SUPPLEMENTARTY TABLES

Table S1. Descriptive statistics and questionnaire data for female (16) and male (16)

Variable	Sex	Mean	Std. Error	Gender Diff. t-test
Age	Female	24.63	1.11	$t(30) = 0.79$
	Male	26.50	2.09	n.s., $P = 0.43$
Education	Female	5.06	0.73	$t(30) = -1.26$
	Male	3.81	0.67	n.s., $P = 0.17$
Pain Intensity Low	Female	1.37	0.12	$t(30) = 1.63$
	Male	1.91	0.24	n.s., $P = 0.11$
Pain Intensity High	Female	8.03	0.16	$t(30) = -0.80$
	Male	7.84	0.17	n.s., $P = 0.43$
Fair Player 'How reasonable/fair'	Female	1.81	0.14	$t(30) = 0.39$
	Male	1.87	0.08	n.s., $P = 0.70$
Unfair Player 'How reasonable/fair'	Female	-1.12	0.18	$t(30) = -0.98$
	Male	-1.37	0.18	n.s., $P = 0.33$
Fair Player 'How pleasant/agreeable'	Female	1.81	0.10	$t(30) = 0.00$
	Male	1.81	0.14	n.s., $P = 1.00$
Unfair Player 'How pleasant/agreeable'	Female	-0.94	0.23	$t(30) = -.35$
	Male	-1.06	0.26	n.s., $P = 0.73$
Fair Player 'How much you liked'	Female	1.50	0.13	$t(30) = 0.67$
	Male	1.62	0.12	n.s., $P = 0.49$
Unfair Player 'How much you liked'	Female	-0.69	0.20	$t(30) = -0.80$
	Male	-0.87	0.12	n.s., $P = 0.43$
Fair Player 'How attractive'	Female	0.75	0.23	$t(30) = 0.65$
	Male	0.94	0.17	n.s., $P = 0.52$
Unfair Player 'How attractive'	Female	-0.62	0.29	$t(30) = 1.30$
	Male	-0.12	0.26	n.s., $P = 0.20$
Empathic Concern Scale, Davis	Female	17.56	3.59	$t(30) = -1.66$
	Male	15.44	3.60	P = n.s., 0.12

Note. The range of the scale for pain intensity ratings was from 0 (no feeling) to 10 (unbearable pain); for all other ratings from -2 (not at all) to +2 (very much).

Table S2. Foci of pain-related activation when women experience pain in the "self"

	Coordinates of peak activation (mm)			Z scores
Brain regions	**x**	**y**	**z**	
Pain-Related Activation in Self [Pain – no pain in Self]				
Regions of Interest ('Pain Matrix')				
ACC	3	36	24	4.61*
ACC	3	24	33	4.85*
ACC	0	12	42	4.41*
ACC	9	-6	48	4.62*
ACC	6	33	12	3.65*
o ACC	0	39	6	3.50*
Right AI	51	24	-9	4.75*
Right AI/FI	33	18	-12	4.51*
Right AI	39	12	9	4.05*
Left mid-anterior insula	-36	0	-6	4.23*
o mid-anterior insula	-39	6	9	4.16*
o AI/FI	-30	15	-18	3.76*
o AI	-42	15	-3	3.63*
Left posterior insula/SII	-33	-15	15	4.60*
o	-60	-30	21	4.48*
o	-48	-21	12	4.46*
Right SII	60	-27	21	4.93*
SI/MI	-33	-27	60	4.31*
o SI	-30	-33	66	4.29*
o SI	-36	-18	54	3.95*
Thalamus	3	-6	6	4.38*
Brainstem/dorsal pons	-6	-15	-15	4.71*
o substantia nigra	-15	-24	-12	3.54*

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; SI, primary; SII, secondary somatosensory cortex; MI, primary motor cortex; All values, $P < 0.005$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within of a cluster.

Table S3. Cerebral foci of pain-related activation when men experience pain in the "self"

	Coordinates of peak activation (mm)			Z scores
Brain regions	**x**	**y**	**z**	
Pain-Related Activation in Self [Pain – no pain in Self]				
Regions of Interest ('Pain Matrix')				
ACC (anterior)	0	24	33	3.97*
ACC (posterior)	0	12	45	4.70*
o ACC	-3	-18	54	4.34*
o ACC	-3	-6	48	4.23*
Right mid-anterior insula	39	15	3	3.85*
o	39	9	12	3.70*
Right anterior insula	36	33	3	3.13*
Left anterior insula/FI	-33	30	3	4.22*
Left mid-anterior insula	-39	6	-21	3.53*
Left posterior insula/SII	-36	-18	18	4.81*
SI/MI	-33	-30	60	4.41*
o SI	-27	-39	63	4.25*
o SI	-21	-24	57	3.65*
Thalamus	-9	12	3	3.28*
Left midbrain/substantia nigra	-15	-18	-6	4.22*
Right midbrain/substantia nigra	12	-24	-12	3.49*
Brainstem/dorsal pons	-6	-33	-15	3.46*

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; SI, primary; SII, secondary somatosensory cortex; MI, primary motor cortex; All values, $P < 0.005$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within a cluster.

