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Between me and we: The importance of self-profit versus social justifiability for ethical decision making

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Abstract

Current theories of dishonest behavior suggest that both individual profits and the availability of justifications drive cheating. Although some evidence hints that cheating behavior is most prevalent when both self-profit and social justifications are present, the relative impact of each of these factors is insufficiently understood. This study provides a fine-grained analysis of the trade-off between self-profit versus social justifiability. In a non-student online sample, we assessed dishonest behavior in a coin-tossing task, involving six conditions which systematically varied both self-profit and social justifiability (in terms of social welfare), such that a decrease in the former was associated with the exact same increase in the latter. Results showed that self-profit outweighed social justifiability, but that there was also an effect of social justifications.

Keywords: dishonest behavior; cheating; social justification; self-profit; social welfare

1 Introduction

Dishonest behavior is prevalent in various everyday situations, ranging from private context (e.g., cheating in romantic relationships), semi-public settings (e.g., tax evasion), to large public crises (e.g., cheating on pollution emissions tests). Corresponding to this significance of dishonesty for inter-individual relations and society at large, research on the determinants of dishonest behavior has recently seen an upsurge of interest, most prominently in the field of behavioral ethics (Bazerman & Gino, 2012; Gino & Shalvi, 2015; Mazar, Amir & Ariely, 2008), which studies dishonesty in the form of cheating behavior – that is, misreporting facts in order to increase gains (most typically, monetary payoffs).

Generally speaking, dishonesty yields potential individual benefits that likely drive the high prevalence of dishonest behavior. Indeed, recent evidence suggests that a substantial proportion of individuals take potential gains into account and become more willing to lie as incentives increase (Hilbig & Thielmann, 2017). However, dishonesty may also incur costs: First, potential punishment or sanctions may result in *external* costs for the cheater (Becker, 1968). Moreover, psychological approaches to dishonesty emphasize that cheating may also incur *internal* (i.e., psychological) costs, namely, a threat to individuals' positive self-image (Mazar et al., 2008). The possibility of cheating thus creates a dilemma in which self-profit and the motivation to maintain a positive self-image conflict. In turn, individuals are assumed to engage in *ethical maneuvering* (Shalvi, Handgraaf & de Dreu, 2011) to find a compromise between the desire to make a profit and the desire to be an honest person.

A prominent strategy to maintain a positive self-view in the face of dishonest behavior is the use of so-called *self-serving justifications* which may reduce the internal costs of cheating by "providing reasons for questionable behaviors and making them appear less unethical" (Shalvi, Gino, Barkan & Ayal, 2015, p. 125). Indeed, prior research shows that cheating typically increases if self-serving justifications are available as, for instance, in ambiguous situations. Specifically, when cheating was attributable to an "unintentional" mistake such as a confusion of payoff-relevant die rolls that had been produced or even merely observed (Bassarek et al., 2017, Shalvi, Dana, Handgraaf & de Dreu, 2011), participants were more likely to cheat than if such attribution was impossible. The same was found for choices in an ambiguous cheating paradigm in which higher ambiguity led to a higher willingness to lie (Pittarello, Leib, Gordon-Hecker & Shalvi, 2015). In addition to ambiguous situations, feelings of entitlement and deserving have been found to increase cheating (Poon, Chen & DeWall, 2013; Schindler & Pfattheicher, 2017), most plausibly because they are likewise used to justify cheating. Finally, people seem to avoid major lies (i.e., lies that necessitate a large distortion of facts) because they are less easily justifiable than more minor ones (Hilbig & Hessler, 2013, Shalvi, Handgraaf, et al., 2011).

Another way to justify cheating applies to situations in which other individuals will additionally benefit from one's dishonesty (so-called *self-serving altruism*; e.g., Shalvi et al., 2015). In such situations providing a *social justifica-*

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tion, cheating has been found to substantially increase. For instance, in a set of studies, participants' payoff for the number of allegedly solved tasks was either given to the participant herself (*pro-self* cheating), split between her and another participant (*self-other* cheating), or entirely given to another participant (*other-only* cheating) (Gino, Ayal & Ariely, 2013; Wiltermuth, 2011). Participants cheated significantly more when cheating incurred a personal benefit *and* was socially justifiable (i.e., self-other cheating) than when either self-profit or social justifications were present (i.e., pro-self or other-only cheating; for similar findings see also Biziou-van-Pol, Haenen, Novaro, Liberman & Capraro, 2015). The authors concluded that individuals care about both self-profit and justifications in their decision to behave dishonestly. Interestingly, no meaningful differences in cheating rates were apparent between the pro-self and other-only conditions (Gino et al. 2013; Wiltermuth, 2011). In a similar vein, individuals lied less in a deception game for their own profit when their lie implied concurrent costs for another individual (Erat & Gneezy, 2012; Gneezy, 2005), most plausibly because this reduces one's justification for lying.

