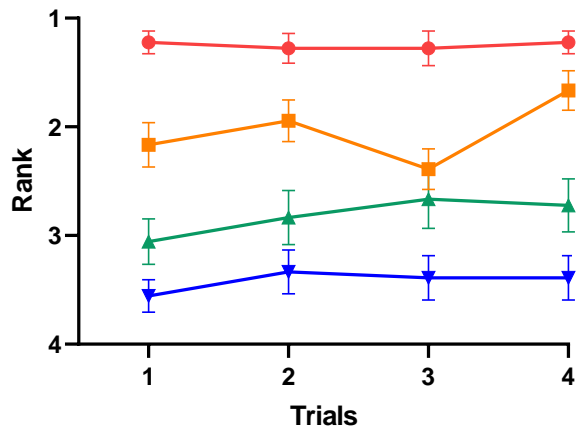


1 **Supplementary Figure 1**



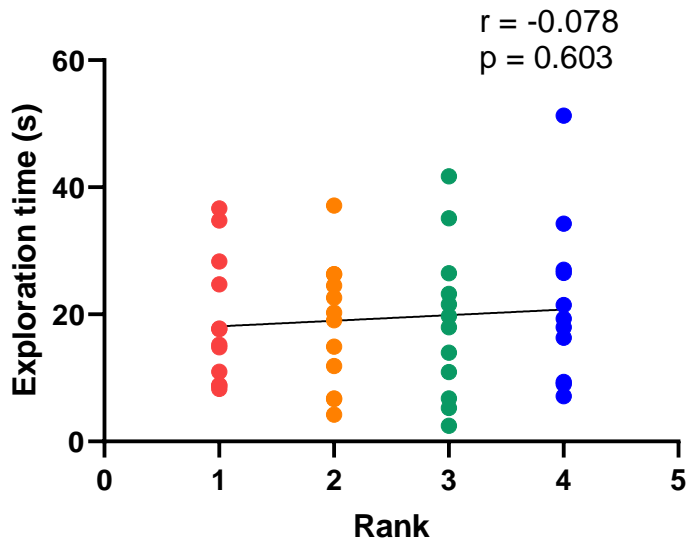
2

3 **Supplementary Figure 1. Summary of social ranks.** Summary of the social ranks of the weanling
4 mice as determined by the tube test over four trials (n = 14 cages). Error bars = SEM.

