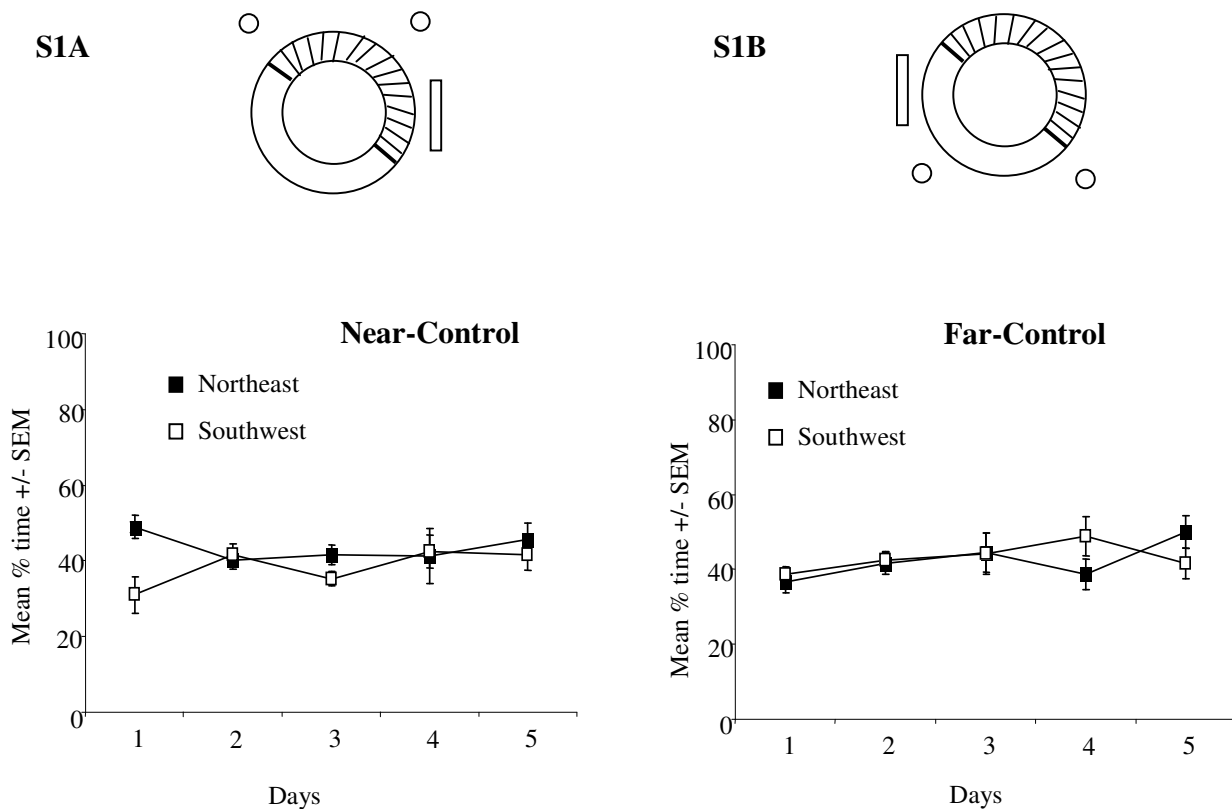


Supplementary Information

To rule out the possibility that animals had a natural tendency to swim at the side of the pool where the cues were located, we performed another experiment. Here, animals were allowed 4 trials/day for 5 days to swim in the watermaze without a platform present. Two groups were used; one group was allowed to swim with the cues positioned in a comparable arrangement to the Near learning group. This group we termed as Near-Control (n=7, Figures S1A) and the second group was allowed to swim with cues in an arrangement equivalent to the Far group. This group we termed as Far-Control (n= 7, Figure S1B). The time spent swimming in the pool for these control groups was matched exactly to equivalent Near and Far trained groups. As the pool contained no platform, both groups spent a significant amount of time swimming at the side of the pool for each of the five days (mean of 80.23 +/- 2% for Near-controls and 85.1 +/-3% for the Far-control group). To examine whether animals spent time swimming at the cues, we divided the pool's outer corridor (a corridor 20cm from the pool edge) into two equal parts, a section containing the cues and a section without. We then compared the % time of total time spent swimming by both the Near-Control and the Far-Control in the both Northeast and Southwest regions. If animals were naturally attracted to the cues, the Near-Control group would spend significantly more time swimming in the Northeast compared to the Southwest region and the Far-control group would spend significantly more time in the Southwest region. We did not find this but rather we found that both groups spent equivalent time in both the Northeast and Southwest region, on all five days. We found no significant differences between the Northeast and Southwest area for the Near-control group ($F_{(1,12)}=1.69$, $P>0.05$) or the Far-control group ($F_{(1,12)} = 0.07$, $P<0.05$), suggesting that animals are not attracted by the presence of cues alone.



Supplementary Figure 1A shows the mean percentage time spent in the Northeast and Southwest outer corridor on all training days for the Near-control group. **S1B** illustrates the mean percentage time spent in the North and South outer corridors for the Far-control.

Bregma – 2.04

Bregma – 3.12

Bregma – 4.08

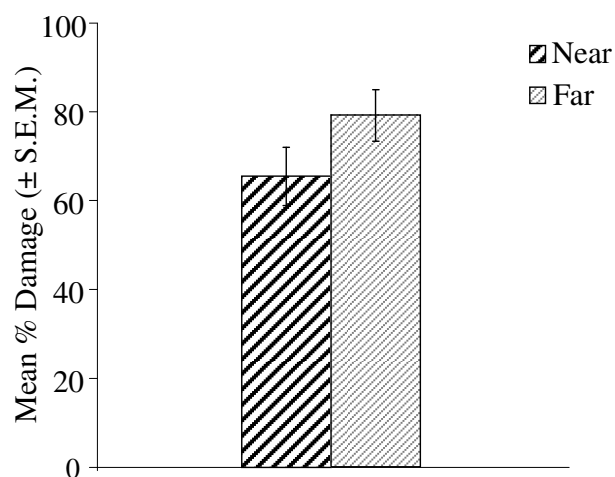
Dorsal
hippocampal
(Near group)

Magnified dorsal
hippocampal
photomicrographs

Dorsal
hippocampal
(Far Group)

