analyzed anonymously.

## Instructions (Screen 2)

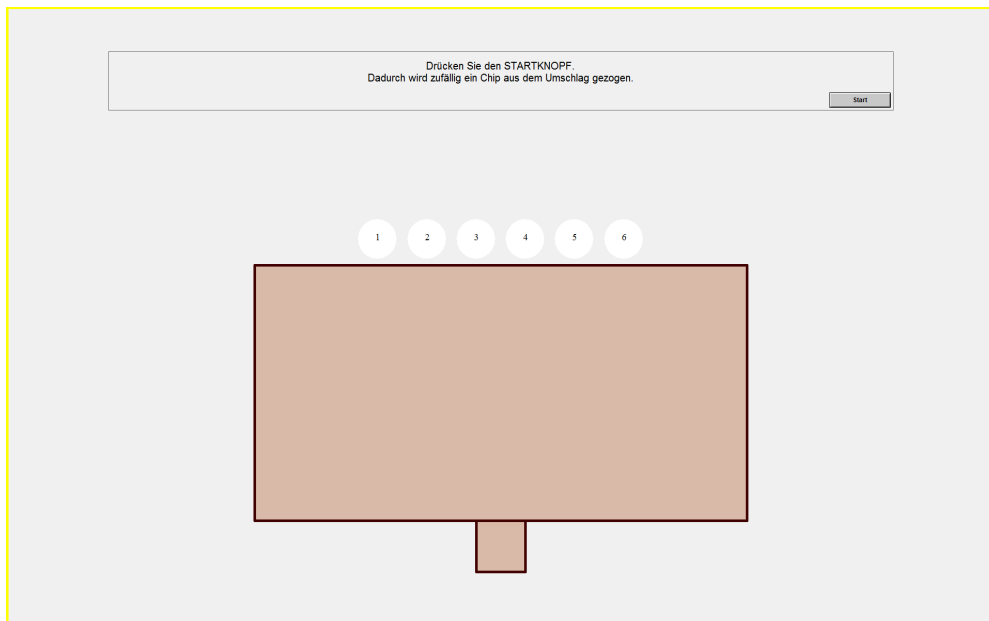
Please read the instructions carefully. When you have finished reading the instructions, click the CONTINUE button.

You will then see **six chips** with the numbers **1, 2, 3, 4, 5, and 6**. Click the START button. The chips will be placed in the envelope. The envelope will be shuffled a couple of times. Then one of the chips will be drawn randomly, and this particular chip will fall out of the envelope.

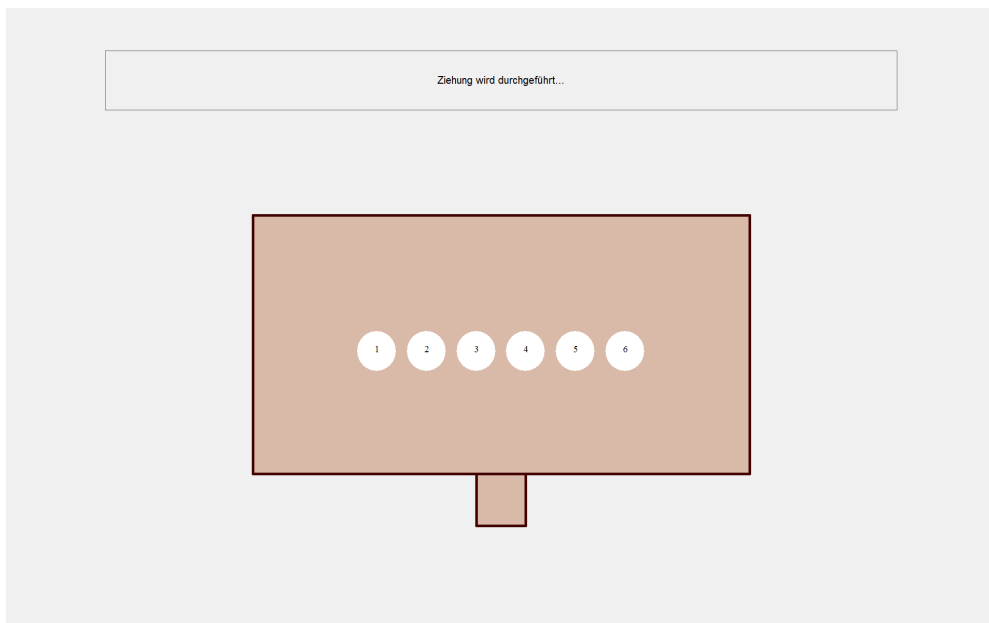
Please enter the number you have drawn into the field provided for this purpose. You will receive **0 Euro** if you enter the numbers **1, 2, 3, 4, or 6**. You will receive **5 Euro** if you enter a **5**. That is, if you fill in a **5**, you will receive an additional payoff of **5 Euros**; you will **not receive** any additional payoff if you fill in **any other number**.

Once you have entered your number, you will receive your payoff anonymously.