Table S4a. Pain-related activation when women observe pain in fair player

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Pain-related Activation in Fair [Pain – no Pain in Fair]				
Regions of Interest				
ACC (anterior)	9	18	27	3.62
ACC (posterior)	12	-15	39	3.32
Left AI/FI	-45	21	-9	3.24
○	-54	18	-9	3.12
Right FI/OFC	39	33	-12	3.16
Right AI/FI	39	21	-27	2.91
Right AI/OFC	30	15	-18	2.69
Right SII	42	-30	15	3.03
Inclusive Masking [Pain – no Pain] in Self masked with [Pain – no Pain] in Fair				
Regions of Interest				
ACC	9	18	27	2.86
Left AI	-51	18	-12	3.71
○ AI	-27	18	-12	2.80
Right FI/OFC	39	33	-12	3.75
Right AI/FI	30	18	-18	3.17
Left SII/supramarginal gyrus	-60	-30	18	2.75

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; OFC, orbito-frontal cortex; SI, primary; SII, secondary somatosensory cortex; All values, $P < 0.005$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within of a cluster.

Table S4b. Pain-related activation for women common to "self" and "fair player"

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Conjunction Analysis				
[Pain – no Pain] in Self and Fair				
Regions of Interest				
ACC	9	18	27	4.96*
o ACC	0	36	27	4.35*
Left AI	-42	15	-3	4.76*
o AI/FI/OFC	-27	18	-15	4.71*
o AI	-54	18	-6	4.70*
Right AI/FI	30	18	-18	5.37*
o FI/OFC	39	33	-15	4.73
o AI/FI	45	27	-9	4.72
Left SII/supramarginal gyrus	-60	-30	18	4.96*
o	-42	-21	18	4.47*
Right SII/supramarginal gyrus	63	-30	24	6.66*
o	57	-42	30	3.85*
o	45	-30	24	3.55*
Brainstem/dorsal pons	3	-18	-18	4.42*

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; OFC, orbito-frontal cortex; SI, primary; SII, secondary somatosensory cortex; All values, $P < 0.001$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within of a cluster.

Table S5. (a) Pain-related activation when men observe pain in the fair player and (b, c) common activation to the "self" and "fair player" conditions.

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
(a) Pain-related Activation in Fair				
[Pain – no Pain in Fair]				
Regions of Interest				
Left FI	-45	33	0	2.67
Left AI	-33	33	3	2.57
Right mid-Insula	39	-6	12	3.19
Right AI/FI	42	33	0	2.69
(b) Inclusive Masking				
[Pain – no Pain] in Self masked with [Pain – no Pain] in Fair				
Left AI	-33	33	3	3.06
o FI	-42	33	3	3.05
Mid insula	39	-6	12	3.51
Right FI/OFC	27	30	-15	2.66
Brainstem/dorsal pons	-12	-30	-27	3.09
(c) Conjunction Analysis (P < 0.001)				
[Pain – no Pain] in Self and Fair				
Left AI	-33	33	3	4.46*
o	-42	33	3	4.45*
Right FI	42	33	3	3.85
Right mid insula	36	-3	12	3.58
Right FI	30	30	-15	3.92
o	24	33	-9	3.47
o	24	24	-9	3.30
Right SII/STS	51	-36	18	4.92*
Brainstem/dorsal pons	3	-33	-30	3.38

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; SI, primary; SII, secondary somatosensory cortex; All values, $P < 0.005$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within a cluster.

Table S6. Pain-related activation when women observe unfair player in pain

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Pain-Related Activation in Unfair [Pain – no Pain Unfair]				
Regions of Interest				
Left AI/FI	-42	15	-6	3.91
Right AI/FI	45	24	-15	3.03
o FI	51	15	-15	2.94
Inclusive Masking [Pain – no Pain] in Unfair masked with [Pain – no Pain] in Self				
Left AI	-42	15	-6	3.91
Right AI/FI	45	24	-15	3.03
o FI	51	15	-15	2.94
Conjunction Analysis (P < 0.001) [Pain – no Pain] in Self and Unfair				
Regions of Interest				
ACC	15	6	42	3.47
Left AI	-42	15	-6	5.78*
Right AI/FI	48	21	-15	4.56*
o FI	33	24	-18	3.65
Right FI	33	27	3	3.49
Left SII/STS	-51	-45	24	4.05
Left SII/supramarginal gyrus	-45	-39	33	3.53

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; SII, secondary somatosensory cortex. All values, * P < 0.05 whole-brain corrected (FDR); ○ = Sub-maxima within of a cluster.

