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Leadership and persistency in spontaneous dishonesty

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Abstract

Extensive evidence shows that when given the opportunity, people cheat for monetary rewards, but only to the extent that they can keep a positive self-concept. In this study, we investigate various factors that may influence the degree to which people can keep their positive self-concept while cheating for monetary gains. We find that authentic leadership, gender, cheating norm, experience of cheating, and expectations of others' cheating behavior have no effect on participants' spontaneous dishonesty on an abstract task. Therefore, reducing people's cheating behavior might be a long-term project for the management of fraudulent organizations and more difficult than might be expected.

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1. Introduction

Current research in behavioral science explores factors that influence the intensity and range of individual dishonesty (Abeler, Becker, & Falk, 2014; Conrads, Irlenbusch, Rilke, & Walkowitz, 2013; Conrads & Lotz 2015; Fischbacher & Föllmi-Heusi, 2013; Pascual-Ezama et al., 2015). In general, there is consensus that dishonesty is prevalent among humans, though, when given the opportunity, people do not cheat to the fullest extent possible (Mazar, Amir, & Ariely, 2008). For example, Cohn, Fehr, and Maréchal (2014) suggest that the business culture in the banking industry undermines the honesty norm, while Cappelen, Sørensen, and Tungodden (2013) provide evidence that non-economic features of a decision-making environment increase lying aversion. Our goal herein is to extend this research by investigating the effect of leadership on individual dishonesty. In particular, we examine whether the authenticity of a male or female leader can spur honest behavior under conditions of salient deception by others.

Cheating in professional contexts is a prevailing phenomenon. The Association of Fraud Examiners (2014) projects a potential global fraud loss of more than $3.7 trillion per year. Losses are estimated to comprise 5% of organizational revenues and to last for an average of 18 months before detection. Among the most tangible costs are losses related to theft. For example, retail businesses in the United States have inventory losses of approximately $42 billion per year, with employee theft accounting for 43% of lost revenue (Global Retail Theft Barometer, 2014). These figures suggest that measures reducing dishonesty in an organizational environment are more than needed.

Different academic disciplines have targeted deception in work-related and other contexts. In behavioral economics, scholars have systematically analyzed individuals' cheating behavior in laboratory studies (Conrads et al., 2013; Fischbacher & Föllmi-Heusi, 2013; Houser, Vetter, & Winter, 2012), in online experiments (Gill, Prowse, & Vlassopoulos, 2013), and in the field (Abeler et al., 2014; Ariely, Garcia-Rada, Hornuf, & Mann, 2014; Djawadi & Fahr, 2015; Ichino & Maggi, 2000). In organizational psychology, scholars have described counter-productive work behavior, such as sabotage, theft, and physical or verbal aggression, as voluntary, destructive acts in organizations (Spector & Fox, 2002). Our work contributes to both strands of literature by addressing cheating as a type of misbehavior in professional contexts in a carefully designed laboratory experiment and, relative to leadership, as a potential buffer against counter-productivity in organizations.

The majority of previous academic work has addressed the question whether individuals cheat and how pervasive cheating may be across contexts. With some notable exceptions (Abeler et al., 2014; Erat & Gneezy, 2011; Lundquist, Ellingsen, Gribbe, & Johannesson, 2009), extensive evidence shows that individuals cheat (Alberti & Güth, 2013; Bucciol, Landini, & Piovesan, 2013; Djwadi & Fahr, 2015; Gino, Ayal, & Ariely, 2009; Mann, Garcia-Rada, Houser, & Ariely, 2014), especially when the risk of detection is low (Effron, Bryan, & Murnighan, 2015). In contrast, surprisingly little research has posed the question of how cheating can be prevented.

Rather than questioning *whether* individuals cheat, we analyze whether cheating *persists* under the influence of intervening factors. We specifically focus on the influence of leadership, an important factor that can promote desirable and prevent undesirable behavior in professional contexts (Gardner, Cogliser, Davis, & Dickens, 2011; Hiller, DeChurch, Murase, & Doty, 2011; Peus, Wesche, Streicher, Braun, & Frey, 2012). With regard to cheating, little is known about intra- and inter-individual variations. As noted previously, studies have found differences in cheating between bankers and control groups, whose professional identity had been made salient (Cohn et al., 2014). Furthermore, research has shown that cheating differs between Germans exposed to socialism or capitalism (Ariely et al., 2014). Both these studies, however, focus on long-term influences that alter cheating (socialization in a stable professional or political environment). Indeed, they explain very little about the factors that prevent spontaneous dishonesty in work-related contexts.

