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Abstract

Despite their ubiquity, tattoos continue to be associated with dishonesty. Yet, scarce behavioral evidence exists. We test whether the tattooed and non-tattooed differ in their dishonest reporting in two consecutive incentivized experiments. First, subjects toss a coin privately five times and receive payment for each heads reported. After, subjects perform five additional coin tosses with the payment for each heads reported increased tenfold. We find few differences in the reporting behavior between the tattooed and non-tattooed in the number of heads reported in either reporting task or the difference between the two. Strategic dishonesty is limited to a small minority of subjects and to only one additional reported heads in the high-stakes tosses.

Keywords: experimental economics; tattoo; honesty; strategic cheating.

JEL codes: C91, Z10.

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1. Introduction

Persistent stereotypes suggest that the tattooed tend to be dishonest.[2] Are they? We design a series of low-stakes and comparatively high-stakes reporting experiments to evaluate the honesty of tattooed and non-tattooed individuals. Numerous measures and tests reveal few differences in reporting behavior between the non-tattooed and the tattooed regardless of the latter's number of tattoos or their placement in visible or readily hidden locations.

2. Methods and Sample

2.1 Experimental and Survey Design

We recruited registered Amazon Mechanical Turk (MTurk) users to participate in our 30-minute study. The study consists of three incentivized experiments followed by an extensive survey. The first incentivized experiment elicits subjects' time preferences and is the focus of Ruffle and Wilson (2018). Next, subjects participated in two consecutive incentivized tasks that evaluate their honesty. Specifically, subjects were asked to toss a coin five times in succession and told that they would be paid $0.03 USD for each heads they reported (to be referred to as 'low-stakes' coin tosses). Before carrying out the task, subjects were further told that they would perform five additional coin tosses in succession and earn $0.30 USD for each heads reported ('high-stakes' coin tosses). Thus, by reporting five heads in the high-stakes tosses, subjects could add $1.50 USD to their earnings, more than doubling their participation payment of $1.25 USD. See the Appendix for the participants' instructions.

Knowing upfront that they would perform a series of low-stakes tosses ($0.03 USD per heads) followed by a series of relatively high-stakes tosses ($0.30 USD per heads) represents a modest methodological innovation. In particular, strategic subjects who wish to preserve an honest self-image (Mazar et al. 2008) may elect to under-report the number of heads in the low-stakes task, while granting themselves the liberty to over-report the number of heads in the high-stakes

[2] Degelman and Price (2002) show that subjects rate a woman photographed with a tattoo as significantly less honest than her non-tattooed counterpart. Durkin and Houghton (2000) find that children already from age 6 associate tattoos with a host of antisocial and delinquent attributes. In Johnson and King (2017), a team of research assistants rates visibly tattooed criminal offenders as significantly more physically threatening than those without a visible tattoo.

task.[3] More generally, we anticipate subjects to report fewer heads in the low- than the high-stakes coin tosses.

After completing these experiments, subjects answered a questionnaire that includes a number of socio-demographic questions and the cognitive reflection task (CRT) (Frederick 2005), a well-known measure of impulsivity. Because MTurk participants may be familiar with the three CRT questions, we disguised two of them and added a fourth question from a newer version of the test (see Thomson and Oppenheimer 2016). The questionnaire concludes with a detailed portion on tattoos.[4]

2.2 Sample

In total, 1104 American respondents participated in our study, out of which 781 reported having no tattoos (abbreviated henceforth as "non-tattooed"), while the remaining 323 indicated having at least one permanent ink tattoo. For the purposes of the analysis, we will subsequently divide the tattooed into those having only tattoos that can be readily hidden with clothing (e.g., a long-sleeve shirt or long pants) (abbreviated as "hidden tattooed" or simply "hiddens") and those having at least one visible tattoo (e.g., face, neck, hand) (abbreviated as "visibly tattooed" or "visibles"). Our sample includes 255 hiddens and 68 visibles.

Upon completion of the 30-minute study, a flat payment of $1.25 USD was credited to each participant's MTurk account along with their earnings from the two sets of coin tosses and the time-preferences experiment.

