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Cheating customers in grocery stores: A field study on dishonesty

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ABSTRACT

The study measures how often customers are cheated in real-world transactions. In a pre-registered field study in Prague, Czech Republic, hired confederates posed as foreigners unfamiliar with local currency. While buying snacks in grocery stores (N = 259) either in the morning or in the evening, they provided cashiers with an opportunity to steal money from them by keeping more change than they were supposed to. The customers were cheated in 21% of stores, the median overcharge was 54% of the value of an average purchase, and overcharging occurred more often in the stores with on-line reviews mentioning dishonesty of employees. Although males cheated and were cheated slightly more often than females, gender differences were not significant. In contrast with predictions of the Morning Morality Effect, dishonest behavior occurs slightly more often in the morning than in the evening. The results show that cheating of customers in grocery stores is relatively widespread and it is especially prevalent in the central city district where the odds of being cheated are more than three times higher in comparison with the rest of the city.

Cheating and dishonesty have considerable negative economic and social impacts (Jain, 2001; Murphy, 1993). Finding out who and under which circumstances is more likely to cheat may help create policies preventing or mitigating those impacts (Jaakson, Vadi, Baumane-Vitolina & Sumilo, 2017). However, since dishonest behavior is usually concealed, its study at the individual level presents a serious challenge (Pierce & Balasubramanian, 2015; Zitzewitz, 2012). In recent years, a number of laboratory studies attempted to overcome the challenge and identified many situational factors and personal characteristics that seem to be associated with dishonest behavior (e.g., Fischbacher & Föllmi-Heusi, 2013; Gino, Ayal & Ariely, 2009, 2011; Kouchaki & Smith, 2014; Mazar & Ariely, 2006; Rosenbaum, Billinger & Stieglitz, 2014; Shalvi, Gino, Barkan & Ayal, 2015).

Although some authors have already started recommending practical interventions based on these findings (e.g., Ayal, Gino, Barkan & Ariely, 2015), others have noted that their robustness and practical applicability should first be more thoroughly investigated (Houdek, 2019; Jacobsen, Fosgaard & Pascual-Ezama, 2018). Since the experiments usually use only a limited number of highly stylized tasks and are conducted mostly with students (Gerlach, Teodorescu & Hertwig, 2019), the findings may not be generalizable to real-world settings (Levitt & List, 2007). Such concerns are supported by a recent meta-analysis (Gerlach et al., 2019), which demonstrates that levels of dishonesty and factors that affect it differ between laboratory and field settings and between different experimental tasks employed by researchers. Even though there is a demonstrable relationship between dishonest behavior in the laboratory and in real-life (Dai, Galeotti & Villeval, 2018; Gächter & Schulz, 2016; Potters & Stoop, 2016), to directly assess the robustness of laboratory findings, it is necessary to conduct field studies (Anderson, Lindsay & Bushman, 1999; Jacobsen et al., 2018) and especially field studies focused on naturally occurring dishonest behavior (Pierce & Balasubramanian, 2015). Only with a sufficient number of such studies can their results be systematically reviewed, aggregated, and then broader conclusions regarding dishonesty under natural conditions can be drawn.

However, despite their importance, natural field studies are still relatively scarce (Alem, Eggert, Kocher & Ruhinduka, 2018; Cohn, Maréchal, Tannenbaum & Zünd, 2019). The existing ones often focus on correlates of and interventions influencing honesty in an honor system setting in which people should pay for items (e.g., snacks, newspapers) they take, but nobody verifies whether they have actually paid or not (e.g., Bateson, Nettle & Roberts, 2006; Brudermann, Bartel, Fenzl & Seebauer, 2015; Haan & Kooreman, 2002; Levitt, 2006; Pruckner & Sausgruber, 2013). Others look into whether people return the money they received by mistake to their bank accounts (Alem et al., 2018; Potters & Stoop, 2016) or from a waiter in a restaurant