Our study contributes to the literature in four ways. First, we address the question of which factors reduce the probability that individuals will engage in dishonest behavior in the face of spontaneous opportunities to cheat for their own benefit but at the expense of their organization. Thus, we make clear *who* will actually be cheated, as individuals tend to cheat more as an emotional reaction to wealth-based inequity (Gino & Pierce, 2009) or when others benefit from their cheating (Gino, Ayal, & Ariely, 2013). Second, the study integrates streams of literature from behavioral economics (dishonesty) and organizational psychology (leadership). Our main finding is that cheating is persistent even in response to authentic leadership, which is a values-based leadership style that can promote positive organizational behavior (Gardner et al., 2011). Third, we analyze cheating in a carefully designed laboratory experiment. While experimental research is a standard approach in economics, study designs that allow causal conclusions are increasing in popularity in organizational research (Aguinis & Bradley, 2014). We enhance external validity of common approaches such as surveys and paper-and-pencil tests through video-based variation of authentic leadership combined with a

cheating-of-mind experiment. Fourth, we address a range of variables that may affect cheating over and above leadership. Yet we find that none of these variables (e.g., gender, cheating norm, experience of cheating) affect participants' spontaneous dishonesty. Therefore, we conclude that reducing cheating behavior in professional contexts might be a long-term project for the management of fraudulent organizations and more difficult than might be expected. Our results should spur inter-disciplinary discussion between scholars in economics and psychology as well as between academics and practitioners.

2. Cheating-of-mind experiment

To examine dishonesty, we adapted a task developed by Jiang (2013), which we refer to as the die task. The die task involves rolling a physical die over 40 repeated trials. On each trial, participants are instructed to mentally choose a side of the die (top or bottom) before rolling it. They are asked to remember their choice, roll the die, and, when the outcome is visible, report the outcome on the chosen side in a box on their screen. Participants know that they will be paid 5 cents per dot on the chosen side. Thus, on any roll for which the unfavorable side is initially chosen, participants can cheat by claiming to have chosen the higher-earning side.

A fictitious supervisor supposedly from a personnel economics institute at the University of Munich instructed the participants in our study. The instruction was delivered through a video message, which we recorded with two professional actors. Participants were randomly assigned to receive the video message from a male or female supervisor. In a first step, the supervisors introduced themselves and made clear that instructions would be delivered through a video message owing to their time constrains. While the content of the message explaining the task was the same in all study conditions, the supervisors' self-introduction varied in the style of leadership. Participants were randomly assigned to a supervisor introducing him- or herself with either high or low authenticity. In a second step, the supervisor explained the die task. Through the video message format, we ensured that the instruction was uniformly delivered to all participants and only varied in the extent of authentic leadership expressed.

As part of the video message, participants were informed that their earnings would be paid from the supervisor's project budget. We also made clear that any profits on the participants' side would result in equal levels of losses on the supervisors' side. Thus, in contrast with previous studies, this setup made explicit who would be the beneficiary (participants) and

who would be the target (the supervisors and their organizations) of possible cheating. After the task was explained, 97% of participants indicated having understood the video message and the die-rolling task. The remaining 3% asked for a written explanation and read the instructions again until they fully understood the task.

Recent research has shown that cheating behavior can be contagious (Gino et al., 2009; Weisel & Shalvi, 2015). To determine whether authentic leadership can mitigate such tendencies, in addition to the leadership treatment, we introduced two influencing factors: cheating norm and experience of cheating, both of which make the possibility of cheating behavior more salient. For this purpose, we distributed participants randomly across two rooms in the experimental laboratory with six (room 1) and four (room 2) individual workstations. Each room had one experimenter supervising the study. Students worked on mobile tablets equipped with keyboards and headsets, to shield them acoustically from the outside world. The study content was delivered through the online survey software Unipark.

After the 10th die roll, all participants received an online message that the chat function of their tablet had been activated. Participants in the *cheating norm* condition then received a fake message supposedly from another participant in the second room. The message read that the participant had discovered how to cheat on the die task and would only report the higher earning side of the die from now on. Participants in the *experience of cheating* condition received a fake message supposedly from an experimenter in the second room. The message read that the experimenter had discovered that another participant had taken the participant's €2 show-up fee for arriving on time at the experimental laboratory. Seven study conditions resulted from the variations of authentic leadership, cheating norm, and experience of cheating (including a neutral baseline condition). Table 1 summarizes the conditions.

- Table 1 around here -

3. Theory and hypotheses

Scholars have offered various explanations of what determines individuals' cheating behavior. The economic standard model of crime and punishment predicts cheating as the result of cost–benefit calculations (Becker, 1968, 1993). It includes three main predictors: (1) the expected benefits of deception, (2) the probability of detection, and (3) the magnitude of punishment expected, if cheating is detected. Results from behavioral law and economics underscore the relevance of these three variables, which differ in impact on cheating behavior (Nagin & Pogarsky, 2003). Specifically, the higher the expected probability of being detected,

the lower is the probability of cheating behavior. The same, however, does not hold for the magnitude of punishment.