5

6 **Supplementary Figure 2**

7

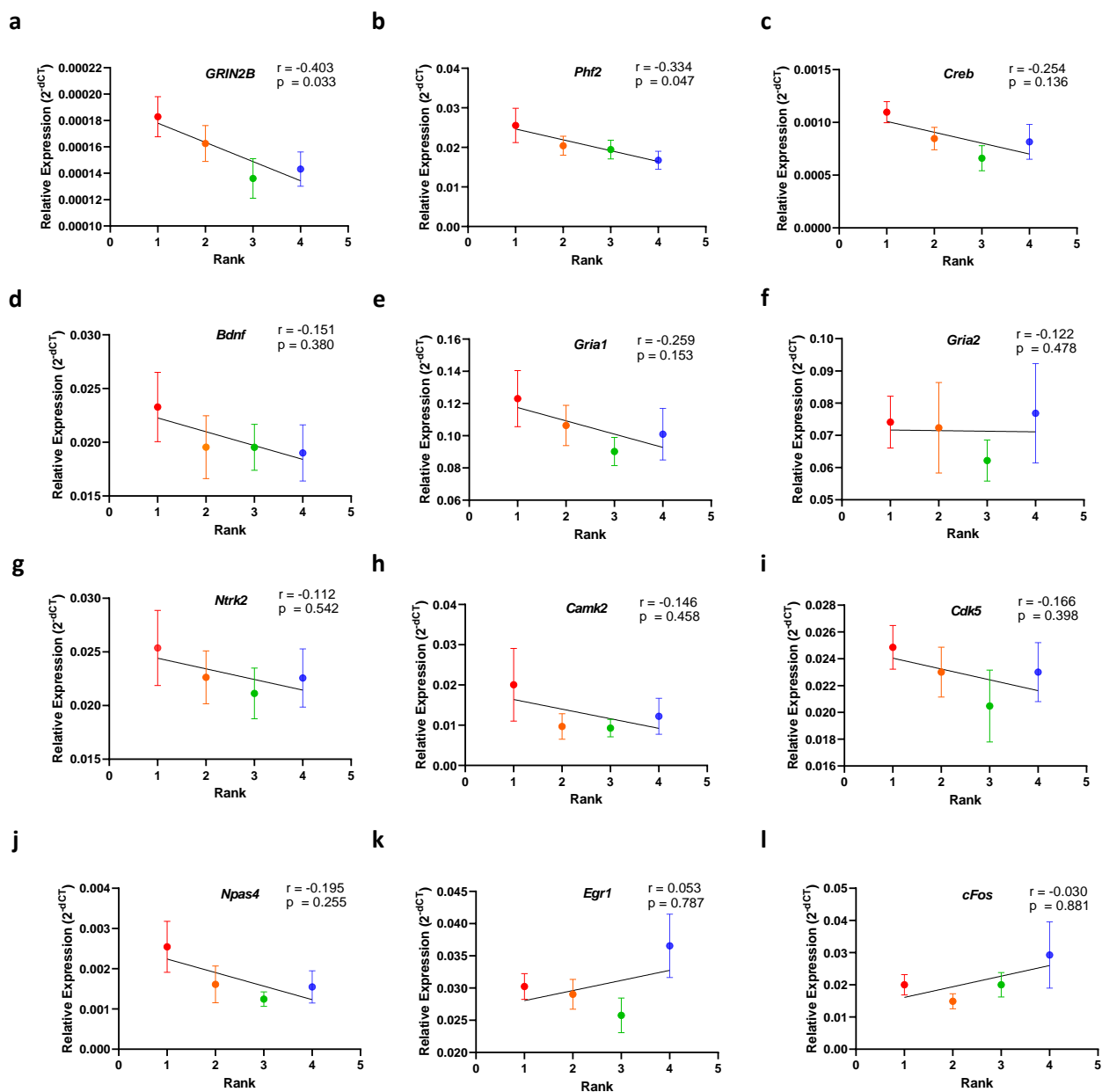


8

9 **Supplementary Figure 2. There was no significant correlation between social rank and**
10 **exploratory behavior.** The correlation between rank and exploration time in the novelty investigation
11 test (Spearman correlation, $n = 12$ cages).

