

May the Best Man Lose: Guilt Inhibits Competitive Motivation

Supplementary Online Material: Additional Measures and Results

Confidence in Experiment 1

In Experiment 1, participants saw a number of objects scattered on the screen for 3 seconds each time, guessed the type of object that appeared most frequently and rated their confidence in their choice. Confidence ratings were made on a percentage scale, ranging from 0 to 100. A 2 (emotion: guilt vs. neutral) \times 2 (goal: individual vs. competitive) ANOVA did not find a significant main effect of either factor, $F(1, 125) \leq 2.37, p \geq .13$, partial $\eta^2 \leq .02$ or an interaction, $F(1, 125) = 1.05, p = .31$, partial $\eta^2 < .01$. The type of goal did not affect participants' confidence in either the guilt condition, $t(63) = 1.46, p = .15$, or the neutral condition, $t < 1$. Guilt was associated with lower confidence in the competition, $t(64) = 2.08, p = .04, d = 0.52$, but not in the individual setting, $t < 1$. Table S1 summarizes the mean confidence levels of the different experimental groups.

Table S1. Mean confidence, in percentage values, participants expressed in their categorical estimations in Experiment 1. Standard deviations are in parentheses.

Goal / Emotion	Neutral	Guilt
Individual	62.19 (23.82)	60.40 (19.79)
Competitive	69.66 (17.35)	60.79 (17.15)

Post-task attitudes in Experiments 1 and 5

Experiments 1 and 5 administered a questionnaire after the experimental task. The questionnaire asked participants to rate the level of effort they thought they had exerted on the task as well as their attitudes toward achieving and failing to achieve their assigned goal. As will be described below, there were no meaningful differences between conditions in participants' responses to these questionnaires. Therefore, they were not used in Experiments 2-4 (which were conducted later). The items are listed in

Table S2. Responses were coded on a 1-9 scale and the order of the items was randomized between participants.

Table S2. *Post-task questionnaire items in by goal condition in Experiments 1 and 5. In Experiment 5, all conditions were competitive, therefore all participants completed the competitive version of the questionnaire.*

	Individual condition	Competitive condition
Effort	How much effort did you put into the tasks?	How much effort did you put into the competition?
Attitudes toward success	How happy would you be if you earned enough points to win the prize?	How happy would you be if you beat your counterpart?
	How motivated were you to succeed in the tasks?	How motivated were you to beat your counterpart?
	How important is it for you to earn enough points to win the prize?	How important is it for you to earn enough points to beat your counterpart?
	How much do you want to earn enough points to win the prize?	How much do you want to earn enough points to beat your counterpart?
Attitudes toward failure	How sad would you be if you did not earn enough points to win the prize?	How sad would you be if you lost to your counterpart?
	How important is it for you to not earn less than the necessary number of points?	How important is it for you to not to lose to your counterpart?
	How afraid are you that you did not earn enough points to win the prize?	How afraid are you that you lost to your counterpart?

Results. The following section presents the results for both Experiments 1 and 5.

Estimated effort. Two-way ANOVAs tested the effect of guilt and competition on self-reported effort levels. In Experiment 1, the analysis found a marginally-significant main effect of guilt: guilty participants reported having exerted higher levels of effort on the task ($M = 8.19$, $SD = 1.19$) than those in the neutral condition ($M = 7.80$, $SD = 1.38$), $F(1,125) = 3.08$, $p = .08$, $partial \eta^2 = .02$. Simple effects tests did not reveal any significant effect of guilt within either the competitive condition, $t(64) = 1.08$, $p = .29$, $d = 0.27$ or the individual condition, $t(61) = 1.38$, $p = .17$, $d = 0.35$. In Experiment 5 there were no significant effects of either factor, $F_s \leq .59$, $p \geq .44$, $partial \eta^2 \leq .003$.

Attitudes toward success and failure. Confirmatory factor analyses confirmed the division of the attitude items into two factors. The items produced two Promax-rotated factors which account for 71.15%

of the variance in Experiment 1 and 76.77% of the variance in Experiment 5. Table S3 reports the factor loadings in both experiments.