Other researchers have proposed that cheating is a stable individual difference construct, implying that external factors neither induce nor prevent dishonest behaviors (Hurkens & Kartik, 2009). Hurkens and Kartik (2009) differentiate ethical personality types, who focus on processes rather than outcomes, from economic personality types, who act for the purpose of the best possible outcomes. Yet these assumptions stand in contrast with findings that individuals are generally motivated to act honestly (Abeler et al., 2014) or that such differentiation of personality types does not exist (Gibson, Tanner, & Wagner, 2013) and any individual might engage in dishonest behaviors depending on contextual conditions. Finally, in contrast with the standard economic model, the theory of self-concept maintenance (Ariely, 2012; Mazar et al., 2008) suggests that individuals' self-concept rather than the described contextual factors predicts cheating. Overall, the economic cheating literature opens up considerable controversy around the question of which factors promote or prevent cheating. With the aim to contribute to an improved understanding of the phenomenon of cheating as spontaneous dishonesty as well as the influencing factors in professional contexts (e.g., leadership, cheating norm, experiences of cheating), we developed a set of five hypotheses.

The focus of our first hypothesis is self-concept maintenance as a predictor of cheating. Self-concept maintenance theory (Ariely, 2012; Mazar et al., 2008) suggests that individuals engage in dishonest behaviors as long as they can maintain a positive self-concept. The self-concept consists of all inferences that individuals make about themselves, and in general individuals are motivated to maintain positive inferences (Baumeister, 1997). Through socialization, individuals internalize norms and standards (e.g., honesty, diligence, community) of the society that surrounds them. Compliance with such norms is rewarding (acceptance), while non-compliance is likely to result in social punishment (exclusion). Beyond these social implications, Mazar et al. (2008) propose that (dis)honesty is also part of an internal reward and punishment system, which influences individuals' self-concept. If individuals transgress against honesty norms, their self-concept is negatively affected. Accordingly, self-concept maintenance theory suggests "a magnitude range of dishonesty within which people can cheat, but their behaviors, which they would usually consider dishonest, do not bear negatively on their self-concept" (Mazar et al., 2008, p. 634). That is, as long as they can still consider themselves honest below a certain perceptual threshold, individuals are likely to cheat. This theory has received initial empirical support (Mazar et al., 2008).

H1: Self-concept maintenance predicts cheating. People cheat to the extent that they can maintain a positive self-concept.

As indicated previously, findings in the field of voluntary organizational behavior indicate that leadership holds the potential to promote desirable outcomes and prevent undesirable ones (Hiller et al., 2011). With regard to counter-productive work behavior such as dishonesty in professional settings, analyses suggest that organizational justice is a strong predictor of counter-productivity (O'Brien & Allen, 2008), which in turn is closely linked to organizational leadership (Cho & Dansereau, 2010; Pillai, Schriesheim, & Williams, 1999). These findings are in line with meta-analytical results of poor leadership and interpersonal injustice as the strongest predictors of supervisor-targeted aggression (Hershcovis et al., 2007).

In essence, research implies that supervisors play a critical role in terms of negative emotions that induce counter-productivity. In a sample of 292 employees at various organizations in the United States, job stressors related positively to counter-productivity (Fox, Spector, & Miles, 2001). According to Kessler, Bruursema, Rodopman, and Spector (2013), who examined 116 dyads of employees and co-workers, passive-avoidant leadership is one stressor that elicits employee counter-productivity. From these findings, we propose that positive leadership styles prevent counter-productivity such as cheating in professional contexts. Scholars suggest that authenticity is directly linked to morality (Gino, Kouchaki, & Galinsky, 2015). More precisely, authentic leadership, which is a leadership style rooted in positive psychology, especially in positive growth and self-fulfillment, buffers corruption in organizations (Gardner et al., 2011). Four dimensions characterize authentic leadership (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008): (1) self-awareness (being aware of one's own strengths and weaknesses), (2) relational transparency (emphasizing open and transparent communication), (3) internalized moral perspective (acting in accordance with strong moral convictions and values), and (4) balanced processing (considering multiple perspectives before decision making). Thus, authentic leaders take on a positive role modeling function. Initial empirical evidence suggests that authentic leadership reduces employees' ethical decision making in the face of temptation (Cianci, Hannah, Roberts, & Tsakumis, 2014) and is negatively related to organizational deviance (Erkutlu & Chafra, 2013). Accordingly, we assume that under the influence of an authentic leader, people are less likely to cheat.

H2: Authentic leadership decreases cheating. Participants in the authentic leadership condition are less likely to cheat than those in the non-authentic leadership condition.

The theory of self-concept maintenance implies that cheating depends on internalized norms and standards. These are established through socialization (interaction with meaningful others, such as parents, siblings, friends, and colleagues). Therefore, it is likely that social interaction (observation) also increases or decreases internally held thresholds of acceptable conduct. This assumption is in line with social learning theory (Bandura, 1965) and social norms theory (Cialdini, Reno, & Kallgren, 1990) and concurs with Gino et al.'s (2009) findings that cheating is contagious. In their experimental studies, spontaneous dishonesty increased when participants witnessed in-group members cheating successfully. However, when the possibility of cheating was made salient, but not enacted by an in-group member, spontaneous dishonesty decreased. Because our study includes students who may regard themselves as comrades, we concur with the view that social contagion positively influences cheating. When observing successful cheating behavior of similar others, a cheating norm is established; this norm is a social standard indicating that it is acceptable to cheat in the given context. Thus, we expect that participants who become aware of a cheating norm will be more likely to display spontaneous dishonesty. However, we also propose that the values set by authentic leadership counteract this influence. As a consequence, participants under authentic leadership will be less likely to display spontaneous dishonesty when they observe successful cheating behavior than those under non-authentic leadership.