Taken together, extant evidence suggests that the conjoint presence of self-profit and social justifications – in terms of benefits for others – increases dishonesty and outweighs the effect of self-profit and social justifications alone. However, the relative importance of self-profit versus social justifiability for cheating behavior remains unclear. Specifically, previous studies (e.g., Gino et al., 2013; Wiltermuth, 2011) typically implemented self-other cheating in a way that provided the exact same extent of self-profit and social justifiability[1] for dishonest behavior (e.g., 1€ for the cheating individual and 1€ for another individual).

To allow for a more fine-grained analysis of the importance individuals place to self-profit versus social justification, we compared individuals' willingness to cheat across different conditions in which we systematically increased individuals' self-profit while simultaneously decreasing the strength of (social) justifiability of cheating. More specifically, we implemented six cheating conditions, each of which was characterized by a pre-defined ratio of how a monetary gain was split between the cheater herself and another unknown participant. That is, a decrease in self-profit from one condition to the next was associated with the exact same increase in social justifiability, manipulated in terms of an increase in *absolute social welfare* defined as the sum of payoffs. By implication, the end points of this gradual design were pro-self cheating (i.e., high self-profit but no social justification) and social welfare maximizing cheating (i.e., high strength of social justification but no self-profit). Overall, the experimental design thus allowed for a direct and straightforward test of the relative importance of self-profit versus social justifiability in a decision to cheat.

[1]Although social justifications may be seen as categorical (i.e., present or absent), we herein adopt a continuous – more or less – view of social justifiability, in line with previous research that considered major versus minor lies (Hilbig & Hessler, 2013, Shalvi, Dana, et al., 2011) and also consistent with our own experimental manipulation of the strength of social justifications in terms of the degree of social welfare.

Table 1: Overview of self- and other-profit as well as resulting social welfare in the six cheating conditions.

Condition	Self-profit	Other-profit	Social welfare
1 (other-only)	0€	5€ x 2 =10€	10€
2	1€	4€ x 2 = 8€	9€
3	2€	3€ x 2 = 6€	8€
4	3€	2€ x 2 = 4€	7€
5	4€	1€ x 2 = 2€	6€
6 (pro-self)	5€	0€ x 2 = 0€	5€

2 Method

2.1 Measures and design

To assess dishonest behavior, we relied on a commonly used cheating paradigm that implements a probabilistic link between participants' reports and actual cheating (Fischbacher & Föllmi-Heusi, 2013; Moshagen, Hilbig, Erdfelder & Moritz, 2014; Shalvi, Dana et al., 2011; Shalvi, Handgraaf et al., 2011). Specifically, we used the following coin-tossing task (Hilbig & Zettler, 2015): Participants take a coin, are informed about the target side (i.e., heads or tails), and toss the coin in private for a specified number of times (in our case twice). Their task is to simply report whether a certain number of successes (the coin turning up target side) was obtained, which is associated with certain payoffs. Clearly, participants can misreport the number of successes (or even not toss a coin at all) while anonymity is fully preserved since it is impossible to determine the actual outcomes of the coin tosses of any one individual. Nonetheless, since the probability of a certain number of successes in a certain number of tosses can be directly calculated from the binomial distribution, the actual probability of dishonesty (i.e., participants reporting the payoff-maximizing number of successes irrespective of the actual successes obtained) can be estimated (Moshagen & Hilbig, 2017).

As sketched above, the experiment implemented a within-subjects design with six conditions, which were presented to participants in counterbalanced order. In each condition, participants tossed the coin twice and generated 5€ (approximately 5.34 US$ at the time of data collection) if they reported having obtained two successes in exactly two tosses (the baseline probability of this to occur assuming full honesty is 25%). The 5€ were then split in a pre-specified ratio (which varied across conditions) between the participant herself and another participant. The crucial manipulation was how the 5€ would be split: As shown in Table 1, self-profit increased in 1€-steps across the six conditions whereas social welfare (the absolute sum of payoffs) decreased in 1€-steps. To achieve the manipulation of social welfare, the share for the other participant was always doubled by the experimenter (much like in a public goods game or similar social dilemmas; e.g., Kollock, 1998). For instance, condition 3 specified a split of 2€ for the participant herself and 3€ for the other unknown person. The latter amount was doubled, resulting in a 6€ payoff for the other and thus a total social welfare of 2€ + 6€ = 8€. In condition 4, by comparison, the split was 3€ for the cheater and 2€ for the other unknown person, resulting in a social welfare of 3€ + 2*2€ = 7€. Consequently, there is a 1€ increase in self-profit and a 1€ decrease in social welfare from condition 3 to 4. Notably, in the end point conditions 1 and 6, either self-profit (pro-self cheating) or social justifications (other-only cheating) were given but not both. These end-point conditions thus make the current study comparable to previous studies that mostly used pro-self and/or other-only cheating. In addition, the inclusion of other-only cheating allowed us to specifically test whether there is an additive effect of social justifications beyond self-profit, meaning that cheating also occurs if only profiting another person. (Instructions, materials, and data are available through the journal's table of contents.)

