Economics Letters 215 (2022) 110480

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

Cross-country comparison in dishonest behaviour: Germany and East Asian countries

Toan L.D. Huynh [a,*], Marc Oliver Rieger [b], Mei Wang [c]

[a] University of Southampton, Department of Decision Analytics and Risk, SO17 1BJ Southampton, UK
[b] University of Trier, Chair of Banking and Finance, 54286 Trier, Germany
[c] WHU – Otto Beisheim School of Management, Chair of Behavioral Finance, 56179 Vallendar, Germany

ARTICLE INFO

Article history:
Received 1 February 2022
Received in revised form 26 March 2022
Accepted 29 March 2022
Available online 5 April 2022

JEL classification:
C91
D03
D63
D82

Keywords:
Cheating
Cross-country comparison
Honesty

ABSTRACT

We conduct an experiment on dishonesty in China, Japan, Germany, Taiwan, and Vietnam to examine country differences in cheating behaviours, using the matrix task paradigm. Our results indicate that studies about honesty vary substantially when different tasks are used.

1. Introduction

Even though there are numerous studies investigating the determinants of lying, which may include socio-economic background, social preferences, cognitive skills, and the beliefs of the individual, the cross-country comparison on lying has still not been properly studied. In the broad literature on honesty, our paper differs from existing cross-country comparison studies in two main aspects. First, previous papers focus on dice-roll, coin-flip, quiz tasks, and lost items (Pascual-Ezama et al., 2015; Hugh-Jones, 2016; Mann et al., 2016; Cohn et al., 2019) as luck outcomes, whereas our study follows the approach of real effort using a matrix-task experiment to study lying in the case of self-reported performance. Second, we also examine the differences within countries (East/West Germany and North/South Vietnam). While the majority of honesty studies have focused on luck-based experiments, we chose matrix-tasks because, in comparison to luck-based tasks, cheating in effort-based tasks entails more psychological cost to overcome cognitive dissonance. Preserving a good self-image is a basic human need. Thus, people tend to find it more challenging to lie about their own actions than to lie about the state of nature (Serra-Garcia et al., 2013). Moreover, there is a lack of cross-country comparison on real-effort tasks, even though it is highly relevant to our everyday life, e.g., cheating on real working performance, etc.

The five countries in our study are interesting in the sense that the political systems, economic development, and cultural roots are to some extent orthogonal to each other, as shown in Table 1. With regard to the impacts of political systems, previous studies show that people from democratic countries tend to be more honest (Ariely et al., 2019). This implies that we should expect Chinese and Vietnamese students to cheat more than students from Germany, Taiwan, and Japan. On the other hand, it is well known that Confucian culture emphasizes the role of effort and diligence in improving social status or acquiring knowledge (Yeh and Xu, 2010). It follows that we could also expect students from countries with Confucian tradition to cheat less in the matrix tasks than German students, because such tasks are academic-oriented and effort-based.

We found that our participants from East Asia (i.e., China, Taiwan, Japan, and Vietnam) cheated less often than our German sample, which seems to be consistent with the positive impacts of Confucianism on academic efforts as discussed above. In addition, we do not find that people from an area with a longer history of a socialist system (East Germany) are more dishonest (in comparison to West Germany). This is different to previous findings by Ariely et al. (2019). However, we report a novel finding from the Vietnamese sample — Southern Vietnamese students tend to

* Correspondence to: Department of Decision Analytics and Risk, Southampton Business School, University of Southampton, Southampton S017 1BJ, UK.
E-mail address: T.Huynh@soton.ac.uk (T.L.D. Huynh).

https://doi.org/10.1016/j.econlet.2022.110480

Table 1
Country differences.

Countries	Political systems	Economic conditions	Culture roots
China	Non-democratic	Emerging market	Confucianism
Vietnam	Non-democratic	Emerging market	Confucianism
Japan	Democratic	Developed market	Confucianism
Taiwan	Democratic	Developed market	Confucianism
Germany	Democratic	Developed market	Christianity

be more dishonest than students from Northern Vietnam, which has a stronger influence from communism and a weaker market economy.

We contribute to the literature by not only reporting the country differences but also extending the discussion to task-dependence in honesty experiments. While the experiments based on luck reported aggregate behaviour at the country level (Pascual-Ezama et al., 2015; Mann et al., 2016), our experiment also allows us to identify dishonest behaviour at the individual level.

