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Supplementary Figures: 9

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Supplementary Videos: 0

Reporting Checklist for Nature Neuroscience

This checklist is used to ensure good reporting standards and to improve the reproducibility of published results. For more information, please read Reporting Life Sciences Research.

Please note that in the event of publication, it is mandatory that authors include all relevant methodological and statistical information in the manuscript.

Statistics reporting, by figure

- Please specify the following information for each panel reporting quantitative data, and where each item is reported (section, e.g. Results, & paragraph number).
- Each figure legend should ideally contain an exact sample size (n) for each experimental group/condition, where n is an exact number and not a range, a clear definition of how n is defined (for example x cells from x slices from x animals from x litters, collected over x days), a description of the statistical test used, the results of the tests, any descriptive statistics and clearly defined error bars if applicable.
- For any experiments using custom statistics, please indicate the test used and stats obtained for each experiment.
- Each figure legend should include a statement of how many times the experiment shown was replicated in the lab; the details of sample collection should be sufficiently clear so that the replicability of the experiment is obvious to the reader.
- For experiments reported in the text but not in the figures, please use the paragraph number instead of the figure number.

Note: Mean and standard deviation are not appropriate on small samples, and plotting independent data points is usually more informative. When technical replicates are reported, error and significance measures reflect the experimental variability and not the variability of the biological process; it is misleading not to state this clearly.

		TEST USED		n			DESCRIPTIVE STATS (AVERAGE, VARIANCE)		P VALUE		DEGREES OF FREEDOM & F/t/z/R/ETC VALUE	
	FIGURE NUMBER	WHICH TEST?	SECTION & PARAGRAPH #	EXACT VALUE	DEFINED?	SECTION & PARAGRAPH #	REPORTED?	SECTION & PARAGRAPH #	EXACT VALUE	SECTION & PARAGRAPH #	VALUE	SECTION & PARAGRAPH #
example	1a	one-way ANOVA	Fig. legend	9, 9, 10, 15	mice from at least 3 litters/group	Methods para 8	error bars are mean +/- SEM	Fig. legend	p = 0.044	Fig. legend	F(3, 36) = 2.97	Fig. legend
example	results, para 6	unpaired t-test	Results para 6	15	slices from 10 mice	Results para 6	error bars are mean +/- SEM	Results para 6	p = 0.0006	Results para 6	t(28) = 2.808	Results para 6

