frontiers | Frontiers in Behavioral Economics

TYPE Original Research
PUBLISHED 03 March 2023
DOI 10.3389/frbhe.2023.1120697

OPEN ACCESS

EDITED BY
Emmanuel Dechenaux,
Kent State University, United States

REVIEWED BY
Lingbo Huang,
Nanjing Audit University, China
Simon Dato,
EBS University of Business and Law, Germany

*CORRESPONDENCE
Lian Xue
lianxue@whu.edu.cn

SPECIALTY SECTION
This article was submitted to Behavioral Microfoundations, a section of the journal Frontiers in Behavioral Economics

RECEIVED 10 December 2022
ACCEPTED 15 February 2023
PUBLISHED 03 March 2023

CITATION
Cartwright E and Xue L (2023) Truth-telling with a smartphone: The effect of communication media in strategic interactions. *Front. Behav. Econ.* 2:1120697.
doi: 10.3389/frbhe.2023.1120697

Truth-telling with a smartphone: The effect of communication media in strategic interactions

Edward Cartwright[1] and Lian Xue[2]*

[1]Department of Economics and Marketing, De Montfort University, Leicester, United Kingdom, [2]Center for Behavioral and Experimental Research, Economics and Management School, Wuhan University, Wuhan, China

Introduction: Technological advancements have transformed our business as well as social interactions. A recent trend is the increasing use of smartphones for work and customer engagement. Given that smartphones have been associated with a heightened sense of personal ownership and moral disengagement we argue that this may have negative implications for ethical behavior.

Method: To evaluate this conjecture we ran an experiment comparing dishonesty when using pen and paper, a desktop computer, or a smartphone. We make this comparison in both a setting where dishonesty benefits another (mutual-gain) and one where it harms another (constant-sum).

Results: We find higher levels of dishonesty when using a smartphone than pen and paper. We find relatively high levels of dishonesty when using a desktop computer in the mutual-gain setting but low levels in the constant-sum setting.

Discussion: Our results are consistent with the conjecture that smartphone use can lead to less ethical behavior.

JEL codes: C72, C91.

KEYWORDS

lie aversion, dishonesty, experiment, smartphone, communication media

1. Introduction

It is now ubiquitous to use digital interactive technology, such as email, online meetings, and instant messaging, to communicate with friends, colleagues, and business partners. The trend toward a digital workplace long pre-dates the COVID-19 pandemic, but clearly reached new heights during the pandemic as remote working became the norm in many businesses (Brynjolfsson et al., 2020; Gottlieb et al., 2020). It has been argued that digital engagement can increase productivity. For instance, it can allow more rapid delivery of services and engagement with customers, as well as facilitate remote and distant interaction between employees (e.g., Tremblay and Thomsin, 2012; Dery et al., 2017). The move toward digital interaction does, however, inevitably come with pitfalls, such as reduced work-life balance and higher social isolation (e.g., Baruch, 2000; Galanti et al., 2021). In this paper, we identify and evaluate another potential negative consequence of digital interaction, namely increased dishonesty and corruption.

We argue that it is important to evaluate the potential for a shift in moral behavior in the workplace, and wider society, due to the rapid development of digital interaction. Evidence has shown that reduced personal touch in communication channels, such as reporting to a machine (Cohn et al., 2022), through e-mail (Naquin et al., 2010), or via tax software (LaMothe and Bobek, 2020), can induce more dishonesty. At a more general level, a range of studies show an effect of communication media (from face-to-face, paper, or online) on uninhibited behavior, such as usage of negative language and impression management (e.g., Kiesler and Sproull, 1986; Richman et al., 1999; Wilkerson et al., 2002; Beer et al., 2006; Suler, 2011). It is also well-documented that unethical behavior, including bullying and abuse, is more common online than in the physical world (e.g., Suler, 2004, 2005). There is also evidence that email requests are viewed differently than face-to-face contact (Kruger et al., 2005; Roghanizad and Bohns, 2017). If dishonesty is indeed more prevalent in an online world then this will have fundamental implications for trust and cooperation in the workplace (Etzioni, 2019).

In understanding the influence of digital communication it is important to evaluate different types of communication. A particularly prominent development over the last decade is the rapid rise in the use of smartphones for, and at, work (e.g., Bautista et al., 2018; Morandin et al., 2018; Li and Lin, 2019). From a psychological perspective smartphones are fundamentally different to a workplace desktop computer because of differing senses of ownership and also of the differing mix between work, leisure, and family activities (Bröhl et al., 2018). It seems reasonable to conjecture, therefore, that patterns of dishonesty may differ between communication via a smartphone, desktop computer, and/or non-digital interaction. That is the question we explore in this paper. We first provide a conceptual framework with which to evaluate the effect of communication media on dishonesty. We then report the results of an experiment designed to compare dishonesty in social interaction when using a smartphone, desktop computer, or pen and paper. We find that rates of dishonesty systematically vary across communication media depending on the payoff incentives for dishonesty.

We proceed as follows. Section 2 sets out our conceptual framework. Section 3 sets out the experimental design and hypothesis, Section 4 our results and Section 5 concludes. Experiment instructions are contained in the Supplementary material.

2. Framework to evaluate digital interaction and dishonesty

There is very strong evidence that most individuals have a predisposition to be relatively honest (Gibson et al., 2013; Rosenbaum et al., 2014; Jacobsen et al., 2018; Abeler et al., 2019; Gerlach et al., 2019). A leading explanation for this is that dishonesty creates ethical dissonance between an individual's behavior and moral values (Barkan et al., 2012; Shalvi et al., 2015). Hence there is an intrinsic value from truth-telling to maintain positive self-concept (Mazar et al., 2008). Various cognitive mechanisms or "tricks" can, however, be used to lie a "little" and still maintain positive self-concept (Bandura, 1999; Mazar et al., 2008; Shalvi et al., 2015; Gneezy et al., 2018a). These mechanisms can be influenced by the environment or frame of decision making (Jacobsen and Piovesan, 2016; Jacobsen et al., 2018; Fosgaard, 2019). One obtains, therefore, a spectrum of honesty (and lying) with heterogeneity across the population, and across different settings (Gibson et al., 2013). In this section, we explore how the media through which an individual communicates may influence the frame and, thereby, levels of dishonesty.

One important aspect of the decision making environment is the influence dishonesty will have on others. A person's lie could directly harm an other. For instance, an employee could claim credit for a task that was largely completed by a colleague. Or they could over-state their performance relative to that of a colleague. In both these examples the person benefits from the lie at the cost of somebody else. These will be referred to as selfish lies (Erat and Gneezy, 2012). In some situations, however, a lie may benefit another. For instance, an employee could over-state the performance of a team in a way that benefits all members of the team. These will be referred to as Pareto lies (Erat and Gneezy, 2012).[1] Intuitively, individuals may be more willing to tell a Pareto than selfish lie (Erat and Gneezy, 2012). For instance it is easier to maintain a positive self-concept from telling a lie that benefits another (Wiltermuth, 2011; Erat and Gneezy, 2012; Gino et al., 2013; Weisel and Shalvi, 2015). There is, therefore, scope for self-serving evaluations when conducting unethical behavior (Di Tella et al., 2015; Gino et al., 2016; Gneezy et al., 2018b; Bicchieri et al., 2019).

The evidence that individuals are more willing to tell a Pareto lie than a selfish lie is, however, mixed (Cartwright et al., 2020). This mixed evidence may reflect the subtle relationship between lie aversion and social preferences (Sanchez-Pages and Vorsatz, 2009; Cappelen et al., 2013; Okeke and Godlonton, 2014; Biziou-van Pol et al., 2015; Li et al., 2022). In particular, if lie aversion correlates positively with social preferences then those willing to help another may not be willing to lie. This relationship could be mediated by the frame of reference and salience of payoff inter-dependence. More specifically, if an individual has a heightened psychological awareness that a lie could benefit or harm another then they may be more or less likely, respectively, to lie. One factor that could influence this awareness is social distance, interpreted as the perceived "closeness" between actors (Charness and Gneezy, 2008; Fiedler et al., 2011; Gino and Galinsky, 2012). Smartphones are associated with moral disengagement (e.g., Lee and Shin, 2017; Mihelič et al., 2022; Wang et al., 2022), reduced situational awareness and attention (e.g., Lin and Huang, 2017; Liebherr et al., 2020), as well as increased sense of perceived psychological ownership (Brasel and Gips, 2014). This all suggests that the use of a smartphone would be associated with higher levels of perceived social distance when compared to alternatives like pen and paper or a desktop computer. This in turn, would, ceteris paribus, suggest a greater propensity to tell selfish lies and a weaker propensity to tell Pareto lies, when using a smartphone than pen and paper or desktop (because the individual takes less account of the negative and positive effect, respectively, their lie has on others).