H3: Cheating norms increase cheating. Observation of others' dishonesty increases spontaneous dishonesty of participants in the non-authentic leadership condition.

In addition to leadership and norms, we analyze the influence of a third factor on cheating in professional contexts: retaliation. This view builds on the concept of social reciprocity. Evolutionary game theory suggests that the tit-for-tat strategy, in which a party will first cooperate and then subsequently replicate an opponent's previous move, is the most successful in many cases of direct competition (Axelrod, 1984). Thus, we expect that participants will be more likely to retaliate through cheating when they experience being cheated by others. Furthermore, we draw on the theory of psychological contracts (Robinson, 1996)—that is, implicit beliefs that employees hold about the reciprocal obligations between them and their organization. If such beliefs are violated (psychological contract breach), feelings of anger and betrayal occur (Morrison & Robinson, 1997). As a consequence, individuals 'strike back' and engage in retaliation through deviance (Bordia, Restubog, & Tang, 2008). Meta-analytic findings of the negative consequences of psychological contract breach for work-related outcomes confirm this relationship (Zhao, Wayne, Glibkowski, & Bravo, 2007). In line with this research, we suggest that experiences of being cheated in

professional contexts are perceived as a psychological contract breach. Participants who are cheated by others will consequently be more likely to show spontaneous dishonesty. However, we again propose that authentic leadership counteracts this influence. As a consequence, participants under authentic leadership will be less likely to show spontaneous dishonesty when they are cheated by others than those under non-authentic leadership.

H4: The experience of being cheated increases cheating. Participants who are cheated by others show increased levels of spontaneous dishonesty.

4. Results

4.1. Descriptive statistics

We recruited participants over the course of two weeks in April 2015 in front of the main cafeteria at the University of Munich as well as through the main university newsletter. This procedure allowed us to recruit students from many different disciplines. The participants were purposely not recruited from a laboratory pool, to avoid contaminating such a pool. Participants were invited to take part in a 30-minute university study to earn money. Our initial sample was 424 participants. To ensure that participants were not excessively familiar with experimental research methods, we *ex ante* decided to limit our study to individuals who reported being students of fields different from psychology (57 psychology students or non-students were excluded). Furthermore, 24 participants who were interrupted during the study due to technical problems or personal issues were also excluded. Though told otherwise, four students repeatedly took part in our experiment, so we counted only their first appearance. With these constraints, our final sample included 343 individuals.

Table 2 provides descriptive statistics of the participants. Participants differ in age (25% were under 21 years of age, 50% were between 21 and 25 years, and 25% were above 25 years of age), gender (117 men vs. 218 women), previous work experience (191 experience vs. 147 no experience), marital status (155 single vs. 168 in a relationship), and current standard of living (278 very well-off or living comfortably vs. 53 just getting along or poor), which provides variation for our empirical analysis. Furthermore, a male leader was randomly assigned to instruct 50% of the participants through a video message, while a female leader spoke directly to the other 50%. Finally, 25% of participants believed that less than 31% of participants had earned more than they themselves did, 50% believed that 31% to 60% had

earned more, and 25% believed that 61% or more had earned more. On average, participants believed that only 45% (median also 45%) had earned more than they themselves did, providing a first indication that they must have been aware of their cheating behavior.

- Table 2 around here -

Differences in reported high rolls for the first 10 trials (before additional treatments were implemented in Condition 4–7) reveal that individual characteristics have no significant effect on individual cheating behavior. Women reported the side with the larger number of dots, resulting in a higher monetary payout, 2.7% more frequently than men (t-test, $p = 0.1809$, Mann–Whitney U-test, $P > |z| = 0.0733$). Singles cheated 2.9% less than those in a relationship (t-test, $p = 0.1314$, Mann–Whitney U-test, $P > |z| = 0.0687$), and participants who were (self-reported) poorer cheated as much as those who lived comfortably or were very well-off (t-test, $p = 0.9273$, Mann–Whitney U-test, $P > |z| = 0.9960$). Likewise, we found no difference for participants with and without previous work experience (t-test, $p = 0.7939$, Mann–Whitney U-test, $P > |z| = 0.8496$).

4.2. Self-concept maintenance

In line with previous field and laboratory experiments (Ariely et al., 2014; Jiang, 2013), we found that participants cheated, but not to the fullest extent possible. This is in accordance with hypothesis 1. In the baseline Condition 1, the distribution of reported outcomes shifted to the right of the binomial distribution (Fig. 1, Panel A), with participants declaring 61.8% high rolls on average, which is statistically different from the fair outcome of 50.0% (Table 3, Column [1]). Moreover, we found no significant change in cheating behavior when splitting the sample at the mean of 20 rolls ($p = 0.1178$). Thus, there is no indication that participants adapted to the die task the longer they took part in it. These findings are in line with self-concept maintenance theory, as outlined in Hypothesis 1, and previous findings by Mazar et al. (2008).

