ORIGINAL RESEARCH REPORT

Association between Social Class, Greed, and Unethical Behaviour: A Replication Study

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Recent research has focused on the potential negative consequences of belonging to the upper class. The present study attempted to directly replicate previous research examining whether upper-class individuals had more positive attitudes toward greed than lower-class individuals, and whether these attitudes mediated the negative association between social class and unethical behaviour. The current research includes two studies with 317 and 320 participants, from Amazon's Mechanical Turk and Prolific Academic, respectively. We used the same measures and procedures of the original research. The resulting dataset, and analytic code, are hosted on the Open Science Framework (Clerke et al., 2017). Collectively these datasets provide access to data from over 600 participants pertaining to social class, ethical behaviour, and sociodemographic information, such as obtained education and religious and political orientation. As in the original, we found a significant positive correlation between SES and greed in one of two studies, however the size of the effect was smaller. Contrary to the original, we did not find a significant association between SES and the propensity to lie in a hypothetical salary negotiation.

Recent social and political events have led to increased attention towards potential devious and unethical behaviour of individuals from high socioeconomic status (SES). Research by Piff, Stancato, Côté, Mendoza-Denton, and Keltner (2012) found that upper-class individuals were more likely to report behaving unethically compared to lower-class individuals across several studies. Specifically, upper-class individuals were more likely to commit traffic violations, exhibit unethical decision-making tendencies, lie during a negotiation task, and cheat in a laboratory dice game. Piff et al. noted that perhaps due in part to an abundance of resources and greater independence, upper-class individuals may exhibit greater unethical behaviour because they are better equipped to mitigate future consequences.

Piff et al. (2012) also proposed that upper-class individuals might engage in more unethical behaviour because they tend to report more favourable attitudes toward greed. This hypothesized link was investigated across three studies. In each instance, positive attitudes toward greed partially explained the positive relation between social class and unethical behaviour. Piff et al. concluded that although there may be several determinants of attitudes toward greed, "greed motives are not equally prevalent across all social strata"

(pp. 4089), and that the presence of such motives among upper-class individuals accounts for an increased propensity toward self-interest.

Several reports have provided support for Piff et al.'s (2012) original findings. Two research teams approached students on campus and provided the same measures as used in Piff et al. and found that social class was positively associated with unethical responses (Konigsberg, MacGregor, Johnson, Massey, & Daubman, 2013; Lyons et al., 2012). In addition, individuals from lower SES were found to be more generous and giving compared to individuals from higher classes (Piff, Kraus, Côté, Cheng, & Keltner, 2010) and in other studies high SES was associated with greater self-inflated and narcissistic behaviours (Piff, 2013) and with an inflated view of one's skills and abilities compared to members of other classes (Varnum, 2015). Finally, recent biopsychosocial research has demonstrated that children from wealthier families are less altruistic than other children (Miller, Kahle, & Hastings, 2015).

In contrast, a recent large-scale study indicated positive associations between social ranking and prosocial behaviour (Korndörfer, Egloff, & Schmukle, 2015), and further research has supported that individuals from higher SES are more generous than individuals from lower SES (Smeets, Bauer, & Gneezy, 2015). Other studies have detected a more nuanced link, where general relations between class and ethical behaviour are not evident without the presence of moderators, such as level of social inequality in the community and the social class of the target (Côté, House, & Willer, 2015; Trautmann, van de

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Kuilen, & Zeckhauser, 2013; Van Doesum, Tybur, & Van Lange, 2017). Finally, other research has found no relation between social class and ethical behaviour (Van Doesum, Tybur, & Van Lange, 2017).