Another key impact on willingness to lie is perceptions of anonymity and unobservability. Anonymity can exist at the level of the lie, e.g., someone is "looking over my shoulder" and so can tell if there is a lie. Or, can exist at the level of communication, e.g., someone "sees what I report" and so can infer the likelihood of the individual having lied. Reduced anonymity of both these types is associated with lower levels of dishonesty (Zhong et al., 2010; Kroher and Wolbring, 2015; Pascual-Ezama et al., 2015; Schitter et al., 2019). Conrads and Lotz (2015), for example, find

1 Such lies may have a negative consequence for others. For instance, a team over-stating their performance could negatively impact another team. The effect is, however, indirect and less salient.

TABLE 1 Conjectures on how communication media influences willingness to lie.

Willingness to tell	Anonymous	Less anonymous
Less distant	DESKTOP	PAPER
	Pareto lies: High	*Pareto lies:* Low
	selfish lies: Low	*selfish lies:* Low
Distant	PHONE	
	Pareto lies: High	
	selfish lies: High	

that reporting in a coin tossing task is increasing in the anonymity of the communication between subject and experimenter (see also Pascual-Ezama et al., 2015; Hermann and Ostermaier, 2018). One important channel through which reduced anonymity at the level of communication may influence willingness to lie is individuals' reputational concerns (Abeler et al., 2019). In particular, a desire to maintain a reputation as someone who does not lie.[2] Different communication media may naturally be associated with differing levels of anonymity. Prior evidence suggests that digital interaction is perceived as more anonymous than the use of pen and paper (Naquin et al., 2010). A powerful illustration of this is online bullying where individuals seemingly perceive greater anonymity even if their identity is known (e.g., as classmates) (Wang and Ngai, 2020; Zhao and Yu, 2021). We also suggest that the effect of anonymity is not mediated by whether the dishonesty benefits or harms another. In other words, it is bad to be seen to lie, even a Pareto lie. This could be because behavior that is suggestive of dishonesty harms an individual's reputation (Abeler et al., 2019). If digital interaction increases perceived anonymity then we would expect, ceteris paribus, a greater propensity to tell selfish and Pareto lies with a smartphone and desktop than pen and paper.

In Table 1 we summarize our basic conjectures. We compare two dimensions of the choice environment: perceived social distance between the individual and those affected by choice to lie, and the anonymity or observability of a lie. Crucially, consistent with the mixed evidence on willingness to tell Pareto lies, we assume that individuals' propensity to lie is primarily influenced by perceived anonymity, with perceived social distance playing a secondary role. Specifically:

- We associate smartphone use with higher anonymity and social distance. The high anonymity suggests a high willingness to lie. The high social distance suggests no extra willingness to tell a Pareto lie over a selfish lie.
- We associate pen and paper with lower social distance and anonymity. The low anonymity suggests a low willingness to lie, including Pareto lies.
- We associate the desktop computer with lower social distance and higher anonymity. The high anonymity suggests a high willingness to lie. The low social distance, however, should moderate the willingness to tell a selfish lie, while increasing further willingness to tell a Pareto lie.

As we shall see shortly, the framework summarized in Table 1 allows us to make specific and testable hypotheses about how communication media may influence willingness to lie. In particular, it suggests that lying will be more prevalent with a smartphone compared with pen and paper. In the following section, we describe an experiment conducted to test our framework.

3. Experimental design and hypotheses

3.1. The coin-flipping task

There are various experimental paradigms for measuring dishonesty in the experimental lab (see, e.g., Gerlach et al., 2019). A drawback of these designs is that a subject's dishonesty benefits themselves at the cost of "the experimenter" and, arguably, it is not so immoral to take money from an experimenter (who gives you the chance to do so).[3] Moreover, we have seen that the effect of communication media may differ for a Pareto and selfish lie. We, therefore, use a simple extension to the standard coin-flipping task that allows us to study dishonesty in a setting with direct payoff inter-dependence (see also Biziou-van Pol et al., 2015; Hermann and Ostermaier, 2018; Thielmann and Hilbig, 2019; Cartwright et al., 2020).

Subjects were asked to perform two tasks in sequence, a guesser task and a marker task. In the *guesser task*, subjects were asked to guess the outcome, heads or tails, of 10 coin tosses. These guesses were recorded by the guesser on a guess sheet, see Figure 1. In the *marker task*, subjects were asked to toss a coin 10 times and record whether or not each guess was correct. Payoffs were determined, as we discuss shortly, based on how many guesses were recorded as correct. Crucially there was no external validation of the marker's record. Markers tossed the coin privately with nobody, neither the guesser nor experimenter, having any opportunity to verify if the marker's record was accurate. Thus, markers could report any number between 0 and 10. This provides an opportunity for "dishonesty" (Cohn et al., 2014; Hugh-Jones, 2016). In application we can think of the guesser as performing a job and the the marker as reporting the quality of job done. The marker then reports the guesser's performance to the experimenter. We are interested in examining the influence of the mode of communication of the report.

We used the role-switching method, meaning that every subject performed both the roles of guesser and marker. Specifically, after all subjects completed the guesser task, the guess sheet was passed randomly to another anonymous subject in the room to be marked. Subjects were informed (correctly) that the subject marking their guess sheet would be different from the subject whose guess sheet

2 Interestingly, this may mean an individual lies because the truth is "not credible." For instance, someone who genuinely gets 10 heads in a row in a coin tossing task may report a "more credible" outcome.

3 Dishonesty has also been widely considered in sender-receiver games where lying does have direct consequences for another, but here there is a strategic element in which an individual can, for instance, try to deceive by telling the truth (Erat and Gneezy, 2012; Capraro, 2018; Cartwright, 2019).

Guesser Task

	Guesser payoff	Marker payoff
If guess is **CORRECT**	2 Yuan	0 Yuan
If guess is **INCORRECT**	0 Yuan	2 Yuan

Please make 10 guesses of the marker's coin tossing results

Guess Number	HEADS or TAILS	Correct or Incorrect?	Guesser payoff	Marker payoff
1	◯ Head ◯ Tail			
2	◯ Head ◯ Tail			
3	◯ Head ◯ Tail			
4	◯ Head ◯ Tail			
5	◯ Head ◯ Tail			
6	◯ Head ◯ Tail			
7	◯ Head ◯ Tail			
8	◯ Head ◯ Tail			
9	◯ Head ◯ Tail			
10	◯ Head ◯ Tail			

Next

FIGURE 1
An example of a guess sheet.

they were marking.[4] This rules out any reciprocal incentives. At the end of the experiment, each subject was paid based on one of the tasks. The task chosen was randomly determined, subject to the preservation of legitimate pairings.[5]

3.2. Treatment design and procedures

To examine the effect of communication media on ethical behavior and to distinguish between Pareto and selfish lies, we used a 2 (payoff structure) × 3 (communication media) between-subject factorial design. The two treatment variables were payoff structure: mutual-gain or constant-sum, and communication media: Desktop, Phone, or Paper. We describe each in turn:

(i) Constant-sum vs. Mutual-gain (between-subject): In the *constant-sum* treatments, for each correct guess, the guesser received a positive payoff of B tokens, and the marker received zero. For each incorrect guess, the marker received B tokens, and the guesser received zero. Given that there was no external validation of the marker's record, the marker could allocate any amount of money up to $10B$ to themselves. This is the opportunity, and incentive, to be dishonest. Dishonesty, though, comes as the direct cost of the guesser. To lie is, thus, to tell a selfish lie. In *mutual-gain* treatments, a correct guess resulted in B tokens for the guesser and B tokens for the marker. An incorrect guess resulted in zero for both. Again, the marker could allocate any amount of money up to $10B$ to themselves. Here, though, the incentives of the guesser and marker are perfectly aligned. To lie is, thus, to tell a Pareto lie.[6]

(ii) PHONE vs. DESKTOP vs. PAPER (between-subject): Conditions were kept as similar across the three communication media treatments as possible. Specifically, all sessions were run in the same physical lab, with subjects sitting in randomly assigned desktop terminals. The instructions and mark sheet were standardized across communication media, and the recruitment of subjects was identical. The DESKTOP and PHONE treatments were run using o-Tree (Chen et al., 2016). PAPER treatments were implemented with instructions and the guess sheet in paper format with two experimenters exchanging the guess sheet between marker and guesser. DESKTOP treatments were implemented using a web browser on laboratory desktops. PHONE treatments were implemented by subjects using their own phones and scanning a QR code, provided by the experimenter on projected screens, to access the online interface.