- Figure 1 around here -

- Table 3 around here -

4.3. Influencing factors

4.3.1. Authentic leadership

To determine whether authentic leadership reduces participants' cheating behavior, in Condition 2 and Condition 3 an authentic and non-authentic leader, respectively, presented the die task through a video message. As a manipulation check, we asked participants 16 questions from a validated version (Hörner, Weisweiler, & Braun, 2015) of the Authentic Leadership Inventory (Neider & Schriesheim, 2011). For each of the questions, participants evaluated how authentic the leader appeared to them on a scale from 0% to 100%. When averaging the results of these 16 questions, we found that participants under the authentic leader condition rated the authenticity of the actors twice as high (67%) as those under the non-authentic leader condition (33%). Therefore, participants indeed perceived the actors in the video message more or less authentic depending on the condition under which they were instructed.

However, for Conditions 2 and 3 we found that participants cheated just as much as those in the baseline Condition 1 (see Fig. 1, Panel B, and Table 3, Column [2]). Authentic leadership did not reduce individual cheating behavior, as participants in Condition 2 reported, on average, just as many high rolls as those in the baseline condition. Participants in Condition 3 reported 63.7% high rolls, which represent no significant statistical difference from Condition 2 (Table 3, Column [3]). Thus, having the task delivered by an authentic leader did not *per se* change individual cheating. We therefore reject Hypothesis 2.

4.3.2. Cheating norm

In the next step, we tested whether authentic leadership reduces cheating behavior when cheating becomes more salient and, consequently, might be more contagious. We therefore showed participants a chat message after they reported the first 10 outcomes in which another student informed them that it was possible to cheat during the task and that this student had decided to report only the high side as an outcome (cheating norm). Under an authentic leader, participants in Condition 4 cheated with 63.5% high rolls in a similar magnitude to those in the baseline condition (see Fig. 1, Panel C). When a non-authentic leader delivered the instructions and participants were informed about the possibility of cheating, participants reported 63.3% high rolls, which is no different from those in either the baseline condition or Condition 5 (Table 3, Columns [2] and [3]). We also tested whether cheating behavior varied within subject rather than between conditions. We therefore compared the first 10 rolls with

the next 30 rolls when participants received the cheating norm treatment. However, students did not change their cheating behavior spontaneously when observing dishonest behavior by others (Table 3, Column [4]). We therefore reject hypothesis 3.

4.3.3. Experience of cheating

Finally, we tested whether being cheated by a fellow student (experience of cheating) spurs cheating behavior and whether authentic leadership might constitute a remedy. We found that participants reported 61.3% high rolls under the authentic leadership condition and 59.2% under the non-authentic condition (see Fig. 1, Panel D), which is not statistically different from either those in the baseline condition or each other (Table 3, Columns [2] and [3]). Finally, we again compared the first 10 rolls with the next 30 rolls when participants received the experience-of-cheating treatment. Again, students did not change their cheating behavior when observing dishonest behavior by others (Table 3, Column [4]). We therefore reject hypothesis 4.

4.4. Robustness

As a robustness check, we investigate whether the gender of the participants or the leader or a combination of the two has a significant impact on their cheating behavior. The results show that participants perceived the male actor on average no more or less authentic then the female actress ($p = 0.7484$). Not surprisingly, we again found no differences in outcomes. Individual cheating occurred at the same magnitude regardless of whether the participants or leaders were male or female (Fig. 2, Panel B and C).

Finally, we tested whether the expectations of others cheating influenced the individual propensity to cheat. We found that participants who believed that less than 31% of students had earned more than they themselves did cheated about the same as those who believed that more than 61% of students had earned more than they themselves did (Table 2, columns [4] and [6]).

- Figure 2 around here -

5. Discussion and conclusion

Spontaneous dishonesty in professional contexts—that is, when employees feel entitled to enrich themselves at the cost of their organizations—is a major problem for the corporate

sector. We investigated the persistency of spontaneous dishonesty in professional contexts under the influence of leadership, cheating norm, and experience of cheating. In doing so, we integrated behavioral economics and organizational psychology theory, used a carefully designed laboratory experiment (video variation of authentic leadership and cheating-of-mind task), and tested a range of variables that may affect cheating levels.

Across seven experimental conditions tested in this research, we found that cheating was persistent. In line with self-concept maintenance theory (Ariely, 2012; Mazar et al., 2008), we found that participants engaged in minor acts of spontaneous dishonesty, but not to the fullest extent possible. Cheating did not change significantly under the influence of authentic leadership, contingent on a cheating norm or the experience of cheating. Consequently, cheating at low levels seems more difficult to prevent than we might believe. For example, organizational psychology indicates that managerial behavior (authentic leadership) can prevent employees from unethical decision making (Cianci et al., 2014). While this might hold true in general, we propose that restrictions to this assumption must be made in light of our findings. First, cheating at low levels (taking smaller items from their firm) may not induce cheating costs to employees; rather, employees may perceive minor theft or dishonesty as acts of trivial offense, and those who engage in such acts will likely maintain their positive self-concept. As a consequence, cheating at low levels continues and, in sum, affects organizational functioning significantly and negatively. Second, while we assumed that leadership affects the threshold under which individuals view themselves positively, even if they cheat, this might not be the case. At the very least, in our experiment that included a short-term relationship between an employee and a newly introduced supervisor, authentic leadership did not impede spontaneous dishonesty. This finding is in line with theory recommending that leadership research take time into account (Shamir, 2011).