Table S3. *Factor loadings and reliability scores of post-task attitude measures in Experiments 1 and 5.*

	Experiment 1		Experiment 5	
	Factor 1	Factor 2	Factor 1	Factor 2
<u>Attitudes toward success</u>	$\alpha = .85$		$\alpha = .90$	
Happiness in case of success	.816		.826	
Motivation to succeed	.866		.897	
Importance of success	.789		.870	
The extent to which the participant wanted to succeed	.889		.923	
<u>Attitudes toward failure</u>		$\alpha = .70$		$\alpha = .75$
Sadness in case of failure		.804		.878
Importance of not failing		.707		.650
Fear of failure		.812		.855

In Experiment 1, a multivariate ANOVA on these two factors found no significant effects on either concerns with success, [$0.62 \leq F \leq 2.28$, $.43 \geq p \geq .13$, $.005 \leq \text{partial } \eta^2 \leq .01$], or on concerns with failure [$0.24 \leq F \leq 2.03$, $.62 \geq p \geq .16$, $.002 \leq \text{partial } \eta^2 \leq .02$]. In Experiment 5, a similar analysis found a significant positive effect of guilt on attitudes toward losing, $F(1,171) = 4.69$, $p = .03$, $\text{partial } \eta^2 = .03$, but also a significant *negative* effect of prize donation on this factor, $F(1,171) = 5.05$, $p = .03$, $\text{partial } \eta^2 = .03$. The interaction effect was not significant, $F(1,171) = 0.61$, $p = .44$, $\text{partial } \eta^2 = .004$. The effects on attitudes toward winning displayed similar patterns, but were not statistically significant, $F_s \leq 2.26$, $p_s \geq .14$, $\text{partial } \eta^2 \leq .01$. Simple effects tests show that the only significant difference was within the *neutral* emotion condition, as participants who were to keep only half of their prize expressed lower concern with avoiding losing ($M = 4.51$, $SD = 1.70$) than those who competed for the whole prize ($M = 5.42$, $SD = 1.86$), $t(83) = 2.33$, $p = .02$, $d = 0.51$. All other simple effects were non-significant, $t_s \leq 1.15$, $p_s \geq .26$, $d_s \leq .24$.

Individual difference measures in Experiment 3

Experiment 3 included measures of individual attributes, among which were guilt proneness, shame proneness and empathy. Guilt and proneness were measured with the GASP scale (Cohen et al.,

2011), whereas empathy was measured with the Toronto Empathy Questionnaire (TEQ; Spreng, McKinnon, Mar, & Levine, 2009).

Guilt and shame proneness. The GASP scale comprises four subscales, representing moral evaluations and intent to take actions that are related to either guilt or shame. These include negative behavior evaluations (NBE) associated with guilt; guilt-related repair intentions (guilt-repair); negative self-evaluations (NSE) associated with shame; and shame-related withdrawal intentions (shame-withdrawal). Whereas three of the four subscales displayed moderate internal consistency, guilt-repair intentions showed very low internal consistency, ($\alpha = .157$), rendering its analysis as a unitary construct meaningless. Therefore, the subscale's items were analyzed separately. A series of hierarchical negative binomial regression models tested the effects of competition and of the various GASP components on participants' effort. Table S4 presets the results of these regressions, as well as of analyses that tested the effects of each GASP component on task effort within each goal condition.

