**Supplementary Materials**

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**Supplemental Figure 1.** Timeline illustrating the number of weeks each pair of monkeys participated in each study period.

**Results for other performance measures in the 4-item oSDR task**

 The following six performance variables were also measured for each monkey at each delay on every testing day: control accuracy rate, WM and control completion rates, WM and control reaction times, and initiation time. As for the WM accuracy rate, control accuracy rate is the proportion of correct control trials among the completed ones; completion rate is the proportion of completed trials among presented ones; and latency is the time difference between the appearance of the sample (initiation) or choice (reaction) stimuli and the responses to those stimuli.

 Unlike WM accuracy rate in this task, these performance measures showed no differences over time. Therefore, the segmented model was not applied to these measures. Summary tables (Supplemental Tables S1-S6) for each variable at each delay for both treatment groups are provided here. In each table, one measure was summarized for each treatment group with the mean and standard deviation of the response at week 0, every eight weeks after week 0 until week 60 and over week 0 to week 60. At week 0, delay 12 was replaced by delay 16. For each group of the weeks, a t test was performed to compare the THC and vehicle group. Each table demonstrates that no differences between the THC and vehicle group were present over time for any of these measures.

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| **Table S1 Summary of Statistics of 4-item SDR Control Accuracy Rate** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 0.954 | 0.935 | 0.953 | 0.959 | 0.967 | 0.970 | 1.000 | 1.000 | 1.000 | 0.969 |
| Std | 0.065 | 0.060 | 0.041 | 0.020 | 0.052 | 0.050 | 0.000 | 0.000 | 0.000 | 0.020 |
| Veh | Mean | 0.947 | 0.951 | 0.949 | 0.970 | 0.943 | 0.991 | 1.000 | 1.000 | 1.000 | 0.972 |
| Std | 0.059 | 0.031 | 0.045 | 0.050 | 0.075 | 0.016 | 0.000 | 0.000 | 0.000 | 0.019 |
| THC-Veh | T Stat | 0.184 | -0.622 | 0.178 | -0.539 | 0.682 | -1.053 |  |  |  | -0.318 |
| p-value | 0.857 | 0.545 | 0.862 | 0.600 | 0.508 | 0.313 |  |  |  | 0.756 |
| 8 | THC | Mean | 0.925 | 0.920 | 0.948 | 0.952 | 0.926 | 0.989 | 1.000 | 1.000 | 1.000 | 0.961 |
| Std | 0.088 | 0.059 | 0.034 | 0.025 | 0.046 | 0.021 | 0.000 | 0.000 | 0.000 | 0.008 |
| Veh | Mean | 0.863 | 0.872 | 0.912 | 0.900 | 0.876 | 0.945 | 1.000 | 1.000 | 1.000 | 0.928 |
| Std | 0.154 | 0.086 | 0.100 | 0.120 | 0.129 | 0.040 | 0.000 | 0.000 | 0.000 | 0.059 |
| THC-Veh | T Stat | 0.922 | 1.206 | 0.918 | 1.123 | 0.974 | 2.556 |  |  |  | 1.459 |
| p-value | 0.375 | 0.251 | 0.377 | 0.283 | 0.349 | 0.025 |   |   |   | 0.170 |
| 16 | THC | Mean | 0.892 | 0.888 | 0.909 | 0.900 | 0.927 | 0.969 | 1.000 | 1.000 | 1.000 | 0.941 |
| Std | 0.103 | 0.073 | 0.069 | 0.093 | 0.082 | 0.053 | 0.000 | 0.000 | 0.000 | 0.029 |
| Veh | Mean | 0.833 | 0.870 | 0.931 | 0.900 | 0.875 | 0.968 | 1.000 | 1.000 | 1.000 | 0.934 |
| Std | 0.110 | 0.109 | 0.052 | 0.079 | 0.128 | 0.043 | 0.000 | 0.000 | 0.000 | 0.044 |
| THC-Veh | T Stat | 1.045 | 0.361 | -0.693 | 0.000 | 0.904 | 0.034 |  |  |  | 0.366 |
| p-value | 0.316 | 0.724 | 0.502 | 1.000 | 0.384 | 0.973 |   |   |   | 0.721 |

