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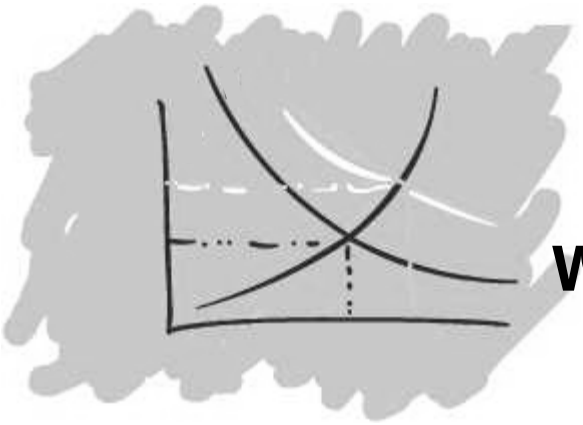

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Do Economists Lie More?

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Do Economists Lie More?

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Abstract: Recent experimental evidence suggests that some people dislike telling lies, and tell the truth even at a cost. We use experiments as well to study the socio-demographic covariates of such lie aversion, and find gender and religiosity to be without predictive value. However, subjects' major is predictive: Business and Economics (B&E) subjects lie significantly more frequently than other majors. This is true even after controlling for subjects' beliefs about the overall rate of deception, which predict behavior very well: Although B&E subjects expect most others to lie in our decision problem, the effect of major remains. An instrumental variables analysis suggests that the effect is not simply one of selection: It seems that studying B&E has a causal impact on behavior.

Keywords: Communication, honesty, lie aversion, major, norms.
JEL Classification: C70, C91, D03, D64.

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1. Introduction

A recent experimental literature shows that people often tell the truth, even at some personal cost (Gneezy, 2005; Fischbacher and Heusi, 2008, Erat and Gneezy, 2009; Lundquist et al., 2009). This evidence contrasts with the standard homo economicus view that all agents are self-interested money-maximizers, and suggests that people's preferences in this regard are significantly more complex. In particular, it has been suggested that some people have a preference for being honest and dislike lying (e.g., Ellingsen and Johannesson, 2004; Kartik, 2009; López-Pérez, forthcoming). An ability to predict such incentives would be of great benefit in many economic settings. Therefore a careful examination of the extent to which various observable socio-demographic indicators such as gender, field of study (major), political ideology, and religiosity show a consistent correlation with a preference for honesty or *lie aversion* seems warranted. In this paper, we use an experiment with a simple decision problem that isolates lie aversion from other motivations mentioned in the literature in order to investigate these potential covariates.

Some of the indicators mentioned seem likely candidates to correlate with a preference for honesty. For instance, many religions expressly encourage pro-social behavior and commend truth-telling; one might therefore expect strong religious beliefs to correlate with honest choices. With respect to gender, Croson and Gneezy (2009) review a growing experimental literature documenting subtle gender differences in preferences. For a preference for honesty, though, significant uncertainties still remain. While Dreber and Johannesson (2008) and Erat and Gneezy (2009) find differences between men and women in sender-receiver games, Lundquist et al (2009) and Holm and Kawagoe (2010) do not observe a correlation between gender and honest behavior.

Another issue concerns the relation between major and honesty. Several experimental studies report that economics students conform more closely to the homo economicus "ideals" than do those from other disciplines – see Marwell and Ames (1981) on public-good experiments, Frank, Gilovitch and Regan (1993, 1996) in a Prisoners' Dilemma context, and Carter and Irons (1991) on the Ultimatum Game.[1] More specifically related to our study, economics students in Lundquist et al. (2009) lied more than subjects from other fields. However, a perennial issue is causation. Does

[1] However, Stanley and Tran (1998) report no difference in an Ultimatum Game, and Yezer, Goldfarb and Poppen (1996) find economists more likely to *return* an experimental "lost letter".