Importantly, depending on the relative importance of self-profit and social justifiability, cheating rates should differ in systematic ways across the six conditions: If self-profit is the predominant driver of dishonesty, cheating rates should increase with self-profit, despite the corresponding decrease in social justifiability (i.e., loss in social welfare). If, in turn, social justifiability is the predominant driver of dishonesty, cheating rates should increase with social justifiability, despite the corresponding decrease in self-profit. Finally, if self-profit and social justifiability are of comparable importance such that they compensate for each other, cheating rates should be highly similar across conditions.

2.2 Procedure and participants

The experiment was conducted as a web-based study via *Bilendi*, a professional panel provider in Germany. Participants first provided informed consent and demographic information. Next, they completed a personality questionnaire[2] not pertinent to this investigation, before receiving detailed instructions on the coin-tossing task. That is, participants were told that they were going to complete six trials of the same task that differed only with regard to how the to-be-generated 5€ is split between themselves and a randomly selected other participant. Participants were informed that the other participant was another unknown person (also participating in the study) in each trial and that one trial would ultimately be selected at random to determine their own and the other's payoffs. In each trial, participants then received information about the self- and other-profit at stake, and were also provided with a randomly determined target side for the coin toss (determined anew in each trial). Participants were instructed to take a coin, to toss it twice, and to report whether the target side occurred twice in exactly two tosses. Correspondingly, the response options were "Yes, the coin turned up target side in both tosses" and "No, the coin did not turn up target side in both tosses". Participants were aware that nobody would be able to observe their tosses and that the outcome depended entirely on whether they *reported* having obtained two successes. If participants indicated that the target side occurred twice, they generated 5€ that were split between themselves and another randomly chosen participant as specified in the specific trial. If participants indicated that the target side did not occur twice, no payoff was generated in the specific trial at hand and the 5€ remained in the experimental budget. Once participants had completed the six coin-toss trials, we selected one trial at random and informed participants about their own and the other's payoff resulting from their own response in this particular trial.

After data collection, participants received their payment consisting of a flat fee, the additional payout from their own coin toss (if any), and (if applicable) the additional payout from another's coin toss (M = 2.93€ in addition to the flat fee). Payment was entirely handled by the recruiting panel provider, who was blind to the specific task at hand, thus further increasing anonymity of participants. Of note, conducting the study online via a professional panel provider allowed us to recruit a particularly diverse sample (N = 210[3]). That is, participants were virtually equally distributed across the sexes (51.2% female) and spanned a broad age range from 19 to 67 years (M = 39.9, SD = 12.7). The majority of participants (70.5%) were employed, only 9.5% were students.

3 Results

Table 2 reports the observed proportion of "yes"-responses per condition. As can be seen, the proportion of "yes"-responses was within the typical range found in these types of paradigms, that is, consistently above the baseline probability of winning (.25), but not substantially more than twice as large. However, since there is necessarily a non-zero chance of two actual successes in two tosses, the observed rate of "yes"-responses conflates cheating and legitimate wins. Thus, for each condition we additionally calculated

[2]Specifically, we used the German version (Moshagen, Hilbig & Zettler, 2014) of the 60-item HEXACO Personality Inventory-Revised (Ashton & Lee, 2009).

[3]The sample size was determined for the analysis originally planned, which is reported in full in the Appendix.

TABLE 2: Observed proportion of "yes"-responses, associated estimate of the probability of dishonesty (95% confidence intervals of this estimate in parentheses), and test of the latter probability against 0 (i.e., whether cheating occurred), separately per condition

Condition	Observed proportion of "yes"-responses	Probability of dishonesty $\hat{d}$	Test of $\hat{d}$ against 0
1 (other-only)	.36	.15 [.06; .24]	$\Delta G^2(1) = 12.92$, $p < .001$, Cohen's $\omega = .10$
2	.36	.15 [.06; .24]	$\Delta G^2(1) = 12.92$, $p < .001$, Cohen's $\omega = .10$
3	.44	.26 [.17; .35]	$\Delta G^2(1) = 36.80$, $p < .001$, Cohen's $\omega = .17$
4	.45	.26 [.17; .35]	$\Delta G^2(1) = 38.55$, $p < .001$. Cohen's $\omega = .17$
5	.51	.35 [.26; .44]	$\Delta G^2(1) = 67.18$, $p < .001$, Cohen's $\omega = .23$
6 (pro-self)	.44	.25 [.16; .34]	$\Delta G^2(1) = 35.08$, $p < .001$, Cohen's $\omega = .17$

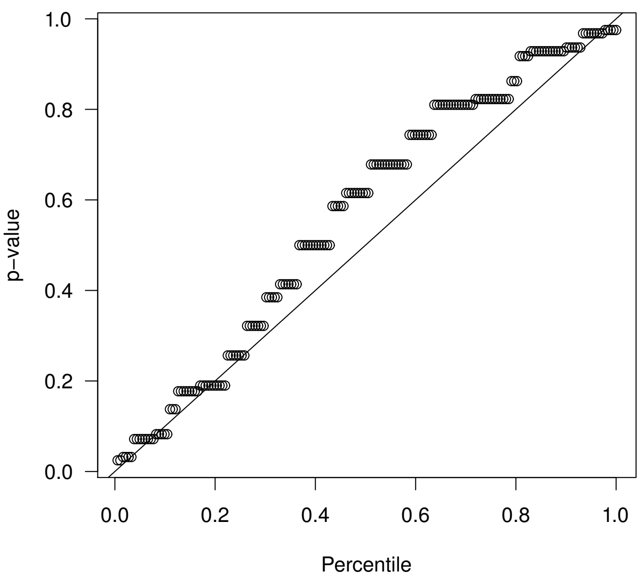

FIGURE 1: Distribution of one-tailed p-values of inter-correlations (Kendall's τ) between responses (1 = "yes", 0 = "no") in the coin-tossing task and experimental condition per participant (n = 182, as 28 participants gave the same responses in all conditions and could thus not be included in this analysis).