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| **Table S2 Summary of Statistics of 4-item SDR WM Completion Rate** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 0.996 | 0.972 | 0.981 | 0.959 | 0.970 | 0.932 | 0.964 | 0.972 | 1.000 | 0.965 |
| Std | 0.007 | 0.036 | 0.033 | 0.060 | 0.039 | 0.095 | 0.078 | 0.040 | 0.000 | 0.036 |
| Veh | Mean | 0.994 | 0.969 | 0.943 | 0.967 | 0.958 | 0.949 | 0.924 | 0.914 | 0.958 | 0.948 |
| Std | 0.010 | 0.046 | 0.069 | 0.034 | 0.074 | 0.088 | 0.112 | 0.147 | 0.102 | 0.057 |
| THC-Veh | T Stat | 0.381 | 0.107 | 1.327 | -0.296 | 0.371 | -0.338 | 0.774 | 1.005 | 1.000 | 0.685 |
| p-value | 0.710 | 0.917 | 0.209 | 0.773 | 0.717 | 0.741 | 0.454 | 0.335 | 0.341 | 0.506 |
| 8 | THC | Mean | 0.996 | 0.949 | 0.965 | 0.934 | 0.956 | 0.929 | 0.929 | 0.961 | 1.000 | 0.948 |
| Std | 0.009 | 0.050 | 0.032 | 0.052 | 0.053 | 0.098 | 0.104 | 0.065 | 0.000 | 0.049 |
| Veh | Mean | 0.983 | 0.950 | 0.936 | 0.953 | 0.936 | 0.935 | 0.904 | 0.900 | 0.944 | 0.932 |
| Std | 0.019 | 0.063 | 0.087 | 0.054 | 0.091 | 0.106 | 0.156 | 0.124 | 0.101 | 0.080 |
| THC-Veh | T Stat | 1.639 | -0.018 | 0.841 | -0.679 | 0.524 | -0.096 | 0.360 | 1.153 | 1.348 | 0.435 |
| p-value | 0.127 | 0.986 | 0.417 | 0.510 | 0.610 | 0.925 | 0.725 | 0.271 | 0.207 | 0.672 |
| 16 | THC | Mean | 0.992 | 0.934 | 0.961 | 0.919 | 0.936 | 0.906 | 0.929 | 0.959 | 1.000 | 0.936 |
| Std | 0.014 | 0.061 | 0.038 | 0.047 | 0.052 | 0.111 | 0.133 | 0.045 | 0.000 | 0.052 |
| Veh | Mean | 0.968 | 0.946 | 0.914 | 0.945 | 0.929 | 0.923 | 0.886 | 0.877 | 0.944 | 0.919 |
| Std | 0.042 | 0.059 | 0.113 | 0.063 | 0.096 | 0.124 | 0.169 | 0.169 | 0.136 | 0.093 |
| THC-Veh | T Stat | 1.424 | -0.360 | 1.042 | -0.855 | 0.162 | -0.267 | 0.536 | 1.235 | 1.000 | 0.430 |
| p-value | 0.180 | 0.725 | 0.318 | 0.409 | 0.874 | 0.794 | 0.602 | 0.240 | 0.341 | 0.675 |