3. Results

If everyone reported truthfully, we would expect the distribution of reported heads for both the low- and high-stakes coin tosses to appear as follows: a subject reports 0 heads or 5 heads each with probability (w.p.) .03125 (1/32), 1 or 4 heads each w.p. .15625 (5/32) and 2 or 3 heads each w.p. .3125 (10/32). Figure 1 displays the distributions of the reported numbers of heads for the low-stakes coin tosses separately for the non-tattooed, hidden tattooed and visibly tattooed

[3] Other authors have explored the effect of incentives on dishonesty in experiments involving die rolls or coin tosses (e.g., Abeler et al. forthcoming; Fischbacher and Föllmi-Heusi 2013; Kajackaite and Gneezy 2017). However, all of these studies employ a between-subjects design and therefore do not permit the strategic misreporting that we hypothesize in our study.

[4] See our companion paper, Ruffle and Wilson (2018), for further details on the questionnaire.

samples.[5] For all three samples, the Pearson chi-square test rejects the hypothesis that subjects' reported numbers of heads is drawn from the truthful distribution ($\chi^2(5) > 10, p \leq .05$ for all three tests). Subjects report too many outcomes of three and five heads and too few one and two heads outcomes compared to the distribution expected from honest reporting.[6] In fact, three heads is the modal outcome, accounting for between 36.4% of reports among the visibles and 41.9% among the non-tattooed. Two heads is the second most commonly reported outcome, accounting for between 25.8% (visibles) and 31.9% (non-tattooed). The Kruskal-Wallis non-parametric test fails to reject the equality of the three sample distributions of reported numbers of heads ($\chi^2(2) = 3.1, p = .21$), suggesting no difference between tattooed and non-tattooed groups.

<insert Figure 1 here>

<insert Table 1 here>

For the high-stakes coin tosses, the three sample distributions of reported heads deviate even farther from the truthful distribution ($\chi^2(5) \geq 14, p < .02$ for all three tests). At the same time, these three distributions of reported heads become even more similar to one another, according to Figure 2 and the inability of the Kruskal-Wallis test to reject their equality ($\chi^2(2) = 0.2, p = .92$). Three heads is again the modal outcome among all three groups (32.4% to 39.6% of subjects). However, four heads is now the second most commonly reported outcome (25.4% to 26.7%). The outcome of four heads gains between 12 and 14 percentage points in going from the low- to high-stakes tosses whereas the two-heads outcome sheds 8 to 14 percentage points.

<insert Figure 2 here>

To assess the extent to which individual subjects strategically reported more heads in the high- than the low-stakes coin tosses, we compute for each subject the difference between these two reports and compare this distribution to the one that would arise based on truthful reporting. Figure 3 reveals that reporting one additional heads in the high-stakes than the low-stakes tosses is the modal outcome for all three samples, accounting for between 33.3% (visibles) to 37.4% (hiddens) of outcomes. By comparison, Table 2 shows that honest reporting would lead to 20.5% of subjects reporting one more heads in the high-stakes tosses ($p < .01$ for all three Binomial tests). By symmetry, 20.5% would report one fewer heads in the high- than the low-stakes tosses.

[5] We drop six subjects from the analysis who report non-whole numbers of heads in the low-stakes tosses. There are no such subjects for the high-stakes tosses and thus none are excluded.

[6] Most of these differences are highly significant based on one-sided Binomial tests. See Table 1.

Yet, only between 13.4% and 16.8% of subjects do so. Two more heads reported in the high- than the low-stakes ought to occur 11.7% of the time. In fact, Figure 3 shows all three subpopulations differ from this prediction by less than 1.1% ($p > .16$ for all three tests). Three more heads in the high- than in the low-stakes tosses is reported by only 1.6%, 2.4% and 0% of non-tattooed, hidden tattooed and visibly tattooed subjects, respectively, significantly below the expected frequency of 4.4% had subjects reported truthfully ($p < .01,\ .07$ and $.05$, respectively).

