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Shame-Prone People Are More Likely to Punish Themselves:

A Test of the Reputation-Maintenance Explanation for Self-Punishment

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Abstract

Recent experimental studies have accumulated evidence about self-punishment. In accordance with the evolutionary perspective that shame has a reputation-maintenance function, we speculated that shame would promote self-punishment. Accordingly, we tested whether proneness to shame would predict self-punishment. In the first phase of the experiment, 98 undergraduates completed the Test of Self-Conscious Affect (TOSCA), a standard measure of proneness to shame and guilt. About two months later, 50 of the original participants took part in a self-punishment experiment, in which they all unintentionally made an unfair resource allocation, and then had the opportunity to inflict self-punishment by abandoning some of the money they had allocated to themselves. The amount of money the participants relinquished was significantly correlated with their shame-proneness. The intensity of post-transgression shame mediated the effect of shame-proneness on self-punishment. These results provide support for the evolutionary theorization of shame as a reputation-maintenance emotion.

Keywords: self-punishment, shame, guilt, test of self-conscious affect (TOSCA)

Shame-Prone People Are More Likely to Punish Themselves:

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People sometimes inflict physical pain or financial loss on themselves in order to compensate for their misbehaviors, such as hurting others or violating social norms. Beyond anecdotal evidence, self-punitive behaviors have been demonstrated in psychological laboratories (e.g., Inbar, Pizarro, Gilovich, & Ariely, 2013; Nelissen, 2012; Nelissen & Zeelenberg, 2009; Watanabe & Ohtsubo, 2012). For example, in Inbar et al.'s (2013) experiment, participants first recalled a situation in which they had felt a strong sense of guilt, and then engaged in a pain tolerance task, in which they administered electric shocks at a level of their choosing. Compared with the participants in control conditions, in which they recalled a sad event or a neutral event, those in the guilt condition administered stronger shocks to themselves.

As exemplified in Inbar et al.'s (2013) study, previous research on self-punishment tended to implicate guilt as an antecedent emotion of self-punishment. However, evolutionary considerations posit that shame also promotes self-punishment because it is associated with two distinct adaptive functions: *relationship maintenance* and *reputation maintenance* (Watanabe & Ohtsubo, 2012). As part of the repertoire of reparative acts, self-punishment after an interpersonal transgression signals the perpetrators' benign intent and repentance to their victims, and it facilitates interpersonal reconciliation (Nelissen, 2012; Ohtsubo & Watanabe, 2009). This function is attributable to guilt because guilt is known to promote reparative acts, such as apology and compensation (Howell, Turowski, & Buro, 2012; Tangney & Dearing, 2002).

Self-punishment can also signal the perpetrator's respect for social norms to a wider range of targets (i.e., societal members at large). This reputation maintenance function is compatible with the proposed adaptive function of shame (Fessler, 2007; Gilbert, 1997; Sznycer

et al., 2012). In the course of human evolution, the importance of prestige hierarchy, which centers on being accepted as a cooperative social partner, increased and might have outgrown the importance of dominance hierarchy, which centers on physical strength and prowess (Fessler, 2007). Thus, maintaining a good reputation became crucial to gaining the acceptance of other group members. The proposed function of shame is to alert the self to possible damages to one's reputation (Gilbert, 1990; Sznycer et al., 2012), and then "drive individuals to behave in ways that advertise to others that they will constitute reliable cooperative partners" (Fessler, 2007, p. 181). Empirical evidence is also in line with the shame–reputation link. In an episode-sampling study, concerns about others' evaluations were associated with shame experiences, but not with guilt experiences (Tangney, 1992). A vignette study also revealed that public exposure of one's wrongdoing augmented the feeling of shame but not guilt (Smith, Webster, Parrott & Eyre, 2002). Therefore, if self-punishment has a reputation-maintenance function, it is predicted that shame will promote self-punishment.

Testing this prediction is not as simple as it might appear. People often experience shame along with guilt, and most naïve research participants have difficulty determining which emotion they are experiencing (Smith et al., 2002; Tangney & Dearing, 2002). Therefore, self-report state shame and guilt scores tend to be highly correlated with each other (e.g., r = .83 in Watanabe & Ohtsubo, 2012), and a factor analysis is unlikely to separate these two affects (Giner-Sorolla, Piazza, & Espisona, 2011). In an exceptional study by Nelissen (2012), which succeeded in disentangling state guilt from state shame, guilt, but not shame, predicted self-punishment. However, close scrutiny of the shame items used in the study revealed that the measured shame was concomitant with embarrassment, which is typically associated with less serious transgressions than shame (Keltner, 1995; Keltner & Buswell, 1997).