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Table 1
Study conditions.

Condition	No.	Factor 1: Authentic		Factor 2: Cheating norm		Factor 3: Being cheated	
		High	Low	Yes	No	Yes	No
Baseline	**[1]**				X		X
Authentic	**[2]**	X					
Non-authentic	**[3]**		X				
Authentic & cheating norm	**[4]**	X		X			X
Non-authentic & cheating norm	**[5]**		X	X			X
Authentic & being cheated	**[6]**	X			X	X	
Non-authentic & being cheated	**[7]**		X		X	X	

Table 2
Descriptive statistics.

		N	Mean	Median	SD	Min	Max
Age		333	23.35	22	5.06	17	57
Under 21	[1]	92					
Between 21 and 25	[2]	177	[1] vs. [3]: p = 0.0619, P > |z| = 0.0802				
Over 25	[3]	74					
Expectations		337	44.56	45	19.49	0	91
Less than 31%	[4]	96					
Between 31% and 60%	[5]	163	[4] vs. [6]: p = 0.6890, P > |z| = 0.6198				
Over 61%	[6]	82					
Semester		327	5.82	5	3.73	1	22
Work experience		338	0.57	1	0.50	0	1
Yes	[7]	191	[7] vs. [8]: p = 0.7939, P > |z| = 0.8496				
No	[8]	147					
Gender		335	0.35	0	0.48	0	1
Male	[9]	117	[9] vs. [10]: p = 0.1809, P > |z| = 0.0733				
Female	[10]	218					
Marital status							
Single	[11]	155	[11] vs. [12]: p = 0.1314, P > |z| = 0.0687				
In a relationship	[12]	168					
Married	[13]	6					
Divorced	[14]	2					
Other	[15]	2					
Prefer not to answer	[16]	10					
Living standard							
Very well-off	[17]	6					
Living very comfortably	[18]	149					
Living comfortably	[19]	123	[17-19] vs. [20-22]: p = 0.9273, P > |z| = 0.9960				
Just getting along	[20]	43					
Nearly poor	[21]	4					
Poor	[22]	6					
Prefer not to answer	[23]	12					

Differences report p-values on a two-sided t-test between means as well as Prob > z for Mann–Whitney U-tests.

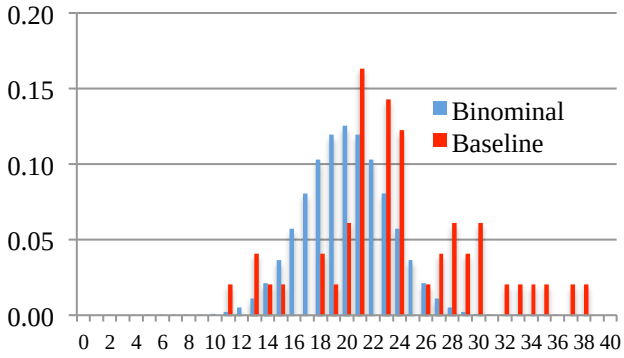
Table 3: Differences in cheating behavior

		High rolls in %					(1)	(2)	(3)	(4)
		N	Mean	SD	Min	Max	Diff. 50%	Diff. [1]	Diff. Cond.	Diff. 10 vs. 30
Condition 1 (baseline)	**[1]**	49	61.8	13.8	32.5	95.0	p = 0.0000***			p=0.9109
Condition 2 (authentic)	**[2]**	47	61.8	12.1	40.0	97.5	p = 0.0000***	p = 0.9755 P>|z|=0.8802	**[2] vs. [3]** p = 0.4752	p = 0.1909
Condition 3 (non-authentic)	**[3]**	42	63.5	12.3	40.0	100.0	p = 0.0000***	p = 0.5101 P>|z|=0.8066	P>|z|=0.7315	p = 0.4670
Condition 4 (authentic & cheating norm)	**[4]**	46	61.5	13.1	42.5	92.5	p = 0.0000***	p = 0.5596 P>|z|=0.6035	**[4] vs. [5]** p = 0.7529	p = 0.7062
Condition 5 (non-authentic & cheating norm)	**[5]**	55	63.7	15.2	40.0	100.0	p = 0.0000***	p = 0.3854 P>|z|=0.6287	P>|z|=0.9362	p = 0.1972
Condition 6 (authentic & experience of cheating)	**[6]**	52	64.4	15.4	40.0	100.0	p = 0.0000***	p = 0.9096 P>|z|=0.6353	**[6] vs. [7]** p = 0.4606	p = 0.1222
Condition 7 (non-authentic & experience of cheating)	**[7]**	51	59.7	11.0	40.0	95.0	p = 0.0000***	p = 0.3936 P>|z|=0.2001	P>|z|=0.6400	p = 0.3429