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		TEST USED		n			DESCRIPTIVE STATS (AVERAGE, VARIANCE)		P VALUE		DEGREES OF FREEDOM & F/t/z/R/ETC VALUE	
	FIGURE NUMBER	WHICH TEST?	SECTION & PARAGRAPH #	EXACT VALUE	DEFINED?	SECTION & PARAGRAPH #	REPORTED?	SECTION & PARAGRAPH #	EXACT VALUE	SECTION & PARAGRAPH #	VALUE	SECTION & PARAGRAPH #
+ -	1b	repeated measures ANOVA; paired t-tests for post-hoc tests	main text, para 3	70	number of participants	main text, para 3	error bars are mean +/- SEM	Fig. legend	P=1.55e-06; Safe vs. Solo: P=0.000081; Risky vs. Solo: P=0.0025; Mix vs. Solo: P=0.69	main text, para 3, Fig. 1b	F(3, 207)=14.36; Safe vs. Solo: t(69)=4.19; Risky vs. Solo: t(69)=-3.14; Mix vs. Solo: t(69)=-0.40	main text, para 3, Fig. 1b
+ -	1c	ANOVA	main text, para 5	70, 70, 70, 70	BIC values generated from 4 models x 70 leave-one-out estimations	main text, para 5	error bars are mean +/- SEM	Fig. legend	P=0.00000	main text, para 5, Fig. 1c	F(3, 276)=1.79e+06	main text, para 5, Fig. 1c
+ -	1c	independent sample t-test	main text, para 5	70, 70	BIC values generated from Blind following vs. Solo risk preference/risk preference change/other-conferred utility	main text, para 5	error bars are mean +/- SEM	Fig. legend	P=8.48e-286; P=6.55e-286; P=6.39e-286	main text, para 5, Fig. 1c	t(138)=1.34e+03; t(138)=1.34e+03; t(138)=1.34e+03	main text, para 5, Fig. 1c
+ -	1c	independent sample t-test	main text, para 5	70, 70	BIC values generated from Solo risk preference vs. risk preference change/other-conferred utility	main text, para 5	error bars are mean +/- SEM	Fig. legend	P=9.91e-50; P=1.08e-54	main text, para 5, Fig. 1c	t(138)=23.33; t(138)=25.82	main text, para 5, Fig. 1c
+ -	1c	independent sample t-test	main text, para 5	70, 70	BIC values generated from risk preference change vs. other-conferred utility	main text, para 5	error bars are mean +/- SEM	Fig. legend	P=0.012	main text, para 5, Fig. 1c	t(138)=2.53	main text, para 5, Fig. 1c
+ -	2b	paired t-test	main text, para 7	16	conformity bias between safe and risky influence, 1st quartile high risk aversion	main text, para 7	error bars are mean +/- SEM	Fig. legend	P=3.85e-04	main text, Fig. 2b	t(15)=-4.55	main text, Fig. 2b
+ -	2b	paired t-test	main text, para 7	15	conformity bias between safe and risky influence, 2nd quartile risk aversion	main text, para 7	error bars are mean +/- SEM	Fig. legend	P=0.0029	main text, Fig. 2b	t(14)=-3.60	main text, Fig. 2b
+ -	2b	paired t-test	main text, para 7	16	conformity bias between safe and risky influence, 3rd quartile risk aversion	main text, para 7	error bars are mean +/- SEM	Fig. legend	P=0.17	main text, Fig. 2b	t(15)=-1.46	main text, Fig. 2b
+ -	2b	paired t-test	main text, para 7	15	conformity bias between safe and risky influence, 4th quartile low risk aversion	main text, para 7	error bars are mean +/- SEM	Fig. legend	P=0.0032	main text, Fig. 2b	t(14)=3.55	main text, Fig. 2b

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+ -	2d	Pearson's correlation	main text, para 8	608, 184, 182, 239, 467, 456, 241, 186, 182, 615 (trials per bin symmetric around 0)	'safe, safe' and 'risky, risky' trials pooled across subjects to examine fixed effects of conformity; conformity binned based on absolute value distance from others	main text, para 8	error bars are mean +/- SEM	Fig. legend	P=1.02e-11	main text, Fig. 2d	r=-0.96	main text, Fig. 2d
+ -	3ai	Multilevel linear regression, second level one-tailed t-test	Fig. legend, main text, para 9	56	number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	main text, para 9	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.004 FWE, cluster level SVC	main text, para 9, Fig. legend	peak at [x=-3, y=35, z=-20], t(55)=4.48, Z=4.11, k=19	Fig. legend, Supple Table. 1
+ -	3aii	Multilevel linear regression, second level one-tailed t-test	Fig. legend, main text, para 9	56	number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	main text, para 9	Statistical parametric map, showing no activation surviving threshold	Fig. legend	Displayed at P=0.001 uncorrected, presented as a negative result in contrast to the 3Ai result	main text, para 9, Fig. legend	t(55)=3.48	main text, para 9
+ -	3bi	Pearson's correlation	main text, para 9	56	number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	main text, p6, para 2	error bars are mean +/- SEM	Fig. legend	P=0.035	main text, para 6, Fig. legend	r=0.28	main text, para 9
+ -	3bii	Pearson's correlation	main text, para 9	56	number of participants; three who had excessive movements and eleven who did not have unique solution for OCU estimation were excluded	main text, para 9	error bars are mean +/- SEM	Fig. legend	P=0.93	main text, para 9, Fig. legend	r=0.012	main text, para 9
+ -	4a, left	Multilevel linear regression, second level regression	Fig. legend, main text, para 10	56	number of participants; three who had excessive movements, eight who did not have unique solution for risk preference estimation on Solo trials, and three additional participants whose parametric modulator cannot be uniquely specified were excluded	main text, para 10	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.002 FWE, cluster level SVC	main text, para 10, Fig. legend	peak at [x=-3, y=32, z=31], t(54)=4.39 Z=4.04, k=27	Fig. legend, Supple Table. 2

