nature neuroscience

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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 #
+ -	results	two-way ANOVA with subsequent binomial test	para 5	223, 343, 150, 188	units in amygdala, hippocampus, entohinal cortex, parahippocampal cortex	para 4	percentage of units showing a significant main effect of person identity or gaze direction	para 5	p < 10^-6 (amygdala for person identity) p = 0.23 (amygdala for gaze direction) p = 0.001 (parahippocampal cortex for person identity) p > 0.05 (other regions)	para 5	n/a for binomial test	
+ -	results	Wilcoxon ranksum test with subsequent binomial test	para 5	223, 343, 150, 188	units in amygdala, hippocampus, entohinal cortex, parahippocampal cortex	para 4	percentage of units showing a significant effect for direct vs. averted gaze	para 5	p > 0.05 for all four regions	para 5	n/a for binomial test	
+ -	fig.2, results	Representational Similarity Analysis with subsequent permutation test	para 6	223, 343, 150, 188	units in amygdala, hippocampus, entohinal cortex, parahippocampal cortex	para 4	similarity scores for 5 persons x 9 gaze directions	para 6	p < 10^-5 (amygdala for person identity) p = 0.001 (hippocampus for person identity) p > 0.05 (entorhinal cortex for person identity) p < 10^-4 (parahippocampal cortex for person identity) p > 0.05 (all regions for gaze direction)	para 6	n/a for permutation test	
+ -	results	Wilcoxon signed-rank test with subsequent binomial test	para 8	223, 343, 150, 188	units in amygdala, hippocampus, entohinal cortex, parahippocampal cortex	para 4	percentage of units showing a significant effect for direct gaze vs. eyes averted vs. eyes closed	para 8	p > 0.05 (all regions for all comparisons)	para 8	n/a for binomial test	
+ -	results	Wilcoxon signed-rank test	para 8	223, 343, 150, 188	units in amygdala, hippocampus, entohinal cortex, parahippocampal cortex	para 4	--		p = 0.013 (amygdala, live encounter vs. viewing task) p > 0.02 (other three regions)		n/a for Wilcoxon signed-rank test	
+ -												

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+ -	results	Fisher's exact test	para 5	28 of 220 vs. 11 of 220 (overlapping cells excluded)	units found to show a significant main effect in the two-way ANOVA	para 5	relative and absolute numbers of units showing a significant main effect of either person identity or gaze direction	para 5	p = 0.007		n/a for Fisher's exact test	
+ -	Supplementary Figure 6a	Chi square test with Yates correction	Face selectivity of amygdala units, last para	384 (124)	amygdala units (single units only)	Face selectivity of amygdala units, last para	response probabilities with 68% binomial confidence intervals	Face selectivity of amygdala units, last para	p = 0.594 (p=0.613)	Face selectivity of amygdala units, last para	1 deg. of freedom chi^2=0.279 (chi^2=0.256)	Face selectivity of amygdala units, last para
+ -	Supplementary Figure 6b	Wilcoxon signed-rank test	Face selectivity of amygdala units, last para	81 (28)	responsive amygdala units (single units only)	Face selectivity of amygdala units, last para	average response magnitude with SEM	Face selectivity of amygdala units, last para	p=0.377 (p=0.631)	Face selectivity of amygdala units, last para	n/a for Wilcoxon signed-rank test	
+ -												
+ -												

Representative figures

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

   If so, what figure(s)?

   A representative cell response along with action potential waveforms is shown in Fig. 1.

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 #)?

   We report the total number of neurons we recorded as well as the fraction of neurons that were significantly modulated by person identity or gaze direction.

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.

   The number of subjects, experimental sessions, and recorded units already exceeds that of most studies reported in the field of human single unit recordings by far.
   We find clear effects of person identity, but not of gaze direction, so the sample size is clearly sufficient for comparing these two factors. We also report a significant difference in effects sizes for these two factors.

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

   Where (section, paragraph #)?

   Yes, they are described and justified in the sections 'Statistical analysis' and 'Representational Similarity Analysis' in the Supplemental Online Material (SOM).

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

      Yes. See sections 'Statistical analysis' and 'Representational Similarity Analysis'.