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(Azar, Yosef & Bar-Eli, 2013) or whether honest reporting increases when people sign a report form at the beginning instead of at the end (Shu, Mazar, Gino, Ariely & Bazerman, 2012). In all these instances, the dishonest behavior does not have a clear and directly present victim, it is oftentimes passive (e.g., not paying for something, not returning the excessive change), and can be relatively easily framed as a mistake, thus mitigating possible negative effects on self-image (Mazar, Amir & Ariely, 2008). Field studies exploring dishonesty in situations in which perpetrators actively cheat or steal from their victims while directly facing them are even rarer. The few existing studies focus on how people cheat their customers. For example, Balafoutas, Beck, Kerschbamer and Sutter (2013) showed that taxi drivers cheat foreigners, driving them through unnecessarily long routes and overcharging them in 19% of cases. Other studies demonstrated how car mechanics use price discrimination based on how knowledgeable their customers are about car repairs and charge more or perform unnecessary repairs to less informed customers (Busse, Israeli & Zettelmeyer, 2013; Schneider, 2012). Recently, two other field studies showed how frequently sellers cheat on weight in Indian fish markets (Dugar & Bhattacharya, 2016) and how such behavior is relatively uncommon at German candy-selling mini-markets (Conrads, Ebeling & Lotz, 2015).

Our present field study aims to expand this relatively limited behavioral field evidence on dishonesty by exploring how often are customers cheated in grocery stores in the Czech capital. We use a variation of the over-payment paradigm (Feldman, 1968; Rabinowitz et al., 1993). In over-payment studies, confederates in the role of customers buy goods and give a cashier more than the marked price. An international comparative study employing the over-payment method (Feldman, 1968) estimated that from 27% cashiers in Boston up to 54% cashiers in Paris had kept the whole over-paid sum. A similar study conducted in Salzburg, Austria (Rabinowitz et al., 1993) examined whether employees of souvenir shops would keep an over-paid sum from a tourist and whether they would protest when the tourist pays too little. The results suggest that at least some over-payments kept by cashiers can be explained by carelessness or inattention: there was no difference between the number of noticed under-payments and the number of returned over-payments. Therefore, we have modified the procedure to eliminate the confounding influence of honest mistakes caused by insufficient attention.

In addition to estimating the prevalence of dishonest behavior in the field, we also aim to explore the correlational relationships between dishonesty and three factors previously identified as related to dishonest behavior, namely gender (Erat & Gneezy, 2012; Muehlheusser, Roider & Wallmeier, 2015), the time of day (Kouchaki & Smith, 2014) and location (Biagi & Detotto, 2014; Montolio & Planells-Struse, 2016).

Men's higher propensity to engage in dishonest behavior and cheating is well documented across different experimental tasks (Abeler, Nosenzo & Raymond, 2016; Gerlach et al., 2019; Jacobsen et al., 2018). According to current laboratory and field experiments, men are also more likely to be intuitively dishonest (Fosgaard, Hansen & Piovesan, 2013). However, in comparison to the number of studies using experimental tasks, there are only a relatively few field studies observing gender differences in natural dishonest behavior. According to these studies, men seem to be responsible for most thefts, violent crimes, and other illegal activities (Kruttschnitt, 2013; Lauritsen, Heimer & Lynch, 2009). Men are more willing to keep money that does not belong to them or which they gained by mistake (Azar et al., 2013; Friesen & Gangadharan, 2012). They also more often free-ride in public transportation (Bucciol, Landini & Piovesan, 2013). However, it seems that when potential benefits of dishonest behavior are high enough, the gender difference tends to disappear (Childs, 2012).

Even though the existence of gender differences in dishonesty is hardly questionable, the size of these differences in different contexts is less clear. For example, a large meta-analysis of dishonest behavior across four experimental tasks estimates that 42% males and 38% females are cheaters – a difference of mere four percentage points (Gerlach et al., 2019). On the other hand, in the field study by Azar et al. (2013), 79% males and 52% females did not return the excessive change – a much more substantial difference. Our study provides more field evidence that can be used to better understand gender differences in dishonest behavior in natural settings.