In response to mixed findings from previous research, the present study attempted to directly replicate Piff et al.'s Study 5 (2012), which was selected for replication for several reasons. First, the 95% confidence interval presented for the mediational effect of greed on social class and unethical behaviour was very wide (–3.74 to –0.64). Second, Francis (2012) suggested that the consistent support, across seven studies, for the relation between high social class and unethical behaviour was not very likely and thus "too good to be true". Francis recommended that new studies be conducted to provide more certainty for the pattern of effects obtained, which is the goal of the present replication. Third, as discussed previously, research published since Piff et al. provides mixed support for the original findings; importantly, all of these studies have attempted conceptual, but not yet direct, replications of Piff et al.

We first contacted to the original authors to ensure that the materials and procedure in the current protocol matched those of the original study as closely as possible. In an effort to increase experimental power, the present studies sought to increase sample size from 108 to 270 (i.e., 2.5 times larger), which is considered the current standard for replication protocols (Simonsohn, 2015). We collected two independent samples in an effort to provide more opportunity to replicate the original results (e.g., larger number of participants across samples helps mitigate issues associated with sampling error). While we did not post a time-stamped pre-registration for this study, we have a replication report on the Open Science Framework (OSF) which details the study materials and analysis plan. All data and materials used in the present studies have been made publicly available on the OSF (Clerke, Brown, Campbell, & Forchuk, 2017).

Methods
Participants
The first study included 317 participants (161 females) aged 18 to 69 (M = 35.69, SD = 11.24) who responded to a recruitment advertisement posted on Amazon's Mechanical Turk (MTurk). Initially, we collected a sample of 346 participants. We removed 29 participants from the analysis because they either did not meet our inclusion criteria of being a current United States resident or they had already participated in the study before. Having participated in this study before was not detailed as an exclusion criterion in our replication report. However, this is because the replication report was written in the context of a graduate course project and at this time we did not know that we would be collecting further samples for publication (likewise for study 2). In the final sample 248 identified as European/European American, 19 as African American, 17 as East Asian/Asian American, 18 as "Other" or Mixed, 12 as Latino, and 3 as Native American.

The second study included 320 participants (135 females) aged 18 to 79 (M = 31.37, SD = 10.92) who responded to a recruitment advertisement posted on

Prolific Academic. Initially, we collected a sample of 338 participants. We removed 18 participants from the analysis because they either did not meet our inclusion criteria of being a current United States resident or they had already participated in the study before. In the final sample 180 identified as European/American, 45 as East Asian, 44 as "Other" or Mixed, 23 as African American, 20 as Latino, and 4 as Native American.

Both studies took approximately 10 minutes for participants to complete. Participants on MTurk and Prolific Academic were compensated $0.50 USD (a $0.20 USD inflation from when Piff et al. (2012) published their study) and £0.84 (the minimum payment on Prolific Academic), respectively. As in Piff et al.'s study, the inclusion criteria were that participants needed to be at least 18 years of age and current residents of the United States. All study procedures were approved by our university's ethics board.

Materials and Procedure
Participants responding to the study advertisement on either MTurk or Prolific Academic were redirected to an external survey using Qualtrics. In both cases, participants were presented a letter of information and by continuing to the survey indicated their informed consent. In the first part of the study, participants were presented with a hypothetical negotiation task to measure unethical behaviour. Participants were instructed to imagine themselves as an employer responsible for negotiating as low of a salary as possible for a job candidate seeking stable employment for at least two years. In this scenario, participants were to imagine that they would be rewarded if able to fill the position quickly, and if able to negotiate a salary below a certain amount. Participants were told that, unbeknownst to the candidate, the job would be eliminated in 6 months. Participants were then asked, "What is the percentage chance that you will tell the job candidate that the position is certain to be eliminated in 6 months if she/he specifically asks about job security?" Participants indicated their responses with a slider scale ranging from 0–100.

Demographic information was then collected, which included: the MacArthur Scale of subjective Socio-Economic Status (Adler, Epel, Castellazzo, & Ickovics, 2000), an item measuring political orientation (1 = *extremely liberal* and 7 = *extremely conservative*), and an item measuring religiosity (1 = *not at all religious* and 7 = *deeply religious*). Finally, all participants completed a 7-item scale that assessed the extent to which they considered greedy behaviour as justifiable and moral (1 = *strongly disagree* and 7 = *strongly agree*; Study 1: α = .69, Study 2: α = .45). All participants were presented with a debriefing form after completing the survey that contained a code to be used for receiving compensation. For further details, please refer to the project page on the OSF (Clerke et al., 2017).