The present study was designed to overcome the difficulty to empirically separating state shame from state guilt. First, it aimed to examine whether shame-proneness, rather than state shame, would predict self-punishment. Previous research established the discriminant validity of shame-proneness and guilt-proneness: These two trait variables, assessed by a standard measure of proneness to shame and guilt (the Test of Self-Conscious Affect: TOSCA), predicted different outcome variables (see Tangney & Dearing, 2002, for a review). Second, by excluding the possibility of reconciliation with the victim, the present experimental task aimed to minimize the role of guilt. Accordingly, the present study tested the following hypothesis: *Shame-prone people will be more likely to punish themselves after committing a transgression*. To test this hypothesis, the present study consisted of two phases. Phase 1 was the assessment of shame-proneness and guilt-proneness. Phase 2, the self-punishment experiment, followed about two months later.

Method

Phase 1

Participants in Phase 1 were 98 undergraduates (58 males and 40 females, mean age = 18.54 years, *SD* = .68, range = 18 – 20 years) at a large Japanese university. They individually completed several questionnaires including TOSCA. The latest version of TOSCA (TOSCA 3; Tangney & Dearing, 2002) was translated into Japanese. Pilot studies, which administered the Japanese version of TOSCA along with relevant scales (e.g., Japanese self-conscious affect scale, self-esteem scale, self-rating depression scale), confirmed its validity (see Supplementary Material). Presenting 16 different situations, TOSCA asks respondents how they would feel/behave in each situation. There are 16 shame items and 16 guilt items, measured on a 5-point scale. Cronbach's α was .67 and .65 for shame-proneness and guilt-proneness,

respectively. The slightly low α-coefficients were understandable, given that the 16 TOSCA scenarios covered divergent social situations and the between-items redundancy was low (John & Benet-Martinez, 2000). The 16 shame-related items and 16 guilt-related items were aggregated to obtain the shame-proneness and guilt-proneness scores, respectively.

Phase 2

Participants. Approximately two months later, all participants were invited to re-visit the laboratory. Of the original 98 participants, 50 participants (28 males and 22 females) agreed to take part in the self-punishment experiment. Those who agreed to participate in Phase 2 were slightly higher in their shame-proneness (M = 3.61, SD = .44) than those who declined (M = 3.42, SD = .45), $t(96) = 2.07$, $p = .04$, $d = .42$.[1] This unexpected difference might have been caused by sampling errors because there was no a priori reason to predict this difference.

Procedures of the self-punishment experiment. Participants individually took part in the self-punishment experiment. The instructions of the game were as follows. The participants would play the “resource allocation game” anonymously with another participant. They would never see the partner during the experiment. The allocators had to decide how to distribute a total of 1,000 Japanese yen (JPY), approximately 10 USD, between themselves and the partner by drawing a card from a box. Unbeknownst to the allocators, all of the cards in the box bore an unfair allocation: 800 JPY to themselves and 200 JPY to their partner. All participants were assigned to the allocator role, and thus unintentionally behaved in an unfair manner. The allocators subsequently filled out the questionnaire involving the State Shame and Guilt Scale (Tangney & Dearing, 2002). The experimenter then gave the allocators the opportunity to relinquish some of their money. Two things were emphasized: (a) The relinquished money would not be transferred to the partner, and (b) the partner would not be informed that the allocators had

abandoned some of their money. The allocators were asked to indicate the maximum amount of money they were willing to abandon. It was explained to the allocators that if the indicated value (i.e., the self-punishment score) was equal to or greater than a pre-fixed amount, *x*, of which the allocators were not informed in advance, their monetary reward would be reduced by *x* JPY (in this experiment, *x* was set at 100). If the self-punishment score was smaller than *x*, nothing would happen. It was expected that this measure would facilitate the participants' honest report of the maximum cost they would incur, because it did not ask them to pay the reported amount (see Watanabe & Ohtsubo, 2012, for more details about this measure). In order to make the self-punishment a completely anonymous act, a different experimenter checked the participants' answers to the self-punishment questionnaire. Phase 2 experiment was part of a larger research project (Ohtsubo et al., in press). This research was approved by the Institutional Review Board of the first author's institute.

