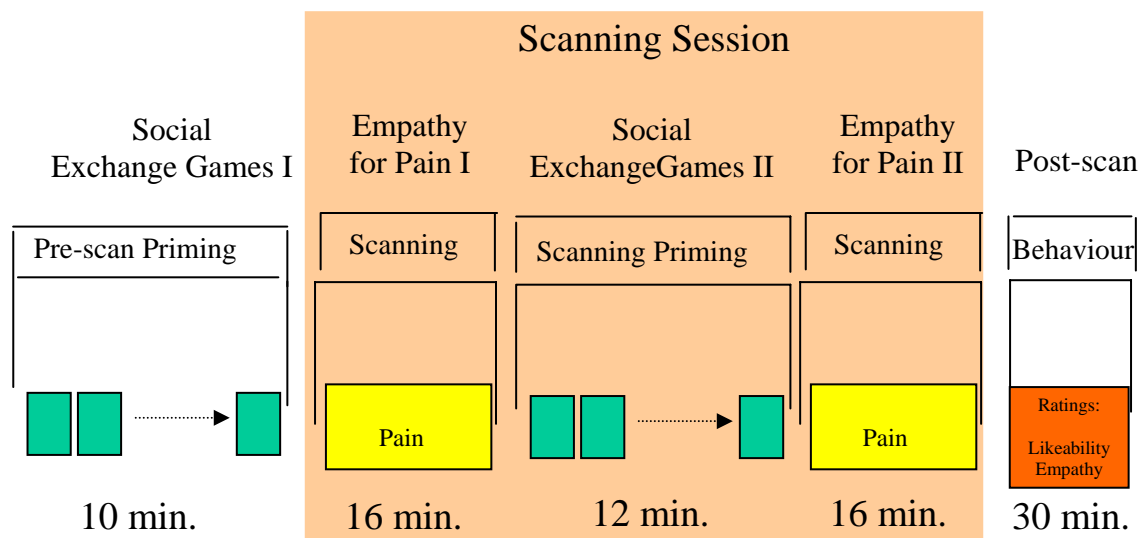


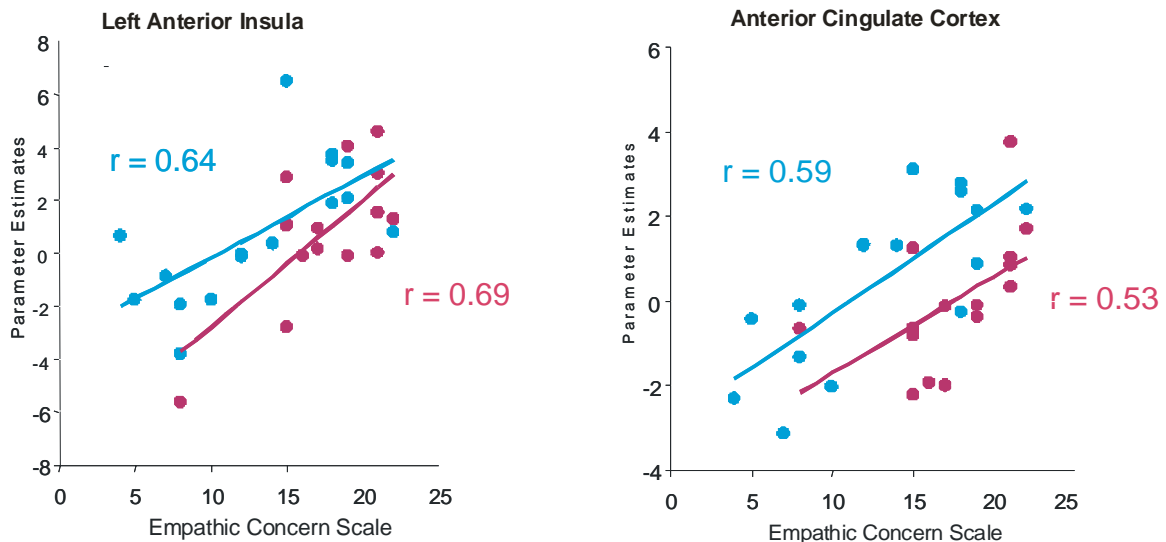
## SUPPLEMENTARY FIGURES

### Experimental Design



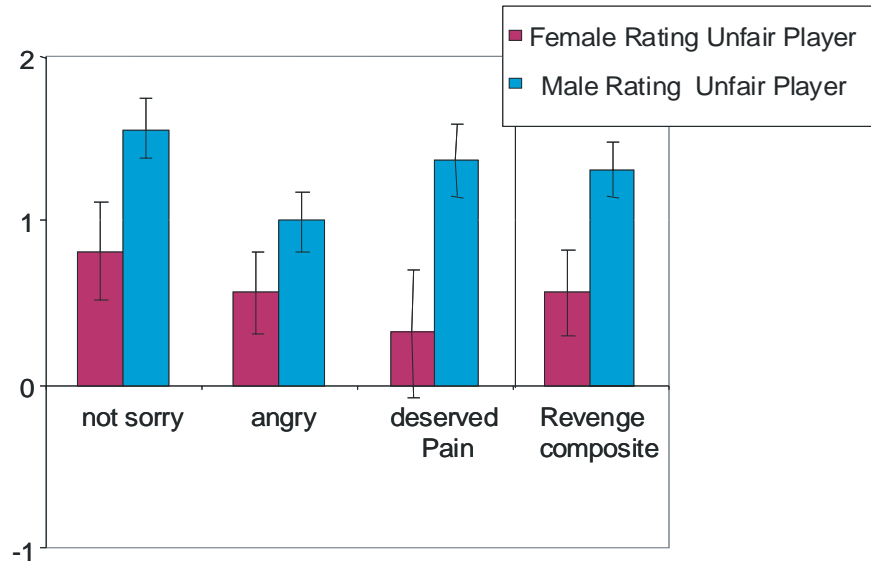
Supplementary Figure 1. Schematic representation of the experimental procedure. The study consisted of two independent experiments, one on social exchange, and the other on empathy for pain. Each experiment consisted of two blocks which were alternated. After the scanning phase the study ended with an extensive behavioral assessment.

## Correlations between Empathy Scales and Empathy-related Brain Activations



Supplementary Figure 2. Activation Level (parameter estimates) observed within peaks of activation of the ACC and the left anterior insula for women (pink) and men (blue) during empathy-related conditions (pain – no pain in fair) are significantly correlated with individual differences in empathy as measured by the Empathic Concern Scale of Davis (3). The lines represent the linear best fit;  $r$  refers to the correlation coefficient. All correlations are significant on the  $P < 0.05$  level. The left panel shows peak activation in left AI for men  $[-36\ 3\ -24]$  and women  $[-33\ 6\ -27]$ ; the right panel shows peak activation in ACC for men  $[-12\ 39\ 30]$  and women  $[12\ 12\ 33]$ . Significant correlation in regions of interest were also observed for women in left AI  $[-42\ 3\ -15]$ ,  $[-45\ -3\ -3]$ , left FI  $[-39\ 30\ -3]$ , left mid-insula  $[39\ 0\ -21]$ ; right AI  $[39\ 0\ -21]$ ,  $[48\ 0\ -9]$  and right mid-insula  $[36\ 0\ 0]$ ; and for men in right AI  $[33\ 18\ -30]$ ,  $[33\ 12\ -6]$ .