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+ -	4a, right	Multilevel linear regression, second level regression	Fig. legend, main text, para 10	56	number of participants; three who had excessive movements, eight who did not have unique solution for risk preference estimation on Solo trials, and three additional participants whose parametric modulator cannot be uniquely specified were excluded	main text, para 10	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.0055 FWE, cluster level	main text, para 10, Fig. legend	peak at [x=-27, y=17, z=10], t(54)=5.37, Z=4.79, k=96	Fig. legend, Supple Table. 2
+ -	4b, left	independent sample t-test	Fig. legend, main text, para 10	338, 378	fitted neural response for trials on which participants subsequently conformed; for participants who were more risk averse on solo trials (via median split, N=31)	main text, para 10	Each point is the average fitted response of the trials at the indicated distance; Red lines illustrate the mean activation within 'safe, safe' and 'risky, risky' trials	Fig. legend	P=1.12e-29	main text, para 10, Fig. 3d, left	t(714)=11.85	main text, para 10, Fig. 3d, left
+ -	4b, right	independent sample t-test	Fig. legend, main text, para 10	498, 351	fitted neural response for trials on which participants subsequently conformed; for participants who were more risk seeking on solo trials (via median split, N=31)	main text, para 10	Each point is the average fitted response of the trials at the given distance; Red lines illustrate the mean activation within 'safe, safe' and 'risky, risky' trials	Fig. legend	P=3.35e-70	main text, para 10, Fig. 3d, right	t(847)=-19.49	main text, para 10, Fig. 3d, right
+ -	4c, left	independent sample t-test	Fig. legend, main text, para 10	338, 378	fitted neural response for trials on which participants subsequently conformed; for participants who were more risk averse on solo trials (via median split, N=31)	main text, para 10	Each point is the average fitted response of the trials at the indicated distance; Red lines illustrate the mean activation within 'safe, safe' and 'risky, risky' trials	Fig. legend	P=2.072e-37	main text, para 10, Fig. 3e, left	t(714)=13.55	main text, para 10, Fig. 3e, left
+ -	4c, right	independent sample t-test	Fig. legend, main text, para 10	498, 351	fitted neural response for trials on which participants subsequently conformed; for participants who were more risk averse on solo trials (via median split, N=31)	main text, para 10	Each point is the average fitted response of the trials at the indicated distance; Red lines illustrate the mean activation within 'safe, safe' and 'risky, risky' trials	Fig. legend	P=1.37e-143	main text, para 10, Fig. 3e, right	t(847)=-31.31	main text, para 10, Fig. 3e, right
+ -	S4	repeated measures ANOVA	main text, para 3	30	number of participants	main text, para 3	error bars are mean +/- SEM	Fig. legend	P=0.55	main text, para 3	F(3, 87)=0.71	main text, para 3, Fig. S4
+ -	S4	paired t-test	main text, para 3	30, 30	percent safe choices between 'safe, safe' and solo trials	main text, para 3	error bars are mean +/- SEM	Fig. legend	P=0.55	main text, para 3	t(29)=0.61	main text, para 3, Fig. S4

