Supplementary Note 6: Detailed statistical document of article figures

June 13, 2023

Contents

A repeated measures analysis of variance (ANOVA) was conducted using the MATLAB ranova function to examine the effects of within-subject factors, such as sucrose concentration, and between-subject factors, including gender and experimental conditions (baseline vs. food deprivation). To assess the between-subject differences, a two-sample Kolmogorov-Smirnov test was employed with the MATLAB kstest2 function. Additionally, pairwise comparisons were conducted to further explore the differences between groups using a post-hoc analysis, specifically the Tukey's honestly significant difference method, implemented with the MATLAB multcompare function.

1 Figure 2

1.1 Figure 2a

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 7.3397e-26.
p-value for gender: 6.3880e-02.
kstest2 results: h=0, p=8.2894e-02, ks2stat=0.2557 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 5.9941e-01, \quad 2\% : 2.0283e-02, \quad 5\% : 1.0142e-01, \quad 9\% : 5.3385e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.3032, ks2stat = 0.3788 \\ RStest : Conc1 : h = 0, p = 0.4049, zval = 0.8329 \\ KStest2 : Conc2 : h = 1, p = 0.0087, ks2stat = 0.6439 \\ RStest : Conc2 : h = 1, p = 0.0187, zval = 2.3510 \\ KStest2 : Conc3 : h = 0, p = 0.2812, ks2stat = 0.3864 \\ RStest : Conc3 : h = 0, p = 0.1314, zval = 1.5086 \\ KStest2 : Conc4 : h = 0, p = 0.9465, ks2stat = 0.2045 \\ RStest : Conc4 : h = 0, p = 0.5156, zval = -0.6501 \end{aligned}$$

1.2 Figure 2b

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 2.061e-10.
p-value for gender: 0.15301.
kstest2 results: h=0, p=9.9819e-02, ks2stat=0.2481 (overall gender difference)

Post-hoc analysis:

$$240lux : 1.8263e-01, \quad 260lux : 5.1534e-02, \quad 290lux : 8.8968e-01, \quad 320 : 3.7194e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.5833, ks2stat = 0.3030$$
$$RStest : Conc1 : h = 0, p = 0.2815$$
$$KStest2 : Conc2 : h = 0, p = 0.2407, ks2stat = 0.4015$$
$$RStest : Conc2 : h = 0, p = 0.0602$$
$$KStest2 : Conc3 : h = 0, p = 0.6484, ks2stat = 0.2879$$
$$RStest : Conc3 : h = 0, p = 1.0000$$
$$KStest2 : Conc4 : h = 0, p = 0.7136, ks2stat = 0.2727$$
$$RStest : Conc4 : h = 0, p = 0.4235$$

1.3 Figure 2c

Statistical significance was determined using **Statistical Package for the Social Sciences (SPSS)** package (F = 12, M = 9)
p-value for concentration: <0.0001.
Sex differences across all concentrations p = 0.8.
Post-hoc analysis:

$$0.5\% : p = 0.05, \quad 2\% : p = 0.007, \quad 5\% : p = 0.8, \quad 9\% : p = 0.4.$$

1.4 Figure 2d

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 7.8859e-04.
p-value for gender: 4.3484e-01.
kstest2 results: h=0, p=3.1096e-01, ks2stat=0.1986 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 8.9816e-01, \quad 2\% : 4.5069e-01, \quad 5\% : 5.3396e-01, \quad 9\% : 5.9227e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.7358, ks2stat = 0.2727$$
$$RStest : Conc1 : h = 0, p = 0.6458, zval = -0.4597$$
$$KStest2 : Conc2 : h = 0, p = 0.4896, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.6682, zval = -0.4286$$
$$KStest2 : Conc3 : h = 0, p = 0.8286, ks2stat = 0.2500$$
$$RStest : Conc3 : h = 0, p = 0.7169, zval = -0.3627$$
$$KStest2 : Conc4 : h = 0, p = 0.7136, ks2stat = 0.2727$$
$$RStest : Conc4 : h = 0, p = 0.7350, zval = -0.3385$$

1.5 Figure 2e

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 8.9008e-02.
p-value for gender: 2.4720e-03.
kstest2 results: h=1, p=9.4199e-06, ks2stat=0.5019 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.2707e-03, \quad 2\% : 1.1033e-02, \quad 5\% : 3.5299e-03, \quad 9\% : 8.9459e-03$$