studying economics give people "maximizing" habits of thought, and thus cause them to behave more in line with its own predictions, or do people already inclined towards such behavior tend to self-select into economics? Our demographics include stated political position, which is a plausible instrument to test this. A good instrument must be correlated with the endogenous predictor, and exogenous to the outcome. In this case, it is intuitively plausible – and will be statistically confirmed – that students for business and economics tend to be more politically conservative (that is, identify themselves as more right-wing) than others. This establishes the relevance of the instrument. For the exogeneity, note that political position is measured on a semantic differential scale from left to right. There is no *a priori* reason to think that left- or right-wing people will be more likely to lie, so no *a priori* reason to think that political position will correlate with behavior. This, again, is subjected to an over-identifying restrictions test, which it passes.

We finally note that our analysis controls for a potential effect of beliefs on preferences and honest behavior. In effect, it has been argued (Cialdini, Reno and Kallgren, 1991; Bicchieri, 2006; Erat and Gneezy, 2009; López-Pérez, forthcoming) that normative behavior, including honest behavior, may be sensitive to expectations about how others will act. That is, people may be more likely to comply with an honesty norm if they expect many others to respect it as well. Since we elicit the expectations for truth-telling, we can clarify whether, say, a potential correlation between major and honesty is due to subjects from different majors having different expectations.

Our results indicate that Business and Economics (B&E) students are more likely to lie in our experiment than are students from other fields. Instrumentation with political ideology, moreover, suggests that the effect may be causal: B&E education does more than select students who make this choice; it seems actually to increase the chances of the behavior. Although we find that expectations are highly significant predictors of honesty and that B&E students tend to be pessimistic in their expectations of honest behavior, the correlation between major and truth-telling still persists. Overall, gender is not associated with the decision to lie, and religion is similarly lacking in predictive value.

The rest of the paper is structured as follows. The next section describes our experimental design and procedures. In turn, section 3 reports the results from our experiment and the instrumental variables analysis. Section 4 concludes.

2. Experimental Design and Procedures

The decision problem considered in our experiment is extremely simple. A random process with common-knowledge distribution generates a colored circle (blue or green, henceforth called the *signal*) on a computer screen. A 'sender' observes the signal and sends a message to a 'receiver', indicating either "The blue circle has appeared" or "The green circle has appeared". The sender earns 14/15 Euros for saying the color is "blue"/"green", irrespective of the true color. Consequently, she faces a dilemma between honesty and material interest if the signal happens to be blue. The receiver, in turn, receives a payoff of 10 Euros irrespective of either the message or the true color. In fact, he is uninformed of the true color, and hence cannot verify whether the message received is false or true. The description of this decision problem is common knowledge, so the receiver does know the probabilities of each color signal.[2]

Our design allows us to analyze the correlation between pure lie aversion and our socio-demographic variables. To clarify this point, note first that a lie-averse sender should announce the true color of both signals.[3] Further, there seems to be no other plausible reason to announce the true color that a preference for honesty. Indeed, a selfish sender should always announce 'green'. The same is true even if the sender is altruistic: There is no altruistic reason to tell the truth as the receiver always gets 10 Euros, even if he is deceived. Similarly, guilt-aversion as in Charness and Dufwenberg (2006) is irrelevant because the receiver's payoff expectations are fixed. In short, it seems safe to assume that any sender who announces always the true color has a preference for honesty.

We conducted 20 computerized sessions (10 High and 10 Low) at the Universidad Autónoma de Madrid, with a total of 258 participants. The software used for our sessions was z-Tree (Fischbacher, 2007). After being seated at a visually isolated computer terminal, each participant received written instructions that described the game (these may be consulted in the appendix). Subjects read the instructions at

[2] We considered two treatments, varying the probability of the blue signal (0.25 vs. 0.75). Since there are no significant differences in truth-telling rates across treatments (consult López-Pérez and Spiegelman, 2011), all results are pooled across those treatments.