Magnified dorsal
hippocampal
photomicrographs

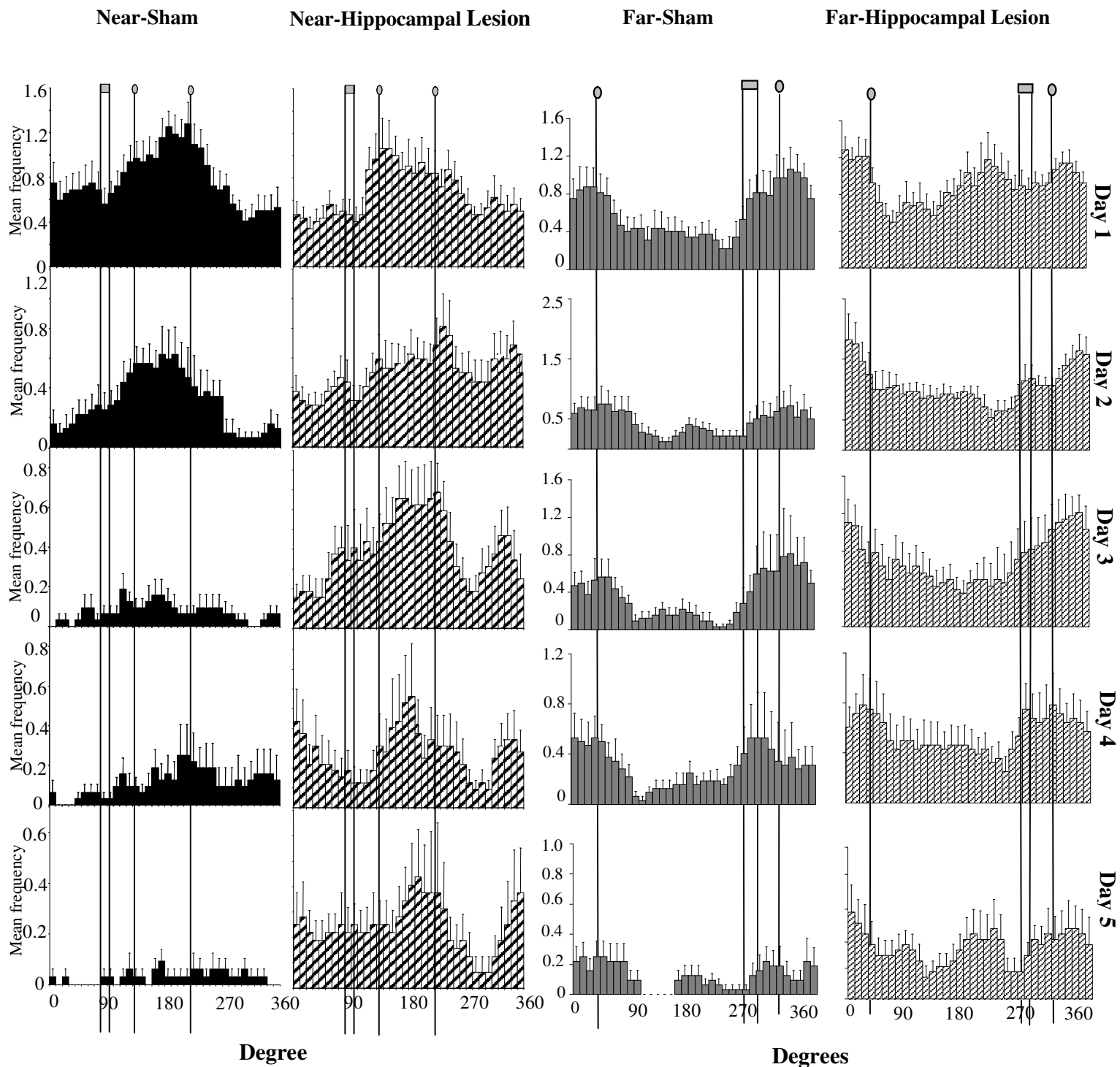
Magnified dorsal
hippocampal
photomicrograph
(Sham)