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| **Table S3 Summary of Statistics of 4-item SDR Control Completion Rate** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 1.000 | 0.979 | 0.988 | 0.963 | 0.988 | 0.918 | 0.914 | 0.932 | 0.917 | 0.955 |
| Std | 0.000 | 0.031 | 0.027 | 0.054 | 0.016 | 0.106 | 0.070 | 0.090 | 0.204 | 0.032 |
| Veh | Mean | 0.993 | 0.959 | 0.952 | 0.963 | 0.935 | 0.914 | 0.894 | 0.897 | 0.958 | 0.933 |
| Std | 0.019 | 0.049 | 0.052 | 0.067 | 0.101 | 0.076 | 0.111 | 0.102 | 0.070 | 0.053 |
| THC-Veh | T Stat | 1.000 | 0.888 | 1.612 | 0.014 | 1.386 | 0.091 | 0.398 | 0.667 | -0.473 | 0.956 |
| p-value | 0.337 | 0.392 | 0.133 | 0.989 | 0.191 | 0.929 | 0.698 | 0.518 | 0.646 | 0.358 |
| 8 | THC | Mean | 1.000 | 0.954 | 0.965 | 0.952 | 0.958 | 0.860 | 0.847 | 0.850 | 0.917 | 0.914 |
| Std | 0.000 | 0.031 | 0.044 | 0.041 | 0.038 | 0.139 | 0.104 | 0.078 | 0.204 | 0.040 |
| Veh | Mean | 0.986 | 0.958 | 0.944 | 0.958 | 0.951 | 0.862 | 0.804 | 0.833 | 0.861 | 0.903 |
| Std | 0.038 | 0.060 | 0.065 | 0.044 | 0.074 | 0.124 | 0.170 | 0.164 | 0.155 | 0.079 |
| THC-Veh | T Stat | 1.000 | -0.157 | 0.698 | -0.275 | 0.245 | -0.021 | 0.578 | 0.239 | 0.531 | 0.316 |
| p-value | 0.337 | 0.878 | 0.499 | 0.788 | 0.811 | 0.984 | 0.574 | 0.815 | 0.607 | 0.757 |
| 16 | THC | Mean | 0.993 | 0.942 | 0.962 | 0.957 | 0.961 | 0.805 | 0.739 | 0.838 | 0.917 | 0.889 |
| Std | 0.019 | 0.061 | 0.053 | 0.045 | 0.045 | 0.163 | 0.103 | 0.151 | 0.204 | 0.041 |
| Veh | Mean | 0.970 | 0.958 | 0.924 | 0.944 | 0.921 | 0.817 | 0.718 | 0.759 | 0.861 | 0.868 |
| Std | 0.058 | 0.061 | 0.093 | 0.067 | 0.092 | 0.107 | 0.133 | 0.170 | 0.188 | 0.073 |
| THC-Veh | T Stat | 1.012 | -0.480 | 0.928 | 0.409 | 1.030 | -0.175 | 0.332 | 0.917 | 0.491 | 0.660 |
| p-value | 0.331 | 0.640 | 0.372 | 0.690 | 0.323 | 0.864 | 0.746 | 0.377 | 0.634 | 0.522 |

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| **Table S4 Summary of Statistics of 4-item SDR WM Reaction Time** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 902.800 | 805.848 | 652.260 | 1031.386 | 1024.941 | 1150.096 | 953.271 | 886.372 | 395.444 | 919.493 |
| Std | 427.878 | 276.729 | 158.575 | 541.509 | 686.264 | 655.795 | 667.037 | 791.862 | 129.637 | 416.710 |
| Veh | Mean | 908.427 | 794.628 | 848.459 | 794.488 | 1018.186 | 810.023 | 994.716 | 1070.077 | 1768.813 | 915.289 |
| Std | 600.146 | 442.316 | 617.357 | 546.331 | 997.725 | 608.020 | 988.467 | 983.689 | 2251.727 | 609.677 |
| THC-Veh | T Stat | -0.020 | 0.057 | -0.814 | 0.815 | 0.015 | 1.006 | -0.092 | -0.385 | -1.492 | 0.015 |
| p-value | 0.984 | 0.956 | 0.431 | 0.431 | 0.988 | 0.334 | 0.928 | 0.707 | 0.167 | 0.988 |
| 8 | THC | Mean | 1517.959 | 1865.893 | 1473.749 | 1653.268 | 1740.706 | 1582.011 | 1639.743 | 1731.289 | 1321.111 | 1668.885 |
| Std | 744.372 | 954.596 | 361.329 | 782.808 | 848.465 | 913.074 | 1296.727 | 1431.721 | 622.141 | 911.591 |
| Veh | Mean | 1924.898 | 1713.411 | 1182.348 | 1169.517 | 1474.592 | 1450.747 | 1325.699 | 1571.433 | 1458.089 | 1418.435 |
| Std | 984.831 | 1013.502 | 457.223 | 684.095 | 1111.662 | 905.598 | 616.932 | 1053.141 | 829.540 | 756.122 |
| THC-Veh | T Stat | -0.872 | 0.290 | 1.323 | 1.231 | 0.503 | 0.270 | 0.579 | 0.238 | -0.324 | 0.559 |
| p-value | 0.400 | 0.777 | 0.211 | 0.242 | 0.624 | 0.792 | 0.574 | 0.816 | 0.753 | 0.586 |
| 16 | THC | Mean | 1577.479 | 2368.526 | 1872.374 | 2106.939 | 2003.588 | 1798.600 | 1816.058 | 1849.710 | 1413.056 | 1965.128 |
| Std | 687.967 | 1254.504 | 504.690 | 848.182 | 1025.676 | 1070.589 | 1292.517 | 1130.054 | 983.039 | 966.504 |
| Veh | Mean | 1834.189 | 2035.150 | 1577.513 | 1487.769 | 1522.294 | 1581.414 | 1889.763 | 1830.970 | 1955.810 | 1706.454 |
| Std | 863.038 | 1341.365 | 657.570 | 903.113 | 1000.914 | 926.898 | 1524.572 | 1313.420 | 1120.952 | 977.955 |
| THC-Veh | T Stat | -0.615 | 0.480 | 0.941 | 1.322 | 0.889 | 0.406 | -0.098 | 0.029 | -0.892 | 0.498 |
| p-value | 0.550 | 0.640 | 0.365 | 0.211 | 0.392 | 0.692 | 0.924 | 0.978 | 0.394 | 0.628 |