Recall that we distinguished above two types of anonymity: at the level of the lie and the level of communication. Our experiment design [similar to others (e.g., Fischbacher and Föllmi-Heusi, 2013)] guarantees subjects anonymity at the level of the lie in the sense that markers flip their coin privately across all treatments and can be sure nobody is watching. This allows us to focus on the perceived anonymity of the communication between the marker and the experimenter and guesser. While subjects were anonymous across all treatments their perception of that anonymity may differ across communication media, as set out in Section 2.

At the end of the experiment, subjects were asked to complete a standard questionnaire of demographics, including gender, age, college degree, whether they are a single child in the family, and

4 The instructions said "You will be matched with different subjects in the two tasks".

5 For example, if subject 1 was randomly chosen to be paid as guesser and subject 2 marked her sheet, then subject 2 was paid as a marker.

6 We note that there is a slight difference in how to benefit from lying between mutual-gain and constant-sum in reporting behavior. The marker has to report the mark as "correct" in the mutual-gain setting and "incorrect" in the constant-sum setting in order to get a positive payoff. There may exist a psychological tendency to prefer reporting things as correct when evaluating others' performance. If so, we might expect more lying in the mutual-gain than constant-sum setting. This effect would be in the same direction as that predicted by social preferences.

prior experience in economic experiments. They also completed an equality equivalent test for egalitarian preferences (adopted from Bartling et al., 2009). The test consisted of four binary choices involving allocation of income between self and another subject. Details of the test can be seen in the Supplementary material. One of the equality test questions was randomly selected for real payment. The quality equivalent test provides a control for the mediating effect of social preferences.

The experiment was conducted in the laboratory of the [blank for anonymity]. subjects were recruited from the lab's standard subject pool, which is managed using the [blank for anonymity]. All sessions were finished within 45 min. We set $B = 2$RMB. The average payment was 28.04 RMB,[7] including an average supplementary payment of 16.5 RMB for participation fee (5 RMB) and equality equivalent task (11.5 RMB). A total of 229 subjects took part. These were split: 40 subjects in constant-sum DESKTOP, 39 in mutual-gain PAPER, 38 in constant-sum PAPER and constant-sum PHONE, 37 in mutual-gain PHONE and mutual-gain DESKTOP.

We highlight two distinguishing aspects of our experimental design compared to the prior literature. First, we consider communication media across different payoff structures, constant-sum, and mutual-gain, allowing us to explore the role of payoff-interdependence. In comparison, Abeler et al. (2014) compared the influence of the mode of communication on the lying rate of a coin tossing task where lies only affected the individual's own payoff. Second, we study different communication media within the same physical, controlled location. This contrasts with prior studies that compare online with lab based interaction (e.g., Hergueux and Jacquemet, 2015; Arechar et al., 2018). We were able to randomly assign subjects to use either a desktop or smartphone, whereas in an online experiment there is no or little control on whether a subject uses a desktop or smartphone. The subject's use of own phone contrasts, in terms of ownership, with use of the lab's desktop. This asymmetry, however, is consistent with many workplaces where employees use own phones and company desktops for work purposes. Closest to our experiment in terms of design is Conrads and Lotz (2015), who compare lying behavior across face-to-face, in-lab telephone, in lab web-form, and home web-form. Like us, they were able to control for location. They, however, considered an individual decision making context where lying had no payoff consequences for another (except the experimenter). Another related study is Drouin et al. (2016), who compare lying behavior across four online venues, while we compared across digital and non-digital communication media.

3.3. Behavioral hypotheses

In stating our main hypotheses we focus on each subject's task as a marker. Recall that in the marker's task, subjects mark independently whether the 10 guesses from the other subjects are correct or not. To ease readability, we refer to "correct" marks in the mutual-gain sessions and "incorrect" marks in the constant-sum sessions as "*reported own payoff*." If markers report honestly, then the average own reported payoff should be $5B$ in all treatments. Own reported payoff is, thus, a measure of dishonesty at the treatment level. We state three hypotheses based on the framework discussed in Section 2. In the Appendix A we show that these hypotheses can be derived from a theoretical model that captures lie aversion, reputation concerns and social preferences.

Our first hypothesis concerns the constant-sum treatments and willingness to tell selfish lies. On the basis that perceived anonymity, and then perceived social distance, influence willingness to lie we hypothesize (see Table 1) that lying is more prevalent with PHONE (anonymous and distant) than DESKTOP (anonymous and less distant) than PAPER (less anonymous and less distant). The prediction of less lying with DESKTOP than PHONE follows from reduced social distance and the the desire to not harm the marker. The prediction of less lying with PAPER than DESKTOP follows from reduced anonymity.

Hypothesis 1. In the constant-sum treatments, reported own payoffs are higher in the PHONE treatment than the DESKTOP and higher in the DESKTOP than the PAPER, i.e., PHONE > DESKTOP > PAPER.

Our second hypothesis concerns the mutual-gain treatments and willingness to tell Pareto lies. We hypothesize that lying is more prevalent with DESKTOP than PHONE because of reduced social distance and the the desire to help the marker. The comparison between PHONE and PAPER is somewhat ambiguous but we predict more lying with PHONE than PAPER based on reduced anonymity being more influential than increased social distance.

Hypothesis 2. In the mutual-gain treatments, reported own payoffs are higher in the DESKTOP treatment than PHONE and higher in PHONE than PAPER, i.e., DESKTOP > PHONE > PAPER.

Our final hypothesis concerns the comparison between mutual-gain and constant-sum settings. In the PAPER treatments we hypothesize that reduced anonymity results in an unwillingness to tell any lies and so there is little difference across payoff settings. In the PHONE treatments we hypothesize that social distance results in no extra willingness to tell Pareto lies. It is, thus, in the DESKTOP treatment we expect to see the biggest difference.

Hypothesis 3. The difference in reported own payoffs between mutual-gain and constant-sum treatments is higher in the DESKTOP than PHONE treatment and higher in the DESKTOP than PAPER treatment, i.e., $\Delta_{Desktop} > \Delta_{Phone}$ and $\Delta_{Desktop} > \Delta_{Paper}$, where Δ_{Device} is the difference in reported own payoffs across payoff structures.

We note that Hypotheses 1 and 2 suggest that reported own payoffs, and thus lying, will be higher with use of smartphone than paper, irrespective of the payoff structure.

4. Results

4.1. Overview

We begin our analysis of the experimental data by considering the overall extent of dishonesty. Figure 2 plots the distribution of reported own payoffs by treatment. We also plot the binomial

7 Based on the interests rate at the date of the experiment, the average payment is equivalent to 4.05 US dollars, which is comparable to the local hourly minimum wage, which is 19.5 Yuan (2.91 US dollars).

