# Supplement

Table S1: List of obtainable parameters in ANY-Maze with their associated *p-*values from one-way analysis of variance and post-hoc analysis with Bonferroni’s corrections (between-drug comparisons in each experiment) and independent T-test analysis (between-experiment comparisons; corresponding heat-map found in Figure 1). Significant associations were *p*<0.005 are highlighted in red and significant associations common to both experiments are highlighted in red and bolded. Statistical analyses were obtained in R (v.4.3.0).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number and parameter name | | Between-drug comparisonsa | | | | Between-experiment comparisonsb | | |
| **Experiment 1** | | **Experiment 2** | | **Saline** | **MK801** | **Scopolamine** |
| **MK801**  **(ref. saline)** | **Scopolamine**  **(ref. saline)** | **MK801**  **(ref. saline)** | **Scopolamine**  **(ref. saline)** |
| Apparatus measure | | | | | | | | |
| 1 | Duration | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 2 | Distance | 0.000 | 0.000 | 0.000 | 0.531 | 0.347 | 0.028 | 0.048 |
| 3 | Mean speed | 0.000 | 0.000 | 0.000 | 0.493 | 0.357 | 0.029 | 0.050 |
| 4 | Max speed | 0.000 | 1.000 | 0.000 | 1.000 | 0.001 | 0.130 | 0.004 |
| 5 | Freezing episodes | 0.064 | 0.136 | 0.042 | 1.000 | 0.079 | 1.000 | 1.000 |
| 6 | Time freezing | 0.120 | 0.263 | 0.481 | 1.000 | 0.077 | 0.553 | 0.430 |
| 7 | Freezing latency | 1.000 | 1.000 | 0.690 | 1.000 | 0.732 | 0.239 | 0.359 |
| 8 | Mean freezing score | 0.938 | 1.000 | 0.002 | 1.000 | 0.224 | 0.001 | 0.087 |
| 9 | Time mobile | 0.003 | 0.680 | 0.154 | 1.000 | 0.006 | 0.060 | 0.944 |
| 10 | Time immobile | 0.003 | 0.680 | 0.154 | 1.000 | 0.006 | 0.060 | 0.944 |
| 11 | Mobile episodes | 0.000 | 0.259 | 1.000 | 0.792 | 0.002 | 0.032 | 0.274 |
| 12 | Immobile episodes | 0.000 | 0.264 | 1.000 | 0.776 | 0.001 | 0.034 | 1.000 |
| 13 | Mobility latency | 0.747 | 1.000 | 1.000 | 0.142 | 1.000 | 1.000 | 0.305 |
| 14 | Immobility latency | 0.039 | 1.000 | 1.000 | 0.479 | 0.540 | 0.113 | 0.285 |
| 15 | Rotations | 0.027 | 1.000 | 0.296 | 1.000 | 0.006 | 0.758 | 0.623 |
| 16 | Clockwise rotations | 0.533 | 1.000 | 0.016 | 1.000 | 0.037 | 0.236 | 1.000 |
| 17 | Anti-clockwise rotations | 0.363 | 1.000 | 0.107 | 1.000 | 0.999 | 0.765 | 0.157 |
| 18 | Absolute turn angle | 0.003 | 1.000 | 0.276 | 1.000 | 0.064 | 0.029 | 0.141 |
| 19 | Path efficiency | 0.041 | 0.883 | 0.015 | 1.000 | 1.000 | 1.000 | 1.000 |
| 20 | Line crossings | 0.178 | 0.010 | 0.000 | 0.004 | 0.007 | 0.094 | 1.000 |
| 16-grid measure | | | | | | | | |
| 21 | 16-grid crossings | 0.114 | 0.004 | 0.000 | 1.000 | 0.625 | 0.014 | 0.003 |
| Centre-point measures | | | | | | | | |
| 22 | Mean distance from | 0.000 | 0.085 | 0.037 | 0.105 | 0.002 | 0.789 | 1.000 |
| 23 | Max. distance from | 0.000 | 0.085 | 0.037 | 0.105 | 0.001 | 1.000 | 0.275 |
| 24 | Min. distance from | 0.000 | 0.127 | 0.024 | 1.000 | 0.003 | 0.559 | 0.018 |
| 25 | Time moving towards | 0.149 | 0.000 | 0.001 | 0.000 | 0.618 | 0.265 | 0.655 |
| 26 | Time moving away | 0.001 | 0.037 | 1.000 | 0.000 | 0.023 | 0.149 | 0.704 |
| 27 | Mean speed moving towards | 0.897 | 1.000 | 0.000 | 0.429 | 0.075 | 0.024 | 1.000 |
| 28 | Initial heading error | 0.395 | 1.000 | 1.000 | 1.000 | 1.000 | 0.059 | 0.599 |
| 29 | Average absolute heading error | 0.000 | 0.030 | 0.071 | 0.325 | 1.000 | 1.000 | 1.000 |
| Thigmotaxis measures | | | | | | | |  |