Regarding victims of cheating and dishonest behavior, studies are less numerous (Soraperra, Weisel & Ploner, 2019) and even less clear. Although in the above-mentioned over-payment study male confederates were cheated less often (Rabinowitz et al., 1993), in another study male customers were cheated more often by cashiers (Gabor, Strean, Singh & Varis, 1986). Car repair shops quoted higher prices to female callers in a recent field experiment (Busse et al., 2013) and women get inferior offers in bargaining for cars (Ayres & Siegelman, 1995) or sportscards (List, 2004), however these findings likely reflect a purely statistical discrimination without any intent to deceive. Nevertheless, Fox, Nobles and Piquero (2009) found that women report being victims of personal, sexual, and property crimes more often than men. Based on these findings, we expect that perpetrators in our field study are more likely to be men and victims are more likely to be women.

Secondly, we investigated the possible relationship between dishonesty and the time of day. Because behaving in accordance with the legal and moral norms requires inhibiting dishonest impulses (Shalvi, Eldar & Bereby-Meyer, 2012), especially in situations where the risk of getting caught is low, depleted self-control resources should lead to more dishonest and immoral behavior (Barnes, Schaubroeck, Huth & Ghumman, 2011; Gino et al., 2011). Based on these findings, Kouchaki and Smith (2014) predicted and in a series of four experiments demonstrated that the ability to resist the temptation to act immorally decreases during the day and people behave more dishonestly in the evening. The so-called Morning Morality Effect is also accentuated by situational factors, for example, by worse light conditions in the evening (Chalfin, Hansen, Lerner & Parker, 2019; Chiou & Cheng, 2013). Our study is the first to explore the predictions of Morning Morality Effect in natural settings and test whether cashiers' propensity to act dishonestly will really be lower in the morning than in the late afternoon.

Finally, because tourists are common victims of theft, fraud, and scams, even despite being aware of the increased risks (Harris, 2012; Tarlow, 2006) and several studies demonstrated relations between tourism and criminality (Biagi & Detotto, 2014; Montolio & Planells-Struse, 2016), we decided to explore whether the prevalence of dishonest behavior is higher in a central city district that is notorious for the high number of visiting tourists (Dumbrovská & Fialová, 2014).

1. Method

All used measures, procedure and main analysis were pre-registered on the OSF (https://osf.io/c7tzh) before the start of the data collection, in accordance with current methodological recommendations (Open Science Community, 2014). However, the idea to analyze the relationship between the location and dishonesty occurred to us only ex-post, and thus, this particular analysis is not pre-registered and its results should be treated as exploratory. The field study was conducted between June 27th and September 7th, 2015 in the wider center of Prague, the capital of the Czech Republic.

1.1. Pretest

Before the main study, we have conducted a pretest to verify whether cashiers in fact experience cases like the scenario we intended to use; that is, if customers sometimes ask cashiers to pick the correct amount of change for them. The pretest consisted of an informal interview with cashiers in shops which were later excluded from the main study. We have interviewed 19 cashiers. Seventeen of them had experience with the described situation. Their estimates of how often they encounter such situations varied from "daily occurrences" to "occurring a few times a month". Tourists and seniors were two groups of customers named most often as behaving in the described way. The pretest has therefore established that our intended scenario is a commonly occurring, realistic situation.

1.2. Sample

1.2.1. Confederates

The confederates were four Czech research assistants (two women and two men) from our laboratory in their twenties. They wore T-shirts with a sign "I \clubsuit Prague" and spoke only English during their interaction with cashiers, therefore implying they are tourists not familiar with Czech money. Although it is possible that they spoke English with a slight accent, our aim was not to pose specifically as native English speakers, only as foreigners. The Czech accent is not distinguishable from accents of many other Slavic nations in Europe.

1.2.2. Participants

The participants were 319 cashiers (56% female) in grocery and corner stores in Prague, the capital of the Czech Republic. The stores were selected by the confederates walking through streets in the center of Prague, visiting each grocery and corner store they encountered on their way. The median estimated age of cashiers was 35 years (ranging from 20 to 60 years).