an estimate of the rate of cheating by

$$d = \frac{p(\text{"}yes\text{"}) - p}{1 - p}$$

where $p(\text{"}yes\text{"})$ denotes the observed proportion of "yes"-responses and p denotes the baseline probability of winning (.25) (for formal details, see Moshagen & Hilbig, 2017). The estimated probability of dishonesty ($\hat{d}$), which is equivalent to the proportion of dishonest participants in the present design, was consistently larger than 0 and smaller than .40. As is apparent in Table 2, all likelihood-ratio tests testing the probability of dishonesty against 0 for each condition were significant, thus confirming that cheating occurred in all conditions.

Next, we tested whether and how dishonesty differed across conditions. As can be seen descriptively in Table 2, the probability of dishonesty tended to increase across conditions. To analyze this potential effect of condition on cheating behavior, we analyzed "yes"-responses per individual per condition using a multi-level logistic regression as implemented in the glmer function of the lme4 package (Bates, Maechler, Bolker & Walker, 2015) in R (R Core Team, 2017).[4] Specifically, we included a subject-level random intercept and specified the experimental condition as fixed linear effect to predict "yes"-responses (coded as 1, "no"-responses as 0). Mirroring the descriptive pattern summarized in Table 2 – and implying that cheating indeed increased with increasing self-profit – results showed a significant positive effect of condition on the probability to respond "yes", $B = .11$, SE = .04, $p = .001$. Notably, adding a random slope to the model to account for potential individual variation in the effect of condition on "yes"-responses did not improve model fit, $\chi^2(df = 2) = 0.03$, $p = .986$. This implies that, overall, individuals were similarly responsive to changes in self-profit versus social justifiability, meaning that there was a general tendency to become more likely to cheat the higher the self-profit.

The conclusion that individuals were *generally* more likely to cheat with increasing self-profit was also supported by the distribution of p-values for the individual-level correlation between responses and conditions. Specifically, we calculated the one-tailed p-value for Kendall's τ between responses (1 = "yes", 0 = "no") and condition (1–6) for each individual and plotted the resulting p-values against their percentile rank (Figure 1; for details on this procedure, see Baron, 2010). Each point in the plot represents the p-

[4]Given that the rate of "yes"-responses is not a direct measure of cheating because it conflates honest with dishonest responses, we additionally conducted analyses on the estimated probability of dishonesty (see Moshagen & Hilbig, 2017). The analyses, which fully confirm the findings reported here, can be found in the Appendix.

value of one single participant for the hypothesis that "yes"-responses become less likely from condition 1 (other-only cheating) to condition 6 (pro-self cheating). If there is no relation between the variables of interest (here: responses and condition), all p-values should roughly fall on the diagonal which implies a uniform (random) distribution. Apparently, however, the p-values systematically deviated from the diagonal, clustering above the diagonal in the upper right part of the plot. This implies that *if* participants reacted to the experimental manipulation of self-profit versus social welfare, their willingness to respond "yes" increased with increasing self-profit, confirming the general preference for self-interest over social justifiability on the individual level. In turn, essentially no participant showed a clear preference for social welfare and thus for social justifiability over self-profit, as indicated by the absence of systematic deviation from the diagonal in the lower left part of Figure 1.[5]

Finally, as is apparent in Table 2, there was one notable exception to the trend of an increasing probability of dishonesty with increasing self-profit. Specifically, dishonesty was not largest in condition 6 incorporating self-profit only (i.e., pro-self cheating): Once social justifiability was absent (i.e., social welfare dropped to zero), the estimated probability of dishonesty again decreased. To test whether this decrease was significant, we conducted an analysis using the same random-intercept regression model from above but adding a dummy variable contrasting the pro-self cheating condition 6 (codes as 1) against the remaining conditions 1–5 involving some degree of social justifiability (coded as 0). Confirming that cheating indeed decreased once social justifiability was completely absent, the dummy variable yielded a significant negative effect on "yes"-responses, $B = -.50$, SE = .22, $p = .022$, whereas the general positive trend of increasing probability of "yes"-responses with higher self-profit still remained significant, $B = .19$, SE = .05, $p < .001$. This implies that cheating consistently increased with increasing self-profit but only as long as cheating was still somehow justifiable.