[3] This prediction holds true if the utility of earning 1 additional Euro is lower than the disutility of lying (see again López-Pérez and Spiegelman, 2011 for details), a condition which does not seem to be restrictive. Incidentally, this point partially accounts for our payoff constellation: a lie-averse sender could decide not to tell the truth if the cost of that behavior was high, making thus impossible to discriminate between lie-averse and selfish agents.

their own pace and we answered their questions in private. We used neutral language and avoided terms such as "lie".

Each session then consisted of a number of steps, which all subjects knew from the start. In chronological order: First, participants were anonymously matched in pairs. Second, all chose as if they were senders. We used the strategy method; that is, before knowing the actual realization of the random signal, subjects indicated what message they would send for each possible realization of the signal (blue/green). In this manner, we maximized the amount of data gathered.[4] Third, we elicited first- and second-order beliefs from all subjects in an incentive-compatible manner. More precisely, first-order beliefs refer to beliefs about the proportion of subjects who send the 'green' message when the signal is blue, that is, the percentage of subjects who lie in that situation. Second-order beliefs are beliefs about the average first-order beliefs by other subjects. Fourth, one subject in each pair was randomly selected as the real sender, the other as the receiver. Fifth, the color of the circle was generated based on the relevant probability (conditional on treatment), the sender informed of the actual color, and the message previously selected by that sender sent to the corresponding receiver. Sixth, we collected several socio-demographic variables from the participants, including gender, major, religiosity and political ideology. Finally, subjects were paid in private by an assistant who was not informed about the details of the experiment. Each session lasted approximately 40 minutes, and subjects earned on average 12.70 Euros.

3. Results

3.1 Correlation among the variables

Let strategies be specified such that (G, B) indicates the message vector ('Green if signal is green', 'Blue if signal is blue'), and so on. In the full sample (N = 258), 50.78, 38.76, 8.14, and 2.33 percent of the subjects respectively chose the message vector (G, G), (G, B), (B, B) and (B, G). That is, the most frequent choices (89.53% of the total) correspond to the 'payoff maximizing' (G, G) and 'honest' (G, B) strategies, while other strategies are much less frequently chosen. A total of 21 subjects chose the payoff minimizing strategy (B, B), and six chose the "pathological" (B, G) strategy. Table 1 shows an overall picture of the demographics of the three main behavioral groups – to simplify the table, we do not include the small group of (B, G) subjects.

[4] We have run a control treatment to check for possible effects of the strategy method on behavior, and we observe no significant effect (see López-Pérez and Spiegelman, 2011).

Strategy	N	B&E	Hum	Other	Foe	Sex	Religion	Politics
Honest (G,B)	99	18	37	44	53.86 *2.928*	0.45 *0.05*	3.34 *0.277*	4.4 *0.182*
Maximizer (G,G)	131	50	26	55	84.527 *1.693*	0.489 *0.044*	3.565 *0.228*	4.878 *0.161*
Minimizer (B,B)	21	9	4	8	50.81 *6.586*	0.762 *0.095*	4.048 *0.603*	5.286 *0.448*
Total	251	77	67	107	69.548 *1.836*	0.496 *0.032*	3.516 *0.169*	4.722 *0.118*

Note: Columns B&E, Hum and Other respectively show the number of subjects from Business & Economics, Humanities, and other majors choosing the corresponding strategy. For the rest of variables, defined as follows, we report the mean and *standard error* conditional on strategy choice. Foe: first-order beliefs; Sex: percent male; Religion: scale of 1 (not religious) to 10 (deeply religious); Politics: scale of 1 (extreme left) to 10 (extreme right). Sample restricted to "non-pathological" liars.

Table 1: Demographic breakdown of non-pathological subjects

The table shows that overall there was relatively little socio-demographic difference between the honest and maximizing groups. Minimizers appear distinct (more males, more religious, and farther to the right), but the small numbers leave the statistics inconclusive. Further, there is a significant relationship between program of study (major) and strategy (Pearson Chi-square (4) = 16.24; $p < 0.01$), and a quite remarkable difference between maximizers and the rest in terms of stated first-order expectations (Mann-Whitney; $p < 0.01$). Interestingly, while minimizers are closer to the maximizers in their politics, religion and major status, they state expectations similar to the honest.