Data Analytic Plan
The data analytic plan for the present studies was designed to closely follow the analyses performed by Piff et al. (2012). Before beginning analyses, we prepared the data file by computing a mean score for the attitudes towards greed scale and reverse-coding the MacArthur

Scale of Subjective SES, such that 1 is the lowest possible SES and 10 is the highest possible SES. All analyses including attitudes towards greed and SES were computed on these recoded variables. First, zero-order correlations between social class, positive attitudes toward greed, and probability of telling the job candidate the truth would be computed. Partial correlations between these variables would also be computed, controlling for participant sex, age, ethnicity, religiosity, and political orientation. Next a series of three linear regressions were planned: 1) truth-telling scores regressed on social class; 2) attitudes toward greed regressed on social class and, 3) truth-telling regressed on attitudes toward greed. Each of these regressions would be computed twice, first with no covariates entered (see supplementary materials) and a second time entering sex, age, ethnicity, religiosity, and political orientation as covariates. Finally, we planned to test the mediation model proposed by Piff et al. even if a significant total effect did not emerge. This method was favored in the interest of having the most direct replication of the original study as possible. While it has been argued that mediation can exist in the absence of a significant total effect (Hayes, 2009), there is much debate in the literature regarding whether and when it is appropriate to conduct these analyses (e.g., Kenny & Judd, 2014). Specifically, there are assumptions that should be met when testing an indirect effect in absence of a total effect (for a more detailed discussion see Kenny & Judd, 2014). Despite not meeting these assumptions we've decided to include the mediation analyses (even if a total effect does not emerge) in order to increase comparability between our studies and Piff et al. (2012). However, we advise that in the case of a non-significant total effect that these results are interpreted with caution. For the mediation analysis we used Preacher and Hayes' (2008) bootstrapping method (with 10,000 iterations) to test the significance of the indirect effect of social class on probability of telling the truth through attitudes toward greed. This indirect effect would be tested for significance based on the 95% confidence interval.

The data as well as the syntax for both samples is located on the OSF and is publicly available (Clerke et al., 2017).

Results

Correlational Analyses

The correlational findings reported by Piff et al. (Study 5; 2012) are shown in **Table 1**, whereas **Tables 2** and **3** show the correlations between the same variables in our two samples. As in Piff et al., in both samples there were negative zero-order correlations between truth-telling and positive attitudes towards greed, $r(315) = -.20$, $p < .001$ and $r(319) = -.32$, $p < .001$, respectively. The negative and significant associations reported by Piff et al. between social class and truth-telling were not observed in our two samples, $r(315) = .01$, $p = .911$ and $r(315) = .03$, $p = .559$, respectively. In the first sample, the association between social class and greed also did not emerge, $r(316) = .06$, $p = .322$, however, this effect did emerge in the second sample, $r(316) = .13$, $p = .021$.

As a follow-up analysis, the significant correlations between truth-telling and greed found in the present

Table 1: Piff et al. Study 5 Zero-Order and Partial Correlations.

	Social Class	Greed	Truth Telling
Social Class		.36**	−.24*
Greed	.36**		−.35**
Truth Telling	−.25*	−.34**	

Note. Zero-order correlations are presented above the diagonal. Partial correlations controlling for sex, age, ethnicity, religiosity, and political orientation are reported below the diagonal.
*$p < .05$. **$p < .01$.

Table 2: Study 1 Zero-Order and Partial Correlations.

	Social Class	Greed	Truth Telling
Social Class		.06	.01
Greed	.07		−.20***
Truth Telling	−.02	−.19**	

Note. Zero-order correlations are presented above the diagonal. Partial correlations controlling for sex, age, ethnicity, religiosity, and political orientation are reported below the diagonal.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3: Study 2 Zero-Order and Partial Correlations.