4 Discussion

Dishonest behavior is highly prevalent in everyday life, arguably because it yields noteworthy profits for the cheating individual. However, since cheating also appears to bear costs such as posing a threat to one's moral self-image (Mazar et al., 2008), individuals are assumed to seek justifications that render dishonest behavior subjectively less severe. For instance, whenever cheating incurs a profit for others in addition to oneself, individuals are more willing to cheat because cheating is socially justifiable (Shalvi et al., 2015). However, it is unclear just how self-profit affects cheating vis-à-vis social justifiability. To close this gap, the present experiment investigated the relative impact of both determinants using a gradual design in which self-profit and social justifiability (in terms of social welfare) were inversely related. Specifically, across six conditions using a coin-tossing task, the strength of social justifications decreased to the exact same extent as self-profit increased, with the end point conditions of this design implementing either pure other-profit or pure self-profit.

Overall, our results imply that cheating occurred in each condition, but to a notably different extent across conditions. Specifically, cheating increased with increasing self-profit and decreasing strength of social justifications. This shows that self-profit is the primary driver of dishonesty, suggesting that individuals place more importance on what they personally gain from cheating than on what is gained in total (in terms of social welfare). Nonetheless, cheating also occurred in the other-only condition in which only social justifiability was present whereas self-profit was zero. Also, once social justifiability was absent (social welfare dropped to zero), cheating decreased (despite the further increase in self-profit). Taken together, these findings demonstrate an effect of social justifiability beyond self-profits: Justifications alone suffice to produce some cheating, and cheating is clearly fostered if social justifications are available in addition to self-profit.

Notably, the present results are highly compatible with previous studies investigating cheating behavior. First, the rate of dishonesty in the pure pro-self condition 6 (d = .25) is perfectly consistent with the mean rate of dishonesty found across many studies using similar paradigms (median estimate of d across studies = .24; Hilbig & Hessler, 2013; Hilbig, Moshagen & Zettler, 2016; Hilbig & Zettler, 2015; Moshagen et al., 2014; Thielmann, Hilbig, Zettler & Mosagen, 2017; Zettler, Hilbig, Moshagen & de Vries, 2015; see also Abeler, Nosenzo & Raynold, 2016, for a recent meta-analysis). Second, a significant rate of dishonesty in the other-only condition corresponds to findings showing that people cheat not only to profit themselves but also (and exclusively) to profit others (Erat & Gneezy, 2012). This – as well as the significant cheating rates in the remaining conditions 2, 3, and 4 in which other-profit exceeded self-profit – once again indicates that participants are even willing to cheat if this results in larger benefits for another and thus makes the participant relatively worse off. By implication, individuals seem to care more about their absolute self-profit than about direct social comparison to another individual.

[5]Note that individuals were somewhat consistent in their inclination to respond "yes" across conditions, as evidenced by Cronbach's $\alpha = .51$ across the six decisions. Although this value may not seem overly high, it must be evaluated in view of the fact that cheating was assessed with six "items" only and that responses were further concealed by design due to the random noise introduced by the coin toss. Thus, individuals indeed showed a somewhat consistent willingness to cheat, irrespective of the specific incentives provided – which fully aligns with an individual difference perspective on dishonest behavior (Hilbig & Thielmann, 2017; Hilbig & Zettler, 2015).

Finally, evidence shows that cheating rates typically peak in the joint presence of self-profit and social justifications (Gino et al. 2013; Wiltermuth, 2011), especially when self-profits are relatively high (Erat & Gneezy, 2012). In our experiment, the highest probability of dishonesty ($d_5 = .35$) also occurred when both social justifications and self-profit were present – specifically, when self-profit was highest but social justifiability was still given.

Although our study extends prior findings in providing first evidence on the relative impact of self-profit and social justifiability for dishonesty to occur, future research might investigate whether self-profit outweighs social justifications *in general*. First, social justifications could become more important than self-profit when they are manipulated in another way than via social welfare. For instance, previous research shows that cheating for the benefit of another is especially prevalent when the other is a person in need, a finding that has been referred to as the *robin-hood-effect* (Gino & Pierce, 2010a, 2010b). This implies that dishonesty for the mere benefit of another might be higher than observed in the present study when the beneficiary is needier than the cheating individual herself. A gradual design as the one used in our experiment with the beneficiary being a needy person (with varying need) instead of some random other participant might thus provide further insight into the relative importance of self-profit and social justifications.

Second, we cannot rule out that social justifiability might be more important than self-profit for other groups of participants stemming from different societies or cultures, respectively, and/or being recruited in a different way. The sample in our study consisted of people registered in a panel for participating in online studies. One could argue that the main goal of participating in these studies is to make money. Thus, the fact that self-profit outweighed social justifiability might be specific for such sample types. Although (i) our findings are overall compatible with much previous evidence using other samples and (ii) not a single participant of our sample actually appeared to place more weight on social justifications than on self-profit, future research should investigate the possibility that the relative weight assigned to self-profit and social justifiability might depend on characteristics of the specific sample or other moderators such as culture, personality, or whether losses rather than gains are at stake (Erat & Gneezy, 2012; Gneezy, 2005; Schindler & Pfattheicher, 2017).