Because major appears predictive of behavior, Table 2 shows the percent of subjects from each major choosing the "honest" strategy (Table A in the appendix also provides socio-demographic data on the average subject from each major). Because many of the majors were represented by only a few individuals, however, we generally group them together in the analysis. Based on the previous literature, we had some expectations that business and economics (B&E) students would comprise a behaviorally distinct group. Therefore the "main groups" classification on the bottom of the table sets B&E students apart. It also separates Humanities students, who comprised the largest single group, and were also behaviorally distinct (see below).

Major	Bus	Econ	Hum	Sci	Law	Eng	Psych	Others	Total
N	47	32	70	28	21	12	29	18	257
(G,B)	0.234	0.219	0.529	0.464	0.524	0.250	0.414	0.278	0.385
	0.062	*0.074*	*0.060*	*0.096*	*0.112*	*0.131*	*0.093*	*0.109*	*0.030*
Main Groups	**B&E**		**Hum**	**Other**					**Total**
N	79		70	108					257
(G,B)	0.228		0.529	0.407					0.385
	0.047		*0.060*	*0.048*					*0.030*

Note: All subjects included except one who did not report his/her major (N = 257). (G, B) denotes the percent of each category choosing the "honest" strategy; mean and *standard error* values are reported. Bus = business; Econ = economics; Hum = humanities; Sci = science; Eng = engineering; Psych = psychology. The group 'Other' comprises all students who are not in Bus, Econ, or Hum.

Table 2: Honest behavior, conditional on major

Table 2 shows a significant variation in honesty rates across majors, ranging from more than 50% among humanities and law students to less than 25% among engineers and economists.[5] On a more aggregate level, only 22.8% of the B&E subjects chose strategy (G, B), whereas 45.5% of the (pooled) non-B&E subjects did so, a significant difference (Mann-Whitney test; p-value < 0.01). Among those other subjects, the highest rate of honesty was found in the humanities. The average rate of the "honest" profile outside the humanities (i.e., including B&E) was 33.5%; for the humanities it was 52.9% (Mann-Whitney p-value < 0.01). Note that Fisher's exact test rejects independence between honesty and major classification ($p < 0.01$).

Thus our data seem to corroborate the pattern discussed above, that B&E students are more likely to be "maximizers" than are others. To further investigate this issue, Table 3 reports the results from a series of marginal effects probit regressions of honesty on our socio-demographic variables. We use the main classifications of major from Table 2, above, and construct indicator values for each quartile of the religiosity variable. In addition, we consider the subjects' self-reported first-order beliefs about deception (recall, the percentage of subjects expected to send the 'green message' after the blue signal), and investigate any potential treatment effect due to the probability of the signal.

[5] We have received the comment that it makes sense to include engineering students in the B&E category, as "mathy thinkers". While this would only strengthen the results in this paper, we refrain from doing so because of the *ad hoc* nature of the adjustment, after viewing the data.

	(a) All variables			(b) B&E vs. others			(c) Hum vs. others		
	ME	**S.E.**	**p**	**ME**	**S.E.**	**p**	**ME**	**S.E.**	**p**
B&E	-0.15	0.08	0.07	-0.18	0.07	0.02			
Hum	0.09	0.08	0.26				0.15	0.07	0.05
Sex	-0.08	0.07	0.26	-0.08	0.07	0.24	-0.09	0.07	0.15
High	0.05	0.07	0.42	0.05	0.07	0.44	0.04	0.07	0.50
R2	-0.07	0.09	0.49	-0.07	0.09	0.49	-0.08	0.09	0.39
R3	-0.10	0.08	0.22	-0.10	0.08	0.20	-0.11	0.08	0.17
R4	-0.01	0.09	0.89	-0.01	0.09	0.91	-0.05	0.09	0.61
Foe	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00

Notes: Marginal effects (ME) estimates on the probability of honesty versus pooled other strategies, standard error (S.E.) and the p-value for a zero null hypothesis. For all independent variables except Foe, ME evaluates the effect of the change of the corresponding dummy from 0 to 1. The variable Sex refers to a dummy for gender (male = 1). B&E and Hum are as defined above. The variable High takes value 1 if the subject participated in the treatment in which the probability of the blue signal was 0.75. R2, R3, and R4 refer to second, third, and fourth quartile of stated religiosity, respectively. Foe indicates first-order beliefs. N = 257 for all regressions.