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| **Table S5 Summary of Statistics of 4-item SDR WM Reaction Time** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 902.800 | 805.848 | 652.260 | 1031.386 | 1024.941 | 1150.096 | 953.271 | 886.372 | 395.444 | 919.493 |
| Std | 427.878 | 276.729 | 158.575 | 541.509 | 686.264 | 655.795 | 667.037 | 791.862 | 129.637 | 416.710 |
| Veh | Mean | 908.427 | 794.628 | 848.459 | 794.488 | 1018.186 | 810.023 | 994.716 | 1070.077 | 1768.813 | 915.289 |
| Std | 600.146 | 442.316 | 617.357 | 546.331 | 997.725 | 608.020 | 988.467 | 983.689 | 2251.727 | 609.677 |
| THC-Veh | T Stat | -0.020 | 0.057 | -0.814 | 0.815 | 0.015 | 1.006 | -0.092 | -0.385 | -1.492 | 0.015 |
| p-value | 0.984 | 0.956 | 0.431 | 0.431 | 0.988 | 0.334 | 0.928 | 0.707 | 0.167 | 0.988 |
| 8 | THC | Mean | 1517.959 | 1865.893 | 1473.749 | 1653.268 | 1740.706 | 1582.011 | 1639.743 | 1731.289 | 1321.111 | 1668.885 |
| Std | 744.372 | 954.596 | 361.329 | 782.808 | 848.465 | 913.074 | 1296.727 | 1431.721 | 622.141 | 911.591 |
| Veh | Mean | 1924.898 | 1713.411 | 1182.348 | 1169.517 | 1474.592 | 1450.747 | 1325.699 | 1571.433 | 1458.089 | 1418.435 |
| Std | 984.831 | 1013.502 | 457.223 | 684.095 | 1111.662 | 905.598 | 616.932 | 1053.141 | 829.540 | 756.122 |
| THC-Veh | T Stat | -0.872 | 0.290 | 1.323 | 1.231 | 0.503 | 0.270 | 0.579 | 0.238 | -0.324 | 0.559 |
| p-value | 0.400 | 0.777 | 0.211 | 0.242 | 0.624 | 0.792 | 0.574 | 0.816 | 0.753 | 0.586 |
| 16 | THC | Mean | 1577.479 | 2368.526 | 1872.374 | 2106.939 | 2003.588 | 1798.600 | 1816.058 | 1849.710 | 1413.056 | 1965.128 |
| Std | 687.967 | 1254.504 | 504.690 | 848.182 | 1025.676 | 1070.589 | 1292.517 | 1130.054 | 983.039 | 966.504 |
| Veh | Mean | 1834.189 | 2035.150 | 1577.513 | 1487.769 | 1522.294 | 1581.414 | 1889.763 | 1830.970 | 1955.810 | 1706.454 |
| Std | 863.038 | 1341.365 | 657.570 | 903.113 | 1000.914 | 926.898 | 1524.572 | 1313.420 | 1120.952 | 977.955 |
| THC-Veh | T Stat | -0.615 | 0.480 | 0.941 | 1.322 | 0.889 | 0.406 | -0.098 | 0.029 | -0.892 | 0.498 |
| p-value | 0.550 | 0.640 | 0.365 | 0.211 | 0.392 | 0.692 | 0.924 | 0.978 | 0.394 | 0.628 |