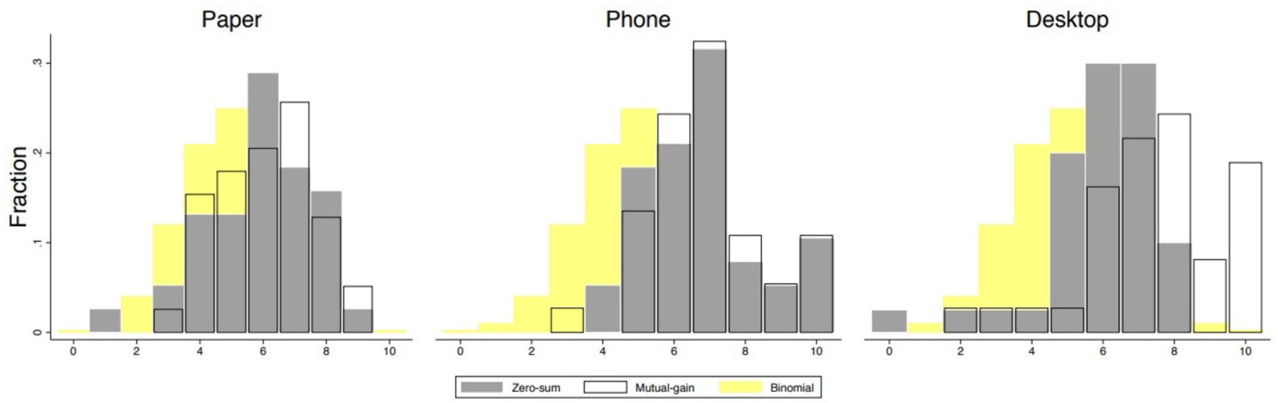

FIGURE 2
Distribution of reported own payoff by treatment.

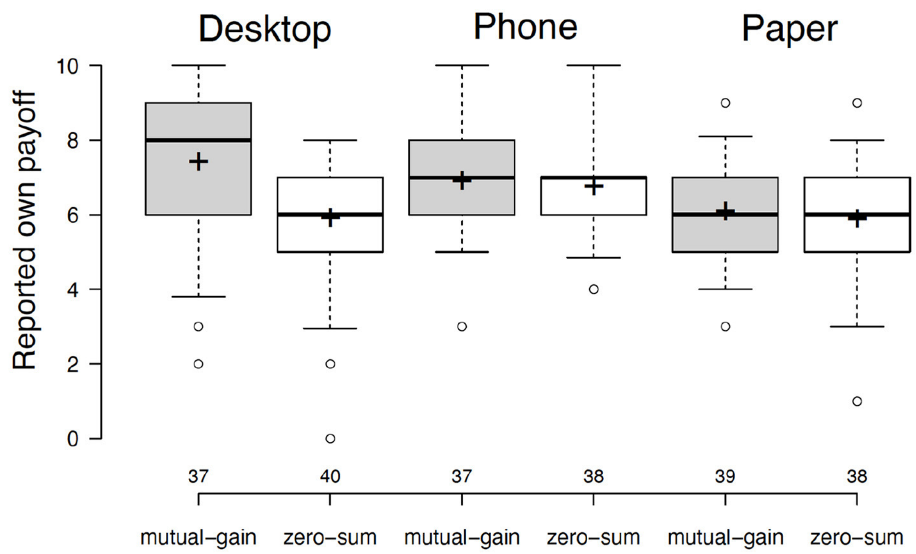

FIGURE 3
Box plot of reported own payoff by treatment. This figure reports the box plot of the reported own payoff across treatments. Center lines show the medians; box limits indicate the 25th and 75th percentiles, whiskers extend to 5th and 95th percentiles; outliers are represented by dots; crosses represent sample means. Numbers of subjects are reported at the bottom of each graph.

distribution (expected from honest reporting) for comparison. It can be seen that the distribution of reported own payoff puts weight on higher payoffs than that expected with the binomial distribution, for both mutual-gain and constant-sum treatments ($p < 0.01$ from one-sided binominal tests). This is evidence of dishonesty, with subjects reporting, on average, implausibly large reported own payoffs. Few subjects, however report the maximum own payoff of 10 and so we observe "moderated dishonesty" consistent with lying "a little bit."

To provide a clearer picture of treatment effects, Figure 3 provides a box plot of reported own payoff by treatment. In Table 2 we detail average own reported payoff by treatment. When conducting Mann-Whitney-Wilcoxon (MWW) tests between two treatments, we report the effect size r. We write a test between treatments x and y as $MWW(x, y)$. Given $MWW(x, y)$, the effect size r reports the probability that, given a randomly-selected subject from treatments x and y, the reported own payoff is larger in treatment x. We now evaluate each of our three hypotheses in turn.

4.2. Constant-sum payoff structure

We focus first on the constant-sum payoff structure. It can be seen from Table 2 the PHONE treatment has the largest reported own payoff among all three communication media [$MWU(\text{PHONE}, \text{DESKTOP}, p = 0.098, r = 0.606$; $MWU(\text{PHONE}, \text{PAPER}), p = 0.073, r = 0.617$]. Given the relatively small sample size and the marginal level of significance, a non-parametric bootstrapping procedure was carried out based on 1,000 resampling of the data (Mooney and Duval, 1993).

TABLE 2 Reported own payoff by treatment.

Communication media		Payoff structure			Effect size
		Mutual-gain		Constant-sum	
Paper	Mean	6.1	∼	5.9	*0.52*
	Median	*6*		*6*	
		$\wedge^{**}$		$\wedge^{*}$	
Phone	Mean	6.9	∼	6.8	*0.54*
	Median	*7*		*7*	
		$\wedge^{*}$		$\vee^{*}$	
Desktop	Mean	7.4	$>^{***}$	5.9	*0.75*
	Median	*8*		*6*	

The mean and median frequency (out of 10 marks) of own reported payoff by treatment. Significance levels and effect size are derived from Mann-Whitney tests.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

The results from the bootstrap t-tests confirm the comparisons [$t - test$(Phone, Desktop), $p = 0.012$; $t - test$(Phone, Paper), $p = 0.016$]. This is consistent with Hypotheses 1. The difference between Desktop and Paper is not statistically significant [MWU(Desktop, Paper), $p = 0.834$, $r = 0.513$; $t - test$(Desktop, Paper), $p = 0.937$].

As a robustness check, Table 3 reports the results of a Tobit regression analysis with reported own payoff as the dependent variable (ranging from 0 to 10). Column 1 reports the results from the sub-sample with a constant-sum payoff structure, column 2 with a mutual-gain payoff structure, and columns 3–5 results from the full sample, where columns 4 and 5 further control for demographic variables. Wald tests (see Table 3) show that the differences in reported own payoff between Phone and Desktop ($p = 0.013$), and Phone and Paper ($p = 0.02$) are both positive and significant at 5% levels.[8] Whereas there is no significant difference between Desktop and Paper.

Result 1. In the constant-sum setting we observe more dishonesty with the use of Phone than Desktop or Paper. We find no significant difference in levels of dishonesty between use of Desktop and Paper.

These findings provide mixed support for Hypothesis 1. Recall, we hypothesized that Phone > Desktop > Paper in terms of reported own payoff. We find evidence that Phone > Desktop and Phone > Paper but do not find evidence that Desktop > Paper. In terms of our framework (see Table 1) this suggests that the increased anonymity we associated with Desktop compared to Paper is not resulting in the hypothesized increase in willingness to tell selfish lies.

4.3. Mutual-gain payoff structure

We next consider the mutual-gain payoff structure. It can be seen from Table 2 that the Desktop treatment has the highest reported payoff in mutual-gain, followed by Phone and Paper [MWU(Desktop, Phone), $p = 0.0908$, $r = 0.612$; MWU(Phone, Paper), $p = 0.047$, $r = 0.630$]. Similarly, we carry out the pairwise between-treatment comparison with bootstrapping procedure [$t - test$(Desktop, Phone), $p = 0.243$; $t - test$(Phone, Paper), $p = 0.025$]. Therefore, we see significantly higher levels of dishonesty with use of Phone than Paper. This is consistent with Hypothesis 2. The high reported payoffs in Desktop, compared with Phone, is also consistent with Hypothesis 2 but the difference is either marginally significant or not significant with non-parametric tests. These results are confirmed by the regression analysis, see Table 3. Wald tests show that both Desktop and Phone treatments have significantly higher reported own payoff than Paper treatment ($p < 0.01$), whereas the difference between Desktop and Phone is not statistically significant ($p = 0.549$).