The picture that emerges is that few subjects cheat maximally in either the low- or high-stakes coin tosses. Moreover, the extent of strategically shifting reported heads from the low- to the high-stakes is limited to a small minority of subjects and to only one additional reported heads in the high-stakes tosses. This finding is consistent with the highly robust result of incomplete cheating observed in the literature, even when stakes are increased (see Fischbacher and Föllmi-Heusi's (2013) original die-rolling experiment and Abeler et al. forthcoming for a recent survey).

<insert Figure 3 here>

<insert Table 2 here>

The results from our linear regression analysis, reported in Table 3, confirm the lack of significant differences in the mean numbers of reported heads between the tattooed and non-tattooed. Regressions (1) – (3) apply to the low-stakes coin tosses, while (4) – (6) apply the same specifications to the high-stakes tosses. The constant term in all regressions reflects the mean number of heads reported by non-tattooed subjects. The estimate of -0.039 on the indicator variable for tattooed subjects in regression (1) does not differ significantly from zero ($p = .57$). Yet, this estimate masks small differences in the number of heads reported by those subjects with only hidden tattoos and those with at least one visible tattoo. Although neither group reports significantly different numbers of heads from the non-tattooed according to (2), the additional 0.28 heads reported by visibles compared to hiddens is weakly significant ($p = .09$). After controlling for each subject's number of tattoos, self-reported tendency to take risks, CRT score and a host of socio-demographic controls (3), none of the differences in reported heads between any two subpopulations is significantly different from zero. Also, a subject's number of correctly answered CRT questions is not a significant predictor of the number of heads reported. The only significant controls are subjects' tendency to take risks ($p = .07$) and their age ($p < .01$): the younger and the more willing subjects are to take risks, the more heads they report, on average.

For the high-stakes coin tosses, regressions (4) – (6) all show that the mean numbers of reported heads do not differ significantly between any of the three subpopulations. Regression (6) reveals that the number of reported heads decreases with the number of tattoos ($p = .05$); however, the magnitude of the effect is negligible: each additional tattoo is associated with 0.02 fewer reported heads. More interesting is the result that subjects who answered three or all four of the CRT questions correctly report about 0.23 more heads on average than those who answered all four questions incorrectly. Recall that CRT scores and reported numbers of heads were not significantly correlated for the low-stakes coin tosses. We conjecture that less-impulsive, more contemplative subjects thought through the task and recognized the impossibility of detection. Still, they did not view additional cheating worthwhile when the stakes were low, but pursued extra cheating for high-stakes tosses.

Conclusions

Stereotypes notwithstanding, we find that tattooed and non-tattooed individuals are equally honest. In a within-subjects online experiment in which anonymous subjects are presented with a series of small-stakes opportunities to cheat followed immediately by a second set of cheating opportunities in which the incentives are increased tenfold, cheating is limited. In fact, only about 15% of subjects cheat more when the stakes are increased and the amount by which cheating increases is modest. These findings hold true for the tattooed and non-tattooed alike.

Yet, reputation adjusts slowly to new realities. We might expect the negative stereotypes associated with tattoos to fade eventually as the rate of tattoos among young people continues to increase and they assume positions of power. However, to the extent that current employers may pass over (visibly) tattooed individuals – perhaps due to inaccurate stereotypes about dishonesty – the tattooed may be excluded from some of these positions of power longer than would be anticipated based on demographics alone.