2. Experimental design

We use the matrix task developed by Mazar et al. (2008). Participants were handed a sheet of paper consisting of 20 matrices, each of which contained a set of twelve three-digit numbers (e.g., 1.69). The participants were required to find a pair of numbers in each matrix which would add up to 10.00. The time limit for the task was four minutes, except for China — pre-tests showed that Chinese students on average were much faster in solving such tasks, so we had to set their time limit to three minutes. After they had solved the task with the matrices, the participants were handed an answer sheet, which indicated the positions of the two correct numbers in each matrix. Then the participants were asked to write down the number of correctly solved matrices on a payment slip. Next, the participants were asked to leave all the documents on the table or throw them into the trash bin. Afterwards, subjects received their money outside the room in which the experiment was conducted. It is worth mentioning that results in Mazar et al. (2008) have not been widely replicated. To our knowledge, the only paper that did a registered replication is Verschuere et al. (2018). Our research design is based on the matrix task paradigm developed by Mazar et al. (2008), but we do not rely on the treatment effects reported by the original paper.

Our design is similar to that in the studies of Faravelli et al. (2015) and Friesen and Gangadharan (2012) and allows us to identify cheating behaviour post-hoc at individual level. Unbeknownst to the participants, each matrix task sheet was labelled with a unique identification number, which enables us to reconcile their corrected answers with the reported matrices on the payment slip. This allows us to compare their actual performance with the self-reported results for every participant (while still preserving the anonymity of the participant). In addition, unlike the study of Klimm (2019), we conducted the experiment in the form of a paper-and-pencil experiment in a classroom (instead of conducting it in a laboratory where matrices are solved using computers) to give participants the impression that their claims could not be checked against their actual performance. Aside from the difference between cheating in a real effort task and cheating in a chance game, the matrix tasks have the advantage that we can not only compose a binary variable of cheating behaviour (like in typical coin-flip tasks), but also measure the magnitude of cheating by counting the number of over-reported matrices.

The size of the reward can play a role in experiments on dishonesty and deception, although Mazar et al. (2008) indicated that changing the size of the reward ($0.50 per matrix and $2 per matrix in their study) did not make a difference in the case of a self-reported matrix task. Following previous experiments (e.g., Friesen and Gangadharan, 2013), we chose a standard reward size (approximately one euro per correct matrix, providing a maximum payoff of 20 EUR). We converted this amount for each country based on Purchasing Power Parity (PPP) taking into account average monthly income/expenses of local students; specifically, we offered a reward of 1 EUR per correct matrix in Germany, 3 RMB in China, 15 TWD in Taiwan, 100 JPY in Japan, and 5000 VND in Vietnam.

Instructions were translated into the official language of each given country by native speakers who were familiar with economic experiments. Participants were recruited via on-campus advertisement platforms. All participants were university students, which improves the comparability between countries. In addition, if the number of the participants in one session exceeded 35 – the number of participants allowed in one room – we split the experiment and conducted it in two classrooms. At each university, the experiments were conducted in one day to avoid that the participants might reveal the contents of the experiment to others. Participants were allowed to join the experiment only once. The local experimenters strictly followed the instructions to ensure consistency across different locations. We neither mentioned the possibility of cheating, nor asked the participants to be honest.

3. Results

A total of 493 individuals participated in the experiment: 103 (48% male) from Germany, 169 (33% male) from Vietnam, 85 (46% male) from China, 66 (17% male) from Taiwan, and 70 (70% male) from Japan. The average age of the participants was 20.87 (SD = 2.64) and 41% of participants were males. The experiment was conducted at 11 universities between summer 2018 and summer 2019 (detailed information is provided in the Appendix A). Only country residents who stated that they were (fully or partially) of the nationality of the given country were eligible for further analysis. Fig. 1 depicts the differences in the average correctly solved matrices and average self-reported matrices across five countries. The average number of self-claimed matrices solved by all participants was 7.41 (Germany: 8.44, Vietnam: 6.49, China: 7.48, Taiwan: 6.10, Japan: 9.25). Furthermore, we found a significantly higher difference between actual ability and dishonest behaviour in Germany (t-stat = 4.58, $p < 0.01$).

Table 2 and Fig. 2 show that the average overclaimed performance and the proportion of cheaters is higher in Germany than in Asian countries (two-sample test of proportions, $p < 0.05$). In general, the average of overreported answers varies significantly in the five countries (one-way analyses of variance (ANOVA) between groups and within groups revealed $F(4,488) = 13.65$, $p < 0.01$. In addition, ANCOVA with demographic controls, $p < 0.01$). Thus, we find differences in cheating behaviour among the five countries. Next, we will compare our findings with the results of previous studies. In the study by Mazar et al. (2008), the proportion of participants who solved all 20 matrices was only 0.6%, while Kajackaite (2018) indicated that 15 participants (15.79%) reported the highest payoffs. At the same time, 16.7% of participants in the study by Klimm (2019) reported having solved all matrices. In our experiment, it was only in Germany that 5 out of 103 participants (4.8%) reported having solved all twenty matrices. Therefore, our findings are in line with the findings of previous studies (e.g., Mazar et al., 2008; Fischbacher and Föllmi-Heusi, 2013; Kajackaite, 2018; Klimm, 2019), which concluded that people rarely cheat by reporting the highest performance, even when they have the opportunity.