To further explore the influence of social-preference on individuals' willingness to tell Pareto lies, our main regression in column 5 includes interaction terms between mutual-gain and three categorized social preferences adopted from Bartling et al. (2009). We define a subject as egalitarian, ahead-averse or behind-averse based on the four allocation scenarios in the equality equivalent test performed at the end of the experiment. The subject is classified as egalitarian if they choose the equal outcomes in all four scenarios, ahead-averse if they choose the equal outcome in the two out of the four scenarios where the unequal payoff allocation benefits them, and behind-averse if they choose the equal outcome in the two scenarios where the unequal payoff allocation benefits the other player. It can be seen from Table 3 that the interaction between mutual-gain and egalitarian is positive ($p < 0.05$) while the other two interaction terms are negative. This suggests subjects with an egalitarian preference are more willing to tell Pareto lies.

Result 2. In the mutual-gain setting we observe more dishonesty with the use of Desktop or Phone, than Paper. We find no significant difference in levels of dishonesty between Desktop and Phone.

These findings provide mixed support for Hypothesis 2. Recall, we hypothesized that Desktop > Phone > Paper in terms

8 These tests are based on the full regression in Column 5 that takes into account demographic variables. The results are very similar if just using the regression results from Column 1.

TABLE 3 Determinants of willingness to lie: Tobit model.

Dep Var: Reported own payoff	(1) Selfish lies	(2) Pareto lies	(3) All	(4) All	(5) All
Phone constant-sum	6.832***		6.837***	6.718***	6.700***
	(0.293)		(0.293)	(0.407)	(0.383)
					[0.0099]
Desktop constant-sum	5.914***		5.914***	5.830***	5.719***
	(0.260)		(0.259)	(0.359)	(0.354)
					[0.0198]
Paper constant-sum	5.895***		5.895***	5.803***	5.801***
	(0.274)		(0.274)	(0.335)	(0.322)
					[0.0693]
Phone mutual-gain		7.002***	6.997***	7.053***	7.028***
		(0.297)	(0.293)	(0.385)	(0.392)
					[0.0198]
Desktop mutual-gain		7.595***	7.585***	7.462***	7.283***
		(0.367)	(0.363)	(0.467)	(0.437)
					[0.0099]
Paper mutual-gain		6.103***	6.103***	6.029***	5.984***
		(0.241)	(0.240)	(0.340)	(0.352)
					[0.0693]
Mutual-gain × ahead-averse					-2.282**
					(0.879)
Mutual-gain × behind-averse					-1.898**
					(0.899)
Mutual-gain × egalitarian					2.551**
					(1.092)
Wald test of linear restrictions	$H1^a$	$H2^a$	$H3^b$	$H3^b$	$H3^b$
Phone − Desktop	0.981**	-0.255			
Phone − Paper	0.890**	1.044***			
Desktop − Paper	-0.082	1.299***			
$\Delta_{Desktop} - \Delta_{Phone}$			1.511**	1.297**	1.237**
$\Delta_{Desktop} - \Delta_{Paper}$			1.464**	1.405**	1.381**
$\Delta_{Phone} - \Delta_{Paper}$			-0.048	0.108	0.144
Control for demographics	No	No	No	Yes	Yes
Observations	116	113	229	229	229

The outcome variable in all regressions is own reported own payoff, ranging from 0 to 10. The regressions do not include a constant. Column 1(2) includes only treatments with constant-sum(mutual-gain) payoff-structure; Columns 4–5 include the following controls: gender, lab experience, single child, egalitarian, ahead averse, and behind averse. Robust standard errors are in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. Adjusted p-values from multiple-testing adjustments are reported in the bracket (Romano and Wolf, 2016).
[a]Tests of hypotheses 1 and 2 are based on the Wald tests from column 5. The results remain qualitative the same from columns 1–2 (without the demographic controls).
[b]Tests of hypotheses 3 are based on the Wald tests from column 3–5, respectively.
$\Delta_{Desktop}$ denotes the difference in coefficients between mutual-gain and constant-sum payoff structure in Desktop treatments.

of own reported payoff. Consistent with this hypothesis, we find that DESKTOP > PAPER and PHONE > PAPER, but we do not find support for DESKTOP > PHONE. We note that own reported payoffs are higher in DESKTOP than PHONE and so the lack of a statistically significant effect could reflect lack of statistical power. Or, within our framework (see Table 1) it could mean that social distance does not impact on willingness to tell Pareto lies in anonymous settings.

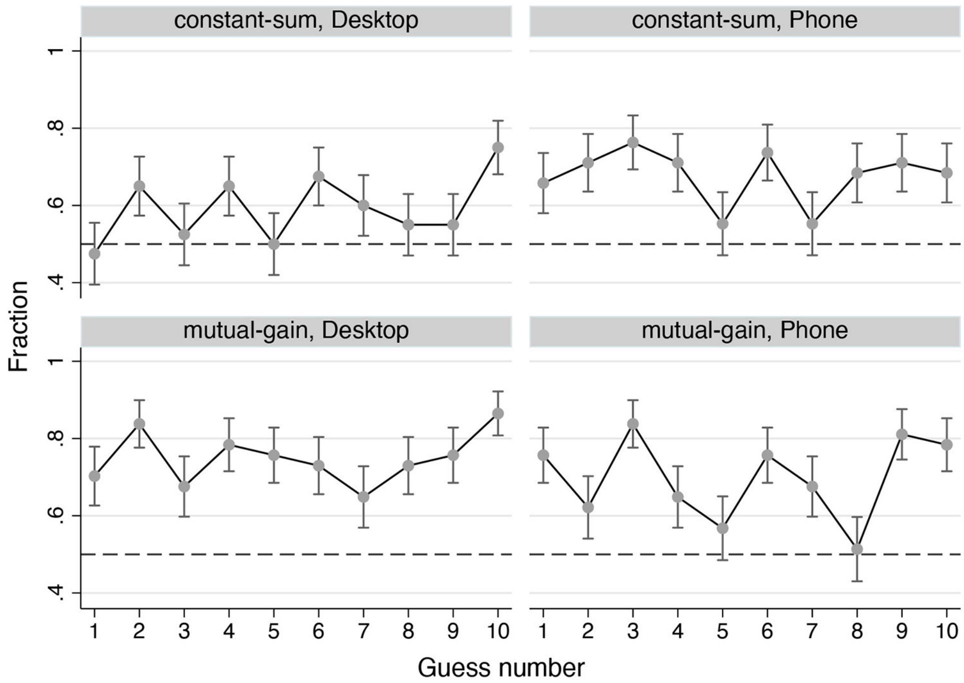

FIGURE 4
Average proportion of reported own payoff by guess round. This figure plots the average proportion of subjects reported own payoff (±1 standard error of the mean) by guess number and treatment.

4.4. Comparing payoff structures

We next consider the effect of payoff structure across communication media. It can be seen from Figure 3 and Table 2 that the differences in median and mean reported own payoff between mutual-gain and zero-sum settings are stark in the DESKTOP treatments. In contrast, the same comparisons yield negligible differences in the PHONE or the PAPER treatments. The differences across payoff structures are highly statistically significant with use of DESKTOP [$MWU(mutual - gain, zero - sum)$, $p = 0.0001$, $r = 0.747$], but not PAPER or PHONE. The regression results in Table 3 reaffirm these findings. The difference across payoff structures, denoted as Δ_{device} is significantly higher in DESKTOP compared with PHONE or PAPER treatments. There is no difference between PHONE and PAPER treatments. This is consistent with Hypothesis 3.

Result 3. In the case of DESKTOP we observe significantly more dishonesty in the mutual-gain than constant-sum treatment. In the case of PHONE and PAPER we observe no difference across payoff structure.

4.5. Guess sequences

Result 4. Subjects are more likely to lie in the last guess than first guess in the DESKTOP treatments but not PHONE treatments.

To examine behavior patterns in more detail, we analyze reported own payoff by guess number for the DESKTOP and PHONE treatments.[9] Recall that subjects mark 10 guesses in turn with each guess incrementing their payoff by B or 0. A subject could, thus, alter behavior during the sequence of guesses; for instance, starting honest but then "engineering" an outcome depending on a desired minimum payoff. The results are provided in Figure 4 which plots own reported payoff across the 10 guesses. With honest reporting we would expect 50% of guesses to be correct. Dishonesty, is therefore, a success rate above 50%.