Results

Fifty percent of the participants indicated their willingness to abandon some of their money. The participants who were not willing to punish themselves were assigned 0 as their self-punishment score. The mean self-punishment (in JPY) was 126.12 (*SD* = 155.90) for all 50 participants. There were no sex differences in the self-punishment tendencies: 50% of females and 50% of males punished themselves. The sex difference in the mean self-punishment was not significant either, $t(48) = 1.05$. Thus, we did not include sex in the subsequent analyses.

The means and standard deviations of the variables of interest as a function of self-punishment appear in Table 1. Correlations among the variables of interest also appear in Table 1. Confirming the hypothesis, shame-proneness, measured two months before, was significantly correlated with self-punishment, $r(48) = .33$, $p = .019$ (Figure 1a), while

guilt-proneness was not, $r(48) = .21$, *ns* (Figure 1b).[2] As the figures reveal, there was an outlier participant whose self-punishment score was 600. After omitting this participant, self-punishment was correlated with shame proneness at a marginally significant level, $r(47) = .24$, $p < .10$. To confirm the reliability of the result, we also combined this dataset with previous datasets (Ohtsubo & Watanabe, 2013; Watanabe & Ohtsubo, 2012, Study 3) after standardizing the self-punishment scores within each experiment. The correlation between shame-proneness and self-punishment was significant, $r(144) = .18$, $p = .030$.

Although the above analyses showed that shame-proneness (predictor) facilitated self-punishment (outcome), the underlying reasoning was that shame-prone people would experience a stronger post-transgression shame (mediator), which would, in turn, facilitate self-punishment. We tested this mediation effect after confirming that the mediator variable (i.e., state shame) was significantly correlated with both the predictor variable, $r(48) = .50$, $p < .001$, and the outcome variable, $r(48) = .54$, $p < .001$.[3] When the outcome variable was regressed on the predictor and mediator variables, the predictor variable became no longer significant (β decreased from .33 to .08), while the mediator remained significant, $\beta = .50$, $p < .001$. A bootstrapping mediation analysis indicated that the 95% confidence interval of the indirect effect (.04 – .51) did not include zero.

As we stated in the introduction section, the state shame score was indistinguishable from the state guilt score. As shown in Table 1, only shame-proneness predicted post-transgression state shame and guilt (for similar results, see Giner-Sorolla et al., 2011; Ohtsubo & Watanabe, 2013). The lack of significant correlation between guilt-proneness and state guilt might be attributable to the experimental procedure (i.e., no chance of reconciliation) that deemphasized the role of guilt.

Discussion

The results of the present study support the hypothesis that shame-proneness promotes self-punishment. In addition, the results indicate that the effect of shame-proneness on self-punishment was mediated by the intensity of the post-transgression shame. The result is congruent with the reputation maintenance explanation of self-punishment. However, we do not deny the presence of relationship-maintenance motivation (nor the role of guilt) behind self-punishment. There is in fact clear evidence for the relationship-maintenance explanation (Nelissen, 2012). On the other hand, since the present experiment exclusively focused on the reputation-maintenance function, it minimized the role of relationship-maintenance motivation. Accordingly, this study provided evidence of the reputation-maintenance function of self-punishment.

Although we attributed the difference between our result and that of Nelissen (2012) to the differential procedures, in fact, it may be attributable to cultural differences. As the Japanese culture emphasizes social harmony (Markus & Kitayama, 1991), the Japanese participants in this study might have been more prone to punish themselves to protect their reputation. Despite such West-East cultural differences, one might consider that Japanese undergraduates are still close to the so-called WEIRD people (i.e., Western, Educated, Industrialized, Rich, and Democratic people), except that they belong to the Eastern cultural tradition (Henrich, Heine, & Norenzayan, 2010). Therefore, the result could reflect some modern custom, but not the evolved psychological traits. To address these issues, it would be fruitful to conduct the same experiment simultaneously in a wide range of societies.

Apart from the possible cultural effects, the reputation-maintenance function of self-punishment yields several testable predictions. For example, it is expected that

self-punishment will increase when a good reputation has a great value (e.g., when one will benefit from being chosen as an exchange partner by observers). To test this prediction, the partner choice manipulation (e.g., Barclay & Willer, 2007) may be borrowed from the competitive altruism research. It is also possible that images of “watching eyes” activate the hypothesized reputational psychology. Therefore, studies using eye-spot manipulation (e.g., Haley & Fessler, 2005) would be informative as well.