| 30 | Entries | 0.174 | 0.010 | 0.000 | 0.005 | 0.007 | 0.093 | 1.000 |
| 31 | Number exits | 0.179 | 0.010 | 0.000 | 0.004 | 0.007 | 0.094 | 0.550 |
| 32 | Time | 0.000 | 0.055 | 0.042 | 0.011 | 0.002 | 0.435 | 0.442 |
| 33 | Was 1st zone | 1.000 | 1.000 | 0.698 | 1.000 | 1.000 | 0.151 | 1.000 |
| 34 | Distance | **0.000** | **0.000** | **0.000** | **0.000** | 0.448 | 0.279 | 0.067 |
| 35 | Distance to first entry | 0.166 | 1.000 | 0.019 | 0.787 | 0.141 | 0.611 | 0.218 |
| 36 | Latency to first entry | 0.232 | 1.000 | 0.012 | 1.000 | 0.013 | 0.641 | 0.063 |
| 37 | Latency to first exit | 0.334 | 1.000 | 0.016 | 1.000 | 0.565 | 0.618 | 0.026 |
| 38 | Latency to last entry | 0.211 | 0.478 | 0.567 | 1.000 | 0.656 | 0.443 | 0.182 |
| 39 | Average speed | **0.001** | **0.000** | **0.000** | **0.007** | 0.163 | 0.063 | 0.094 |
| 40 | Max. speed | 0.000 | 0.860 | 0.000 | 1.000 | 0.020 | 0.729 | 0.018 |
| 41 | Max. visit | 1.000 | 0.499 | 0.184 | 0.108 | 1.000 | 0.541 | 0.444 |
| 42 | Min. visit | 1.000 | 0.721 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 43 | Mean visit | 0.922 | 0.003 | 1.000 | 0.102 | 0.009 | 0.124 | 1.000 |
| 44 | Time mobile | **0.000** | **0.002** | **0.000** | **0.001** | 0.218 | 0.756 | 0.318 |
| 45 | Time immobile | 0.008 | 1.000 | 0.856 | 0.400 | 0.004 | 0.169 | 0.984 |
| 46 | Immobile episodes | 0.000 | 0.839 | 0.069 | 0.874 | 0.015 | 0.081 | 1.000 |
| 47 | Initial distance | 0.462 | 1.000 | 1.000 | 0.260 | 0.033 | 0.099 | 0.002 |
| 48 | Mean distance from | 0.000 | 1.000 | 0.031 | 1.000 | 0.001 | 1.000 | 1.000 |
| 49 | Max. distance from | 1.000 | 0.055 | 1.000 | 0.249 | 1.000 | 1.000 | 0.147 |
| 50 | Min. distance from | 1.000 | 1.000 | 0.698 | 1.000 | 1.000 | 0.151 | 1.000 |
| 51 | Cumulative distance | 0.000 | 0.339 | 0.042 | 0.497 | 0.001 | 0.833 | 0.326 |
| 52 | Mean distance to border | 0.023 | 0.319 | 1.000 | 0.432 | 1.000 | 1.000 | 1.000 |
| 53 | Max. distance to border | 0.029 | 1.000 | 0.349 | 1.000 | 1.000 | 1.000 | 1.000 |
| 54 | Min. distance to border | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 55 | Time getting closer to zone | 0.232 | 1.000 | 0.230 | 1.000 | 0.014 | 0.414 | 0.043 |
| 56 | Time getting further from zone | 0.253 | 1.000 | 0.248 | 1.000 | 0.057 | 0.423 | 0.101 |
| 57 | Initial heading error | 0.277 | 0.953 | 1.000 | 1`.000 | 0.868 | 0.144 | 0.416 |
| 58 | Signed initial heading error | 1.000 | 1.000 | 1.000 | 1.000 | 0.563 | 0.711 | 0.514 |
| 59 | Average absolute heading error | **0.001** | **0.001** | **0.000** | **0.000** | 1.000 | 1.000 | 1.000 |
| 60 | Time moving towards | 0.021 | 0.000 | 0.893 | 0.000 | 0.850 | 0.350 | 0.636 |
| 61 | Time moving away from | 0.000 | 0.844 | 0.093 | 0.016 | 0.011 | 0.253 | 0.497 |
| 62 | In zone oriented to centre | 0.005 | 0.005 | 0.354 | 0.467 | 0.867 | 0.480 | 0.158 |
| 63 | Absolute turn angle | 0.000 | 0.009 | 0.000 | 0.073 | 0.226 | 0.208 | 0.040 |
| 64 | Freezing episodes | 0.049 | 0.131 | 0.562 | 1.000 | 0.061 | 1.000 | 0.399 |
| 65 | Time freezing | 0.131 | 0.296 | 1.000 | 0.515 | 0.066 | 0.612 | 0.532 |
| 66 | Path efficiency to entry | 0.523 | 0.686 | 0.241 | 1.000 | 0.991 | 0.746 | 0.480 |
| 67 | Corrected integrated path length | 0.000 | 0.336 | 0.040 | 0.464 | 0.001 | 0.858 | 0.348 |
| 68 | Number of line crossings | 0.177 | 0.010 | 0.000 | 0.005 | 0.007 | 0.093 | 1.000 |