	Social Class	Greed	Truth Telling
Social Class		.13*	.03
Greed	.17*		−.32***
Truth Telling	.02	−.26***	

Note. Zero-order correlations are presented above the diagonal. Partial correlations controlling for sex, age, ethnicity, religiosity, and political orientation are reported below the diagonal.
*$p < .05$. **$p < .01$. ***$p < .001$.

studies were compared to the correlation found by Piff et al. (2012) using Preacher's (2002) calculation for the test of difference between two independent correlation coefficients. Results indicated that the zero-order correlations found in Studies 1 and 2 were not significantly different from the zero-order correlations reported by Piff et al., Fisher's Z = −1.44, $p = .149$ and Fisher's Z = −.03, $p = .764$, respectively. We also conducted these same follow-up analyses to test for differences in the social class and greed relation as well as the social class and truth-telling relation. Results indicated that the zero-order correlations in Studies 1 and 2 between social class and greed differed significantly from that reported by Piff et al. Fisher's Z = 2.81, $p = .005$ and Fisher's Z = 2.18, $p = .029$, respectively. Further, the zero-order correlations in Studies 1 and 2 between social class and truth-telling differed significantly from that reported by Piff et al., Fisher's Z = −2.26, $p = .024$ and Fisher's Z = −2.44, $p = .015$.

Linear Regressions

Truth-telling was regressed on social class, controlling for participant age, sex, ethnicity, religiosity, and political orientation. Social class did not significantly predict truth-telling in either study, $b = -.35$, $SE = 1.34$, $t(262) = -.26$, $p = .792$ and $b = .47$, $SE = 1.31$, $t(221) = .36$, $p = .722$. The

full regression model (with and without covariates) is available in supplementary materials (likewise for social class predicting attitudes towards greed and attitudes towards greed predicting truth-telling). Greed was first regressed on social class with all covariates entered. Social class did not significantly predict greed in Study 1, $b = .03$, $SE = .03$, $t(263) = 1.18$, $p = .239$, but did in Study 2, $b = .08$, $SE = .03$, $t(221) = 2.57$, $p = .011$. Lastly, truth-telling was regressed on attitudes towards greed, with covariate entered. Attitudes towards greed significantly predicted truth-telling in both studies, $b = -8.65$, $SE = 2.78$, $t(262) = -3.11$, $p = .002$ and $b = -11.57$, $SE = 2.87$, $t(222) = -4.03$, $p < .001$.

Mediation Model

In addition to the regressions, Piff et al. (2012) tested a mediation model with attitudes towards greed as a mediator between social class and truth-telling. Though we did not find a total effect between social class and truth-telling, we nonetheless ran the planned models as described in the data analytic plan.

We conducted the mediation using the bootstrapping method (with 10,000 iterations) in both studies. In Study 1, the indirect effect was not significant, $b = -.00$, $\beta = -.01$, $SE = .00$, $CI = -.0021$ to $-.0004$. The 95% confidence interval for the indirect effects includes zero, which suggests that positive attitudes towards greed does not mediate the relations between social class and truth-telling behaviours. However, in Study 2 the indirect effect was significant, $b = -.00$, $\beta = -.05$, $SE = .00$, $CI = -.0052$ to $-.0005$. The 95% confidence interval for the indirect effects does not include zero, which suggests that positive attitudes towards greed does mediate the relation between social class and truth-telling behaviour in Study 2. The results across the two studies provide inconclusive, and at best weak evidence, for a small indirect effect. However, they are also quite consistent with no indirect effect, especially when one considers that there was no total effect.

Sample Comparison

Due to the difference in results between our two samples and Piff et al.'s (2012) original data, we tested possible difference in sample characteristics between these studies. **Table 4** reports the descriptive statistics for all relevant variables in both Piff et al. and the present research. Independent samples t-tests were computed to test for mean differences between the two samples.