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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 #)?	Whenever possible, we used nonparametric tests or even permutation tests. See sections 'Statistical analysis' and 'Representational Similarity Analysis'.
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 #)?	Whenever possible we used nonparametric tests or permutation tests that make no assumptions about the variance of the data groups.
d. Are tests specified as one- or two-sided?	All tests were two-sided as specified in the SOM.
e. Are there adjustments for multiple comparisons?	Yes. By using an omnibus test (2-way ANOVA) and subsequent binomial tests.
3. Are criteria for excluding data points reported? Was this criterion established prior to data collection? Where is this described (section, paragraph #)?	No data were excluded.
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 #)?	No randomization was used except for the permutation test described in the section 'Representational Similarity Analysis' in the Supplemental Online Material.
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 #)?	The Medical Institutional Review Board at the University of Bonn approved the protocol. This is stated in the first paragraph of the Supplemental Online Material.
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 #)?	Sex of the human subjects is reported in the first paragraph of the Supplemental Online Material.
10. Is the age of the animals/subjects reported? Where (section, paragraph #)?	Age of the human subjects is reported in the first paragraph of the Supplemental Online Material.

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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 #)?

All experiments were performed during the day.

14. Is the previous history of the animals/subjects (e.g. prior drug administration, surgery, behavioral testing) reported?

    Where (section, paragraph #)?

Yes. They all have epilepsy.

    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 #)?

No subject was excluded.

    a. How were the criteria for exclusion defined?

       Where is this described (section, paragraph #)?

n/a

    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)?

    a. Is antibody catalog number given?

       Where does this appear (section, paragraph #)?

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

       Where does this appear (section, paragraph #)?

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

   Where (section, paragraph #)?

   a. Were they recently authenticated?

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

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 #)?

   We'd be happy to share the data. Due to the high sampling rates, however, the size of the total data set is in the order of 1 Terabyte so it cannot be distributed over the web.

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.

   Matlab was used to perform the statistical analyses and for generating the figures.

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.

   For extraction and sorting of action potentials (spikes), we used Waveclus, a Matlab-based software freely available on the web.

Human subjects

1. Which IRB approved the protocol?

   Where is this stated (section, paragraph #)?

   The Medical Institutional Review Board at the University of Bonn approved the protocol. This is stated in the first paragraph of the Supplemental Online Material.

2. Is demographic information on all subjects provided?

   Where (section, paragraph #)?

   Number, age and sex of subjects are stated in the first paragraph of the Supplemental Online Material.

3. Is the number of human subjects, their age and sex clearly defined?

   Where (section, paragraph #)?

   Number, age and sex of subjects are stated in the first paragraph of the Supplemental Online Material.

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4. Are the inclusion and exclusion criteria (if any) clearly specified? Where (section, paragraph #)?	n/a. No data was excluded.
5. How well were the groups matched? Where is this information described (section, paragraph #)?	n/a. No group comparison.
6. Is a statement included confirming that informed consent was obtained from all subjects? Where (section, paragraph #)?	Informed written consent was obtained from each subject. This is stated in the first paragraph of the Supplemental Online Material.
7. For publication of patient photos, is a statement included confirming that consent to publish was obtained? Where (section, paragraph #)?	Yes. This statement is included in the figure caption of Supplemental Figure 2.

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?	
a. If yes, is the number rejected and reasons for rejection described? Where (section, paragraph #)?	
2. Is the number of blocks, trials or experimental units per session and/or subjects specified? Where (section, paragraph #)?	
3. Is the length of each trial and interval between trials specified?	
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.	
5. Is the task design clearly described? Where (section, paragraph #)?	
6. How was behavioral performance measured?	
7. Is an ANOVA or factorial design being used?	
8. For data acquisition, is a whole brain scan used? If not, state area of acquisition.	

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a. How was this region determined?

9. Is the field strength (in Tesla) of the MRI system stated?

a. Is the pulse sequence type (gradient/spin echo, EPI/spiral) stated?

b. Are the field-of-view, matrix size, slice thickness, and TE/TR/flip angle clearly stated?

10. Are the software and specific parameters (model/functions, smoothing kernel size if applicable, etc.) used for data processing and pre-processing clearly stated?

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 #)?

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 #)?

13. How were anatomical locations determined, e.g., via an automated labeling algorithm (AAL), standardized coordinate database (Talairach daemon), probabilistic atlases, etc.?

14. Were any additional regressors (behavioral covariates, motion etc) used?

15. Is the contrast construction clearly defined?

16. Is a mixed/random effects or fixed inference used?

a. If fixed effects inference used, is this justified?

17. Were repeated measures used (multiple measurements per subject)?

a. If so, are the method to account for within subject correlation and the assumptions made about variance clearly stated?

18. If the threshold used for inference and visualization in figures varies, is this clearly stated?

19. Are statistical inferences corrected for multiple comparisons?

a. If not, is this labeled as uncorrected?

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20. Are the results based on an ROI (region of interest) analysis?

    a. If so, is the rationale clearly described?

    b. How were the ROI's defined (functional vs anatomical localization)?

21. Is there correction for multiple comparisons within each voxel?

22. For cluster-wise significance, is the cluster-defining threshold and the corrected significance level defined?

Additional comments

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