In DESKTOP treatments we find evidence of increasing dishonesty. Specifically, subjects appear more likely to lie in the last guess than the first, in both constant-sum and mutual-gain settings [$MWU(first, last)$, $p = 0.003$, $r = 0.39$]. By contrast, in PHONE treatments we observe no such dynamic effect ($p = 0.717$). This suggests a further distinction between use of desktop and smartphone. A dynamic effect could be a signal of subjects looking to use moral wiggle room. For instance using logic of the form "given I was honest for previous marks it will not matter if I lie on the last one." That we observe no dynamic effect in the PHONE treatments is consistent with our conceptual framework of anonymity and moral disengagement with use of a smartphone. It is noteworthy that in the PHONE treatments, and the mutual-gain DESKTOP treatment, we see considerable evidence of dishonesty with the first guess. To give some perspective a 70% success rate would suggest 40% of subjects were dishonest.[10]

9 The data for Paper treatments was not recorded.

10 This is calculated on 50% marking correctly an own reported payoff and 40% of those who should have not marked an own reported payoff lying.

5. Conclusion

Smartphones are becoming ever more important in reshaping business communication. For instance, smartphones are now the primary source of communication media for small to medium start-up companies (Giachetti, 2018). We suggest that the more frequent use of smartphones in the workplace could impact on ethical decision making. Specifically, smartphones can create a sense of anonymity and social disengagement that could lead to higher levels of dishonesty. For example, a worker may exaggerate the output on a task or their contribution to a project. While there is a large amount of research comparing interaction across different media [e.g., experiments in the lab vs. online (Conrads and Lotz, 2015; Hergueux and Jacquemet, 2015)] there is much more we can learn about ethical behavior using smartphones as compared to conventional communication media, such as desktop computers or pen and paper.

In this paper, we report on an experiment that tests the role of communication media, comparing pen and paper, mobile phone, or desktop computer, while keeping constant the physical environment and the task. Crucially, we compare two strategic settings, one where dishonesty harms another (constant-sum) and one where it benefits another (mutual-gain). We find significantly higher levels of dishonesty when using phone than paper, for both constant-sum and mutual-gain settings. We find that dishonesty using a desktop computer is relatively high in the mutual-gain setting and low in the constant-sum setting. Our results, thus, confirm that use of smartphones may increase levels of dishonesty, particularly in terms of selfish lies that benefit a person at the cost of someone else.

These experimental findings are consistent with our conceptual framework that looks at perceived anonymity and social distance. When using a phone we argue there is anonymity and social disengagement, because subjects are using their own phone, with small screens, etc. This means they focus on self and are relatively dishonest. When using paper there is reduced social distance but also lower perceived anonymity, because paper is exchanged between parties etc. We argue that reduced anonymity brings lie aversion to the fore and we, therefore, see a lower willingness to be dishonest. Finally, when using a desktop there is reduced social distance and a sense of anonymity. Anonymity is associated with a higher propensity to be dishonest, while reduced social distance brings into play social preferences. This can explain high levels of dishonesty in the mutual-gain setting while honesty in the constant-sum setting in DESKTOP treatments.

In application, our results suggest that as we move toward a more digital environment, we will likely see increased dishonesty. This is consistent with prior findings (Naquin et al., 2010; Cohn et al., 2014; LaMothe and Bobek, 2020). The novelty in our work is to show that different types of digital communication may lead to different levels of dishonesty. And also to highlight the mediating effect of whether dishonesty benefits or harms another. To give one example of how this can have real-world implications consider tax evasion. Jacobsen and Piovesan (2016) show that a tax frame increases dishonesty. On the flip side, evidence suggest that people are more willing to report taxes honestly if they believe their taxes will be wisely spent to benefit others (Alm, 2012; Pickhardt and Prinz, 2014). Our results suggest that these kinds of effects are likely to be mediated by the way that the tax-payer communicates with the authorities.

We recognize that our study has several limitations. First, subjects used their own phone in the PHONE treatments and the laboratory desktop in the DESKTOP treatments. While this is consistent with many workplaces it means we cannot disentangle the effect of ownership from the influence of communication media. Second, the numbers of observation are not enough to identify individual heterogeneity in the influence of devices. Finally, the experiments were conducted in 2018, which is before the COVID-19 pandemic and behavior may have evolved during the pandemic (for good or bad) given the enhanced frequency of online interactions.

We finish by noting that our findings also have implications for how experiments are conducted. Recent years have seen a dramatic shift, in both economics and psychology, from lab-based experiments to online experiments (Arechar et al., 2018). This includes a move toward the use of smartphones (Dufau et al., 2011). Our work points to the benefits of comparing across different communication media to gain additional insight. It also suggests caution in comparing results across studies that use different communication media. It is notable that many of the meta-analyses and literature reviews we consulted in writing this paper do not record the experimental protocol. We suggest this should become a priority in future work.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Wuhan University, Center of Behavioral and Experimental Research. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

LX contributed to the experimental design and results. EC contributed to the conceptual framework and introduction. LX and EC contributed to the literature review and conclusions. All authors contributed to the article and approved the submitted version.

Funding

The project has received funding from the National Natural Science Foundation China (NSFC grant number 71903147, 2019).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frbhe.2023.1120697/full#supplementary-material

References

Abeler, J., Becker, A., and Falk, A. (2014). Representative evidence on lying costs. *J.Public Econ.* 113, 96–104. doi: 10.1016/j.jpubeco.2014.01.005

Abeler, J., Nosenzo, D., and Raymond, C. (2019). Preferences for truth-telling. *Econometrica* 87, 1115–1153. doi: 10.3982/ECTA14673

Alm, J. (2012). Measuring, explaining, and controlling tax evasion: lessons from theory, experiments, and field studies. *Int. Tax Public Finance* 19, 54–77. doi: 10.1007/s10797-011-9171-2

Arechar, A. A., Gachter, S., and Molleman, L. (2018). Conducting interactive experiments online. *Exp. Econ.* 21, 99–131. doi: 10.1007/s10683-017-9527-2

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Pers. Soc. Psychol. Rev.* 3, 193–209. doi: 10.1207/s15327957pspr0303_3

Barkan, R., Ayal, S., Gino, F., and Ariely, D. (2012). The pot calling the kettle black: distancing response to ethical dissonance. *J. Exp. Psychol. Gen.* 141, 757–73. doi: 10.1037/a0027588

Bartling, B., Fehr, E., Maréchal, M. A., and Schunk, D. (2009). Egalitarianism and competitiveness. *Am. Econ. Rev.* 99, 93–98. doi: 10.1257/aer.99.2.93

Baruch, Y. (2000). Teleworking: benefits and pitfalls as perceived by professionals and managers. *New Technol. Work Employment* 15, 34–49. doi: 10.1111/1468-005X.00063

Bautista, J. R., Rosenthal, S., Lin, T. T., and Theng, Y. L. (2018). Predictors and outcomes of nurses' use of smartphones for work purposes. *Comput. Hum. Behav.* 84, 360–374. doi: 10.1016/j.chb.2018.03.008

Beer, J., Knight, R., and D'Esposito, M. (2006). Integrating emotion and cognition: the role of the frontal lobes in distinguishing between helpful and hurtful emotion. *Psychol. Sci.* 17, 448–453. doi: 10.1111/j.1467-9280.2006.01726.x

Bicchieri, C., Dimant, E., and Sonderegger, S. (2019). It's not a lie if you believe it: lying and belief distortion under norm-uncertainty. *SSRN*. doi: 10.2139/ssrn.3326146

Biziou-van Pol, L., Haenen, J., Novaro, A., Occhipinti Liberman, A., and Capraro, V. (2015). Does telling white lies signal pro-social preferences? *Judgment Decis. Mak.* 10, 538–548. doi: 10.1017/S1930297500006987