Table 3: Covariates of honesty

There are two important points in Table 3. *First*, expectations are highly predictive of behavior: an increase in reported expectations of other people's dishonesty decreases the probability of an honest choice, roughly one-for-one. There are at least three possible interpretation of this correlation. To start, people might tend to respect norms only if they expect others to do so as well, as noticed in the introduction. Given our research goal, discounting the effect of beliefs is then crucial to prevent confounds (e.g., B&E subjects might lie more simply because they have particularly 'pessimistic' beliefs). In a different, yet related phenomenon, people might feel some discomfort or cognitive dissonance if beliefs about 'normal' behavior do not coincide with previous decisions. This would then support a tendency to manipulate their beliefs (possibly in an unconscious manner) about what constitutes such 'normal' behavior. That is, the beliefs may have been effect, rather than cause, of the previous choice.[6] Finally, individuals might overstate the extent to which others have beliefs, desires and tendencies similar to their own, the so-called (false) consensus effect. Although controlling for beliefs could lead to an under-estimation of the marginal effect of our socio-demographic variables on honesty if any of the last two interpretations played a role, any potential statistical significance of these variables should not be lost.

[6] In our experiment, we asked for beliefs about other people's action after the subjects chose their own. This was done to eliminate the effect that priming social expectations might have on later behavior.

In this respect, the *second* remarkable point in Table 3 is that, even accounting for the effect of beliefs, B&E students choose the honest strategy significantly less often. It is estimated to reduce the probability of an honest strategy by as much as 18 percentage points. Notice from panel (b) that humanities students, compared to pooled others (that is, when the B&E variables are not included) are significantly more honest. However, when B&E are added this effect disappears (panel (a)), while the converse does not hold: the B&E indicator remains marginally significant even with the inclusion of the Humanities variable. We therefore conclude that the B&E effect is driving the Humanities effect, and focus in what remains on B&E versus pooled other subjects. None of the other determinants appear to be significant.

3.2 Instrumental variable analysis

We turn now to the question of the causal relationship between B&E status and maximizing behavior. As mentioned in the introduction, there are at least two important mechanisms of causality that may exist between these variables. First, it may be that learning about utility maximization and self-interest might lead subjects to apply a similar analysis to other situations. This would, in our case, mean that studying B&E has a causal impact on choosing the maximizing strategy (G, G). On the other hand, major choice is not random. Individuals choose what major they wish to pursue based on pre-existing interests. It might be that those who take up (or stay in) economics courses already have some "rationalistic" tendencies which would independently generate the maximizing behavior (G, G). Thus we have a classic case of unobserved self-selection leading to endogeneity of the explanatory variables, and thus a bias in the estimated effects, for instance, in Table 3.

A common approach to addressing such problems consists of instrumental variables. This method has its inconveniences, especially in finite samples (Davidson and MacKinnon, 2004), but these drawbacks are generally seen as less serious than the endogeneity problems the methods are designed to solve. The estimation procedure is interpretable as a two-stage least squares, first regressing the endogenous predictor on the instruments, and then using the resultant projection to "correct" for the endogeneity (Greene, 2003). To constitute a valid instrument, a variable must satisfy two requirements: it must be correlated with the endogenous explanatory variable (that is, it must be "relevant") and it must be exogenous to the outcome variable.