| aAnalysis of variance with post-hoc Bonferroni’s corrections. bIndependent T-test analysis, associated heat-map representations in Figure 2. *Experiment 1*, with no head-stage/NAT-1; *Experiment 2*, with head-stage/NAT-1; ref., referenced to; Max., maximum; Min., minimum. | | | | | | | | |

Table S2: Statistical summary of comparisons between treatment groups in Experiments 1 and 2 in pre-selected parameters. Conventional statistical comparisons against saline which differ between experimental groups are highlighted in red- significance is considered where p<0.05. All statistical analysis for comparisons to saline in each experimental group were resampled 1000 (seed starting at 123456) in R (v.4.3.0).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameters** |  | **Within-experiment comparisonsa** | | | | | | | **MK801 minus saline** | | **Scopolamine minus saline** | |
| **Saline** | **MK801** | | **Scopolamine** | Fb | **Sig.** | **ηp2** |
| **mean±SD** | **mean±SD** | | **mean±SD** | **Mean difference**  **[95% CI]** | ***p*a** | **Mean difference**  **[95% CI]** | ***p*a** |
| **Distance moved (m)** | **E1** | 131.6±20.2 | 70.0±25.6 | | 182.2±20.0 | 61.9 | <0.001 | 0.826 | -61.6 [-81.5; -42.2] | <0.001 | 50.6 [34.1; 68] | <0.001 |
| **E2** | 139.9±19.2 | 39.3±23.5 | | 155.2±26.7 | 65.3 | <0.001 | 0.845 | -101 [-120; -79.7] | <0.001 | 15.3 [-8.76; 32.5] | 0.531 |
| **Average distance from centre-point (m)** | **E1** | 0.218±0.007 | 0.155±0.03 | | 0.237±0.013 | 48.9 | <0.001 | 0.790 | -0.065 [-0.080; -0.044] | <0.001 | 0.020 [0.008; 0.026] | 0.085 |
| **E2** | 0.199±0.01 | 0.161±0.050 | | 0.230±0.012 | 12.2 | <0.001 | 0.505 | -0.039 [-0.082; -0.014] | 0.037 | 0.032 [0.019; 0.042] | 0.105 |
| **Thigmotaxis (ratio)** | **E1** | 0.532±0.052 | 0.223±0.157 | | 0.807±0.147 | 50.5 | <0.001 | 0.795 | -0.308 [-0.403; -0.201] | <0.001 | 0.278 [0.118; 0.339] | <0.001 |
| **E2** | 0.463±0.049 | 0.285±0.189 | | 0.777±0.128 | 30.7 | <0.001 | 0.710 | -0.179 [-0.304; -0.062] | 0.038 | 0.316 [0.219; 0.394] | <0.001 |
| **Thigmotaxis (s)** | **E1** | 1266.1±96.3 | 545.1±379.3 | 1539.8±184.5 | | 41.7 | <0.001 | 0.762 | -721 [-927; -473] | <0.001 | 274 [95.9; 363] | 0.055 |
| **E2** | 1050.0±105.7 | 699.2±445.6 | | 1475.8±163.8 | 17.3 | <0.001 | 0.590 | -351 [-623; -75.8] | 0.042 | 426 [280; 538] | 0.011 |
| **Line-crossings** | **E1** | 1060.6±145.3 | 866.9±265.1 | | 1374.2±154.3 | 16.9 | <0.001 | 0.565 | -194 [-403; -19.2] | 0.114 | 314 [187; 440] | 0.004 |
| **E2** | 1030.0±132.49 | 458.3±238.5 | | 1012.0±196.9 | 25.4 | <0.001 | 0.679 | -574 [-724; -371] | <0.001 | -20 [-196; 97.6] | >0.999 |
| **Meandering (degrees/m)** | **E1** | 912.5±89.5 | 2716.4±1008.4 | | 705.6±73.5 | 35.9 | <0.001 | 0.734 | 1800 [1260; 2480] | <0.001 | -207 [-277; -142] | >0.999 |
| **E2** | 932.0±107.4 | 3077±1813.4 | | 750.4±89.2 | 13.7 | <0.001 | 0.533 | 2150 [1330; 3860] | 0.001 | -182 [-264; -98.3] | >0.999 |
| **Rotation** | **E1** | 76.5±10.5 | 180.1±142.7 | | 99.8±10.6 | 4.4 | 0.023 | 0.251 | 104 [27.4; 209] | 0.027 | 23.3 [14.7; 32.1] | >0.999 |
| **E2** | 98.8±12.5 | 158.2±138.3 | | 96.1±18.2 | 1.9 | 0.176 | 0.135 | 65.4 [-0.778; 175] | 0.293 | 3.33 [-11.3; 15.6] | >0.999 |
| aBootstrapped analysis of variance with Bonferroni’s corrections. bExperiment 1, F(2,26); Experiment 2, F(2,24). *SD*, standard deviation; *F*, *f*-values; sig., *p*-values with significance levels set at *p*<0.05; *ηp2*, partial eta-squared; CI, confidence intervals (lower; upper bounds); E*1*, Experiment 1 with no head-stage/NAT-1; and *E2*, Experiment 2 with head-stage/NAT-1. | | | | | | | | | | | | |