Brasel, S. A., and Gips, J. (2014). Tablets, touchscreens, and touchpads: how varying touch interfaces trigger psychological ownership and endowment. *J. Cons. Psychol.* 24, 226–233. doi: 10.1016/j.jcps.2013.10.003

Bröhl, C., Rasche, P., Jablonski, J., Theis, S., Wille, M., and Mertens, A. (2018). "Desktop PC, tablet PC, or smartphone? An analysis of use preferences in daily activities for different technology generations of a worldwide sample," in *International Conference on Human Aspects of IT for the Aged Population* (Springer), 3–20. doi: 10.1007/978-3-319-92034-4_1

Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G., and TuYe, H.-Y. (2020). *Covid-19 and Remote Work: An Early Look at US Data.* Technical Report, National Bureau of Economic Research. doi: 10.3386/w27344

Cappelen, A. W., Sorensen, E. O., and Tungodden, B. (2013). When do we lie? *J. Econ. Behav. Organ.* 93, 258–265. doi: 10.1016/j.jebo.2013.03.037

Capraro, V. (2018). Gender differences in lying in sender-receiver games: a meta-analysis. *Judg. Decis. Making* 13, 345–355. doi: 10.1017/S1930297500009220

Cartwright, E. (2019). A survey of belief-based guilt aversion in trust and dictator games. *J. Econ. Behav. Organ.* 167, 430–444. doi: 10.1016/j.jebo.2018.04.019

Cartwright, E., Xue, L., and Brown, C. (2020). Are people willing to tell pareto white lies? A review and new experimental evidence. *Games* 12, 1. doi: 10.3390/g12010001

Charness, G., and Gneezy, U. (2008). What's in a name? Anonymity and social distance in dictator and ultimatum games. *J. Econ. Behav. Organ.* 68, 29–35. doi: 10.1016/j.jebo.2008.03.001

Chen, D. L., Schonger, M., and Wickens, C. (2016). oTree–An open-source platform for laboratory, online, and field experiments. *J. Behav. Exp. Finance* 9, 88–97. doi: 10.1016/j.jbef.2015.12.001

Cohn, A., Fehr, E., and Maréchal, M. A. (2014). Business culture and dishonesty in the banking industry. *Nature* 516, 86–89. doi: 10.1038/nature13977

Cohn, A., Gesche, T., and Maréchal, M. A. (2022). Honesty in the digital age. *Manage. Sci.* 68, 827–845. doi: 10.1287/mnsc.2021.3985

Conrads, J., and Lotz, S. (2015). The effect of communication channels on dishonest behavior. *J. Behav. Exp. Econ.* 58, 88–93. doi: 10.1016/j.socec.2015.06.006

Dery, K., Sebastian, I. M., and van der Meulen, N. (2017). The digital workplace is key to digital innovation. *MIS Quart. Exec.* 16, 4.

Di Tella, R., Perez-Truglia, R., Babino, A., and Sigman, M. (2015). Conveniently upset: avoiding altruism by distorting beliefs about others' altruism. *Am. Econ. Rev.* 105, 3416–42. doi: 10.1257/aer.20141409

Drouin, M., Miller, D., Wehle, S. M., and Hernandez, E. (2016). Why do people lie online? "Because everyone lies on the internet". *Comput. Hum. Behav.* 64, 134–142. doi: 10.1016/j.chb.2016.06.052

Dufau, S., Duñabeitia, J. A., Moret-Tatay, C., McGonigal, A., Peeters, D., Alario, F.-X., et al. (2011). Smart phone, smart science: how the use of smartphones can revolutionize research in cognitive science. *PLoS ONE* 6, e24974. doi: 10.1371/journal.pone.0024974

Erat, S., and Gneezy, U. (2012). White lies. *Manage. Sci.* 58, 723–733. doi: 10.1287/mnsc.1110.1449

Etzioni, A. (2019). Cyber trust. *J. Bus. Ethics* 156, 1–13. doi: 10.1007/s10551-017-3627-y

Fiedler, M., Haruvy, E., and Li, S. X. (2011). Social distance in a virtual world experiment. *Games Econ. Behav.* 72, 400–426. doi: 10.1016/j.geb.2010.09.004

Fischbacher, U., and Föllmi-Heusi, F. (2013). Lies in disguise–an experimental study on cheating. *J. Eur. Econ. Assoc.* 11, 525–547. doi: 10.1111/jeea.12014

Fosgaard, T. (2019). Defaults and dishonesty–evidence from a representative sample in the lab. *J. Econ. Behav. Organ.* 157, 670–679. doi: 10.1016/j.jebo.2018.11.006

Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., and Toscano, F. (2021). Work from home during the covid-19 outbreak: the impact on employees' remote work productivity, engagement, and stress. *J. Occup. Environ. Med.* 63, e426. doi: 10.1097/JOM.0000000000002236

Gerlach, P., Teodorescu, K., and Hertwig, R. (2019). The truth about lies: a meta-analysis on dishonest behavior. *Psychol. Bull.* 145, 1–44. doi: 10.1037/bul0000174

Giachetti, C. (2018). *Smartphone Start-Ups: Navigating the iPhone Revolution.* Springer. doi: 10.1007/978-3-319-67973-0

Gibson, R., Tanner, C., and Wagner, A. F. (2013). Preferences for truthfulness: heterogeneity among and within individuals. *Am. Econ. Rev.* 103, 532–48. doi: 10.1257/aer.103.1.532

Gino, F., Ayal, S., and Ariely, D. (2013). Self-serving altruism? The lure of unethical actions that benefit others. *J. Econ. Behav. Organ.* 93, 285–292. doi: 10.1016/j.jebo.2013.04.005

Gino, F., and Galinsky, A. D. (2012). Vicarious dishonesty: When psychological closeness creates distance from one's moral compass. *Organ. Behav. Hum. Decis. Process.* 119, 15–26. doi: 10.1016/j.obhdp.2012.03.011

Gino, F., Norton, M. I., and Weber, R. A. (2016). Motivated Bayesians: feeling moral while acting egoistically. *J. Econ. Perspect.* 30, 189–212. doi: 10.1257/jep.30.3.189

Gneezy, U., Kajackaite, A., and Sobel, J. (2018a). Lying aversion and the size of the lie. *Am. Econ. Rev.* 108, 419–53. doi: 10.1257/aer.20161553

Gneezy, U., Saccardo, S., and van Veldhuizen, R. (2018b). Bribery: behavioral drivers of distorted decisions. *J. Eur. Econ. Assoc.* 17, 917–946. doi: 10.1093/jeea/jvy043

Gottlieb, C., Grobovsek, J., and Poschke, M. (2020). Working from home across countries. *SSRN*. doi: 10.2139/ssrn.3699854

Hergueux, J., and Jacquemet, N. (2015). Social preferences in the online laboratory: a randomized experiment. *Exp. Econ.* 18, 251–283. doi: 10.1007/s10683-014-9400-5

Hermann, D., and Ostermaier, A. (2018). *Be Close to Me and I Will be Honest: How Social Distance Influences Honesty*. Technical Report, CEGE Discussion Papers. doi: 10.2139/ssrn.3131732

Hugh-Jones, D. (2016). Honesty, beliefs about honesty, and economic growth in 15 countries. *J. Econ. Behav. Organ.* 127, 99–114. doi: 10.1016/j.jebo.2016.04.012

Jacobsen, C., Fosgaard, T. R., and Pascual-Ezama, D. (2018). Why do we lie? A practical guide to the dishonesty literature. *J. Econ. Surveys* 32, 357–387. doi: 10.1111/joes.12204

Jacobsen, C., and Piovesan, M. (2016). Tax me if you can: an artifactual field experiment on dishonesty. *J. Econ. Behav. Organ.* 124, 7–14. doi: 10.1016/j.jebo.2015.09.009

Kiesler, S., and Sproull, L. S. (1986). Response effects in the electronic survey. *Publ. Opin. Quart.* 50, 402–413. doi: 10.1086/268992

Kroher, M., and Wolbring, T. (2015). Social control, social learning, and cheating: evidence from lab and online experiments on dishonesty. *Soc. Sci. Res.* 53, 311–324. doi: 10.1016/j.ssresearch.2015.06.003