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+ -	S4	paired t-test	main text, para 3	30, 30	percent safe choices between mix ('safe, risky' or 'risky, safe') and solo trials	main text, para 3	error bars are mean +/- SEM	Fig. legend	P=0.37	main text, para 3	t(29)=0.90	main text, para 3, Fig. S4
+ -	S4	paired t-test	main text, para 3	30, 30	percent safe choices between 'risky, risky' and solo trials	main text, para 3	error bars are mean +/- SEM	Fig. legend	P=0.61	main text, para 3	t(29)=-0.52	main text, para 3, Fig. S4
+ -	S6	Pearson's correlation	main text, para 7	62	number of participants; eight participants who did not have unique solution for risk preference estimation were excluded	main text, para 7	Each dot is an individual participant, and the red line is the regression line between risk preference and conformity bias	Fig. legend	P=1.51e-04	supple, Fig. S6	correlation coefficient r=-0.46	Fig. legend, supple, Fig. S6
+ -	S7	repeated measures ANOVA	main text, para 9	56, 11	number of participants, three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded; eleven potential value signals were tested with and without OCU	main text, para 9	error bars are mean +/- SEM	Fig. legend	P=7.51e-06	Fig. legend	F(10, 550)=4.33	Fig. legend, Fig. S7
+ -	S7	paired t-test	main text, para 9	56, 56; 56, 56; 56, 56; 56, 56; 56, 56;	number of participants, three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded; each of potential value signals with and without OCU were compared	main text, para 9	error bars are mean +/- SEM	Fig. legend	Urisky, P=0.016; Usafe, P=0.21; Urisky–Usafe, P=0.047; Utotal, P=0.031; Uchosen, P=0.19	Fig. legend	Urisky, t(55)=–2.49; Usafe, t(55)=1.28; Urisky–Usafe, t(55)=–2.03; Utotal, t(55)=–2.22; Uchosen, t(55)=–1.32	Fig. legend, Fig. S7
+ -	S7	paired t-test	main text, para 9	56, 56; 56, 56; 56, 56; 56, 56; 56, 56;	number of participants, three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded; each variable tested vs beta for [Uchosen OCU - Uunchosen OCU]	main text, para 9	error bars are mean +/- SEM	Fig. legend	Urisky OCU, P=0.099; Usafe OCU, P=0.00028; Urisky OCU – Usafe OCU, P=0.079; Utotal OCU, P=0.030; Uchosen OCU, P=0.13	Fig. legend	Urisky OCU, t(55)=-1.68; Usafe OCU, t(55)=-3.88; Urisky OCU – Usafe OCU, t(55)=-1.79; Utotal OCU, t(55)=-2.22; Uchosen OCU, t(55)=-1.52	Fig. legend, Fig. S7

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+ -	S8a	Multilevel linear regression, second level one-tailed t-test	SI, Fig.S8	49	number of participants; three who had excessive movements, eleven participants who did not have unique solution for OCU estimation, and eight participants who did not have unique solution for risk preference estimation on Solo trials were excluded (one overlapping participant for the OCU and risk preference criteria)	SI, Fig.S8	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.011 FWE, cluster level SVC	SI, Fig.S8	peak at [x=-3, y=35, z=-20], t(48)=4.39, Z=4.01, k=18	Fig. legend, Fig. S8a
+ -	S8b, left	Multilevel linear regression, second level regression	SI, Fig.S8	46	number of participants; three who had excessive movements, eleven participants who did not have unique solution for OCU estimation, eight participants who did not have unique solution for risk preference estimation on Solo trials (one overlapping participant for the OCU and risk preference criteria), and three additional participants whose parametric modulator cannot be uniquely specified were excluded	SI, Fig.S8	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.0070 FWE, cluster level SVC	SI, Fig.S8	peak at [x=-3, y=32, z=31], t(44)=4.50, Z=4.06, k=32	Fig. legend, Fig. S8b, left
+ -	S8b, right	Multilevel linear regression, second level regression	SI, Fig.S8	46	number of participants; three who had excessive movements, eleven participants who did not have unique solution for OCU estimation, eight participants who did not have unique solution for risk preference estimation on Solo trials (one overlapping participant for the OCU and risk preference criteria), and three additional participants whose parametric modulator cannot be uniquely specified were excluded	SI, Fig.S8	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=5.72e-04 FWE, cluster level	SI, Fig.S8	peak at [x=-27, y=17, z=7], t(44)=5.33, Z=4.66, k=140	Fig. legend, Fig. S8b, right