Among the variables we gathered, political position seems a plausible choice for an instrument. Consider first the issue of exogeneity. There seems to be neither compelling *a priori* reasons why being an honest person would lead to any political opinion, nor the converse, reasons why identification with one political position over another would lead one to be more honest. While people of different political ideology disagree on many subjects, the importance of honesty does not seem to be one of them. Thus politics do not seem to have any link with honesty, apart from correlation with other factors that might influence such choices. This is the ideal situation for instrumental variables.

More precisely, our analysis will use two related instrumental variables: (i) the stated political position, and (ii) the ideological quartile, as used for religiosity above. The number (i) between one and 10 seems to have less social significance than the rank (ii) within the distribution. Note also that variable (i) gives us more variation in the instrument. Finally, since expectations were revealed predictive, we choose this as a non-excluded instrument (a control variable) in the analysis. The inclusion of additional variables allows us to perform an over-identifying restrictions test to (partially) investigate whether the endogeneity has been successfully controlled (Stock and Watson, 2003).

The other requirement for a valid instrument is relevance. Political position is quite strongly associated with major status, as Table A in the appendix suggests. In fact, a Mann-Whitney test of average political position across B&E status shows B&E students identify themselves as significantly more "right-leaning" than non-B&E students ($p < 0.01$). As a rule of thumb, Stock and Watson (2003, p.193) indicate that in the first stage of the IV regression procedure outlined above, the F-statistic for the overall model should be greater than 10 for a single endogenous variable. Regressing B&E status on expectations and political position yields a statistic of $F(2, 254) = 19.72$, which passes the test. When we run the regression on quartiles of politics, each of the quartiles is significant, with a high t-value. However, the constant term is close to zero, so the overall $F(4, 252) = 9.34$ does not pass the 'rule of thumb' test. Restricted to not having a constant, the F in this case rises to 41.57. Also, the subsequent IV regression is of much higher significance, as we see below.

Table 4 presents the second-stage results of the instrumental variables estimation. Panel (i) considers political position as an instrument, whereas regression (ii) considers the political quartile (i.e., rank) as the instrument. We see that in both

formulations, B&E status remains a significant predictor of (low) honesty. This means that the portion of the variation in B&E status that is shadowed by the exogenous political position does impact the probability of maximizing behavior, which suggests that there is exogenous causal impact of studying economics: economists lie more in our study in part because they have learned to do so.

	(i) Stated position				(ii) Quartiles			
	Coef.	**S. E.**	**t**	**P>t**	**Coef.**	**S. E.**	**t**	**P>t**
B&E	-0.359	0.179	-2.010	0.046	-0.546	0.194	-2.820	0.005
Foe	-0.006	0.001	-6.080	0.000	-0.006	0.001	-5.340	0.000
Constant	0.937	0.077	12.220	0.000	0.964	0.081	11.880	0.000
p	1.00				0.210			

Note: Second-stage results of 2SLS regression of B&E status and expectations (Foe) on the honest strategy. N = 257. The p-value corresponds to the Hansen-Sargan *J* statistic, explained below.

Table 4: Second-stage regression results

The non-excluded instrument in Table 4, first-order expectations, enables us to perform the Hansen-Sargan over-identifying restrictions test to investigate whether the endogeneity has been successfully controlled. This test resides in calculating the residuals from the regression above, then regressing the instruments upon them: all coefficients should be zero, if there is no correlation. The results of this regression can be used to calculate a statistic that distributes according to a chi-square distribution with degrees of freedom equal to the number of non-excluded instruments (recalling the over-identification in the name), under the null hypothesis that the instruments are exogenous. In our case, the *J*-statistic equals 0.00 in (i) and 1.57 in (ii), so that the instruments we choose pass this test: the hypothesis of exogeneity cannot be rejected.

4. Conclusion

Our results show that the subjects most likely to exhibit honest behavior in our decision problem are the non-B&E students, particularly if they expect this behavior from other subjects. In contrast, we do not find significant differences in honesty between males and females or between religious or non-religious people. In addition, an instrumental variable analysis suggests that the difference between B&E and other students is in part a matter of learning, and not only self-selection. Hence, our results are in accordance with other experiments showing that B&E students tend to conform more neatly with the homo economicus paradigm, or alternatively with a utilitarian or consequentialistic mode of reasoning in moral matters.