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| **Table S6 Summary of Statistics of 4-item SDR Control Reaction Time** |
| Delay | Treatment | Summary | Week |
| 0 | 1-8 | 9-16 | 17-24 | 25-32 | 33-40 | 41-48 | 49-56 | 57-60 | 0-60 |
| 1 | THC | Mean | 522.614 | 637.730 | 530.227 | 655.968 | 464.707 | 580.678 | 420.875 | 441.917 | 355.222 | 532.352 |
| Std | 149.795 | 213.225 | 212.756 | 383.178 | 112.703 | 198.579 | 101.266 | 186.953 | 65.853 | 84.138 |
| Veh | Mean | 505.236 | 643.406 | 717.605 | 551.292 | 490.365 | 449.311 | 430.609 | 470.807 | 397.926 | 530.676 |
| Std | 128.211 | 528.115 | 545.018 | 288.427 | 347.366 | 203.191 | 243.596 | 280.583 | 127.206 | 224.587 |
| THC-Veh | T Stat | 0.233 | -0.026 | -0.847 | 0.577 | -0.186 | 1.223 | -0.098 | -0.227 | -0.730 | 0.018 |
| p-value | 0.820 | 0.979 | 0.413 | 0.574 | 0.856 | 0.245 | 0.924 | 0.824 | 0.482 | 0.986 |
| 8 | THC | Mean | 1285.536 | 1764.944 | 1347.117 | 1522.859 | 1953.011 | 1333.776 | 1645.779 | 1751.281 | 1249.167 | 1611.844 |
| Std | 689.058 | 937.554 | 524.486 | 439.272 | 792.197 | 817.166 | 1093.393 | 900.543 | 1159.397 | 483.161 |
| Veh | Mean | 1602.107 | 1461.565 | 1543.980 | 1776.704 | 1377.727 | 1375.250 | 1246.857 | 1294.618 | 1192.493 | 1426.793 |
| Std | 1070.956 | 787.240 | 632.974 | 755.710 | 811.480 | 695.660 | 717.336 | 1140.223 | 1149.513 | 514.855 |
| THC-Veh | T Stat | -0.658 | 0.656 | -0.634 | -0.768 | 1.342 | -0.102 | 0.807 | 0.832 | 0.085 | 0.693 |
| p-value | 0.523 | 0.524 | 0.538 | 0.457 | 0.204 | 0.920 | 0.435 | 0.422 | 0.934 | 0.501 |
| 16 | THC | Mean | 1370.352 | 1727.814 | 1278.518 | 1927.103 | 1680.021 | 1553.263 | 1912.985 | 2280.105 | 1737.722 | 1761.004 |
| Std | 739.326 | 889.274 | 348.552 | 961.542 | 754.682 | 659.923 | 1203.307 | 1534.590 | 1104.434 | 701.467 |
| Veh | Mean | 1435.873 | 1339.028 | 1285.888 | 1442.871 | 1760.687 | 1721.039 | 1830.425 | 1576.419 | 1249.208 | 1538.555 |
| Std | 780.998 | 570.081 | 737.370 | 685.887 | 1412.372 | 661.698 | 1074.356 | 553.596 | 556.447 | 605.709 |
| THC-Veh | T Stat | -0.161 | 0.974 | -0.024 | 1.085 | -0.133 | -0.475 | 0.135 | 1.141 | 0.968 | 0.635 |
| p-value | 0.875 | 0.349 | 0.981 | 0.299 | 0.896 | 0.643 | 0.895 | 0.276 | 0.356 | 0.537 |