Supplemental data

	free word recall	cued association recall	combined score
drug	$F_{1,20}=.356$, p=.558, $\eta^2=.017$	$F_{1,20}=.014$, p=.906, $\eta^2=.001$	$F_{1,20}=.271$, p=.608, $\eta^2=.013$
time	$F_{1,20}=6.415$, p=.020, $\eta^2=.243$	$F_{1,20}=3.237$, p=.087, $\eta^2=.139$	$F_{1,20}=8.700$, p=.008, $\eta^2=.303$
stimulus	$F_{1,20}=8.273$, p=.009, $\eta^2=.293$	$F_{1,20}=.816$, p=.377, $\eta^2=.039$	$F_{1,20}=3.720$, p=.068, $\eta^2=.157$
drug × time	$F_{1,20}=.059$, p=.811, $\eta^2=.003$	$F_{1,20}=.018$, p.896=, $\eta^2=.001$	$F_{1,20}=.023$, p=.882, $\eta^2=.001$
drug × stimulus	$F_{1,20}=.828$, p=.374, $\eta^2=.040$	$F_{1,20}=.028$, p=.868, $\eta^2=.001$	$F_{1,20}=.545$, p=.469, $\eta^2=.027$
time × stimulus	$F_{1,20}=.247$, p=.625, $\eta^2=.012$	$F_{1,20}=1.850$, p=.189, $\eta^2=.085$	$F_{1,20}=.070$, p=.794, $\eta^2=.003$
drug × time × stimulus	$F_{1,20}=.589$, p=.452, $\eta^2=.029$	$F_{1,20}=1.079$, p=.311, $\eta^2=.051$	$F_{1,20}=.328$, p=.573, $\eta^2=.016$

Supplemental Table T1: For the three different outcome measures free word recall, cued location-word association recall, and a combined score of these two, repeated measures ANOVAs comprising the factors drug (ghrelin vs. placebo), time (consolidation vs. encoding) and stimulus (food vs. non-food) did not reveal any significant main effect of drug and no significant interaction of drug with any of the other factors. The analyses did reveal significant main effects of time, probably due to more interference in the second as compared to the first encoding run. Further, the analyses did reveal a significant stimulus effect for free recall, suggesting that participants could utilize the food category as a cue that helped to recall food words. Non-food word did not stem from a single congruent category, hence no categorical cue could be utilized for these. This interpretation is supported by the fact that no significant stimulus effect was found for cued location-word association recall.

Voxels	P	Z max	Z-max X	Z-max Y	Z-max Z	Z-COG X	Z-COG Y	Z-COG Z
645	0.000938	3.49	32	-82	24	25.8	-78	34.1
408	0.0195	3.66	24	-60	-10	24.1	-70.6	-6.67

Supplemental Table T2: Cluster showing a significant interaction of condition (ghrelin vs. placebo) and time (consolidation vs. encoding) in the positive contrast between encoding vs. baseline blocks. Effects are cluster-corrected at p<0.05 with Z>2.3. For each significant cluster, the number of voxels, the p-value, the maximum z-value, MNI space coordinates of the maximum z-value voxel, and coordinates of the center of gravity (COG) are given.

Subsequent memory effect, positive contrast:

Voxels	P	Z max	Z-max X	Z-max Y	Z-max Z	Z-COG X	Z-COG Y	Z-COG Z
1815	3.57E-10	3.71	-40	-50	62	-28.1	-60.9	52.7
817	2.06E-05	3.48	-34	-30	-20	-46.9	-58.6	-2.7
812	2.20E-05	3.95	10	10	66	-1.61	11.6	61.7
671	0.000141	3.4	-28	-2	64	-41.8	4.76	43.2
347	0.0181	3.48	50	-42	-20	47.5	-50.1	-11.8

Subsequent memory effect, negative contrast:

| Voxels	P	Z max	Z-max X	Z-max Y	Z-max Z	Z-COG X	Z-COG Y	Z-COG Z
803	2.47E-05	3.47	54	-60	42	50.6	-59.6	42.8
422	0.00534	3.82	46	46	-8	44.3	49.5	-4.82
346	0.0184	3.35	14	70	18	16.6	62.5	25.4
337	0.0215	3.62	4	-48	22	5.51	-47	26.9