1.3. Procedure

After entering a grocery store, a confederate picked one or two items (such as a granola bar or a can of soda) that cost approximately 40 CZK (\sim \$ 1.66) and purchased them by placing a fistful of change on a desk in front of a cashier, telling him/her in English: "Sorry, I don't know the change, can you pick it for me, please?". After the cashier picked the change, the confederate collected the rest of it, took the purchased item (s), and left the store. After leaving the store, the confederate took a note of the following variables: the name of the store, its location, the time of the visit, the price of the purchased items, the value of change left, number of other customers, the number of cash desks, estimated age and gender of the cashier, his/her own gender, and any additional notes concerning the interaction. After the data collection, information about the city district in which the store was located was added to the dataset.

The change offered to cashier always consisted of coins of the following values: 3×50 CZK; 4×20 CZK; 3×10 CZK; 4×2 CZK; 3×1 CZK (total value: 271 CZK). Each grocery store was visited only once; either in the morning (approx. between 9:00 – 11:00 AM) or in the evening (approx. between 6:00 – 8:00 PM).

2. Results

After exclusion of all instances in which the interaction did not occur according to the pre-registered protocol (e.g., other persons intervened during the interaction, the same store was visited for the second time by a different research assistant by mistake, the store was located too far from the broad city center, or the price of the purchase differed more than 20 CZK from the target price of 40 CZK), 259 valid cases remained out of the initial 319 (see Fig. 1).

The number of cases in which cashiers overcharged, undercharged or charged the correct amount can be found in the Table 1 together with accompanying descriptive statistics.

Cashiers overcharged confederates in 21% of cases and the median overcharged amount was 20 CZK. The value of an average purchase was 36.8 CZK; therefore, the median overcharged amount of 20 CZK represents 54% of the value of an average purchase. The total value of all purchased goods was 9533 CZK and confederates were overcharged for a total of 1438 CZK, that is 15% of the total value of all purchased goods.

Before the presentation of results of the more complex pre-registered regression analysis, in Table 2 we present an overview of main results. For each investigated binary factor, the probabilities of overcharging in each group are presented, together with an overall number of observations for the groups, odds-ratio, and a chi-square test. There were no significant differences between any pair of groups expect for a comparison between the central city district and the other districts – the odds of getting overcharged in the central district of Prague 1 were more than three times higher than in the rest of the capital (see Fig. 2 for geographical distribution of visited stores). However, all analyses concerning the location variable should be treated only as exploratory, as it was not a part of the original design of the study.

In the first model, we conducted a probit regression with overcharging as a dichotomous dependent variable. We used four binary predictors: whether the shop was visited in the morning, whether the customer was male, whether the cashier was male, and whether their genders differed (the first column in Table 3). None of the predictors was significant, despite sufficient statistical power of 0.89 to detect Morning Morality Effect of magnitude reported in the original study (Kouchaki & Smith, 2014) as well as sufficient power of 0.84 to detect gender differences of size reported in the field study by Azar et al. (2013).

It can be argued that at least a fraction of the small overcharges does not represent true cheating. These cases can be arguably caused by cashiers' unwillingness to carefully search for the correct amount. The fact that cashiers sometimes undercharged by a small amount (at most 6 CZK) provides a support for this notion. Thus, when using the instances of undercharging as an indicator, we can safely assume that all cases when confederates were overcharged for 10 and more CZK constitute intentional cheating. There were 38 such cases (14.7%). Because the initial analysis mixed together cheating with cases that might have simply been mistakes, we repeated the probit regression analysis with an occurrence of cheating for 10 and more CZK as a dependent variable (see the second column in Table 3) in order to check the robustness of the initial results. As this analysis was not pre-registered, it should be treated only as exploratory.

Once again, the model did not fit the data significantly better than a base model including only an intercept. However, it seems that confederates might have been more likely to be cheated in the morning than in the late afternoon (b = 0.415, p = .03). This effect is in the opposite direction than we expected. None of the remaining predictors was significant.¹

3. Discussion

Our study found that cashiers cheat customers often: cheating occurred in 21% of all transactions. If we count as cheating only cases when tourists were over-charged for more than 10 CZK (\sim \$ 0.42), the rate of cheating was still considerably high at 14.7%. Cheating cashiers over-charged usually about 50% of the price of bought goods, however in three out of 259 cases cashiers over-charged from 100% to 400% of the price. These results are in line with laboratory findings that cheaters usually do not cheat to the fullest extent possible (Fischbacher & Föllmi-Heusi, 2013; Mazar et al., 2008).