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+ -	S9b	Multilevel linear regression, second level one-tailed t-test	SI, Fig.S9	56	number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	SI, Fig.S9	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.0092 FWE, cluster level SVC	SI, Fig.S9	peak at [x=-3, y=35, z=-20], t(54)=4.45, Z=4.09, k=20	Fig. legend, Fig. S9b
+ -	S9c, left	Multilevel linear regression, second level regression	SI, Fig.S9	56 (male/ female= 43/13)	number of participants; three who had excessive movements, eight who did not have unique solution for risk preference estimation on Solo trials, and three additional participants whose parametric modulator cannot be uniquely specified were excluded	SI, Fig.S9	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.0087 FWE, cluster level SVC	SI, Fig.S9	peak at [x=-3, y=32, z=31], t(53)=4.26, Z=3.93, k=23	Fig. legend, Fig. S9c, left
+ -	S9c, right	Multilevel linear regression, second level regression	SI, Fig.S9	56 (male/ female= 43/13)	number of participants; three who had excessive movements, eight who did not have unique solution for risk preference estimation on Solo trials, and three additional participants whose parametric modulator cannot be uniquely specified were excluded	SI, Fig.S9	Statistical parametric map showing whole brain activation	Fig. legend	Displayed at P=0.001 uncorrected, significant at P=0.012 FWE, cluster level	SI, Fig.S9	peak at [x=-27, y=17, z=7], t(53)=5.24, Z=4.68, k=81	Fig. legend, Fig. S9c, right
+ -	SI, Fig. S9 legend	Multiple linear regression	SI, Fig. S9 legend	62 (male/ female= 46/16)	number of participants; eight who did not have unique solution for risk preference estimation on Solo trials were excluded	SI, Fig. S9 legend	N/A	N/A	Intercept, t=0.48, P=0.63; log(risk preference), t=-4.40, P=4.65e-05; gender, t=-1.15, P=0.25	SI, Fig. S9 legend	F(2, 59)=9.89, P=1.97e-04	SI, Fig. S9 legend
+ -	main text, para 5	likelihood ratio test	main text, para 5	70	BIC values generated from Random-choice model vs. other-conferred utility	main text, para 5	N/A	N/A	P<0.001	main text, para 5	chi-square(3)=64.06, pseudo R-square=0.48	main text, para 5
+ -	Fig.3, main text, para 9	effect size comparison with Fisher r to z transformation	Fig. 3, main text, para 9	56, 56	number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	Fig. 3, main text, para 9	N/A	N/A	P=0.043	Fig. legend, main text, para 9	z=2.02	Fig. legend, main text, para 9

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+ -	online methods, ROI section, para 1	Pearson's correlation	online methods, ROI section, para1	56	other-conferred utility signal; leave-one-out validations as many as the number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	online methods, ROI section, para1	N/A	N/A	P=0.042	online methods, ROI section, para1	correlation coefficient r=0.27	online methods, ROI section, para1
+ -	online methods, ROI section, para 1	Pearson's correlation	online methods, ROI section, para1	56	solo utility signal; leave-one-out validations as many as the number of participants; three who had excessive movements and eleven participants who did not have unique solution for OCU estimation were excluded	online methods, ROI section, para1	N/A	N/A	P=0.46	online methods, ROI section, para1	correlation coefficient r=0.10	online methods, ROI section, para1

Representative figures

1. Are any representative images shown (including Western blots and immunohistochemistry/staining) in the paper?

   If so, what figure(s)?