Recall that this study took advantage of the presence of individual differences in shame. From the evolutionary perspective, however, it is important to explain why such individual differences exist in the first place (Buss, 2009). Costly reputation-maintenance strategies, such as self-punishment, might be more beneficial to those who have no other ways to ameliorate their reputation (e.g., those who lack competence and expertise in socially valued domains; Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013). In addition, a low level of social worth might be associated with a greater risk of being an outcast. If this is the case, shame-prone people might be more sensitive to cues leading to social rejection, such as gossiping (e.g., Kniffin & Wilson, 2005). These lines of research may deepen the evolutionary understanding of the individual differences in shame.

The results of the present study demonstrate the relevance of the emotion of shame to self-punishment. Although post-transgression reactions (e.g., apology) have been mostly studied in relation to reconciliation, it seems fruitful to examine them in the context of reputation maintenance. Furthermore, shedding more light on the behavioral manifestations of shame also seems like an interesting endeavor. These investigations will contribute to completing a full picture of the adaptive functions of shame and reputation in the course of human evolution.

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Footnotes

[1] The two groups did not differ in terms of guilt-proneness, $t(96) < 1$.

[2] The difference between these two correlated correlations was not significant ($z = .84$) by the procedure recommended by Meng, Rosenthal, and Rubin (1992). Recall that the purpose of the present study was to establish that shame-proneness predicts self-punishment, but not shame-proneness is a better predictor of self-punishment than guilt-proneness.

[3] These correlations were significant at the .01-level after excluding the aforementioned outlier participant, rs = .44 and .43 for shame-proneness and self-punishment, respectively.

Table 1

Means and Standard Deviations of Variables of Interest as a Function of Self-Punitive Behavior, and Correlations among Variables of Interest

		Self-Punishers		Non-Punishers		*t*-test	Correlation Coefficient			
		Mean	*SD*	Mean	*SD*	*t*-value (*df* = 48)	2	3	4	5
1	Self-Punishment	252.24	128.39	0	0	-	.33*	.21	.54***	.53***
2	Shame-Proneness	3.70	0.45	3.53	0.42	1.39		.43**	.50***	.43**
3	Guilt-Proneness	4.02	0.36	3.92	0.43	0.90			.16	.18
4	State Shame	2.44	0.90	1.98	0.63	2.09*				.78***
5	State Guilt	2.39	0.97	1.78	0.54	2.74**				

* $p < .05$, ** $p < .01$, *** $p < .001$.