The irrelevance of gender means that our study does not replicate the results in Dreber and Johannesson (2008, DJ henceforth) and Erat and Gneezy (2009, EG henceforth). Two potential reasons might explain this. *First*, there could be differences in the distribution of subjects' majors across these two studies and our study, an important issue in view of our evidence that a subject's major is correlated with honesty. If many female subjects come from the humanities and many male subjects come from B&E or engineering, the data may show a correlation between gender and honesty. [7] In general, our data suggests that an analysis based on gender alone can be potentially deceptive if females and males are not homogeneously distributed across majors, as seems the case in many western countries. In the game considered in DJ and some of the games in EG, *second*, altruism and honesty are interconnected. In these games, one player sends a false/true message to another player, who can use such information as a recommendation of play. Importantly, the message receiver will harm herself if she is deceived and follows the recommendation of play. If women are more altruistic (as some references cited in DJ and EG indicate), therefore, they might behave differently when communicating, even if they are not more lie-averse than men.

We close by pointing out that some of the data reported here hints at new questions for future research. For instance, we observe that around 10 percent of the subjects acted as minimizers, sending the blue message in any contingency. As we argue in López-Pérez and Spiegelman (2011), this behavior is partially consistent with the hypothesis that some agents expect lies to be disapproved by others, and dislike being disapproved. Interestingly, minimizers are largely male, B&E students. In this line, it might be interesting to study further potential covariates of a dislike of disapproval.

[7] Dreber and Johannesson (2008) and Erat and Gneezy (2009) do not control for the subjects' major. In contrast, Lundquist et al. (2009) control for both gender and major and find no significant correlation between gender and honesty, while they find that students from the Stockholm School of Economics (SSE) are significantly more likely to lie than other subjects (at the 10% level). Holm and Kawagoe (2010) do not find either a relation between gender and lying.

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Appendix

Table A provides a picture of the average subject from each major, showing substantial difference between majors. Science students are the least religious, and psychology and the humanities are the majors with the greatest number of females in the sample (excluding "Other" due to its small size). Business, economics and law students are the most politically conservative, although only Business students claim to be "right of center".[8] They are also the most religious. Indeed religiosity is correlated with conservative politics in the sample, with a Spearman's rho of 0.52 (p-value vs. independence = 0.000).

	Full set of majors					Main groups					
Major	**Sex**	**Reli.**	**Poli.**	**(G,B)**	**N**	**Class**	**Sex**	**Reli.**	**Poli.**	**(G,B)**	**N**
Bus	0.596	4.872	5.957	0.234	47	**B&E**	0.620	4.380	5.671	0.228	79
	0.072	*0.425*	*0.274*	*0.062*			*0.055*	*0.316*	*0.217*	*0.047*	
Econ	0.656	3.656	5.250	0.219	32						
	0.085	*0.446*	*0.348*	*0.074*							
Hum	0.429	3.057	4.071	0.529	70	**Hum**	0.429	3.057	4.071	0.529	70
	0.060	*0.310*	*0.185*	*0.060*			*0.060*	*0.310*	*0.185*	*0.060*	
Sci	0.536	2.071	3.964	0.464	28	**Other**	0.472	3.139	4.444	0.407	108
	0.096	*0.349*	*0.339*	*0.096*			*0.048*	*0.241*	*0.167*	*0.048*	
Law	0.667	4.286	5.429	0.524	21						
	0.105	*0.648*	*0.406*	*0.112*							
Eng	0.750	3.083	4.583	0.250	12						
	0.131	*0.743*	*0.434*	*0.131*							
Psych	0.310	3.172	4.103	0.414	29						
	0.087	*0.474*	*0.278*	*0.093*							
Others	0.222	3.444	4.500	0.278	18						
	0.101	*0.532*	*0.390*	*0.109*							
Total	0.506	3.498	4.720	0.385	257	**Total**	0.506	3.498	4.720	0.385	257
	0.031	*0.167*	*0.116*	*0.030*			*0.031*	*0.167*	*0.116*	*0.030*	