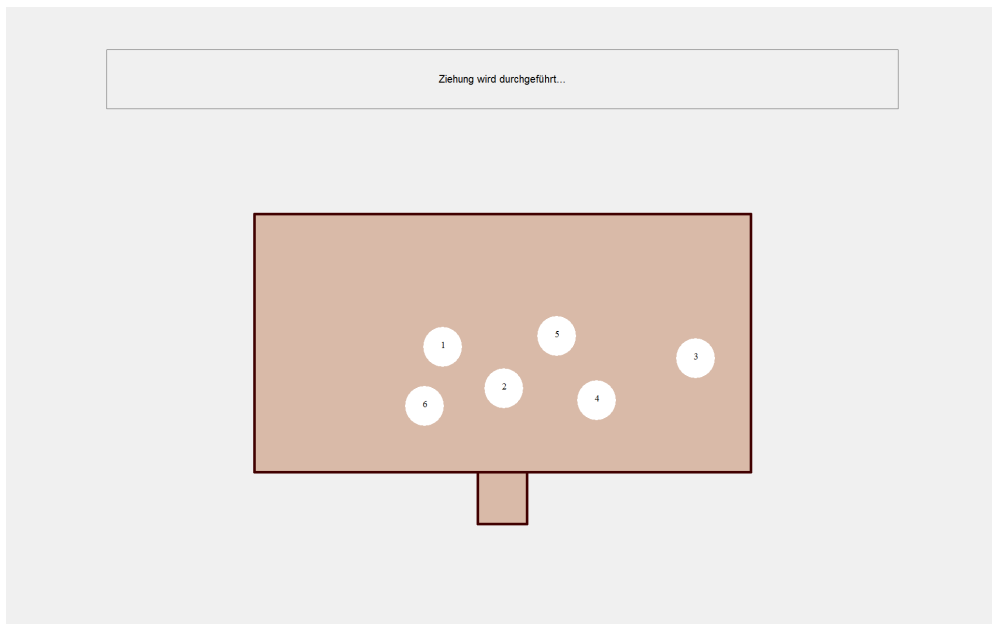
## Six chips above envelope



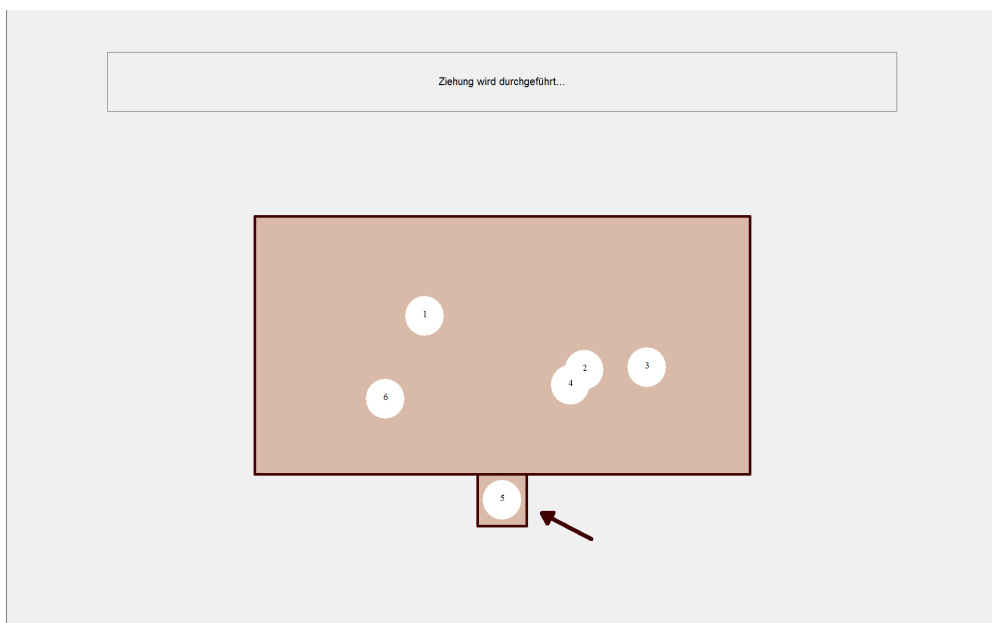
## Six chips in envelope



## Chips are shuffled



## One chip falls out of the envelope



## Subjects report number

**Ihre gezogene Zahl**

*Bitte tragen Sie die Zahl ein, die Sie gezogen haben.*

Gezogene Zahl:

[Instruktionen erneut anzeigen](#) [Gezogene Zahl erneut anzeigen](#) [Weiter](#)



## **Psychological Reactance Scale (Hong, 1992)**

The following statements concern your general attitudes. Read each statement and please indicate how much you agree or disagree with each statement. If you strongly agree, mark a 5. If you strongly disagree, mark a 1. If the statement is more or less true of you, find the number between 5 and 1 that best describes you. There are no right or wrong answers. Just answer as accurately as possible.

### **Behavioral and Cognitive Component (De las Cuevas *et al.*, 2014)**

1. Regulations trigger a sense of resistance in me.
2. I find contradicting others stimulating.
3. When something is prohibited, I usually think, "That's exactly what I am going to do."
4. I consider advice from others to be an intrusion.
5. Advice and recommendations usually induce me to do just the opposite.
6. I am content only when I am acting of my own free will.
7. I resist the attempts of others to influence me.
8. When someone forces me to do something, I feel like doing the opposite.

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### **Affective Component (De las Cuevas *et al.*, 2014)**

9. The thought of being dependent on others aggravates me.
10. I become frustrated when I am unable to make free and independent decisions.
11. It irritates me when someone points out things, which are obvious to me.
12. I become angry when my freedom of choice is restricted.
13. It makes me angry when another person is held up as a role model for me to follow.
14. It disappoints me to see others submitting to standards and rules.