Kruger, J., Epley, N., Parker, J., and Ng, Z.-W. (2005). Egocentrism over e-mail: can we communicate as well as we think? *J. Pers. Soc. Psychol.* 89, 925–936. doi: 10.1037/0022-3514.89.6.925

LaMothe, E., and Bobek, D. (2020). Are individuals more willing to lie to a computer or a human? Evidence from a tax compliance setting. *J. Bus. Ethics* 167, 157–180. doi: 10.1007/s10551-019-04408-0

Lee, C., and Shin, N. (2017). Prevalence of cyberbullying and predictors of cyberbullying perpetration among korean adolescents. *Comput. Hum. Behav.* 68, 352–358. doi: 10.1016/j.chb.2016.11.047

Li, D., Turel, O., Zhang, S., and He, Q. (2022). Self-serving dishonesty partially substitutes fairness in motivating cooperation when people are treated fairly. *Int. J. Environ. Res. Publ. Health* 19, 6326. doi: 10.3390/ijerph19106326

Li, L., and Lin, T. T. (2019). Smartphones at work: a qualitative exploration of psychological antecedents and impacts of work-related smartphone dependency. *Int. J. Qual. Methods* 18, 1609406918822240. doi: 10.1177/1609406918822240

Liebherr, M., Schubert, P., Antons, S., Montag, C., and Brand, M. (2020). Smartphones and attention, curse or blessing? - a review on the effects of smartphone usage on attention, inhibition, and working memory. *Comput. Hum. Behav. Rep.* 1, 100005. doi: 10.1016/j.chbr.2020.100005

Lin, M.-I. B., and Huang, Y.-P. (2017). The impact of walking while using a smartphone on pedestrians' awareness of roadside events. *Accid. Anal. Prev.* 101, 87–96. doi: 10.1016/j.aap.2017.02.005

Mazar, N., Amir, O., and Ariely, D. (2008). The dishonesty of honest people: a theory of self-concept maintenance. *J. Market. Res.* 45, 633–644. doi: 10.1509/jmkr.45.6.633

Mihelič, K. K., Lim, V. K. G., and Culiberg, B. (2022). Cyberloafing among gen Z students: the role of norms, moral disengagement, multitasking self-efficacy, and psychological outcomes. *Eur. J. Psychol. Educ.* 1–19. doi: 10.1007/s10212-022-00617-w

Mooney, C. Z., and Duval, R. D. (1993). *Bootstrapping: A Nonparametric Approach to Statistical Inference*. Vol. 95. SAGE Publications, Inc.

Morandin, G., Russo, M., and Ollier-Malaterre, A. (2018). Put down that phone! Smart use of smartphones for work and beyond. *J. Manage. Inq.* 27, 352–356. doi: 10.1177/1056492618762964

Naquin, C. E., Kurtzberg, T. R., and Belkin, L. Y. (2010). The finer points of lying online: e-mail versus pen and paper. *J. Appl. Psychol.* 95, 387. doi: 10.1037/a0018627

Okeke, E. N., and Godlonton, S. (2014). Doing wrong to do right? Social preferences and dishonest behavior. *J. Econ. Behav. Organ.* 106, 124–139. doi: 10.1016/j.jebo.2014.06.011

Pascual-Ezama, D., Fosgaard, T. R., Cardenas, J. C., Kujal, P., Veszteg, R., de Liaño, B. G.-G., et al. (2015). Context-dependent cheating: experimental evidence from 16 countries. *J. Econ. Behav. Organ.* 116, 379–386. doi: 10.1016/j.jebo.2015.04.020

Pickhardt, M., and Prinz, A. (2014). Behavioral dynamics of tax evasion–a survey. *J. Econ. Psychol.* 40, 1–19. doi: 10.1016/j.joep.2013.08.006

Richman, W. L., Kiesler, S., Weisband, S., and Drasgow, F. (1999). A meta-analytic study of social desirability distortion in computer-administered questionnaires, traditional questionnaires, and interviews. *J. Appl. Psychol.* 84, 754. doi: 10.1037/0021-9010.84.5.754

Roghanizad, M. M., and Bohns, V. K. (2017). Ask in person: you're less persuasive than you think over email. *J. Exp. Soc. Psychol.* 69, 223–226. doi: 10.1016/j.jesp.2016.10.002

Romano, J. P., and Wolf, M. (2016). Efficient computation of adjusted *p*-values for resampling-based stepdown multiple testing. *Stat. Probab. Lett.* 113, 38–40. doi: 10.1016/j.spl.2016.02.012

Rosenbaum, S. M., Billinger, S., and Stieglitz, N. (2014). Let's be honest: a review of experimental evidence of honesty and truth-telling. *J. Econ. Psychol.* 45, 181–196. doi: 10.1016/j.joep.2014.10.002

Sanchez-Pages, S., and Vorsatz, M. (2009). Enjoy the silence: an experiment on truth-telling. *Exp. Econ.* 12, 220–241. doi: 10.1007/s10683-008-9211-7

Schitter, C., Fleiss, J., and Palan, S. (2019). To claim or not to claim: anonymity, symmetric externalities and honesty. *J. Econ. Psychol.* 71, 13–36. doi: 10.1016/j.joep.2018.09.006

Shalvi, S., Gino, F., Barkan, R., and Ayal, S. (2015). Self-serving justifications: doing wrong and feeling moral. *Curr. Dir. Psychol. Sci.* 24, 125–130. doi: 10.1177/0963721414553264

Suler, J. (2004). The online disinhibition effect. *Cyberpsychol. Behav.* 7, 321–326. doi: 10.1089/1094931041291295

Suler, J. (2005). The online disinhibition effect. *Int. J. Appl. Psychoanal. Stud.* 2, 184–188. doi: 10.1002/aps.42

Suler, J. (2011). "The psychology of text relationships," in *Online Counseling, 2nd Edn.*, eds R. Kraus, J. S. Zack, and G. Stricker (Elsevier), 21–53. doi: 10.1016/B978-0-12-378596-1.00002-2

Thielmann, I., and Hilbig, B. E. (2019). No gain without pain: the psychological costs of dishonesty. *J. Econ. Psychol.* 71, 126–137. doi: 10.1016/j.joep.2018.06.001

Tremblay, D.-G., and Thomsin, L. (2012). Telework and mobile working: analysis of its benefits and drawbacks. *Int. J. Work Innov.* 1, 100–113. doi: 10.1504/IJWI.2012.047995

Wang, L., and Ngai, S. S.-Y. (2020). The effects of anonymity, invisibility, asynchrony, and moral disengagement on cyberbullying perpetration among school-aged children in china. *Child. Youth Serv. Rev.* 119, 105613. doi: 10.1016/j.childyouth.2020.105613

Wang, X., Wang, W., Qiao, Y., Gao, L., Yang, J., and Wang, P. (2022). Parental phubbing and adolescents' cyberbullying perpetration: a moderated mediation model of moral disengagement and online disinhibition. *J. Interpers. Violence.* 37, NP5344–NP5366. doi: 10.1177/0886260520961877

Weisel, O., and Shalvi, S. (2015). The collaborative roots of corruption. *Proc. Natl. Acad. Sci. U.S.A.* 112, 10651–10656. doi: 10.1073/pnas.1423035112

Wilkerson, J. M., Nagao, D. H., and Martin, C. L. (2002). Socially desirable responding in computerized questionnaires: when questionnaire purpose matters more than the mode 1. *J. Appl. Soc. Psychol.* 32, 544–559. doi: 10.1111/j.1559-1816.2002.tb00229.x

Wiltermuth, S. S. (2011). Cheating more when the spoils are split. *Organ. Behav. Hum. Decis. Process.* 115, 157–168. doi: 10.1016/j.obhdp.2010.10.001

Zhao, L., and Yu, J. (2021). A meta-analytic review of moral disengagement and cyberbullying. *Front. Psychol.* 12, 681299. doi: 10.3389/fpsyg.2021.681299

Zhong, C.-B., Bohns, V. K., and Gino, F. (2010). Good lamps are the best police: darkness increases dishonesty and self-interested behavior. *Psychol. Sci.* 21, 311–314. doi: 10.1177/0956797609360754