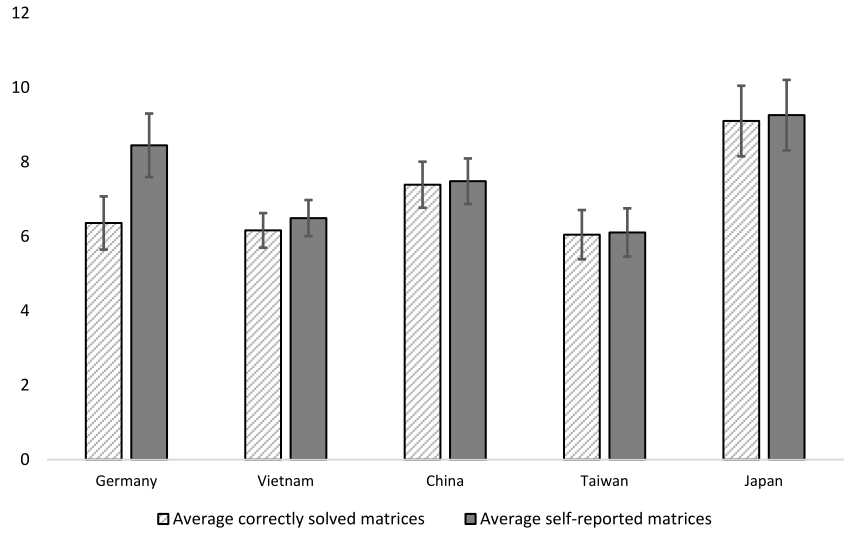

Fig. 1. The difference in mathematical ability and cheating behaviour across 5 countries. **Notes:** The error bar represents the 95% Confidence Interval.

Table 2
Cross-country comparison.

Country	Participants	Overclaimed matrices					Number of participants who overreport			
		Mean	Median	S.D.	Min	Max	=1 matrix (%)	>1 matrix (%)	Maximally (%)	Underreported (%)
Germany	103	8.96	9.00	5.5	1	18	1 (0.97%)	23 (22.33%)	3 (2.90%)	0 (0.00%)
Vietnam	169	3.00	1.00	3.09	1	10	12 (7.11%)	9 (5.32%)	0 (0.00%)	5 (2.96%)
China	85	1.33	1.00	0.52	1	2	4 (4.71%)	2 (2.35%)	0 (0.00%)	0 (0.00%)
Taiwan	66	2.00	2.00	1.41	1	3	1 (1.51%)	1 (1.51%)	0 (0.00%)	0 (0.00%)
Japan	70	2.40	1.00	1.94	1	5	3 (4.28%)	2 (2.85%)	0 (0.00%)	1 (1.42%)
Total	**493**	**5.21**	**3.00**	**5.12**	**1**	**18**	**21 (4.25%)**	**58 (12%)**	**3 (0.61%)**	**6 (1.21%)**

Notes: One-way analyses of variance (ANOVA) of between groups and within groups revealed F (4,488) = 13.65, $p < 0.01$. ANOVA with demographic controls, $p < 0.01$. The numbers of participants in West Germany and East Germany are 40 and 63, respectively. In addition, the numbers of South- and North-Vietnam participants are 100 and 69, respectively.

Fig. 2 shows a significantly higher number of over-reported matrices in Germany, especially in West Germany. Five participants (14.2%) from West Germany reported the maximum number of matrices,[1] whereas no participants from Asian countries reported 20 matrices (Fisher exact test, $p < 0.001$). In contrast, the percentage of Asian participants over-reporting 1 matrix (95.2% out of those who over-reported one correct answer) is higher than in Germany (Two-sample test of proportions, $p = 0.002$). Overall, East Asian participants tend to lie partially with a small number of solved matrices, while the participants from the West often over-report by indicating the maximal value. Furthermore, we also found that 6 Asian participants (5 Vietnamese and 1 Japanese) under-reported their actual correct matrices. West German participants overreported more correct answers than those from East Germany (T-stat = 1.97, $p < 0.1$), although the percentage of participants who overreported is not statistically different between East and West Germany. When comparing Northern and Southern Vietnamese students, we find the average number of overreported matrices by Southern Vietnamese is significantly higher (T-stat = 2.13, $p < 0.05$), and the percentage of cheaters in Southern Vietnam is higher (T-stat = 1.74, $p < 0.1$), albeit only marginally significant. To sum up, we find statistically weak evidence that Western German students cheat more than Eastern German students, whereas Southern Vietnamese tend to cheat significantly more than Northern Vietnamese. In both cases, it seems that the experience of socialism reduced dishonesty, which is opposite to the findings of Ariely et al. (2019).