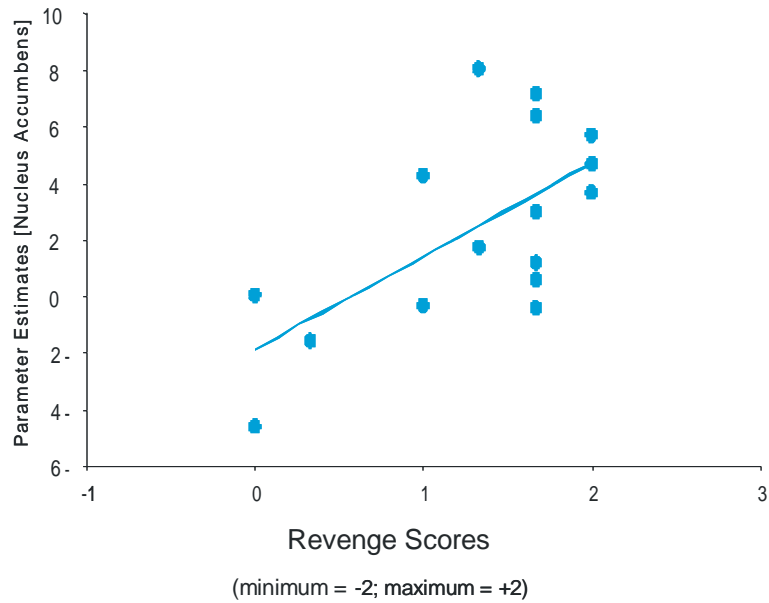
### Revenge Scores as a Function of Gender and Intercorrelations



	Revenge	Angry	Deserv.	Not sorry
Revenge	1	.86**	.87**	.84**
Angry	.69**	1	.61*	.62*
Deserv.	.95**	.62*	1	.58*
Not sorry	.76**	.14	.65**	1

Supplementary Figure 3. Means and intercorrelations of the three revenge scales and the overall revenge composite. On average, men reported that they were less sorry about defectors receiving pain ( $t(30) = 2.10, P < 0.05$ ) and expressed more strongly that these actually deserved to get pain ( $t(30) = 2.34, P < 0.05$ ). Men also appeared to express greater anger toward unfair players, when compared to women, although this trend did not reach significance ( $t(30) = 1.38, P = 0.17$ ). Correlation between the three revenge scales were -with one exception- all significant ( $P < 0.05$ ) and generally very high.

## Correlations between Revenge Scale and Brain Activity in Nucleus Accumbens



Supplementary Figure 4. Activation Level (parameter estimates) observed within peaks of activation in left nucleus accumbens [-6 6 -6] for the interaction contrast ([pain –no pain] unfair – [pain – no pain] fair) correlates significantly with expressed desire for revenge in men ( $r = 0.64$ ,  $P < 0.05$ ) but not in women.