Disguising Lies - Image Concerns and Partial Lying in Cheating Games

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Description of additional online materials

In what follows, we describe:

- the program codes for Wolfram Mathematica,[1] which replicate the empirical calibration analysis in Section IV of the paper.

- the Microsoft Excel file replicating the F-test mentioned in footnote 25.

ReplicationFig1.nb

This code replicates the empirical calibration of the model to the data in the baseline treatment in Fischbacher and Föllmi-Heusi (2013) (see Figure 1). The first cell of the code searches for the parameter values of η and σ which minimize the mean squared error between the predicted and empirical reporting frequencies, subject to equilibrium conditions. The output cell returns the obtained minimum value of the mean squared error, and the calibrated values of η, σ and ρ (with the last one uniquely determined for given η and σ by the equilibrium conditions $\theta(\rho, \eta, \sigma) = 0$ and $\rho \in (\max\{0, K - \eta\}, K)$). The second input cell substitutes the obtained parameter values into the model and calculates the corresponding theoretical values of reporting frequencies.

ReplicationFig2.nb

This code replicates the empirical calibration of the model to the data in the baseline treatment in Fischbacher and Föllmi-Heusi (2013) under assumption $\eta = 0$ (see Figure 2). For η exactly equal to 0 (no image concerns), the model trivially predicts that all types whose $l < K - y$ report $x = K$, and all other types tell the truth (in particular, all types observing $y = K$ tell the truth). Hence, the probability of observing a given report x is

$$\Pr[x \text{ reported}] = \begin{cases} \frac{1}{K+1}\left(\sum_{y=0}^{K-1} F(K-y) + 1\right) & \text{if } x = K \\ \frac{1}{K+1}(1 - F(K-x)) & \text{otherwise.} \end{cases}$$

This model is taken to the empirical data from the baseline treatment in Fischbacher and Föllmi-Heusi (2013). The first cell of the code searches for the parameter value of σ which yields the least mean squared error between the predicted and empirical

[1] The version used to program the codes was Wolfram Mathematica 11.2.

reporting frequencies. The output cell returns the obtained minimum value of the mean squared error, and the calibrated value of σ. The second input cell substitutes the obtained value into the model and calculates the corresponding theoretical values of reporting frequencies.

Note: The same calibrated parameter value of σ may be obtained by setting η to a very small number in the code provided in ReplicationFig1.nb (e.g., to 10^{-5}), and then minimizing the mean squared error with respect to σ.[2]

ReplicationFig3a.nb and ReplicationFig3b.nb

These codes replicate the empirical calibration of the model to the data in the non-observed and observed treatments, respectively, in Gneezy, Kajackaite and Sobel (2018) (see Figure 3).[3] The calculations are analogous to ReplicationFig1.nb.

Note: The range of possible reported payoffs in the experimental treatments was from 1 to 10. At the same time, the lowest reported payoff in the model is normalized to 0. Hence, the value of K in the calibration is set to 9, while a report x in the model corresponds to report $x+1$ in terms of experimental reported payoffs. For instance, the code calibrates the theoretical value of x_L being equal to 7 for the non-observed treatment (Figure 3a), which thus corresponds to x_L being equal to 8 in terms of experimental reported payoffs.

ReplicationFig4.nb

This code replicates the empirical calibration of the model to the data in the observed treatment in Gneezy, Kajackaite and Sobel (2018), regarding the distribution of reports conditional on drawing a given number (see Figure 4a). In particular, we substitute into the model the calibrated parameter values obtained in ReplicationFig3b, and then calculate the corresponding theoretical values of reporting frequencies conditional on actually drawing a particular number.

ReplicationFtest.xlsx

This Excel file replicates the F-test comparing goodness of fit to the data between the restricted and unrestricted models, where the restriction takes the form $\eta = 0$ (see footnote 25).

Note: The unrestricted model has two exogenous parameters (η and σ), while the endogenous parameter ρ is uniquely pinned down for given η and σ under equilibrium

[2] For a higher calculation precision, one could increase the maximum number of allowed iterations using MaxIterations option.

[3] The data for the empirical reporting frequencies have been calculated from the raw experimental data provided in the online additional materials to Gneezy, Kajackaite and Sobel (2018).

conditions (in particular, by $\theta(\rho, \eta, \sigma) = 0$ and $\rho \in (\max\{0, K - \eta\}, K))$. Thus, the unrestricted model has $6 - 2 = 4$ degrees of freedom. The restricted model is structurally equivalent to the unrestricted model under setting η to an infinitely small number. Hence, it bears one parameter restriction.

References

Fischbacher, Urs, and Franziska Föllmi-Heusi. 2013. "Lies in Disguise - An Experimental Study on Cheating." *Journal of the European Economic Association*, 11(3): 525–547.

Gneezy, Uri, Agne Kajackaite, and Joel Sobel. 2018. "Lying Aversion and the Size of the Lie." *American Economic Review*, 108(2): 419–453.