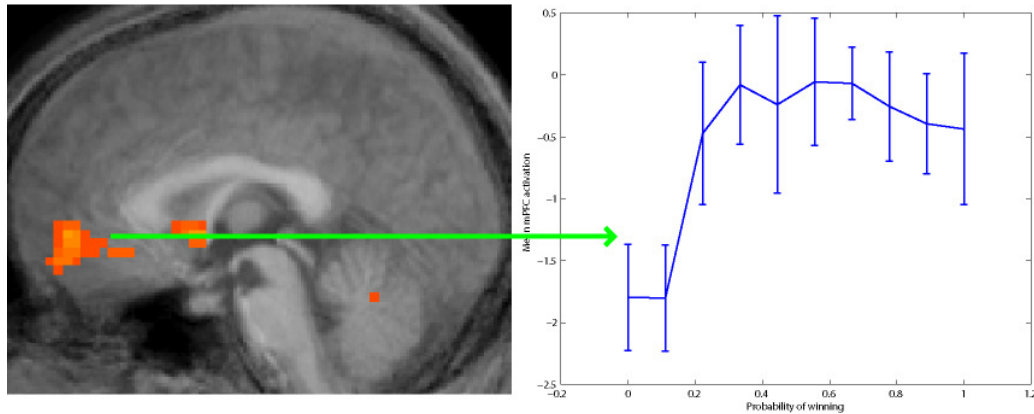


**Investigating Signal Integration with
Canonical Correlation Analysis of fMRI
Brain Activation Data**

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Supplementary Online Material

Figure S1
Activation of the downstream area for variable CCA weights



(a) We show here the activation of the downstream area to the gambling experiment described in the main text. Results are based on a random-effects GLM analysis with the combined signal of ER and risk as one of the predictors. The combined signal was obtained with CCA with fixed weights across all subjects. The area extends for 50 voxels ($3 \times 3 \times 3 \text{mm}^3$) around the center (0, 46, -2) in Talairach coordinates (threshold at $q < 0.025$, corrected for false discovery rate for the whole brain (Genovese et al., 2002)).

(b) Mean activation of the mPFC cluster against the probability of winning. Activation reflects the effect of both ER and risk; as such, mPFC encodes a signal of ER and Risk that is increasing in its two components. The inverted U shape shows that the area encodes risk positively. However, the activation is not symmetrical around $p=0.5$; it is higher for corresponding probabilities of reward above 0.5, reflecting the influence of ER on the activation.

Table S1

Subject #1:	9.64883 ER + 36.8398 ER -	128.528 Risk 50.7502 Risk	(p=1.13496e-007) (p=0.00663731)
Subject #2:	23.0167 ER - 30.2432 ER +	118.01 Risk 71.4444 Risk	(p=0.24606) (p=0.430946)
Subject #3:	37.4796 ER + 4.83338 ER -	14.2743 Risk 136.457 Risk	(p=5.31106e-005) (p=0.347261)
Subject #4:	17.1629 ER + 33.6703 ER -	121.727 Risk 63.2059 Risk	(p=0.00550291) (p=0.606536)
Subject #5:	10.5285 ER + 36.0511 ER -	130.463 Risk 39.7772 Risk	(p=0.0262662) (p=0.0587259)
Subject #6:	30.9063 ER + 21.7995 ER -	71.453 Risk 117.237 Risk	(p=0.000131275) (p=0.0392572)
Subject #7:	36.8018 ER + 10.4833 ER -	14.8235 Risk 138.163 Risk	(p=0.000187338) (p=0.84029)
Subject #8:	34.3306 ER - 16.0396 ER +	51.2403 Risk 127.469 Risk	(p=0.398796) (p=0.870918)
Subject #9:	29.212 ER + 25.1743 ER -	68.3016 Risk 122.158 Risk	(p=0.00411023) (p=0.527578)
Subject #10:	17.9495 ER + 33.1722 ER -	120.223 Risk 65.5006 Risk	(p=0.00151001) (p=0.136472)
Subject #11:	30.3345 ER + 22.3165 ER -	82.8602 Risk 108.725 Risk	(p=0.230737) (p=0.97784)
Subject #12:	25.0819 ER + 28.7212 ER -	89.7165 Risk 105.428 Risk	(p=0.0210484) (p=0.973022)
Subject #13:	33.7852 ER - 18.778 ER +	64.1337 Risk 121.874 Risk	(p=1.85357e-005) (p=0.00630116)
Subject #14:	36.9806 ER + 9.21998 ER -	49.9829 Risk 128.921 Risk	(p=0.0831124) (p=0.542606)
Subject #15:	36.5121 ER - 12.1574 ER +	43.5183 Risk 130.347 Risk	(p=0.000494975) (p=0.120537)
Subject #16:	13.767 ER + 35.3256 ER -	123.949 Risk 59.7966 Risk	(p=0.00427524) (p=0.82054)
Subject #17:	35.3855 ER + 14.2118 ER -	31.7852 Risk 134.704 Risk	(p=0.00399616) (p=0.386965)
Subject #18:	23.0758 ER + 31.0818 ER -	105.158 Risk 89.2707 Risk	(p=0.0773288) (p=0.253785)
Subject #19:	37.6783 ER - 3.93041 ER +	28.6966 Risk 134.483 Risk	(p=6.37116e-005) (p=0.017682)

Estimates of CCA weights and Wilk's lambda p-values for all rows (rows correspond to the two CCA solutions; only the first row is relevant for the post-CCA GLM analysis depicted in Figure S1) and all subjects. We observed that out of 19 subjects, 14 had weights with identical signs for both predictors on both rows ($p(\text{single comparison, all subjects}) < 0.032$).