In comparison with previous studies, we can rule out cashiers'

¹ When the location variable is added to the first model, it is significant (p = .002), but after its addition to the second model, both location and time of day become only marginally significant (p = .071 and p = .051, respectively). As these analyses are only exploratory, they are fully reported on-line in Table 3A at https://osf.io/q6a3g/.



Fig. 1. Distribution of under- and overcharged amounts (in CZK). Note. Cases in which the correct amount was charged (196 cases, 75.7%) are omitted. Probable "rounding mistakes", i.e., amounts from -6 to +7 CZK, are in black.

Table 1

Descriptive statistics.

	N (%)	Mean	SD	Median	Min	Max
Overcharged amount	55 (21%)	26.2	29.6	20.0	1	160
Undercharged amount	8 (3%)	2.4	2.0	1.5	1	6
Correctly charged amount	196 (76%)	0	-	0.0	0	0
Purchase value	259 (100%)	36.8	6.4	36.0	23	57

Table 2Probability of overcharging.

Group	Probability of overcharging	Number of observations	OR	chi-square (df=1) <i>p</i> -value
female customer	20.0	140	0.85	0.278
male customer	22.7	119		0.598
female cashier	19.1	136	0.77	0.768
male cashier	23.6	123		0.381
morning	24.1	116	1.37	1.058
late afternoon	18.9	143		0.304
gender matches	24.4	124	1.50	1.736
gender differs	17.7	135		0.188
Prague 1 district	39.6	48	3.18	11.859
other districts	17.1	211		0.001**

p < 0.01.

inattention as a cause of over-charging. The confederates paid cashiers by offering them a fistful of change in a nominal value approximately six times higher than was the price of bought goods. From these coins, each cashier had to pick the amount that the customer was supposed to pay, which forced cashiers to pay enough attention. In this way, we have almost eliminated the possibility that some cases of over-charging were in fact mistakes caused by cashiers' inattention.

Nevertheless, it is possible that small rounding errors still happened in a fraction of cases: eight times out of 259 cases, cashiers undercharged an equivalent of up to \$ 0.25 and twice as often they overcharged up to the same amount. A plausible explanation may be that cashiers were unwilling to carefully search through all the coins to find the exact correct amount and they simplified their task by rounding. Although cashiers took a smaller amount in some cases, rounding up at the expense of a customer was more likely. Because some of these small over-charges might be motivated by laziness and some might be true mistakes, we conducted an additional exploratory analysis in which we included only cases of over-charging of 10 CZK (\sim \$ 0.42) and more. The effect of time of the day was significant in the second model, however in the opposite direction than predicted by the Morning Morality Effect (Kouchaki & Smith, 2014).

According to the Morning Morality Effect, workers deplete their self-regulatory capacities during the day, and they are, therefore, unable to act according to moral rules when faced with a tempting opportunity to cheat in the evening (Kouchaki & Smith, 2014). Our study did not find any support for the hypothesis that cashiers behave more

dishonestly in the evening than in the morning. However, it is important to note that we were not able to randomly assign cashiers to the morning and evening conditions. There is therefore a possibility that cashiers self-select to morning and evening shifts, possibly in a way that counteracts the Morning Morality Effect. Although the gender proportions are roughly the same in the morning and in the evening, χ^2 (1) = 1.62, p = .203, older cashiers are more likely to work in the evening, $r_s = 0.143$, p = .022. Age was previously shown to be negatively correlated with dishonest behavior (Fosgaard, 2018; Gerlach et al., 2019), so older people working in the evening could possibly interfere with the Morning Morality Effect. However, there was no relation between the estimated age of cashiers and overcharging in our data, $r_s = -0.016$, p = .801, so the difference in age is unlikely to interact with the Morning Morality Effect in our study. Still, the effect of self-selection cannot be ruled out as there may be other, unobserved differences between morning and evening cashiers.