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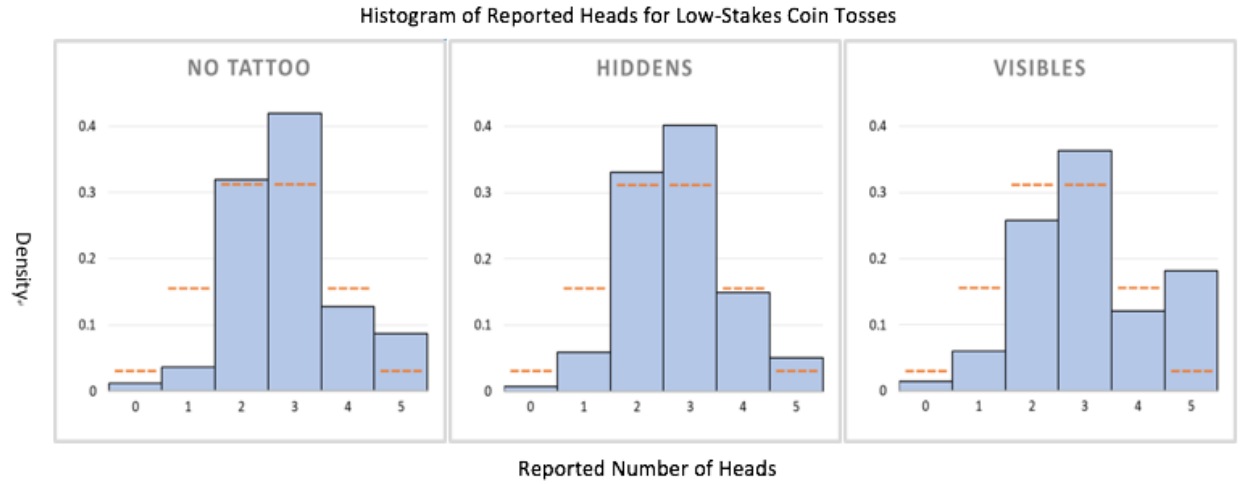
Figure 1



Notes: Distribution of reported number of heads for low-stakes coin tosses by tattoo status. Red dashed lines display the expected distribution if everyone reported truthfully.

Figure 2

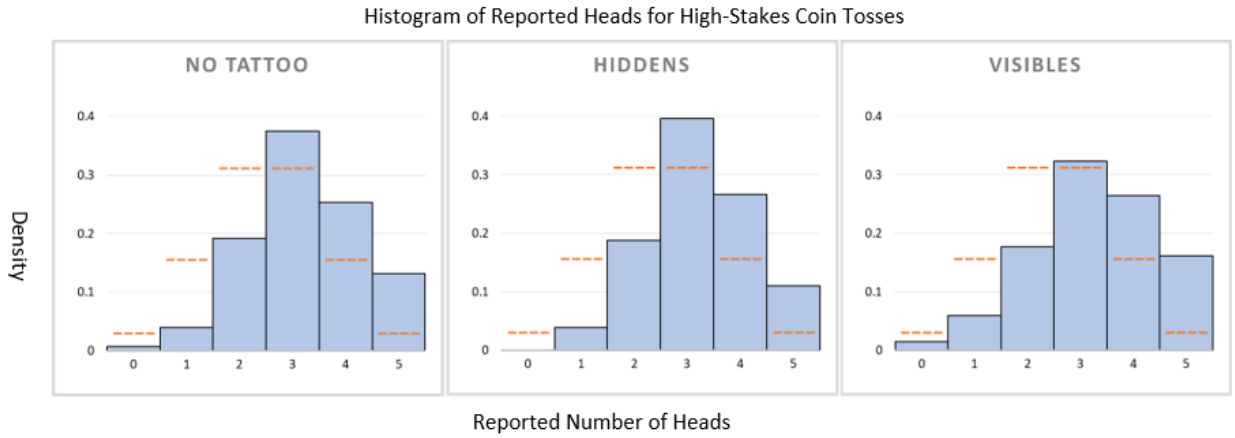


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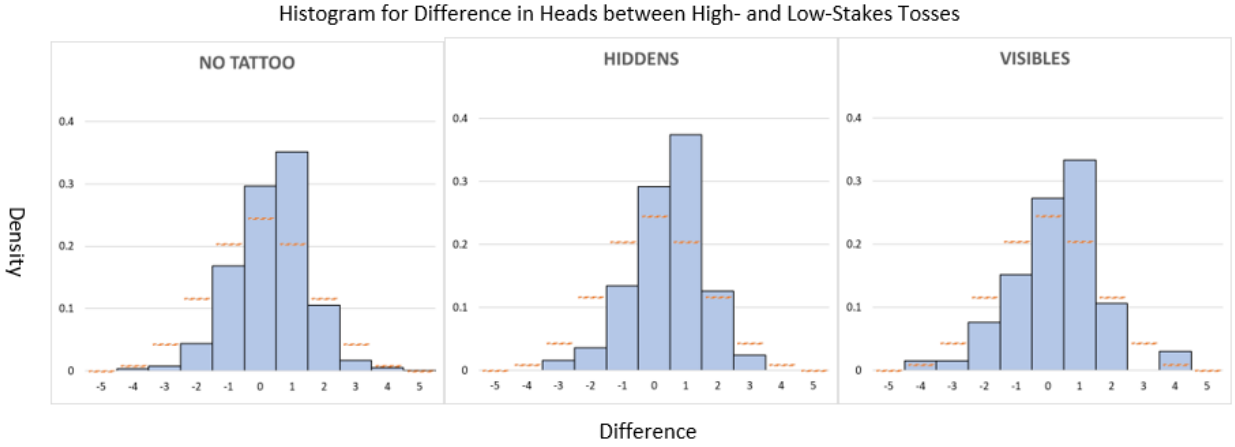
Figure 3