Table S7. Common pain-related activation when women observe fair and unfair players

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Conjunction Analysis				
[Pain – no Pain] in Self, Fair, Unfair				
Regions of Interest				
ACC	15	3	42	4.48*
ACC	-6	30	24	3.64*
Left AI	-42	15	-6	5.99*
o AI	-54	15	-12	3.67*
Right AI/FI	33	24	-15	4.79*
o AI	48	21	-12	4.51*
Right AI	33	27	9	3.86*
Left SII/STS	-54	-45	27	4.18*
o SII	-48	-42	33	4.07*
Conjunction Analysis				
[Pain – no Pain] in Fair and Unfair masked by [Pain – no Pain] in Self				
Left AI	-42	15	-6	4.65
Right AI/FI	33	21	-18	3.64
Right AI	45	24	-12	3.43
Left SII/STS	-54	-45	24	3.65

Note. ACC, anterior cingulate cortex; AI, anterior insula; FI, fronto-insular cortex; STS, superior temporal sulcus; All values, $P < 0.001$ uncorrected; * $P < 0.05$ whole-brain corrected (FDR); ○ = Sub-maxima within of a cluster.

Table S8. Cerebral activity specific to women observing fair or unfair player in pain

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Pain-Related Activity Specific to Fair [Pain Fair – Pain Unfair]				
Regions of Interest				
Left mid-insula	-36	-12	-6	3.81
Right posterior insula/SII	42	-36	21	3.49
Interaction [Pain – no Pain] Fair - [Pain – no Pain] Unfair				
Right mid-insula	36	-21	6	3.83
Right posterior insula/SII	42	-33	15	3.24
Pain-related Activity Specific to Unfair [Pain Unfair – Pain Fair]				
Regions of Interest				
n.s.				
Interaction [Pain – no Pain] Unfair - [Pain – no Pain] Fair				
n.s				

Note. SII, secondary somatosensory cortex. All values, $P < 0.005$ uncorrected.

S9. Pain-related activation when men observe unfair player in pain

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Pain-Related Activation in Unfair				
[Pain – no Pain] in Unfair				
Regions of Interest				
Midbrain/dorsal pons	-3	36	24	2.88
Inclusive Masking				
[Pain – no Pain] in Unfair masked with [Pain – no Pain] in Self				
n.s.				
Conjunction Analysis (P < 0.001)				
[Pain – no Pain] in Self and Unfair				
Right middle insula	39	0	9	3.45
Brainstem/dorsal pons	3	-33	-21	3.40

Note. All values, P < 0.005 uncorrected

Table S10. Common pain-related activation when men observe fair and unfair players

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Conjunction Analysis				
[Pain – no Pain] in Self, Fair, Unfair Player				
Regions of Interest				
Brainstem/dorsal pons	3	-33	-27	3.91
Conjunction Analysis				
[Pain – no Pain] in Fair and Unfair masked with [Pain – no Pain] in Self				
n.s.				

Note. P < 0.001 uncorrected

Table S11. Cerebral activity specific to men observing fair or unfair player in pain

	Coordinates of peak activation (mm)			Z scores
	x	y	z	
Pain-Related Activity Specific to Fair				
[Pain Fair – Pain Unfair]				
Regions of Interest				
Left FI	-39	36	3	3.44
Right FI	42	33	0	2.97
Right FI	24	30	6	2.89
Interaction				
[Pain – no Pain] Fair - [Pain – no Pain] Unfair				
Left FI	-36	36	6	3.07
Right FI	24	27	-9	2.78
Pain-Related Activity Specific to Unfair				
[Pain Unfair – Pain Fair]				
Regions of Interest				
Right posterior insula/SII	39	-24	21	2.99
Nucleus accumbens	-9	15	-9	2.87
Interaction				
[Pain – no Pain] Unfair - [Pain – no Pain] Fair				
Nucleus accumbens	0	9	-6	2.81
Left OFC	-12	39	-12	2.96
Left OFC	-18	27	-15	2.89

Note. SII, secondary somatosensory cortex; OFC, orbito-frontal cortex. All values, P < 0.005 uncorrected