To further investigate the issue, we additionally conducted interviews with cashiers in a random subsample of previously visited stores (N = 11). The interviews showed that there were two major types of grocery stores in our study: (1) Franchise stores (approx. 25% of our sample) that have regular morning and afternoon shifts, starting at approximately 7:00 AM and 1:00 PM, respectively, and (2) family-run stores (approx. 75%) without any clearly defined work shifts. Based on the interviews, in the family-run stores, cashiers would usually stay in the shops throughout the whole day. Based on the average times when shifts start and end, we can estimate that when a franchise store was visited by a confederate during the morning, the cashier had been working fewer hours on average than when a store was visited during the evening slot. Although we were not able to observe exactly how long the cashiers had been working, it does not constitute a serious limitation of the study, because the decrease in honesty is supposed to be a consequence of depletion of self-control caused simply by being awake, and we can safely assume that cashiers working in the late afternoon are awake longer than cashiers working in the morning.

At the same time, we found no significant relationship between gender and dishonest behavior: although male cashiers overcharged slightly more often than female cashiers (the difference of 4.5 percentage points), male customers were cheated more often than female customers (2.7 percentage points), and when genders of the two parties matched, cheating occurred more often than when genders differed (6.7 percentage points), all these differences could very well be only random. On the other hand, the gender difference in cheating in experimental tasks is estimated to be of similar magnitude of only four percentage points (Gerlach et al., 2019). Our results are thus in line with the existence of robust, albeit small gender differences in dishonesty, as well as with mixed findings of previous studies employing a similar field study design (Gabor et al., 1986; Rabinowitz et al., 1993). Therefore, it seems that if there is a relationship between gender and cheating in this setting, it is not likely to be very strong, and its precise estimation is probably impossible without meta-analytical approach aggregating many individual studies. Although our overall sample with 259 grocery shops was sufficiently large to identify effects observed in



Fig. 2. Geographical distribution of visited stores. *Note.* Circles represent stores charging the correct amount; diamonds represent overcharging stores, and stores overcharging more than 10 CZK are marked with a darker color. Squares represent undercharging stores. The approximate area of the Prague 1 district is shaded gray. A small amount of random noise was added to coordinates of each store in order to prevent its exact identification. When stores are too close to each other, individual markers might not be visible on the map. .

Table 3	3				
Results	of probit	regression	predicting	overchargi	ng.

	Probit regression models p any overcharging		oredicting: overcharging of 10 and more CZK		
	b (SE)	р	b (SE)	р	
morning	0.202 (0.178)	.256	0.419 (0.196)	.033*	
male confederate	0.085 (0.178)	.633	0.140 (0.198)	.479	
male cashier	0.179 (0.179)	.316	-0.045 (0.199)	.820	
different genders	-0.251 (0.178)	.158	-0.314 (0.199)	.114	
model fit (diff. from null)					
χ^2 (df)	4.209 (4)	.378	7.366 (4)	.118	
Nagelkerke R^2	0.025		0.050		

p < 0.05.

previous studies (e.g., Azar et al., 2013; Kouchaki & Smith, 2014), in order to achieve sufficient power to detect gender differences of the magnitude identified by a recent meta-analysis (Gerlach et al., 2019), a sample size of more than 7500 observations would be necessary.

3.1. Practical implications

We found a relatively high prevalence of dishonest behavior among retail workers. Such behavior can negatively affect not only the reputation of retail companies (Jaakson et al., 2017), but also the reputation of a city or a country as an attractive travel destination, considering that foreign tourists are often victims of cheating. The identified prevalence of cheating also suggests it is necessary to adopt effective countermeasures. One possibility seems to be closer monitoring of cashiers' work. Although some recent experimental studies suggest that increased monitoring may make employees less intrinsically motivated to perform their work, the studies also show that monitoring considerably lowers prevalence of dishonest behavior (Belot & Schröder, 2016; Pascual-Ezama, Prelec & Dunfield, 2013; Pierce, Snow & McAfee, 2015). Various other tools for securing ethical conduct of employees can also be used: for example, personality tests and integrity tests could provide organizations with insight into employees' dispositions to unethical behavior, because results from these tests can be used to predict future dishonest behavior (Berry, Sackett & Wiemann, 2007; Hogan & Hogan, 1989; McDaniel & Jones, 1988). Lastly, sharing economy companies today use rating systems and customer reviews to help detect and prevent dishonesty. A similar rating system for grocery shops could help people to steer clear of the stores with the worst services which would create pressure to improve their conduct.