Ghrelin modulation of the subsequent memory effect, positive contrast:

Voxels	P	Z max	Z-max X	Z-max Y	Z-max Z	Z-COG X	Z-COG Y	Z-COG Z
1824	4.65E-10	3.75	20	-88	16	15.9	-72.1	22.7
611	0.000381	3.75	-36	-48	70	-37.7	-49.6	63.2
442	0.00446	3.37	-34	-84	16	-31.1	-80.3	19.2

Ghrelin modulation of the subsequent memory effect, negative contrast:

| Voxels	P	Z max	Z-max X	Z-max Y	Z-max Z	Z-COG X	Z-COG Y	Z-COG Z
406	0.00781	3.47	-20	58	8	-15	64	5.27

Supplemental Table T3: Cluster showing a significant subsequent memory effect (words remembered vs. words forgotten after 24h, combined score comprising all words recalled in free or cued recall), and a significant modulation by ghrelin of the significant subsequent memory effect. Effects are cluster-corrected at p<0.05 with Z>2.3. For each significant cluster, the number of voxels, the p-value, the maximum z-value, MNI space coordinates of the maximum z-value voxel, and coordinates of the center of gravity (COG) are given.
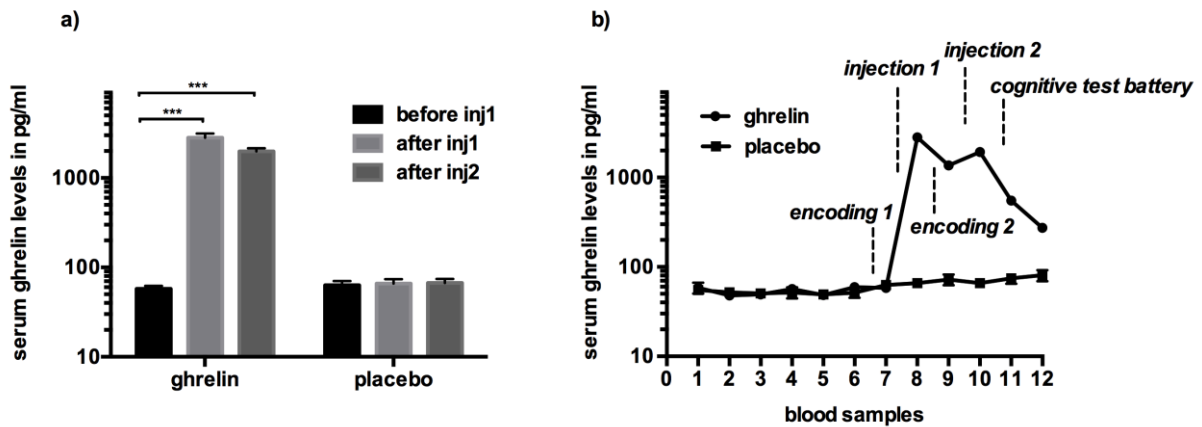
Supplemental Figure S1: a) Group average. Serum ghrelin levels were significantly higher (p<0.0001 each) both after the first and after the second injection than at baseline („before inj1", averaged values of samples taken before the first injection). Bars indicate SEM. b) Serum acyl ghrelin levels rose sharply after the first injection, then took a short dip due to ghrelin's short half-life time and rose again after the second injection before vanishing towards the end of each test day. Both during the second learning phase inside the MRI scanner and during the cognitive test battery, supraphysiological serum acyl ghrelin levels could be measured in all participants.
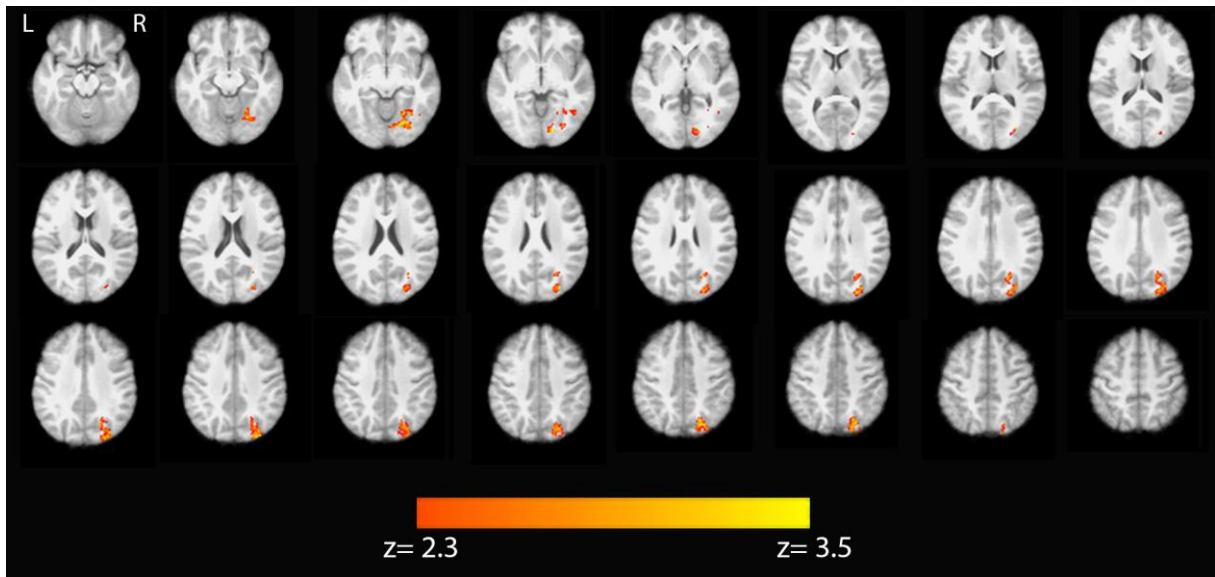