In conclusion, the present work contributes to the understanding of the relative influence of self-profit versus social justifiability on people's decision to cheat. Our data suggests that self-profit is the primary driver of cheating behavior – whereas profits for others have an additive, but smaller impact. As such, people seem to care more about their ultimate gains from cheating than about whether their dishonesty is socially justifiable.

References

Abeler, J., Nosenzo, D., & Raymond, C. (2016). Preferences for truth-telling. *CeDEx Discussion Paper 2016-13*, Center for Decision Research & Experimental Economics.

Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment, 91*(4), 340–345. https://doi.org/10.1080/00223890902935878.

Bassarek, C., Leib, M., Mischkowski, D., Strang, S., Glöckner, A., & Shalvi, S. (2017). What provides justification for cheating – producing or observing counterfactuals? *Journal of Behavioral Decision Making, 30*(4), 964–975. http://dx.doi.org/10.1002/bdm.2013

Batchelder, W. H., & Riefer, D. M. (1999). Theoretical and empirical review of multinomial process tree modeling. *Psychonomic Bulletin & Review*, *6*, 57–86. http://dx.doi.org/10.3758/BF03210812.

Baron, J. (2009). Looking at individual subjects in research on judgment and decision making (or anything). *Acta Psychologica Sinica, 42,* 1–11.

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. http://dx.doi.org/10.18637/jss.v067.i01.

Bazerman, M. H., & Gino, F. (2012). Behavioral ethics: Toward a deeper understanding of moral judgment and dishonesty. *Annual Review of Law and Social Science*. (8), 85–104. http://dx.doi.org/10.1146/annurev-lawsocsci-102811-173815.

Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy*, *76*(2), 169–217. http://dx.doi.org/10.1086/259394.

Biziou-van-Pol, L., Haenen, J., Novaro, A., Liberman, A. O., & Capraro, V. (2015). Does telling white lies signal pro-social preferences? *Judgment and Decision Making*, *10*(6), 538–548.

Erat, S., & Gneezy, U. (2012). White Lies. *Management Science*, *58*(4), 723–733. http://dx.doi.org/10.1287/mnsc.1110.1449.

Erdfelder, E., Auer, T.-S., Hilbig, B. E., Aßfalg, A., Moshagen, M., & Nadarevic, L. (2009). Multinomial processing tree models. *Zeitschrift für Psychologie - Journal of Psychology*, *217*(3), 108–124. http://dx.doi.org/10.1027/0044-3409.217.3.108.

Fischbacher, U., & Föllmi-Heusi, F. (2013). Lies in disguise - An experimental study on cheating. *Journal of the European Economic Association*, *11*(3), 525–547. http://dx.doi.org/10.1111/jeea.12014.

Gino, F., Ayal, S., & Ariely, D. (2013). Self-serving altruism? The lure of unethical actions that benefit others. *Journal of Economic Behavior & Organization*, *93*, 285–292. http://dx.doi.org/10.1016/j.jebo.2013.04.005

Gino, F., & Pierce, L. (2010a). Robin Hood under the hood: Wealth-based discrimination in illicit customer help. *Organization Science*, *21*(6), 1176–1194. http://dx.doi.org/10.1287/orsc.1090.0498.

Gino, F., & Pierce, L. (2010b). Lying to level the playing field: Why people may dishonestly help or hurt others to create equity. *Journal of Business Ethics*, *95*, 89–103. http://dx.doi.org/10.1007/s10551-011-0792-2.

Gino, F., & Shalvi, S. (2015). Editorial overview: Morality and ethics: New directions in the study of morality and ethics. *Current Opinion in Psychology*, *6*, v-viii. http://dx.doi.org/10.1016/j.copsyc.2015.11.001.

Gneezy, U. (2005). Deception: The role of consequences. *The American Economic Review, 95*(1), 384–395. http://dx.doi.org/10.1257/0002828053828662.

Grünwald, P. D. (2007). *The minimum description length principle*. Cambridge, MA: MIT Press.

Heck, D. W., Moshagen, M., & Erdfelder, E. (2014). Model selection by minimum description length: Lower-bound sample sizes for the Fisher information approximation. *Journal of Mathematical Psychology*, *60*, 29–34. http://dx.doi.org/10.1016/j.jmp.2014.06.002.

Heck, D. W., Wagenmakers, E.-J., & Morey, R. D. (2015). Testing order constraints: Qualitative differences between Bayes factors and normalized maximum likelihood. *Statistics & Probability Letters*, *105*, 157–162. http://dx.doi.org/10.1016/j.spl.2015.06.014.

Hilbig, B. E., & Hessler, C. M. (2013). What lies beneath: How the distance between truth and lie drives dishonesty. *Journal of Experimental Social Psychology*, *49*(2), 263–266. http://dx.doi.org/10.1016/j.jesp.2012.11.010.

Hilbig, B. E., Moshagen, M., & Zettler, I. (2016). Prediction consistency: A test of the equivalence assumption across different indicators of the same construct. *European Journal of Personality, 30*, 637–647. http://dx.doi.org/10.1002/per.2085.