4. Concluding remarks

Although the previous literature has extensively studied cheating and dishonest behaviours, many underlying mechanisms regarding human decision-making and its determinants have still not been scrutinized. Our paper sheds light on country differences by using the matrix-task experiment developed by Mazar et al. (2008), providing different patterns in comparison with the luck-based tasks in previous studies. Moreover, we find Southern Vietnamese students tend to cheat more than Northern Vietnamese ones, and West German students tend to cheat more than East German students with marginal statistical significance (the lack of statistical power may be due to a smaller sample size). These patterns seem to be at odds with results from Ariely et al. (2019), who documented a higher likelihood of cheating by individuals with a longer experience in socialist East Germany. Furthermore, our results suggest a higher degree of honesty in countries with Confucian culture for effort-based tasks in academic settings. It would be interesting for future research to directly test the impacts of Confucianism on honesty at the individual level, e.g., using the priming method (Liu et al., 2014). Our findings shed light on the importance of task-dependency in honesty experiments. More studies to disentangle the impacts of cultural, economic, and institutional determinants on domain-specific honesty would be highly valuable.

[1] The real numbers of correct matrices for these subjects were 6 (two cases) and 2 (three cases). The latter three persons tried to obfuscate their cheating by manipulating their solutions after the test. This, however, was easily detectable as they had to use a different pen for this (we had collected our coloured pens before handing in the solutions for self-correction).

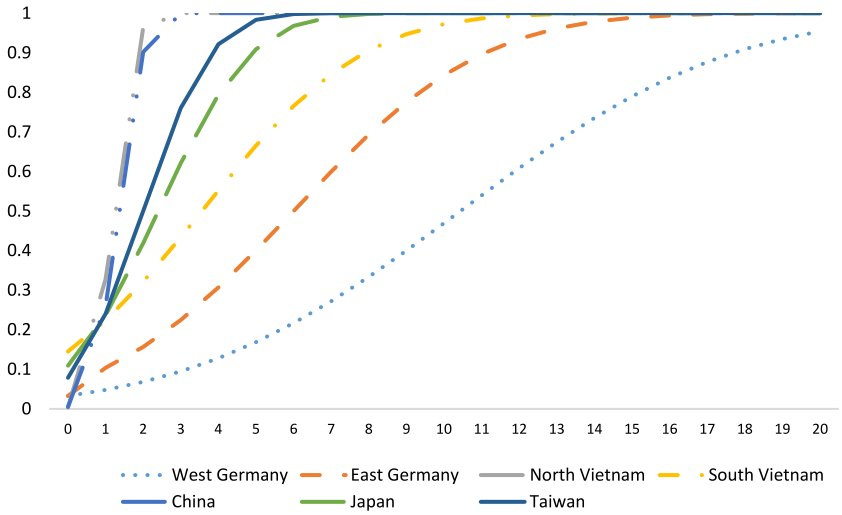

Fig. 2. Cumulative Distribution Functions of overreported performances across and within countries.
Note: The *x*-axis represents the number of overreported matrices while the *y*-axis demonstrates the cumulative probability.

Table A.1
Cross-session comparison of the number of overreported participants.

Sessions	Participants	%	Answers	Session sample
Germany session 1 (Hochschule Trier)	15	43%	10.93	35
Germany session 2 (University of Trier)	1	10%	3.00	10
Germany session 3 (University of Trier)	0	0%	0.00	18
Germany session 4 (University of Magdeburg)	8	20%	6.00	40
Vietnam session 1 (Banking University HCMC)	4	20%	1.50	20
Vietnam session 2 (Banking University HCMC)	5	14%	2.20	35
Vietnam session 3 (University of Economics HCMC)	1	10%	1.00	10
Vietnam session 4 (University of Economics HCMC)	6	17%	6.50	35
Vietnam session 5 (Other universities)	1	7%	1.00	14
Vietnam session 6 (University of Commerce)	1	5%	1.00	22
Vietnam session 7 (Foreign Trade University)	3	9%	1.33	33
China session 1 (University of Xiamen)	0	0%	0.00	10
China session 2 (University of Xiamen)	1	17%	2.00	6
China session 3 (University of Xiamen)	0	0%	0.00	20
China session 4 (Zhongnan Business School)	1	4%	1.00	24
China session 5 (Zhongnan Business School)	4	16%	1.25	25
Taiwan session 1 (Shih Chien University)	0	0%	0.00	20
Taiwan session 2 (Shih Chien University)	1	3%	1.00	31
Taiwan session 3 (National Chengchi University)	1	7%	3.00	15
Japan session 1 (Hiroshima City University)	3	9%	2.00	35
Japan session 2 (Hiroshima City University)	2	6%	3.00	35
Total	**58**	**12%**	**5.21**	**493**