Supplemental Figure S2: Interaction of condition (ghrelin vs. placebo) and time (consolidation vs. encoding) in the contrast between encoding vs. baseline blocks. Effects are cluster-corrected at p<0.05 with Z>2.3. See supplemental table T2 and text for details.
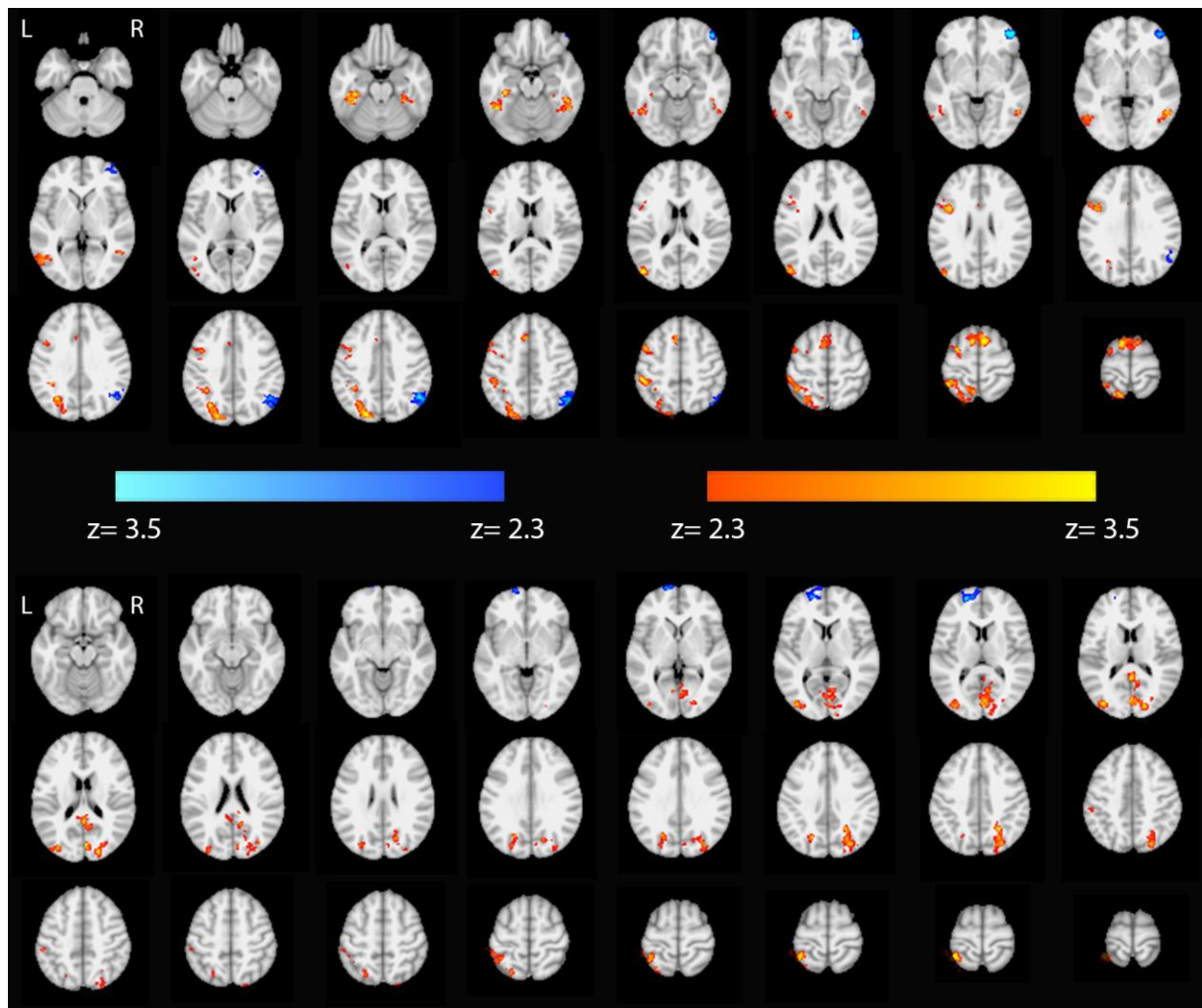
Supplemental Figure S3, top: Subsequent memory analysis of words remembered vs. words forgotten after 24h (combined score comprising all words recalled in free or cued recall). Bottom: Subsequent memory effect as modulated by ghrelin. Effects are cluster-corrected at p<0.05 with Z>2.3. See supplemental table T3 and text for details.
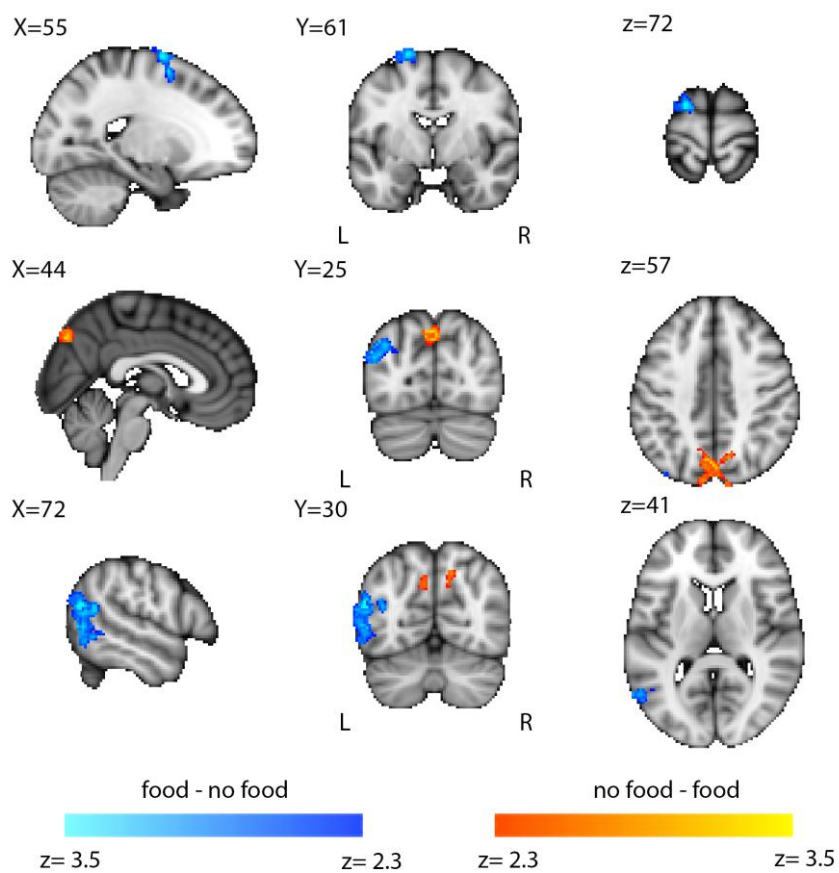
Supplemental Figure S4: Brain activation related to the presentation of food vs. non-food words (main effect). Effects are cluster-corrected at p<0.05 with Z>2.3. See text for details.