   N/A

2. For each representative image, is there a clear statement of how many times this experiment was successfully repeated and a discussion of any limitations in repeatability?

   If so, where is this reported (section, paragraph #)?

   N/A

Statistics and general methods

1. Is there a justification of the sample size?

   If so, how was it justified?

   Where (section, paragraph #)?

   Even if no sample size calculation was performed, authors should report why the sample size is adequate to measure their effect size.

   We targeted standard sample sizes for fMRI studies powered to detect small to medium effects using decision-making paradigms. The sample is larger than standard to allow for sufficient variation in individual differences (e.g., risk preferences) and categorical analyses (e.g., by participants high, low in risk aversion) in which the size of each group also meets current methodological recommendations.

2. Are statistical tests justified as appropriate for every figure?

   Where (section, paragraph #)?

   Yes. The statistical tests for all figures are described in the main text and figure legends.

   a. If there is a section summarizing the statistical methods in the methods, is the statistical test for each experiment clearly defined?

   The details of statistical methods used in the current study are provided in Online Methods and legends associated with each figure.

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b. Do the data meet the assumptions of the specific statistical test you chose (e.g. normality for a parametric test)? Where is this described (section, paragraph #)?	We used SPM8b for standard parametric analyses of fMRI data. Maximum log-likelihood estimation and Bayesian Information Criteria were used for behavioral model parameter estimation and model comparison. These methods are broadly and commonly used in model-based behavioral and fMRI analyses.
c. Is there any estimate of variance within each group of data? Is the variance similar between groups that are being statistically compared? Where is this described (section, paragraph #)?	Yes. We performed both group and individual level estimations to assess within-group variance. Figures also show means +/- s.e.m., derived from variance.
d. Are tests specified as one- or two-sided?	Yes. Tests are specified as one- or two-sided as appropriate.
e. Are there adjustments for multiple comparisons?	Yes. Whole-brain fMRI analyses use cluster level SVC FWE correction with corrected p<0.01 and 15 contiguous voxels.
3. Are criteria for excluding data points reported? Was this criterion established prior to data collection? Where is this described (section, paragraph #)?	All exclusion criteria are reported. Participants who met these criteria (reported in 'Participants' and 'Model-based estimates of individual risk preference' sections) were excluded prior to collection or analyses as appropriate.
4. Define the method of randomization used to assign subjects (or samples) to the experimental groups and to collect and process data. If no randomization was used, state so. Where does this appear (section, paragraph #)?	All subjects belonged to a single experimental group.
5. Is a statement of the extent to which investigator knew the group allocation during the experiment and in assessing outcome included? If no blinding was done, state so. Where (section, paragraph #)?	N/A
6. For experiments in live vertebrates, is a statement of compliance with ethical guidelines/regulations included? Where (section, paragraph #)?	N/A
7. Is the species of the animals used reported? Where (section, paragraph #)?	N/A
8. Is the strain of the animals (including background strains of KO/ transgenic animals used) reported? Where (section, paragraph #)?	N/A
9. Is the sex of the animals/subjects used reported? Where (section, paragraph #)?	Yes. Main text in 'Participants' section.

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10. Is the age of the animals/subjects reported? Where (section, paragraph #)?	Yes. Main text in 'Participants' section.
11. For animals housed in a vivarium, is the light/dark cycle reported? Where (section, paragraph #)?	N/A
12. For animals housed in a vivarium, is the housing group (i.e. number of animals per cage) reported? Where (section, paragraph #)?	N/A
13. For behavioral experiments, is the time of day reported (e.g. light or dark cycle)? Where (section, paragraph #)?	N/A
14. Is the previous history of the animals/subjects (e.g. prior drug administration, surgery, behavioral testing) reported? Where (section, paragraph #)?	N/A
a. If multiple behavioral tests were conducted in the same group of animals, is this reported? Where (section, paragraph #)?	N/A
15. If any animals/subjects were excluded from analysis, is this reported? Where (section, paragraph #)?	Yes. All exclusion criteria are reported in Online Methods. Participants who met these criteria (reported in 'Participants' and 'Model-based estimates of individual risk preference' sections) were excluded prior to collection or analyses as appropriate.
a. How were the criteria for exclusion defined? Where is this described (section, paragraph #)?	As reported in the main text and Online Methods, participants who showed excessive movements in the scanner (> 5mm in x, y, or z direction) and/or whose behavioral model estimation did not yield a unique solution were excluded.
b. Specify reasons for any discrepancy between the number of animals at the beginning and end of the study. Where is this described (section, paragraph #)?	N/A