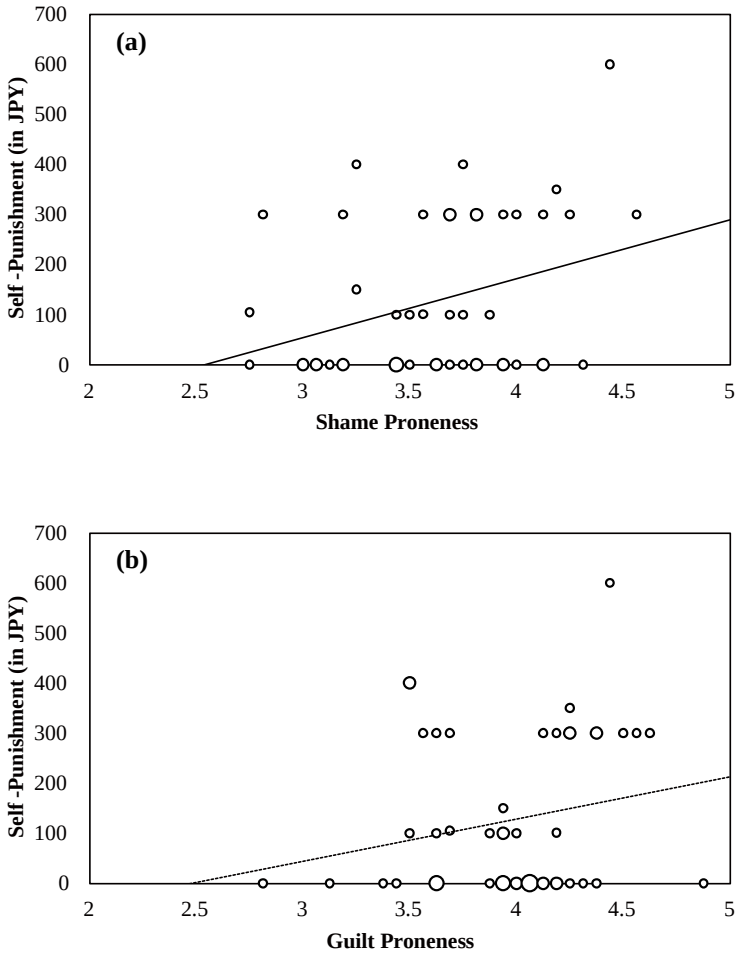

Figure 1. Relationship between shame-proneness and self-punishment (Figure 1a). Relationship between guilt-proneness and self-punishment (Figure 1b). Each includes a simple regression line predicting self-punishment from shame/guilt-proneness. The regression line in Figure 1b (broken line) is not significant. The size of the circles represents the number of observations at each data point: the smallest circles represent one observation, the middle size circles represent two observations, the second largest circles in Figure 1b (or the largest circle in Figure 1a) represent three observations, and the largest circle in Figure 1b represents four observations.

Supplementary Material for
Shame-Prone People Are More Likely to Punish Themselves:
A Test of Reputation-Maintenance Explanation of Self-Punishment

The Japanese version of the Test of Self-Conscious Affects (TOSCA) was developed for the present study. TOSCA was first translated into Japanese by the corresponding author and administered to a sample of 101 Japanese undergraduates. On the basis of the observed correlation matrices, we identified the items that were not highly correlated with other items in the same category, and we corrected the Japanese expressions of those items and the relevant scenarios. After revising those items and scenarios, we administered the Japanese TOSCA, along with other relevant scales, to two sets of Japanese undergraduate samples. These two studies indicated the discriminant validity of shame-proneness and guilt-proneness measured by the Japanese TOSCA.

Study S1

Method. The revised Japanese TOSCA was administered to 186 Japanese undergraduates. Five respondents did not complete TOSCA, and the remaining 181 respondents (88 males, 92 females, 1 unreported; M_{AGE} = 19.07 years, *SD* = 1.74) were retained for the subsequent analyses. In addition to the Japanese TSOCA, the questionnaire also included KA-JiKoKan-12, a Japanese self-conscious affects scale (Kikuchi & Arimitsu, 2006), prosocial behavior scale (Kikuchi, 1988), and self-esteem scale (Rosenberg, 1965: the Japanese version was developed by Yamamoto, Matsui, & Yamanari, 1982).

Hypotheses. We expected the following patterns of correlation. KA-JiKoKan-12 was originally developed in Japanese to assess the respondents' proneness to experiencing various emotions (i.e., Indebtedness, Personal Distress, Guilt, Shame, Role Taking, and Empathic Concern). It was expected that (i) guilt-proneness measured by TOSCA and KA-JiKoKan would be significantly correlated with each other, while (ii) shame-proneness measured by the two scales would be significantly correlated. In addition, (iii) based on a previous finding (Leith & Baumeister, 1998), it was expected that personal distress would be more strongly correlated with shame-proneness than with guilt-proneness. The prosocial behavior scale by Kikuchi (1988) was developed by modifying the altruistic behavior scale (Rushton, Chrisjohn, & Fekken, 1981) for Japanese undergraduates. (iv) It was expected that prosociality would be positively correlated with guilt-proneness, but not with shame-proneness. (v) As for self-esteem, it was expected that shame-proneness, but not guilt-proneness, would be negatively correlated with self-esteem (Tangney & Dearing, 2002).

Results. The internal consistency of shame-proneness and guilt-proneness was decent:

Cronbach's α coefficient = .76 for shame-proneness and .67 for guilt-proneness.

As shown in Table S1, most of the above criterion variables were significantly correlated with both shame-proneness and guilt-proneness. However, partial correlation analyses and the Hotelling *t*-test for correlated correlation showed the discriminant validity of the TOSCA shame and guilt scores. (i) TOSCA guilt was correlated with KA-JiKoKan guilt. After controlling for TOSCA guilt, TOSCA shame was not significantly correlated with KA-JiKoKan guilt. (ii) Although the partial correlation between TOSCA shame and KA-JiKoKan guilt was still significant, TOSCA shame was more highly correlated with KA-JiKoKan shame than with KA-JiKoKan guilt. The difference was significant by the Hotelling *t*-test. (iii) TOSCA shame was correlated with personal distress. After controlling for TOSCA shame, TOSCA guilt was not significantly correlated with personal distress. (iv) Prosociality was significantly correlated with TOSCA guilt, but not with TOSCA shame. (v) TOSCA shame was significantly negatively correlated with self-esteem. After controlling for TOSCA shame, TOSCA guilt was not significantly correlated with self-esteem. Therefore, all predictions were confirmed (at least either by the partial correlation analysis or by the Hotelling *t*-test) and these results suggest the validity of the Japanese version of TOSCA.