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We are thankful to the Research Initiative "*Cultures in Transition*" of the state of Rhineland-Palatinate for financial support. We thank everybody who helped with the data collection process, in particular, Duy Linh Bui, Hung-Ling Chen, Yang Liu-Gerhards, Thomas Neumann, Thanh Dac Nguyen, Thong Trung Nguyen, Diefeng Peng, Thuy Chung Phan, Denis Reinhardt, Junyi Shen, Hiromasa Takahashi, Bodo Vogt, and Sen-Geng Wang. We also thank Tobias Emering, Luisa Kersch, David Berens, Shi Xinyi, Chinung Chen, Nai-Shing Yen, and Fen Ye for their help with the preparation of survey and data. We appreciate helpful comments from Joseph E. Harrington (Editor) and a referee. All remaining errors are ours.

Appendix A

See Table A.1.

Appendix B. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.econlet.2022.110480.

References

Ariely, D., Garcia-Rada, X., Gödker, K., Hornuf, L., Mann, H., 2019. The impact of two different economic systems on dishonesty. Eur. J. Political Econ. 59, 179–195.
Cohn, A., Maréchal, M.A., Tannenbaum, D., Zünd, C.L., 2019. Civic honesty around the globe. Science 365 (6448), 70–73.
Faravelli, M., Friesen, L., Gangadharan, L., 2015. Selection, tournaments, and dishonesty. J. Econ. Behav. Organ. 110, 160–175.
Fischbacher, U., Föllmi-Heusi, F., 2013. Lies in disguise—an experimental study on cheating. J. Eur. Econom. Assoc. 11 (3), 525–547.
Friesen, L., Gangadharan, L., 2012. Individual level evidence of dishonesty and the gender effect. Econom. Lett. 117 (3), 624–626.

Friesen, L., Gangadharan, L., 2013. Designing self-reporting regimes to encourage truth telling: An experimental study. J. Econ. Behav. Organ. 94, 90–102.
Hugh-Jones, D., 2016. Honesty, beliefs about honesty, and economic growth in 15 countries. J. Econ. Behav. Organ. 127, 99–114.
Kajackaite, A., 2018. Lying about luck versus lying about performance. J. Econ. Behav. Organ. 153, 194–199.
Klimm, F., 2019. Suspicious success–cheating, inequality acceptance, and political preferences. Eur. Econ. Rev. 117, 36–55.
Liu, E.M., Meng, J., Wang, J.T., 2014. Confucianism and preferences: Evidence from lab experiments in Taiwan and China. J. Econ. Behav. Organ. 104, 106–122.
Mann, H., Garcia-Rada, X., Hornuf, L., Tafurt, J., Ariely, D., 2016. Cut from the same cloth: Similarly dishonest individuals across countries. J. Cross-Cultural Psychol. 47 (6), 858–874.
Mazar, N., Amir, O., Ariely, D., 2008. The dishonesty of honest people: A theory of self-concept maintenance. J. Mar. Res. 45 (6), 633–644.
Pascual-Ezama, D., Fosgaard, T.R., Cardenas, J.C., Kujal, P., Veszteg, R., de Liaño, B.G.-G., Gunia, B., Weichselbaumer, D., Hilken, K., Antinyan, A., et al., 2015. Context-dependent cheating: Experimental evidence from 16 countries. J. Econ. Behav. Organ. 116, 379–386.
Serra-Garcia, M., Damme, E.Van., Potters, J., 2013. Lying about what you know or about what you do? J. Eur. Econom. Assoc. 11 (5), 1204–1229.
Verschuere, B., Meijer, E.H., Jim, A., Hoogesteyn, K., Orthey, R., McCarthy, R.J., et al., 2018. Registered replication report on Mazar, Amir, and Ariely (2008). Adv. Methods Practices Psychol. Sci. 1 (3), 299–317.
Yeh, Q.J., Xu, X., 2010. The effect of confucian work ethics on learning about science and technology knowledge and morality. J. Bus. Ethics 95 (1), 111–128.