Table S4. *Negative binomial regression coefficients of GASP components and goal types on task effort in Experiment 3. Inter-item reliability values are presented below the title of each subscale.*

Negative Behavior Evaluations (NBE) ($\alpha = .652$)	B	SE (B)
NBE	.10**	.04
Competition	.77**	.27
Interaction	-.15**	.05
NBE: individual goal	.10**	.04
NBE: competitive goal	-.05	.03
Negative Self Evaluations (NSE) ($\alpha = .647$)		
NSE	.05	.04
Competition	.20	.35
Interaction	-.03	.06
NSE: individual goal	.05	.04
NSE: competitive goal	.02	.04
Shame-Withdrawal (SW) ($\alpha = .517$)		
SW	-.03	.04
Competition	-.09	.17
Interaction	.03	.05

Table S4 (continued)

	<i>B</i>	<i>SE (B)</i>
SW: individual goal	-.03	.04
SW: competitive goal	<.001	.04
Guilt-Repair (GR)		
($\alpha = .157$)		
GR item: You are privately informed that you are the only one in your group that did not make the honor society because you skipped too many days of school. What is the likelihood that this would lead you to become more responsible about attending school?		
GR	.004	.03
Competition	.04	.21
Interaction	-.01	.04
GR: individual goal	.004	.03
GR: competitive goal	-.006	.03
GR item: You reveal a friend's secret, though your friend never finds out. What is the likelihood that your failure to keep the secret would lead you to exert extra effort to keep secrets in the future?		
GR	.07*	.03
Competition	.14	.22
Interaction	-.03	.04
GR: individual goal	.07*	.03
GR: competitive goal	.04	.03
GR item: You strongly defend a point of view in a discussion, and though nobody was aware of it, you realize that you were wrong. What is the likelihood that this would make you think more carefully before you speak?		
GR	-.05*	.02
Competition	-.17	.11
Interaction	.06 [†]	.03
GR: individual goal	-.05*	.02
GR: competitive goal	.004	.02
GR item: While discussing a heated subject with friends, you suddenly realize you are shouting though nobody seems to notice. What is the likelihood that you would try to act more considerately toward your friends?		
GR	.04	.04
Competition	-.03	.30
Interaction	.004	.05
GR: individual goal	.04	.04
GR: competitive goal	.04	.03

Notes: Guilt-repair items were analyzed separately due to low inter-item reliability.

** $p < .01$; * $p < .05$; [†] $p < .1$

Empathy. Participants' empathic tendencies were measured by the Toronto Empathy Questionnaire (TEQ; Spreng, McKinnon, Mar, & Levine, 2009). A negative binomial regression tested whether empathy moderated the effects of the guilt and goal manipulations on effort. The analysis found no significant effects involving empathy, $|b| \leq .009$, $p \geq .13$. A test of moderated mediation tested whether empathy mediated the effect of guilt proneness on task effort. The model tested the indirect effect of guilt proneness (NBE) on task effort via empathy, moderated by the type of goal, by computing indirect effects for each of 5,000 bootstrapped samples (Hayes, 2013, model 7). The analysis did not find evidence for moderated mediation, index = $-.02$, 95% CI $[-0.24, 0.08]$. Empathy did not significantly mediate the effect of guilt proneness on effort in either the individual goal condition, 95% CI $[-0.31, 0.67]$ or the competition 95% CI $[-0.28, 0.55]$.

Correlations between motivation and performance measures across studies

The results sections of the studies in the main paper report correlations between motivation and performance. Table S5 summarizes all correlations, including among different performance measures in each study.

Table S5. *Correlations between motivation and performance measures in Experiments 1, 2, 3, and 4.*

Experiment 1	Effort	Performance (error)
Effort		
Performance (error)	-.383***	
Performance (correct choices)	.195*	-.141
Experiment 2	Persistence	Performance (error)
Persistence		
Performance (error)	-.276***	
Performance (accurate estimates)	.185**	-.874***

Table S5 (continued)

Experiment 3	Effort	Performance (error)
Effort		
Performance (error)	-.218***	
Performance (correct choices)	.286***	-.104*

Experiment 4	WTP	Performance (error)
WTP		
Performance (error)	-.087	
Performance (correct choices)	.320***	-.076

Notes: The WTP measure underwent a log(10) transformation
 * $p < .05$, ** $p < .01$, *** $p < .001$.