Notes: Histogram of subjects' reported number of heads for high-stakes coin tosses minus reported heads for low-stakes coin tosses, by tattoo status. Red dashed lines display the expected distribution if everyone reported truthfully.

Table 1 – Distributions of Reported Heads for Low- and High-Stakes Coin Tosses by Sample

Reported Heads	Expected	Non-Tattooed		Hiddens		Visibles	
		Low Stakes	High Stakes	Low Stakes	High Stakes	Low Stakes	High Stakes
0	.03125 (1/32)	.0116***	.0077***	.0079***	0***	.0152	.0147
1	.15625 (5/32)	.0360***	.0397***	.0591***	.0392***	.0606**	.0588***
2	.3125 (10/32)	.3188	.1921***	.3307	.1882***	.257last 6	.1765***
3	.3125 (10/32)	.4190***	.3752***	.4016***	.3961***	.3636	.3235
4	.15625 (5/32)	.1272***	.2535***	.1496	.2667***	.1212	.2647***
5	.03125 (1/32)	.0874***	.1319***	.0512	.1098***	.1818***	.1618***
Total	1	1	1	1	1	1	1
Mean Heads	2.5	2.88 (1.01)	3.22 (1.07)	2.78 (0.97)	3.22 (1.00)	3.06 (1.23)	3.25 (1.19)

Notes: The expected distribution of the reported heads if everyone reports honestly versus the realized distributions for the non-tattooed, hidden tattooed and visibly tattooed samples for both the low- and high-stakes coin tosses as well as the mean number of reported heads (bottom row). Significant differences from one-sided binomial test that the observed frequency of reported outcome differs from the expected frequency are reported: *** 1% level, ** 5% level, * 10% level.

Table 2 - Difference in Reported Heads between High- and Low-Stakes Tosses

Outcome	Expected	Non-Tattooed	Hiddens	Visibles
-5	0.0977	0	0	0
-4	0.9766	0.39**	0*	1.52
-3	4.3945	0.77***	1.57***	1.52
-2	11.7188	4.37***	3.54***	7.58
-1	20.5078	16.84***	13.39***	15.15
0	24.6094	29.69***	29.13*	27.27
1	20.5078	35.09***	37.40***	33.33***
2	11.7188	10.54	12.60	10.61
3	4.3945	1.67***	2.36*	0**
4	0.9766	0.51	0*	3.03
5	0.0977	0.13	0	0
Total	1	1 ($N = 778$)	1 ($N = 254$)	1 ($N = 66$)

Notes: The expected distribution of the difference in reported heads between the high- and low-stakes coin tosses if everyone reports honestly versus the realized distributions for the non-tattooed, hidden tattooed and visibly tattooed samples. Significant differences from one-sided binomial test that the observed frequency of reported outcome differs from the expected frequency are reported: *** 1% level, ** 5% level, * 10% level.