Reagents

1. Have antibodies been validated for use in the system under study (assay and species)?	N/A
a. Is antibody catalog number given? Where does this appear (section, paragraph #)?	N/A

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b. Where were the validation data reported (citation, supplementary information, Antibodypedia)?

Where does this appear (section, paragraph #)?

N/A

2. If cell lines were used to reflect the properties of a particular tissue or disease state, is their source identified?

Where (section, paragraph #)?

N/A

a. Were they recently authenticated?

Where is this information reported (section, paragraph #)?

N/A

Data deposition

Data deposition in a public repository is mandatory for:

a. Protein, DNA and RNA sequences
b. Macromolecular structures
c. Crystallographic data for small molecules
d. Microarray data

Deposition is strongly recommended for many other datasets for which structured public repositories exist; more details on our data policy are available here. We encourage the provision of other source data in supplementary information or in unstructured repositories such as Figshare and Dryad.

1. Are accession codes for deposit dates provided?

Where (section, paragraph #)?

N/A

Computer code/software

Any custom algorithm/software that is central to the methods must be supplied by the authors in a usable and readable form for readers at the time of publication. However, referees may ask for this information at any time during the review process.

1. Identify all custom software or scripts that were required to conduct the study and where in the procedures each was used.

N/A

2. Is computer source code/software provided with the paper or deposited in a public repository? Indicate in what form this is provided or how it can be obtained.

N/A

Human subjects

1. Which IRB approved the protocol?

Where is this stated (section, paragraph #)?

Institutional Review Boards of Baylor College of Medicine and Virginia Tech; Online Methods, paragraph 1.

2. Is demographic information on all subjects provided?

Where (section, paragraph #)?

Yes. Online Methods in 'Participants' section.

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3. Is the number of human subjects, their age and sex clearly defined? Where (section, paragraph #)?	Yes. Online Methods in 'Participants' section.
4. Are the inclusion and exclusion criteria (if any) clearly specified? Where (section, paragraph #)?	Yes. All exclusion criteria are reported in Online Methods. Participants who met these criteria (reported in 'Participants' and 'Model-based estimates of individual risk preference' sections) are excluded prior to collection or analyses as appropriate.
5. How well were the groups matched? Where is this information described (section, paragraph #)?	N/A
6. Is a statement included confirming that informed consent was obtained from all subjects? Where (section, paragraph #)?	Yes. Online Methods in 'Participants' section.
7. For publication of patient photos, is a statement included confirming that consent to publish was obtained? Where (section, paragraph #)?	N/A

fMRI studies

For papers reporting functional imaging (fMRI) results please ensure that these minimal reporting guidelines are met and that all this information is clearly provided in the methods:

1. Were any subjects scanned but then rejected for the analysis after the data was collected?	Yes
a. If yes, is the number rejected and reasons for rejection described? Where (section, paragraph #)?	As reported in the main text and Online Methods, participants who showed excessive movements (> 5mm in x, y, or z direction) and/or whose behavioral model estimation did not yield a unique solution were excluded. This is detailed in main text and Online Methods 'Participants' and 'Model-based estimates of individual risk preference' sections.
2. Is the number of blocks, trials or experimental units per session and/or subjects specified? Where (section, paragraph #)?	Yes. Full details are provided in main text in the 'Experimental procedures' section.
3. Is the length of each trial and interval between trials specified?	Yes. Full details are provided in Online Methods 'Experimental procedures' section.
4. Is a blocked, event-related, or mixed design being used? If applicable, please specify the block length or how the event-related or mixed design was optimized.	We used an event-related design in the current study. The event-related design was optimized with inter-event jitters as reported in Fig. S1.
5. Is the task design clearly described? Where (section, paragraph #)?	Yes. Full details are provided in Online Methods.