Effects of reported emotions across studies

Additional analyses tested the effects on motivation of distinct negative emotions, which were recorded as part of the emotion manipulation check, and their interactions with the goal manipulation in each study. The results of these analyses are reported in brief in the main paper, in footnotes 4 and 6. The following tables report the results of all analyses by experiment.

Table S6a. *Effects of the guilt and goal manipulations and of reported emotions in Experiment1.*

Emotion item		Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction
Guilt manipulation	$b = .40^{**}$	$b = .20$	$b = -.01$	$b = .36^\dagger$	$b = .44^*$	$b = .44^{**}$	$b = .09$	$b = .46^*$	$b = .33^\dagger$
Competitive goal	$b = .36^*$	$b = -.27$	$b = -.12$	$b = .19$	$b = .33$	$b = .32$	$b = .03$	$b = .74^\dagger$	$b = .21$
Guilt \times goal interaction	$b = -.71^{**}$	$b = -.26$	$b = -.37$	$b = -.60$	$b = -.68^{**}$	$b = -.70^{**}$	$b = -.51^\dagger$	$b = -.87^{**}$	$b = -.65^*$
Reported emotion		$b = -.04$	$b = -.07^\dagger$	$b = -.01$	$b = .02$	$b = .02$	$b = -.08^*$	$b = .02$	$b = -.02$
Goal \times emotion interaction		$b = .08$	$b = .06$	$b = .02$	$b = .004$	$b = .01$	$b = .05$	$b = -.05$	$b = .02$
χ^2	10.73*	12.78*	14.05*	10.87 †	11.46*	11.56*	18.09**	11.73*	10.97 †

Note: The first model includes the manipulated independent variables; each subsequent model includes the emotion manipulation check item listed in the column's header.

Table S6b. *Effects of the emotion and guilt manipulations and of reported emotions in Experiment2.*

Emotion item		Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction
Guilt manipulation	$b = .05$	$b = .12$	$b = .10$	$b = .11$	$b = .06$	$b = -.001$	$b = .10$	$b = .08$	$b = .12$
Shame manipulation	$b = -.04$	$b = .031$	$b = .03$	$b = .03$	$b = -.02$	$b = -.09$	$b = .01$	$b = .002$	$b = .07$
Competitive goal	$b = -.07$	$b = -.17$	$b = -.11$	$b = -.14$	$b = -.12$	$b = -.15$	$b = -.09$	$b = -.14$	$b = -.19$
Guilt \times goal interaction	$b = -.19^\dagger$	$b = -.44^*$	$b = -.28^\dagger$	$b = -.33^*$	$b = -.25^\dagger$	$b = -.32^*$	$b = -.23^\dagger$	$b = -.25^*$	$b = -.29^*$
Shame \times goal interaction	$b = .04$	$b = -.19$	$b = -.08$	$b = -.11$	$b = -.03$	$b = -.12$	$b = -.01$	$b = -.04$	$b = -.10$
Reported emotion		$b = -.09$	$b = .07$	$b = .08$	$b = -.02$	$b = .06$	$b = -.09$	$b = -.07$	$b = -.15$
Goal \times emotion interaction		$b = .40^\dagger$	$b = .17$	$b = .26$	$b = .14$	$b = .29$	$b = .08$	$b = .21^\dagger$	$b = .29^\dagger$
R^2	.04*	.05*	.04 †	.05 †	.04 †	.07**	.04 †	.05*	.05*

Note: The first model includes the manipulated independent variables; each subsequent model includes the emotion manipulation check item listed in the column's header.