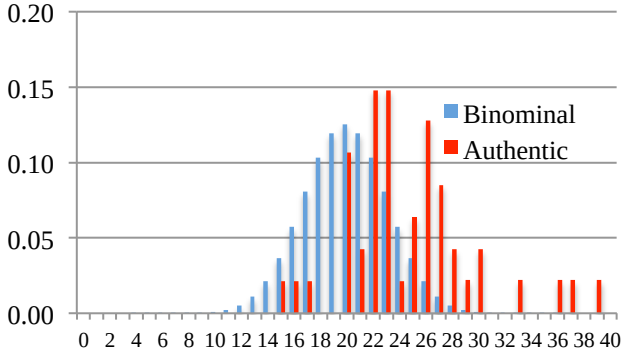
Differences report p-values on a two-sided t-tests as well as Prob > z for a Mann–Whitney U-tests. (1) is the between-subjects variation for rolls 1–40 from the fair outcome of 50% high rolls, (2) is the between-subjects variation for rolls 1–40 from the baseline condition, (3) is the between-subjects variation for rolls 1–40 between the authentic and non-authentic leadership conditions, and (4) reports the difference for the within-subject variation for rolls 1–10 and rolls 11–40 for the respective condition.

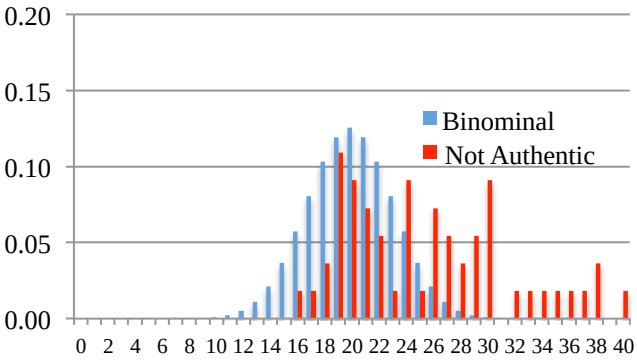
Fig. 1. Distribution of average reported outcomes in the cheating-of-mind task.

Panel A: Baseline (C1)

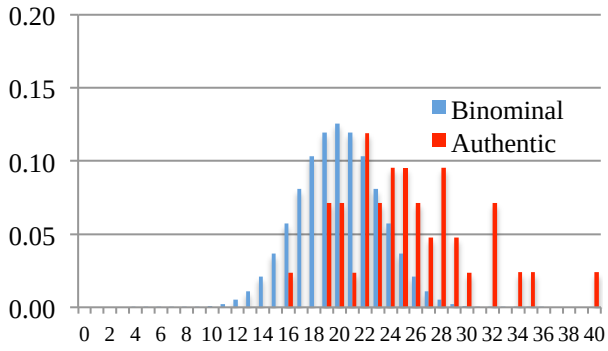


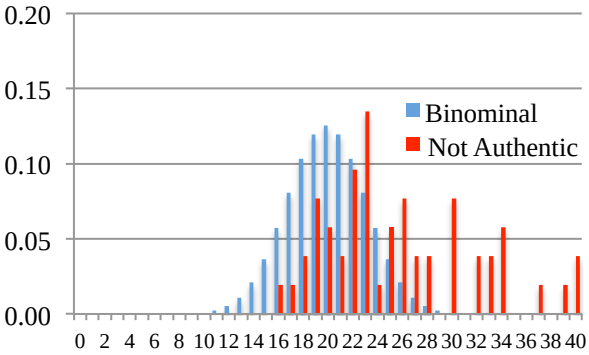
Panel B: Authentic vs. non-authentic leadership (C2 vs. C3)



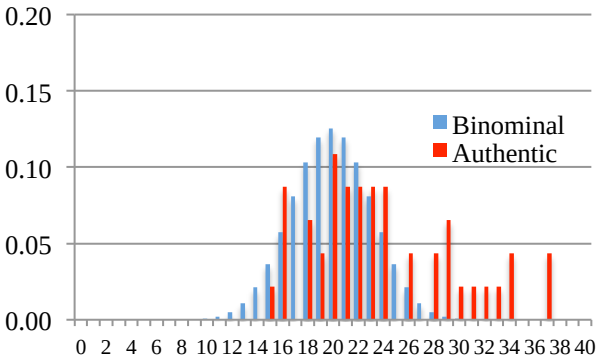


Panel C: Authentic vs. non-authentic leadership and cheating norm (C4 vs. C5)





Panel D: Authentic vs. non-authentic leadership and experience of cheating (C6 vs. C7)