Note: All subjects included except one who did not provide major information. Mean, *standard error* values reported over the categories at left, except for frequency, denoted N. Sex = percent male; Reli and Poli refer to "religion" and "politics", and are defined as in Table 1. The column (G, B) shows the percent of the sample choosing the "honest" strategy. For majors, Bus = business; Econ = economics; Hum = humanities; Sci = science; Eng = engineering; Psych = psychology. The group 'Others' comprises all students who are not in Bus, Econ, or Hum.

Table A: Descriptive Statistics by major

[8] The value 5.5 would be the theoretical center-point of our scale.

Appendix: Instructions

Thank you very much for participating in this experiment, which is financed by a research fund. Our aim is to study how people make decisions. In total, more than 40 people will participate in this study, in several sessions. There are no tricky questions, you must simply choose as you prefer. At the end of the experiment, you will be paid some money; the precise amount will depend on chance and your decisions during the experiment. It is very important that you do not talk to any other participant. If you do not follow this rule we will have to exclude you from the experiment and you will not earn any money. If you have questions, please raise your hand and we will assist you.

Description of the Experiment

In this experiment there are two types of participants (A and B). The basic task of each A is choosing a message for B. More precisely, towards the end of the experiment, A's computer will randomly reveal either a blue circle or a green one – the probability of a blue circle is [75% in the High treatment, 25% in the Low treatment]. A will observe the circle in the screen and then send to B one of the following two messages: (i) 'the blue circle has appeared', or (ii) 'the green circle has appeared'. Payoffs are as follows: A will always get 14 Euros if he/she announces that the blue circle appeared and 15 Euros if he/she announces green. The payoff of any B is 10 Euros in any case. We remark that B will not observe the colour selected by the computer, but only receive A's message.

Since we want to know the message that you would send in any possible contingency, we will proceed according to the following protocol. To start, each of you will choose as if you were an A-participant. In addition, *before* knowing the color (blue/green) selected by the computer, you must indicate the message that you would send to B in two possible cases: (a) if the blue circle were selected and (b) if the green circle were selected. Afterwards, each of you will complete a short and anonymous questionnaire. Only then will your actual type be randomly determined (A or B with probability 50% each) and revealed to you. Moreover, each A-participant will be randomly matched with a different B-participant. If you happen to be A, you will see the color of the circle in the screen, and your corresponding message will be sent to B. If you are chosen to be B, you will receive the message chosen by A, and your previous

responses to (a) and (b) will have no effect. Note well that you will never know the type of any other participant, nor will any other participant get to know your type. The decisions in this experiment are anonymous, that is, no participant will ever know which participant made which choice. For this reason, no participant will know the identity of the person with whom he/she is paired.

The experiment will end with another short and anonymous questionnaire. Your payment will be made in private in an adjoining office by an assistant unrelated to this study. This assistant will only know your final payoff in this experiment, but not what you actually chose in the experiment.

Before we start the experiment, please answer the following questions. Raise your hand when you are done so that we can verify the answers.

In a hypothetical example, assume that the computer selects color _____ (choose either 'green' or 'blue' to construct your own example), and that A had decided in that case to send message _____ (choose either 'green appeared' or 'blue appeared' to construct your own example).

For this hypothetical example, answer the following questions,

- What would A's payoff be? _____
- What would B's payoff be? _____
- What would A's payoff be, if she/he had chosen the other message? _____
- What would B's payoff be, if A had chosen the other message? _____

In addition:

- Will B ever know the color that actually appeared? Yes No
- After your type has been determined and provided that you are of type A, can you change your prior choices? Yes No
- Can A ever affect B's balance? Yes No
- Can B ever affect A's balance? Yes No
- Do A's choices affect A's balance? Yes No
- What is the probability that the circle is blue-colored? _____