12

13 **Supplementary Figure 3**



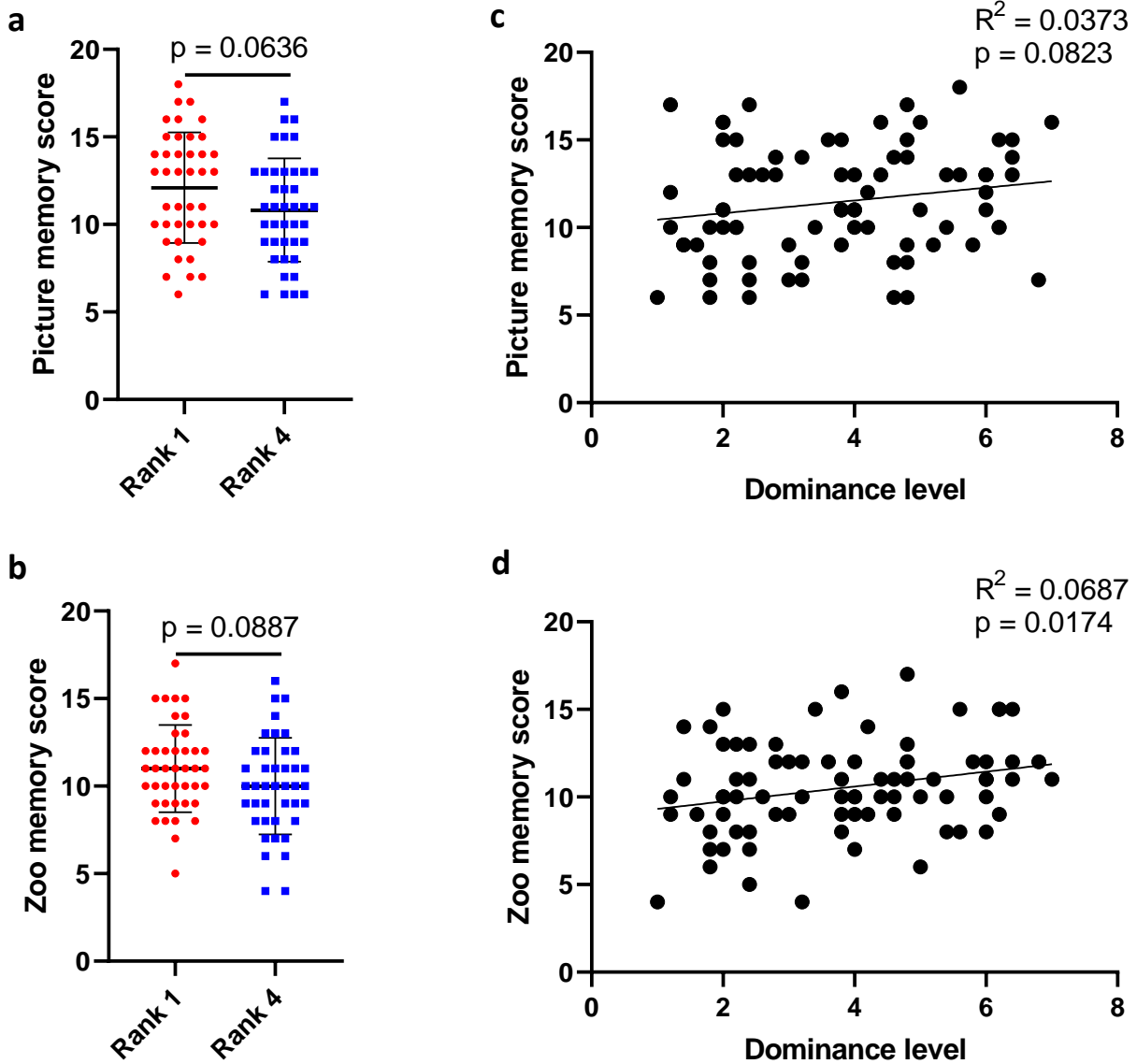
14

15

16 **Supplementary Figure 3. Dominant weanling mice tended to have a higher expression of several**
17 **memory-related genes than subordinate weanling mice. a** The correlation between social rank and
18 *Grin2b* expression (n = 7 cages). **b** The correlation between social rank and *Phf2* expression (n = 9
19 cages). **c** The correlation between social rank and *Creb* expression (n = 9 cages). **d** The correlation
20 between social rank and *Bdnf* expression (n = 9 cages). **e** The correlation between social rank and
21 *Gria1* expression (n = 8 cages). **f** The correlation between social rank and *Gria2* expression (n = 9
22 cages). **g** The correlation between social rank and *Ntrk2* expression (n = 8 cages). **h** The correlation
23 between social rank and *Camk2* expression (n = 7 cages). **i** The correlation between social rank and
24 *Cdk5* expression (n = 7 cages). **j** The correlation between social rank and *Npas4* expression (n = 9
25 cages). **k** The correlation between social rank and *Egr1* expression (n = 7 cages). **l** The correlation
26 between social rank and *cFos* expression (n = 7 cages). Spearman correlation. Error bars = SEM.

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32 **Supplementary Figure 4. Children with higher rank or dominance levels tended to better**
33 **memory. a** The picture memory test scores for 1st- and 4th-rank children (unpaired t test, $n = 82$ pairs).

34 **b** The zoo memory test scores for 1st- and 4th-rank children (unpaired t test, $n = 82$).

35 **c** The correlation between picture memory scores and dominance levels (Pearson correlation, $n = 82$).

36 **d** The correlation between zoo memory scores and dominance levels (Pearson correlation, $n = 82$). Error bars = SEM.

37

38 **Supplementary Table 1. The consistency between social rank and expression level of memory-**
 39 **related genes**

Gene	Rank Pairing						Mean	Z score	P value
	1:4	1:3	2:4	1:2	2:3	3:4			
<i>Phf2</i>	100.000	77.778	77.778	77.778	55.556	77.778	77.778	4.910	<0.001
<i>Creb</i>	66.667	88.889	66.667	66.667	66.667	33.333	69.048	2.280	0.023
<i>Grin2b</i>	71.429	71.429	71.429	57.143	71.429	57.143	66.667	2.291	0.022
<i>Gria1</i>	62.500	75.000	62.500	75.000	75.000	37.500	64.583	2.113	0.035
<i>CamkIIa</i>	71.429	57.143	42.857	85.714	71.429	57.143	64.286	1.932	0.053
<i>Gria2</i>	66.667	77.778	55.556	55.556	66.667	44.444	61.905	1.675	0.094
<i>Bdnf</i>	55.556	77.778	44.444	66.667	44.444	55.556	61.905	1.101	0.271
<i>Npas</i>	55.556	55.556	44.444	55.556	44.444	44.444	57.143	0.000	>0.999
<i>Cdk5</i>	71.429	71.429	42.857	57.143	42.857	28.571	52.381	0.309	0.758
<i>Egr1</i>	28.571	57.143	14.286	42.857	57.143	28.571	45.238	-1.589	0.112
<i>Trkb</i>	50.000	75.000	25.000	37.500	62.500	37.500	45.238	-0.289	0.773
<i>Cfos</i>	57.143	57.143	42.857	57.143	14.286	42.857	38.095	-0.620	0.535