Discussion

The present research attempted to directly replicate Piff et al.'s (2012) Study 5 that found social class predicted unethical behaviour and that this relation was mediated by individuals' positive attitudes toward greed. Some of our findings were consistent with those of Piff et al., such as the significant relations between attitudes toward greed and unethical behaviour (i.e., dishonesty) as well as between social class and greed (in sample 2 only), but we did not obtain any evidence of a positive association between social class and unethical behaviour in either sample. Further, we found inconclusive evidence for the mediation model proposed by Piff et al. across the two samples.

We offer some possible explanations as to why the present studies did not fully replicate the findings of Piff et al. (2012). First, the use of single-item assessments as indicators of social class and unethical behaviour may not be optimal. Single-item assessments have low-reliability, which inevitably produce less consistent and noisier results. Several researchers have demonstrated that aggregation across items (or scenarios, or contexts) can substantially increase the reliability of self-report assessments (Paunonen, 1984). As such, it is often recommended that researchers make use of aggregation whenever possible.

Second, the original study had a relatively small sample size and thus low statistical power. It has been argued (Francis, 2012) that based on the reported effect size, the sample size used by Piff et al. (2012) in Study 5 resulted in the test having 65% power, and the likelihood of rejecting the null hypothesis across all seven studies was approximately 2%. It is therefore possible that some of the significant associations reported were Type I errors, or false positives.

Third, there were some differences between samples on the variables of importance in this study. Sample 1 differed from Piff et al.'s (2012) sample on both truth-telling and religiosity, such that they were significantly less likely to tell the truth and significantly less religious. Sample

Table 4: Descriptive Statistics Compared Across Piff et al. Study 5 and the Current Sample.

	Piff et al.		Study 1		Study 2		Piff & Study 1	Piff & Study 2
	M	**SD**	**M**	**SD**	**M**	**SD**	**t [df]**	**t [df]**
Age	35.87	13.62	35.69	11.24	31.37	10.92	.14 [417]	3.47*** [425]
Truth-Telling	62.30	31.03	54.05	34.60	54.18	32.26	2.19* [421]	2.28* [425]
Religiosity	3.45	2.09	2.85	2.13	2.78	2.03	2.54* [420]	2.94** [419]
Political Orientation	3.76	1.69	3.47	1.70	3.26	1.58	1.53 [415]	2.78** [417]
Social Class	5.35	1.65	5.04	1.69	5.01	1.63	1.66 [422]	1.87 [422]
Greed	3.67	.80	3.62	.82	3.63	.78	.55 [423]	.46 [406]

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Piff et al. reported a Cronbach's alpha = .61 for greed scale and in Study 1 and 2 a Cronbach's alpha = .58 and a Cronbach's alpha = .61 were found respectively.

2 differed from Piff et al.'s sample on age, truth-telling, religiosity, and political orientation, such that our sample was significantly younger, less likely to tell the truth, less religious, and less conservative. The difference between sample 2 and Piff et al.'s original data may be that they were collected on different platforms. Users from Prolific Academic may indeed be different that users on Amazon's Mechanical Turk.

Finally, there may have been differences between the samples that were not detected. Neither of the current studies nor the original included attention check items to check for careless responding. As such, the extent to which participants responded in an inattentive manner in any of the studies may have had a meaningful impact on observed effects.

Data Accessibility Statement
The full dataset and the syntax used in this paper are openly available on the Open Science Framework (OSF; osf.io/nxeaq).

Additional File
The additional file for this article can be found as follows:

· **Linear Regressions.** Regression analyses computed without covariates. DOI: https://doi.org/10.1525/collabra.166.s1

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Competing Interests
The authors have no competing interests to declare.

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· Contributed to analysis and interpretation of data: AC & MB
· Drafted and/or revised the article: AC, MB, CF & LC
· Approved the submitted version for publication: AC, MB, CF, & LC

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