At the suggestion of one of the reviewers, we checked the Google reviews of the visited stores. There was at least one rating on a 5-star scale for 112 (42.3%) of the stores. The median rating was only slightly and non-significantly lower for the overcharging stores (Mdn = 3.5) than for stores charging the correct amount (Mdn = 3.7), U = 784.5, p = .151. However, when we categorized the stores based on whether there was or was not a mention of scam or fraud in the written comments accompanying the ratings, we found that overcharging stores were almost three times more likely to receive at least one such comment (OR = 2.96) than the stores charging the correct amount, χ^2 (1) = 5.087, p = .024. These results support the ecological validity of our procedure for measuring dishonesty and demonstrate the feasibility and usefulness of the rating and review system in practice.

Our study also highlights the necessity of conducting field studies and employing mystery shopping to identify the prevalence of dishonesty in natural settings. Surprisingly, an examination of employees' dishonesty is currently missing in most applications of mystery shopping (Finn & Kayandé, 1999; Frost & Rafilson, 1989; Gosselt, van Hoof, de Jong & Prinsen, 2007; Wilson, 2001).

Finally, our study underscores current concerns about low replicability of a large portion of psychological results. Previously identified psychological effects are often difficult to replicate even in a controlled laboratory setting (Klein et al., 2018; Open Science Collaboration, 2015). It can be therefore expected that their effect sizes will be even smaller in the real-world setting with many interfering influences. Despite the limitation of our study design, the results suggest that the Morning Morality Effect might not be as strong as had been suggested.

3.2. Study limitations and future research

One of the shortcomings of field studies is a relatively limited scope of available data – we had no access to data about the corporate culture of visited stores or about psychological traits and states of individual cashiers. All these variables surely influence the propensity to act dishonestly. Previous laboratory studies, for example, show that people cheat more if they are treated unfairly (Houser, Vetter & Winter, 2012), when they are rewarded non-transparently (Gill, Prowse & Vlassopoulos, 2013), when they deliberately self-select for a setting that allows easier cheating (Gino, Krupka & Weber, 2013; Houdek, 2017), when they experience monetary loss (Grolleau, Kocher & Sutan, 2016), and many other situations (Lau, Wing Tung & Ho, 2003). Cashiers are also relatively strongly influenced by productivity and work style of their colleagues (Mas & Moretti, 2009), which suggests that their propensity to dishonest behavior could be affected by the behavior of their colleagues or by the organizational culture of the company for which they work (Vranka & Houdek, 2015). However, there are not yet enough experimental studies examining the effects of these factors on the prevalence of dishonest behavior in real life, and they could be therefore a subject of future research.

All our findings are possibly limited by the specifics of our study: by its setting (i.e., small grocery stores), by its location (i.e., the capital of the Czech Republic) and by the role played by the confederates (i.e., foreign tourists). On the other hand, it can be reasonably expected that none of these factors should substantially interact with the examined determinants of dishonesty. Furthermore, other studies suggest that the prevalence of certain kinds of dishonest behavior is comparable across different countries (Pascual-Ezama et al., 2015). Although a recent German study (Conrads et al., 2015) found evidence of a lower scope of dishonesty among retail employees, the difference in results can be ascribed to the difference in used methodology: in our study cashiers had an opportunity to gain money from unsuspecting tourists for themselves, while in the study of Conrads et al. (2015) customers could spot larger over-charging more easily and cashiers could not keep the over-charged amount for themselves.

In order to establish the robustness of findings regarding the prevalence of natural dishonest behavior, further field research in different countries and different settings (e.g., restaurants, department stores, etc.) is necessary.

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Ethical approval

The study was approved by the IRB at Faculty of Social and Economic Studies, J. E. Purkyně University in Ústí nad Labem (No. 1/2015).

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Supplementary materials

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