40 *Note. The values indicate the percentage of higher rank mice with higher gene expression than lower*
 41 *rank mice.*

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45 **Supplementary Table 2. Regression analysis of the mediation effect:**
 46 **children memory→prosocial strategy→social dominance (n=175)**

	<u>Prosocial strategy</u>	<u>Social dominance</u>		
	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
	β	β	β	β
Memory ability	0.46***	0.52***		0.33***
Prosocial strategy			0.56***	0.40***
R^2	0.21	0.27	0.31	0.39
Adj R^2	0.20	0.26	0.30	0.39
F	45.09***	62.29***	76.82***	55.99***
df	1.173	1.173	1.173	2.172

47 *** $p < 0.001$.

48

49 **Supplementary Table 3. Two-way ANOVA of FN400 by social status (1st- and 4th-rank children)**
 50 **and social facial expression**

Source of variance	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2_p
Social status (between)	81.537	1	81.537	6.415*	0.019	0.226
Error (between)	279.626	22	12.710			
Social facial expression (within)	18.426	1	18.426	5.649*	0.027	0.204
Social rank* social dominance face	50.266	1	50.266	15.411**	0.001	0.412
Error (within)	71.760	22	3.262			

51 * $p < 0.05$, ** $p < 0.01$. Note. The FN400 amplitudes of each facial expression were corrected by
 52 subtracting the averaged amplitude of the neutral facial condition.

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56 **Supplementary Table 4. FN400 comparisons between 1st- and 4th-rank children when they were**
 57 **evaluating**
 58 **different social facial expressions**

Social status	Face	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>Effect size (d)</i>
Rank 1 vs. rank 4	DF	4.653	1.145	4.065**	22	0.001	1.659
Rank 1 vs. rank 4	SF	0.560	1.163	0.482	22	0.635	0.197
Rank 1	DF vs. SF	-3.286	2.480	-4.589**	11	0.001	1.223
Rank 4	DF vs. SF	0.808	2.626	1.065	11	0.310	0.273

59 ** $p < 0.01$. Note. DF = dominant face, SF = subordinate face. The amplitudes of FN400 were corrected
 60 by subtracting the averaged amplitude of the neutral facial condition.

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62 **Supplementary Table 5. Primer used for quantitative PCR**

Gene	Forward primer (5'-3')	Reverse primer (5'-3')
<i>Bdnf</i>	<i>GGCTGACACTTTTGAGCACGTC</i>	<i>CTCCAAAGGCACTTGACTGCTG</i>
<i>Camk2</i>	<i>ACCCTGGCCTGGTCCTTCAATG</i>	<i>AGCCATCCTCACCACCTATGCTGG</i>
<i>Cdk5</i>	<i>GGCTAAAAACCGGGAAACTC</i>	<i>CCATTGCAGCTGTGCGAAATA</i>
<i>Creb</i>	<i>TCAGGGTACTACCATTC</i>	<i>TTCAGCAGGCTGTGTAGGAA</i>
<i>C-fos</i>	<i>TTCCTGGCAATAGCGTGTTTC</i>	<i>TTCAGACCACCTCGACAATG</i>
<i>Egr1</i>	<i>CGAGCGAACAACCCTATGAG</i>	<i>CATTATTCAGAGCGATGTCAGAAA</i>
<i>Gria1</i>	<i>TTTTCTAGGTGCGGTTGTGG</i>	<i>CCT TTGGAGAACTGGGAACA</i>
<i>Gria2</i>	<i>AAGGAGGAAAGGGAAACGAG</i>	<i>CCGAAGTGGAAAACCTGAACC</i>
<i>Npas4</i>	<i>GCTATACTCAGAAGGTCCAGAAGGC</i>	<i>TCAGAGAATGAGGGTAGCACAGC</i>
<i>GRIN2B</i>	<i>TCTGCCTTCTTAGAGCCATTCAG</i>	<i>AGACAGCTACAGCAGAGAC</i>
<i>Phf2</i>	<i>TGCCCCGAACTGCGAGAAAACCC</i>	<i>TTTCACGTCCGGTGTTGGCCC</i>
<i>Ntrk2</i>	<i>GTGGTGTCATTAGTAGGTTCTTTGTT TT</i>	<i>ACTGAACCTGACCGTACAGAGTT TGGGTCTTTGCTGCC</i>
<i>Gapdh</i>	<i>GGCAAATTCAACGGCACAGT</i>	<i>GGGTCTCGCTCCTGGAAGAT</i>

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