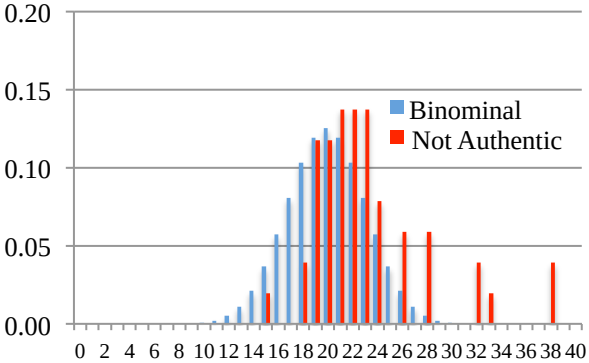
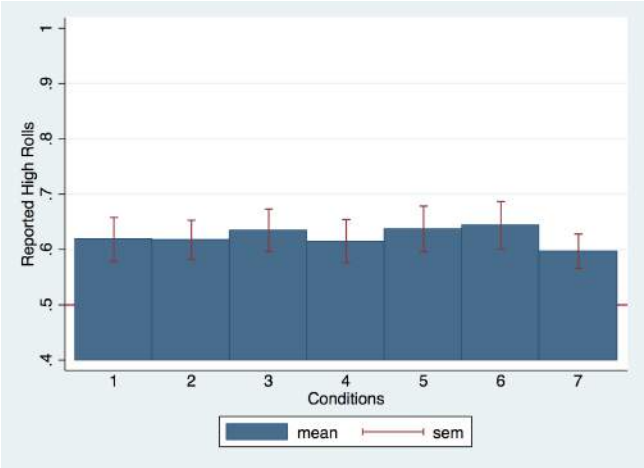
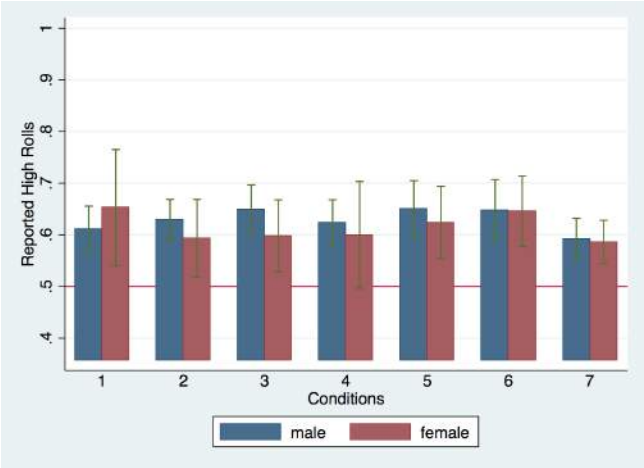


Fig. 2. Differences in cheating behavior by conditions and gender.

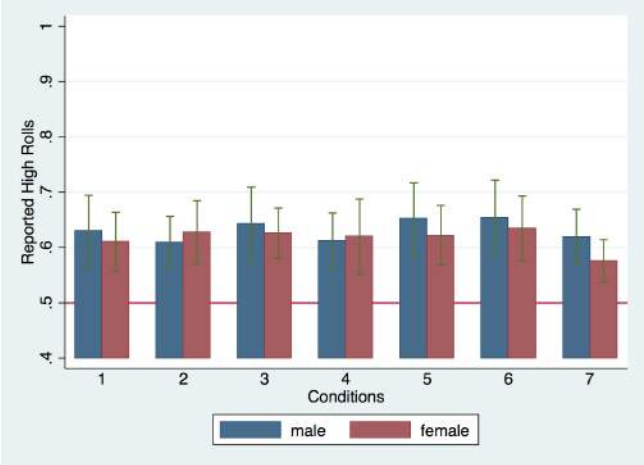
Panel A: Conditions 1–7



Panel B: Conditions 1–7 Gender of participants



Panel C: Conditions 1–7 Gender of supervisor



Appendix. List and definition of variables.

Dependent variable:

High roll: 0 = Participants reported that they had rolled a 1, 2, or 3. 1 = Participants reported that they had rolled a 4, 5, or 6.

Explanatory variables

Age: Participants' age as of April 2015.

Education: Reply to the question 'What is the highest level of education you have completed?' 0 = none, 1 = 'Hauptschule' (lower-level high school), 2 = 'Realschule' (high school), 3 = 'Abitur / Fachabitur' (some college), 4 = 'Bachelor / Fachhochschulabschluss' (3–4 years of university), 5 = 'Master / Diplom' (4–5 years of university) and 6 = 'Promotion / Aufbaustudium' (doctoral degree, post-graduate degree).

Expectations: Reply to the question 'What is the percentage of participants who have earned more than you in the die task?'

Gender: Gender, 0 = female, 1 = male.

Living standard: Reply to the question 'What describes your standard of living?' on a scale from 1 = very well-off to 6 = poor.

Material standard: Reply to the question 'What is your marital status'. 1 = single, 2 = In a relationship, 3 = married, 4 = divorced, 5 = other, 6 = prefer not to answer.

Semester: Number of semester participants had studied as of April 2015.

Work experience: Reply to the question whether the participant had previous work experience in an organization, 0 = no, 1 = yes.

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