Study S2

Method. The revised Japanese TOSCA was administered to 60 Japanese undergraduates (24 males, 36 females; M_{AGE} = 19.03 years, *SD* = 0.96). In addition to the Japanese TOSCA, the questionnaire included the prosocial behavior scale (Kikuchi, 1988), self-esteem scale (Yamamoto, Matsui, & Yamanari, 1982), and self-rating depression scale (Zung, 1965; the Japanese version was developed by Fukuad & Kobayashi, 1973).

Hypotheses. For prosociality and self-esteem, it was expected that the results of Study S1 would be replicated. For depression, it was expected that shame-proneness, but not guilt-proneness, would be positively correlated with the depression score (see Tangney & Dearing, 2002).

Results. The internal consistency of shame-proneness was .71 and that of guilt-proneness was .76.

As shown in Table S2, the results of Study S1 were basically replicated. Prosociality was correlated with guilt-proneness, but not with shame-proneness. After controlling for shame-proneness, guilt-proneness was not correlated with self-esteem, while shame-proneness was negatively correlated with self-esteem even after controlling for guilt-proneness. In addition, depression was significantly correlated with shame-proneness, but not with guilt-proneness. These results indicate the discriminant validity of TOSCA shame and TOSCA guilt.

Table S1

Correlation Coefficients(Study S1) between a Set of Criterion Variables (Indebtedness, Personal Distress, Guilt, Shame, Role Taking, Empathic Concern [These were from KA-JiKoKan-12], Prosociality, and Self-Esteem) and the Two TOSCA Scores (Shame-Proneness and Guilt-Proneness). Results of Difference between the Correlation with Shame-Proneness and Correlation with Guilt-Proneness. Partial Correlation Coefficients between the Set of Criterion Variables and the Two TOSCA Scores.

	KA-JiKoKan-12							
	Indebtedness	Personal Distress	Guilt	Shame	Role Taking	Empathic Concern	Prosociality	Self-Esteem
TSOCA Shame	.65***	.61***	.40***	.72***	.60***	.57***	–.03	–.48***
TOSCA Guilt	.63***	.38***	.64***	.60***	.50***	.57***	.22**	–.20**
Hotelling *t* test for correlated correlation	*t*(178) = 0.42 *ns*	*t*(178) = 4.29 *p* < .001	*t*(178) = 4.61 *p* < .001	*t*(178) = 2.64 *p* = .009	*t*(178) = 1.89 *p* = .061	*t*(178) = 0 *ns*	*t*(172) = 3.86 *p* < .001	*t*(169) = 4.64 *p* < .001
Partial Correlation TOSCA Shame (controlling for guilt)	.44***	.51***	.00	.60***	.43***	.33***	–.20**	–.46***
TOSCA Guilt (controlling for shame)	.40***	.04	.55***	.30***	.24**	.35***	.30***	.12

p < .05 *, *p* < .01 **, *p* < .001 ***

Table S2

Correlation Coefficients(Study S2) between a Set of Criterion Variables (Prosociality, Self-Esteem, and Depression) and the Two TOSCA Scores (Shame-Proneness and Guilt-Proneness). Results of Difference between the Correlation with Shame-Proneness and Correlation with Guilt-Proneness. Partial Correlation Coefficients between the Set of Criterion Variables and the Two TOSCA Scores.

	Prosociality	Self-Esteem	Depression
TSOCA Shame	.12	–.49***	.28*
TOSCA Guilt	.38**	–.38**	.05
Hotelling *t* test for correlated correlation	$t(57) = 2.09$ $p = .041$	$t(57) = 0.92$ *ns*	$t(57) = 1.83$ $p = .072$
Partial Correlation TOSCA Shame (controlling for guilt)	–.08	–.38**	.30*
TOSCA Guilt (controlling for shame)	.37***	–.20	–.10

$p < .05$ *, $p < .01$ **, $p < .001$ ***

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