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6. How was behavioral performance measured?	Participants choices of safe or risky gambles were recorded with an MR compatible optical button box.
7. Is an ANOVA or factorial design being used?	Parametric regressors were used in standard general linear model analyses. Additional regressors were included in the GLMs to test interaction effects.
8. For data acquisition, is a whole brain scan used? If not, state area of acquisition.	Yes
a. How was this region determined?	N/A
9. Is the field strength (in Tesla) of the MRI system stated?	Yes. 3.0T
a. Is the pulse sequence type (gradient/spin echo, EPI/spiral) stated?	Yes. Full details provided in Online Methods in 'fMRI data acquisition and analyses'.
b. Are the field-of-view, matrix size, slice thickness, and TE/TR/ flip angle clearly stated?	Yes. Full details provided in Online Methods in 'fMRI data acquisition and analyses'.
10. Are the software and specific parameters (model/functions, smoothing kernel size if applicable, etc.) used for data processing and pre-processing clearly stated?	Yes. Full details provided in Online Methods in 'fMRI analyses'.
11. Is the coordinate space for the anatomical/functional imaging data clearly defined as subject/native space or standardized stereotaxic space, e.g., original Talairach, MNI305, ICBM152, etc? Where (section, paragraph #)?	Yes. Full details provided in Online Methods in 'fMRI analyses'.
12. If there was data normalization/standardization to a specific space template, are the type of transformation (linear vs. nonlinear) used and image types being transformed clearly described? Where (section, paragraph #)?	Yes. Full details provided in Online Methods in 'fMRI data acquisition and analyses'.
13. How were anatomical locations determined, e.g., via an automated labeling algorithm (AAL), standardized coordinate database (Talairach daemon), probabilistic atlases, etc.?	Combination of standard T1 template, xjview image viewer and coordinate database, and meta-analysis toolbox (neurosynth).
14. Were any additional regressors (behavioral covariates, motion etc) used?	Yes. Full details provided in Online Methods in 'fMRI analyses'.
15. Is the contrast construction clearly defined?	Yes. Full details provided in Online Methods in 'fMRI analyses'.
16. Is a mixed/random effects or fixed inference used?	Random effects
a. If fixed effects inference used, is this justified?	N/A
17. Were repeated measures used (multiple measurements per subject)?	Yes

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a. If so, are the method to account for within subject correlation and the assumptions made about variance clearly stated?	The methods of accounting for within-subject correlation are implicit to the standard random effects GLM analyses.
18. If the threshold used for inference and visualization in figures varies, is this clearly stated?	Yes. Each figure indicates statistical thresholds explicitly.
19. Are statistical inferences corrected for multiple comparisons?	Yes. Whole-brain fMRI analyses use cluster level SVC FWE correction with corrected p<0.01 and 15 contiguous voxels.
a. If not, is this labeled as uncorrected?	N/A
20. Are the results based on an ROI (region of interest) analysis?	A portion. The main imaging results are derived from whole-brain fMRI analyses, followed up with ROI analyses.
a. If so, is the rationale clearly described?	Yes. Full details provided in Online Methods.
b. How were the ROI's defined (functional vs anatomical localization)?	ROIs were defined based on functional activations as described in Online Methods, and confirmed with leave-one-out cross-validation.
21. Is there correction for multiple comparisons within each voxel?	N/A
22. For cluster-wise significance, is the cluster-defining threshold and the corrected significance level defined?	Yes

Additional comments

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