Table S6c. *Effects of the evaluative focus group assignment, goal manipulation and reported emotions in Experiment2.*

Emotion item	Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction	
Focus-behavior	$b = -.07$	$b = .27$	$b = .22$	$b = .22$	$b = .14$	$b = .08$	$b = .13$	$b = .11$	$b = .19$
Focus-self	$b = -.02$	$b = .12$	$b = .12$	$b = .09$	$b = .04$	$b = -.01$	$b = .03$	$b = .03$	$b = .09$
Competitive goal	$b = -.05$	$b = -.20^\dagger$	$b = -.14$	$b = -.17$	$b = -.13$	$b = -.18$	$b = -.08$	$b = -.13$	$b = -.20^\dagger$
Focus-behavior \times goal interaction	$b = -.22^{**}$	$b = -.59^{**}$	$b = -.45^*$	$b = -.48^{**}$	$b = -.34^*$	$b = -.45^{**}$	$b = -.28^*$	$b = -.32^{**}$	$b = -.37^{**}$
Focus-self \times goal interaction	$b = .08$	$b = -.14$	$b = -.09$	$b = -.10$	$b = -.01$	$b = -.10$	$b = .04$	$b = -.002$	$b = -.04$
Reported emotion	$b = -.22$	$b = -.18$	$b = -.17$	$b = -.10$	$b = -.02$	$b = -.11$	$b = -.09$	$b = -.19^\dagger$	
Goal \times emotion interaction	$b = .54^*$	$b = .34$	$b = .42^*$	$b = .22$	$b = .41^*$	$b = .10$	$b = .24^*$	$b = .34^*$	
R^2	.05**	.07**	.06*	.07**	.06*	.08**	.06*	.07**	.07**

Note: The first model includes the manipulated independent variables; each subsequent model includes the emotion manipulation check item listed in the column's header.

Table S6d. *Effects of the emotional concern group assignment, goal manipulation and reported emotions in Experiment2.*

Emotion item	Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction	
Concern-other	$b = .08$	$b = .24$	$b = .20$	$b = .19$	$b = .13$	$b = .08$	$b = .13$	$b = .12$	$b = .17$
Concern-self	$b = -.04$	$b = .01$	$b = .09$	$b = .07$	$b = .01$	$b = -.04$	$b = .02$	$b = .01$	$b = .08$
Competitive goal	$b = -.05$	$b = -.19^\dagger$	$b = -.16$	$b = -.17$	$b = -.13$	$b = -.17$	$b = -.08$	$b = -.13$	$b = -.21^\dagger$
Concern-other \times goal interaction	$b = -.24^*$	$b = -.54^{**}$	$b = -.45^{**}$	$b = -.44^{**}$	$b = -.33^*$	$b = -.38^{**}$	$b = -.28^*$	$b = -.30^{**}$	$b = -.37^{**}$
Concern-self \times goal interaction	$b = .02$	$b = -.26$	$b = -.21$	$b = -.18$	$b = -.08$	$b = -.15$	$b = -.03$	$b = -.06$	$b = -.13$
Reported emotion	$b = -.18$	$b = .04$	$b = -.15$	$b = .06$	$b = -.001$	$b = -.09$	$b = -.09$	$b = -.17$	
Goal \times emotion interaction	$b = .52^*$	$b = .40^\dagger$	$b = .39^\dagger$	$b = .21$	$b = .35^\dagger$	$b = .11$	$b = .22^\dagger$	$b = .36^*$	
R^2	.05*	.07**	.06*	.06**	.05*	.08**	.05*	.06*	.06**

Note: The first model includes the manipulated independent variables; each subsequent model includes the emotion manipulation check item listed in the column's header.

Table S6e. *Effects of the emotion and goal manipulation, guilt-proneness (Negative behavior evaluations) and reported emotions in Experiment3.*

	Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction	
Guilt manipulation	$B = -.27$	$B = -.41$	$B = -.79$	$B = -.21$	$B = -.30$	$B = -.58$	$B = -.93$	$B = -.18$	$B = -.38$
Shame manipulation	$B = -.65$	$B = -.76$	$B = -1.09$	$B = -.59$	$B = -.66$	$B = -.96$	$B = -1.10$	$B = -.58$	$B = -.77$
Competitive goal	$B = -1.40$	$B = -2.50$	$B = -3.57$	$B = 3.51$	$B = 3.56$	$B = -3.04$	$B = -3.48$	$B = -2.11$	$B = -2.82$
Guilt-proneness (GP)	$B = .20$	$B = -.26$	$B = -.36$	$B = -.25$	$B = -.17$	$B = .41$	$B = -.44$	$B = -.11$	$B = -.27$
Guilt \times goal interaction	$B = -.04$	$B = .42$	$B = .85$	$B = .68$	$B = .50$	$B = .26$	$B = .80$	$B = .13$	$B = .33$
Shame \times goal interaction	$B = 1.03$	$B = 1.48$	$B = 1.85$	$B = 1.73$	$B = 1.48$	$B = 1.48$	$B = 1.76$	$B = 1.26$	$B = 1.44$
Guilt \times GP interaction	$B = .10$	$B = .13$	$B = .18$	$B = .11$	$B = .10$	$B = .16$	$B = .22$	$B = .08$	$B = .12$
Shame \times GP interaction	$B = .15$	$B = .17$	$B = .22$	$B = .16$	$B = .14$	$B = .21$	$B = .23$	$B = .13$	$B = .18$
Goal \times GP interaction	$B = .33$	$B = .49$	$B = .64$	$B = .71$	$B = .57$	$B = .60$	$B = .66$	$B = .46$	$B = .64$
Guilt \times goal \times GP interaction	$B = -.07$	$B = -.13$	$B = -.19$	$B = -.19$	$B = -.13$	$B = -.12$	$B = -.20$	$B = -.09$	$B = -.15$
Shame \times goal \times GP interaction	$B = -.22$	$B = -.29$	$B = -.34$	$B = -.35$	$B = -.27$	$B = -.30$	$B = -.34$	$B = -.26$	$B = -.31$
Reported emotion		$B = -.02$	$B = -.08$	$B < .001$	$B = -.01$	$B = -.09$	$B = -.14$	$B = -.02$	$B = -.03$
Goal \times emotion interaction		$B = .08$	$B = .17$	$B = .17$	$B = .20$	$B = .17$	$B = .23$	$B = .07$	$B = .12$
GP \times emotion interaction		$B = .004$	$B = .01$	$B = .04$	$B = -.003$	$B = .02$	$B = .02$	$B = -.01$	$B = .01$
Goal \times GP \times emotion interaction		$B = -.01$	$B = -.02$	$B = -.03$	$B = -.02$	$B = -.03$	$B = -.04$	$B = -.01$	$B = -.03$
χ^2	7.47	7.83	8.38	9.00	10.73	8.50	9.39	8.43	8.10

Note: The first model includes the manipulated independent variables and guilt proneness, as measured by the NBE subscale of the GP-5 questionnaire (Cohen et al., 2016); each subsequent model includes the emotion manipulation check item listed in the column's header.

Table S6f. *Effects of the guilt and prize allocation manipulations and reported emotions in Experiment 5.*

		Guilt	Shame	Regret	Disappointment	Sadness	Fear	Anger	Dissatisfaction
Guilt manipulation	$b = .21^*$	$b = .15$	$b = .38^*$	$b = .23$	$b = .24$	$b = .30^*$	$b = .15$	$b = .14$	$b = .26^\dagger$
Prize donation	$b = .06$	$b = .04$	$b = .05$	$b = .10$	$b = -.14$	$b = -.03$	$b = .09$	$b = .17$	$b = -.16$
Guilt \times donation interaction	$b = -.28^*$	$b = -.35$	$b = -.20$	$b = -.19$	$b = -.40^*$	$b = -.29^\dagger$	$b = -.24$	$b = -.23$	$b = -.43^*$
Reported emotion		$b = .07$	$b = -.20$	$b = -.02$	$b = .04$	$b = -.17$	$b = .09$	$b = .13$	$b = -.07$
Donation \times emotion interaction		$b = .09$	$b = -.07$	$b = -.12$	$b = .32$	$b = .08$	$b = -.07$	$b = -.15$	$b = .36$
R^2	.04 [†]	.04	.05	.04	.05	.05	.04	.04	.05

Note: The first model includes the manipulated independent variables; each subsequent model includes the emotion manipulation check item listed in the column's header.