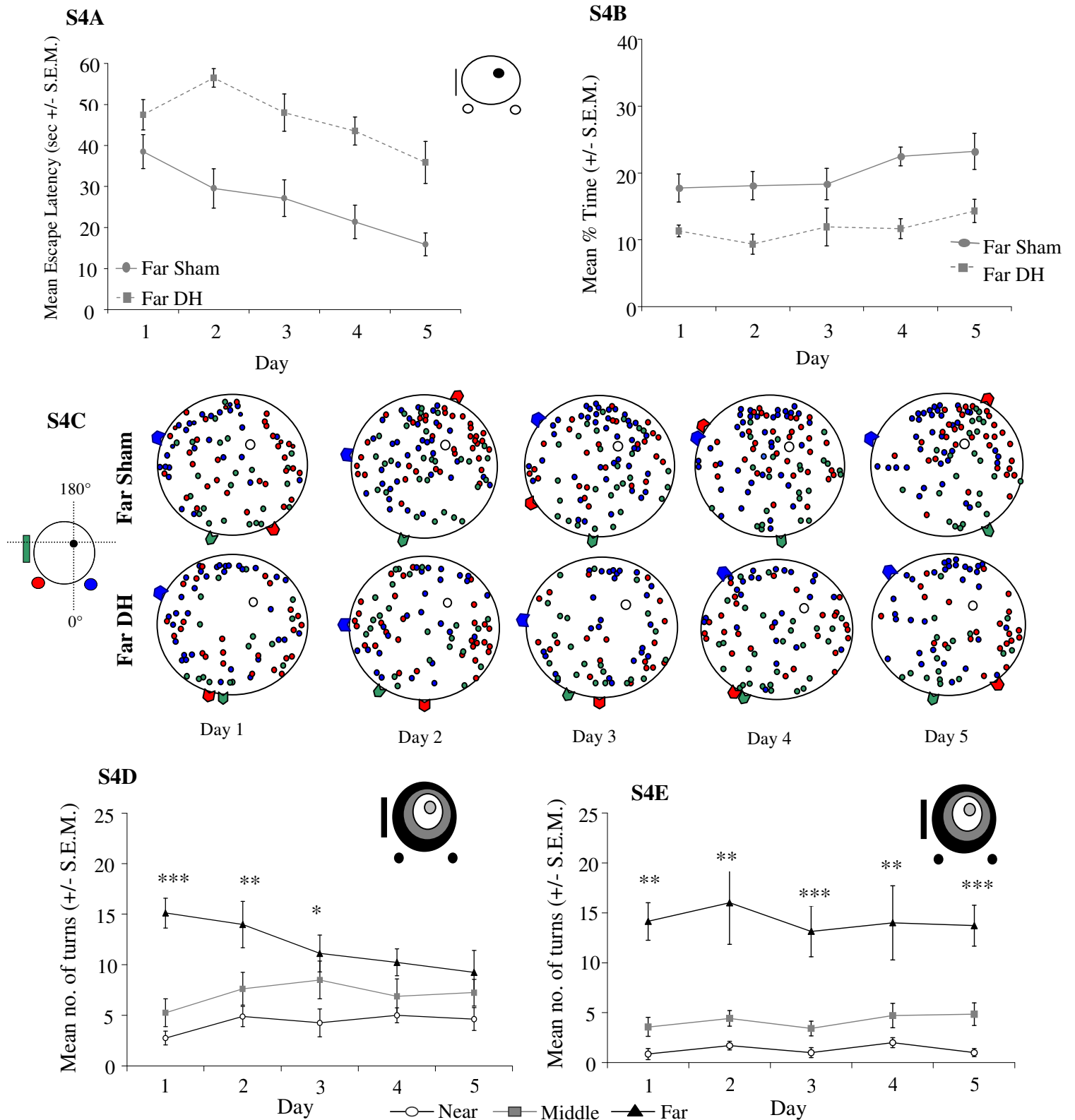
Supplementary Figure 2: A bar chart depicting the mean extent of hippocampal damage for both the Near and Far groups. Inset shows representative samples of damage taken from each group across three coronal levels. An independent samples t-test revealed no significant difference in the extent of damage between the two groups ($t_{(13)} = 1.54$, $P > 0.05$). Scale bar = 500 μ m.

S3A

S3B



Supplementary Figure 3A shows the location at which sham (left) and DH lesioned animals (right) performed vertical thigmotaxis at each degree position around the maze during the 5 acquisition days for Near group. **S3B** shows the location at which sham (left) and DH lesioned animals (right) performed vertical thigmotaxis at each degree position around the maze during the 5 acquisition days for Far group.



Supplementary Figure 4A shows the mean escape latencies ($\pm$ S.E.M.) for the Far sham and Far DH animals with the DH animals significantly slower at locating the hidden platform ($F_{(1,13)} = 17.92$, $P=0.001$). **Figure 4B** illustrates the mean percentage time ($\pm$ S.E.M.), of total time in the maze, spent in direct behaviour, on all training days. The shams spent a significantly higher percentage of time in this behaviour compared to Far DH animals ($F_{(1,13)} = 15.80$, $P<0.01$). **Figure 4C** illustrates the location of turns towards the cues for both groups. **Figure 4D** and **4E** indicate the mean number ($\pm$ S.E.M.) of turns in the near, middle and far zones for the Far sham and Far DH groups, respectively, over 5 days of training. The sham animals displayed a reduction in turns in the outer far zone. In contrast, DH, however, had the highest number of turns in the outer zone of the maze ($F_{(2,12)} = 30.33$, $P<0.001$), even by Day 5.