Table 3 – OLS regressions on number of reported heads

Variable	Low-Stakes Coin Tosses			High-Stakes Coin Tosses		
	(1)	(2)	(3)	(4)	(5)	(6)
Tattoo	-.039 (.068)	___	___	.003 (.070)	___	___
Hidden	___	-.097 (.071)	-.091 (.081)	___	-.003 (.074)	.074 (.084)
Visible	___	.184 (.154)	.176 (.190)	___	.027 (.148)	.221 (.171)
Number of Tattoos	___	___	-.009 (.014)	___	___	-.023** (.011)
Number of Tattoos^2	___	___	.000 (.000)	___	___	.000 (.000)
Take Risks	___	___	.024* (.013)	___	___	.024* (.013)
1 CRT correct	___	___	.048 (.101)	___	___	.107 (.102)
2 CRT correct	___	___	.069 (.106)	___	___	.074 (.104)
3 CRT correct	___	___	.148 (.104)	___	___	.216** (.105)
4 (All) CRT correct	___	___	.153 (.104)	___	___	.242** (.101)
Constant	2.877*** (0.036)	2.877*** (0.036)	3.166*** (0.785)	3.223*** (0.038)	3.223*** (0.038)	3.53*** (0.626)
Socio-demo controls included	No	No	Yes	No	No	Yes
R^2	.000	.004	.046	.000	.000	.077
N	1098	1098	1065	1104	1104	1071
Hidden = Visible	—	$p = .09$	$p = .14$	—	$p = .85$	$p = .36$

Notes: Dependent variable: number of heads reported by individual subject out of five coin tosses. "Tattoo", "Hidden" and "Visible" are indicator variables for whether the subject has one more of tattoos, only readily hidden tattoos, or at least one visible tattoo, respectively. "Number of Tattoos" and "Number of Tattoos^2" are the subject's number of tattoos and number of tattoos squared, respectively (equal to zero if not tattooed). Socio-demographic controls are age, sex, strength of religious beliefs, church attendance and indicators for: educational attainment, employment status, income and U.S. census region. Heteroskedasticity-robust standard errors in parentheses. The last row reports the *p*-value from a t-test of coefficients that Hidden = Visible.

*** significant at the 1% level.
** significant at the 5% level.
* significant at the 10% level.

Appendix - Instructions for coin-toss experiments and selective survey questions

This coin game involves two sets of coin tosses. Please read the instructions carefully.

Set 1 (warm-up round) instructions: For the first set of coin tosses, you are asked to flip your coin in the air five times in succession. Please keep track of whether the coin landed with the heads or the tails side facing upward for each coin toss. For each head that appears you will receive a bonus payment of $0.03 (3 cents). For each tail that appears, you will not earn any bonus (0 cents).

Set 2 instructions: After completing the first set of five coin tosses, you will be asked again to flip your coin five times in a row and record the number of heads. For this second set of five coin tosses, you will be paid $0.30 (30 cents) for each head that appears. For each tail that appears, you will not earn any bonus (0 cents). If you have understood the rules and the way in which your payment is determined, click the >> button below, and go ahead and begin flipping with the first set of five $0.03 per head (warm-up) coin tosses. You will be prompted to record the number of heads you received before proceeding to the second set of five $0.30 per head coin tosses.

(Toss1): Go ahead and begin flipping the first set of five (warm-up) coin tosses, for which you will receive a bonus of $0.03 per head (and no bonus for tails). You will be prompted to record the number of heads you received before proceeding to the second set of five $0.30 per head coin tosses.

Out of the five coin flips, how many heads did you receive? ($0.03 for each heads)

(Toss2) Now, go ahead and begin flipping the second set of five coin tosses, for which you will receive a bonus of $0.30 per head (and no bonus for tails). You will be prompted to record the number of heads you received.

Out of the five coin flips, how many heads did you receive? ($0.30 for each heads)

Cognitive Reflection Task (CRT)

(*CRT1*) A fast-food vendor sells a combo meal consisting of a hamburger and fries. The cost to the vendor of each combo meal is 210 cents. The hamburger costs 200 cents more than the fries. How much do the fries cost? Cents: ____

(*CRT2*) Spanish moss grows on trees. Suppose the moss doubles the amount of tree that it covers every week. If after 60 weeks the entire tree is covered in moss, how long does it take for the moss to cover half of the tree? Weeks: ____

(*CRT3*) It takes 5 printers 5 minutes to print out 5 documents. How much time is needed for 100 printers to print out 100 documents? Minutes: ____

(*CRT4*) You're competing in a 5-mile run. In the last mile of the race you pass the person in 96th position. In which position did you finish? Position: ____