Hilbig, B. E. & Thielmann, I. (2017). Does everyone have a price? On the role of payoff magnitude for ethical decision making. *Cognition, 163*, 15–25. http://dx.doi.org/10.1016/j.cognition.2017.02.011.

Hilbig, B. E., & Zettler, I. (2015). When the cat's away, some mice will play: A basic trait account of dishonest behavior. *Journal of Research in Personality*, *57*, 72–88. http://dx.doi.org/10.1016/j.jrp.2015.04.003.

Kollock, P. (1998). Social dilemmas: The anatomy of cooperation. *Annual Review of Sociology*, *24*, 183–214. http://dx.doi.org/10.1146/annurev.soc.24.1.183.

Knapp, B. R., & Batchelder, W. H. (2004). Representing parametric order constraints in multi-trial applications of multinomial processing tree models. *Journal of Mathematical Psychology*, *48*, 215–229. http://dx.doi.org/10.1016/j.jmp.2004.03.002.

Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research*, *45*(6), 633–644. http://dx.doi.org/10.1509/jmkr.45.6.633.

Moshagen, M. (2010). multiTree: A computer program for the analysis of multinomial processing tree models. *Behavior Research Methods*, *42*(1), 42–54. http://dx.doi.org/10.3758/BRM.42.1.42.

Moshagen, M., & Hilbig, B. E. (2017) The statistical analysis of cheating paradigms. *Behavior Research Methods, 49*, 724–732. http://dx.doi.org/10.3758/s13428-016-0729-x.

Moshagen, M., Hilbig, B. E., & Zettler, I. (2014). Faktorenstruktur, psychometrische Eigenschaften und Messinvarianz der deutschsprachigen Version des 60-Item HEXACO Persönlichkeitsinventars. Diagnostica, 60(2), 86–97.https://doi.org/10.1026/0012-1924/a000112.

Moshagen, M., Hilbig, B. E., Erdfelder, E., & Moritz, A. (2014). An experimental validation method for questioning techniques that assess sensitive issues. *Experimental Psychology*, *61*(1), 48–54. http://dx.doi.org/10.1027/1618-3169/a000226.

Myung, J. I. (2000). The importance of complexity in model selection. *Journal of Mathematical Psychology*, *44*(1), 190–204. http://dx.doi.org/10.1006/jmps.1999.1283.

Myung, J. I., Navarro, D. J., & Pitt, M. A. (2006). Model selection by normalized maximum likelihood. *Journal of Mathematical Psychology*, *50*(2), 167–179. http://dx.doi.org/10.1016/j.jmp.2005.06.008.

Pittarello, A., Leib, M., Gordon-Hecker, T., & Shalvi, S. (2015). Justifications shape ethical blind spots. *Psychological Science*, *26*(6), 794–804. http://dx.doi.org/10.1177/0956797615571018.

Poon, K. T., Chen, Z., & DeWall, C. N. (2013). Feeling entitled to more ostracism increases dishonest behavior. *Personality and Social Psychology Bulletin, 39,* 1227–1239.

R Core Team (2017). *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Rissanen, J. J. (1996). Fisher information and stochastic complexity. *IEEE Transactions on Information Theory*, *42*, 40–47.

Schindler, S., & Pfattheicher, S. (2017). The frame of the game: Loss-framing increases dishonest behavior. *Journal of Experimental Social Psychology, 69,* 172–177.

Shalvi, S., Gino, F., Barkan, R., & Ayal, S. (2015). Self-serving justifications: Doing wrong and feeling moral. *Current Directions in Psychological Science*, *24*(2), 125–130. http://dx.doi.org/10.1177/0963721414553264.

Shalvi, S., Dana, J., Handgraaf, M. J., & de Dreu, C. K. (2011). Justified ethicality: Observing desired counterfactuals modifies ethical perceptions and behavior. *Organizational Behavior and Human Decision Processes*, *115*(2), 181–190. http://dx.doi.org/10.1016/j.

obhdp.2011.02.001.

Shalvi, S., Handgraaf, M. J. J., & de Dreu, C. K. (2011). Ethical manoeuvring: Why people avoid both major and minor lies. *British Journal of Management*, *22*, 16–27. http://dx.doi.org/10.1111/j.1467-8551.2010.00709.x.

Thielmann, I., Hilbig, B. E., Zettler, I., & Moshagen, M. (2017). On measuring the sixth basic personality dimension: A comparison between HEXACO Honesty-Humility and Big Six Honesty-Propriety. *Assessment, 24*(8), 1024–1036.http://dx.doi.org/10.1177/1073191116638411.

Wiltermuth, S. S. (2011). Cheating more when the spoils are split. *Organizational Behavior and Human Decision Processes*, *115*(2), 157–168. http://dx.doi.org/10.1016/j.obhdp.2010.10.001.

Wu, H., Myung, J. I., & Batchelder, W. H. (2010). On the minimum description length complexity of multinomial processing tree models. *Journal of Mathematical Psychology*, *54*(3), 291–303. http://dx.doi.org/10.1016/j.jmp.2010.02.001.

Zettler, I., Hilbig, B. E., Moshagen, M. & De Vries, R. (2015). Dishonest responding or true virtue? A behavioural test of Impression Management. *Personality and Individual Differences, 81,* 107–111.

Appendix

Given that the observed rate of "yes"-responses in the coin-tossing task conflates cheating and legitimate wins, corresponding effect sizes are necessarily underestimated (Moshagen & Hilbig, 2017). The analysis reported in this appendix relies directly on the estimated probability of dishonesty. Analyses were conducted within the multinomial processing tree model framework (Batchelder & Riefer, 1999; Erdfelder et al., 2009) using the multiTree software (Moshagen, 2010). The model estimating the probability of dishonesty (per condition) comprises two parameters: The first, d, is the probability of dishonesty (of an individual respondent in this situation). Dishonest respondents answer "yes" irrespective of the outcome of the coin-tossing task. If one is honest (probability $1 - d$), the response depends on the outcome of the coin-tossing task: In case of two successes (which occurs with probability p), one responds "yes", otherwise (probability $1-p$) "no". The value of p (which represents the second parameter in the model) is known from the binomial distribution (.25 in our paradigm) and thus fixed to this value in all analyses. For the entire experiment, the full (baseline) model comprises six such trees (one per condition) with distinct free parameters representing the probability of dishonesty (i.e., d_{1-6}) and a single p-parameter fixed to .25 across all conditions. The full model equations and corresponding raw data file can be found through the journal's table of contents.

Corresponding to data analyses within the multinomial processing tree framework, our original sample size considerations were based on an a priori power analysis within this framework using multiTree (Moshagen, 2010). Specifically, we determined the sample size required to detect differences in the rate of dishonesty (with assumend dishonesty rates increasing in equal step sizes from 0 in the other-only condition to 0.3 in the pro-self condition) across conditions (tested against a model assuming that dishonesty is constant across conditions) with high power of $1 - \beta = .95$ at $\alpha = .05$. The power analysis yielded a required sample size of $N = 142$ per condition and thus $N = 852$ observations in total, which we considered a lower-bound estimate. Notably, the required sample size also clearly exceeds the minimum-N required for the model comparisons reported below which is $N = 45$ (Heck, Moshagen & Erdfelder, 2014). We recruited $N = 210$ participants who completed the study, generating 1260 observations in total.

Corresponding to our main research question whether cheating differs as a function of self-profit versus social justifications, we first analyzed whether all d-parameters can be constrained to equality (i.e., $d_1 = d_2 = d_3 = d_4 = d_5 = d_6$) which is implied by the hypothesis that self-profit and social justifications are equally important. This model fitted significantly worse than the baseline model allowing all d-parameters to vary freely ($\Delta G^2 = 14.53$, $p = .013$), thus corroborating that the probability of dishonesty indeed differed across conditions. The corresponding effect size of Cohen's $\omega = .11$ indicated a small overall difference between conditions.

To further test whether these differences across cheating conditions were systematic in nature (i.e., showing an upward or downward trend from condition 1 to 6) – as implied by the analyses on the "yes"-responses (see main text) – we compared two specific models, namely model (A) implying that dishonesty increases across conditions (i.e., $d_1 < d_2 < d_3 < d_4 < d_5 < d_6$) and thus that self-profit outweighs social justifications versus model (B) implying that dishonesty decreases across conditions (i.e., $d_1 > d_2 > d_3 > d_4 > d_5 > d_6$) and thus that social justifications outweigh self-profit. Note that the mere larger/smaller-relations are particularly appropriate in the present case as they also allow for non-linear trends which is important given that there is no way to judge by how much subjective self-profits let alone justifications vary across conditions. In addition, the comparison included an unconstrained model (C) with all d-parameters varying freely. The two models representing the possible trends involve parametric order constraints which are easily implemented in the multinomial processing tree framework through reparameterizing the model (Knapp & Batchelder, 2004).

For comparison of these non-nested models involving order constraints, we relied on a criterion based on the minimum description length principle (Grünwald, 2007; Myung, 2000; Myung, Navarro, & Pitt, 2006). Note that the non-nested nature of the models and the inclusion of order constraints ruled out use of the likelihood-ratio test as well as reliance on information criteria such as AIC or BIC which ignore functional complexity (Myung et al., 2006).

The minimum description length of a model is the sum of goodness-of-fit and a model complexity term. In the case of multinomial models, the latter can be defined as the sum of the maximum likelihoods of all possible data vectors from the outcome space. An approximation to the complexity term is the Fisher Information Approximation (cFIA; Rissanen, 1996; Wu, Myung & Batchelder, 2010) which is obtained by a Monte Carlo algorithm in multiTree as used here. The corresponding FIA weights (Heck, Wagenmakers, & Morey, 2015) revealed that model (A) involving the restriction $d_1 < d_2 < d_3 < d_4 < d_5 < d_6$ was clearly superior with a posterior probability of .99. Thus, in summary, the model comparison clearly corroborated the results from the multi-level regression analyses predicting "yes"-responses: Dishonesty increased with increasing self-profit and decreasing social justifications.