KStest2 and wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0258, ks2stat = 0.5758 \\ RStest : Conc1 : h = 1, p = 0.0051, zval = 2.8003 \\ KStest2 : Conc2 : h = 1, p = 0.0361, ks2stat = 0.5530 \\ RStest : Conc2 : h = 1, p = 0.0151, zval = 2.4311 \\ KStest2 : Conc3 : h = 1, p = 0.0230, ks2stat = 0.5833 \\ RStest : Conc3 : h = 1, p = 0.0051, zval = 2.8003 \\ KStest2 : Conc4 : h = 1, p = 0.0361, ks2stat = 0.5530 \\ RStest : Conc4 : h = 1, p = 0.0062, zval = 2.7388 \end{aligned}$$

1.6 Figure 2e (With approach trials)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 0.00016745.
p-value for gender: 0.0037713.
kstest2 results: h=1, p=7.1912e-04, ks2stat=0.4103 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.2870e-02, \quad 2\% : 2.5797e-01, \quad 5\% : 2.5247e-02, \quad 9\% : 1.7835e-02$$

KStest2 and wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0121, ks2stat = 0.6364 \\ RStest : Conc1 : h = 1, p = 0.0104 \\ KStest2 : Conc2 : h = 0, p = 0.2270, ks2stat = 0.4167 \\ RStest : Conc2 : h = 0, p = 0.3734 \\ KStest2 : Conc3 : h = 1, p = 0.0452, ks2stat = 0.5500 \\ RStest : Conc3 : h = 1, p = 0.0192 \\ KStest2 : Conc4 : h = 1, p = 0.0289, ks2stat = 0.5682 \\ RStest : Conc4 : h = 1, p = 0.0074 \end{aligned}$$

1.7 Figure 2f

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 9.8312e-01
p-value for gender: 1.5572e-01
kstest2 results: h=1, p=2.5533e-05, ks2stat=0.4811 (overall gender difference)
Post-hoc analysis:

$$0.5\% : 7.9690e-02, \quad 2\% : 2.5673e-01, \quad 5\% : 1.4691e-01, \quad 9\% : 2.0322e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0067, ks2stat = 0.6591$$
$$RStest : Conc1 : h = 1, p = 0.0028, zval = -2.9850$$
$$KStest2 : Conc2 : h = 0, p = 0.2604, ks2stat = 0.3939$$
$$RStest : Conc2 : h = 0, p = 0.1029, zval = -1.6310$$
$$KStest2 : Conc3 : h = 1, p = 0.0323, ks2stat = 0.5606$$
$$RStest : Conc3 : h = 1, p = 0.0289, zval = -2.1849$$
$$KStest2 : Conc4 : h = 0, p = 0.0915, ks2stat = 0.4848$$
$$RStest : Conc4 : h = 0, p = 0.0905, zval = -1.6925$$

1.8 Figure 2f (With approach trials)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 0.0014948
p-value for gender: 0.4856
kstest2 results: h=0, p=6.2873e-02, ks2stat=0.2710 (overall gender difference)
Post-hoc analysis:

$$0.5\% : 5.8083e-02 \quad 2\% : 8.8005e-01, \quad 5\% : 5.5419e-01, \quad 9\% : 1.6653e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.1473, ks2stat = 0.4545$$
$$RStest : Conc1 : h = 0, p = 0.0878$$
$$KStest2 : Conc2 : h = 0, p = 0.4896, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.5310$$
$$KStest2 : Conc3 : h = 0, p = 0.2689, ks2stat = 0.4000$$
$$RStest : Conc3 : h = 0, p = 0.1985$$
$$KStest2 : Conc4 : h = 0, p = 0.0915, ks2stat = 0.4848$$
$$RStest : Conc4 : h = 0, p = 0.0905$$

1.9 Figure 2g

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 2.6239e-10.
p-value for gender: 1.7542e-03.
kstest2 results: h=1, p=3.0470e-05, ks2stat=0.4773 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.6629e-04, \quad 2\% : 2.5835e-03, \quad 5\% : 5.1037e-03, \quad 9\% : 6.0776e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0003, ks2stat = 0.8258$$
$$RStest : Conc1 : h = 1, p = 0.0006, zval = -3.4158$$
$$KStest2 : Conc2 : h = 1, p = 0.0059, ks2stat = 0.6667$$
$$RStest : Conc2 : h = 1, p = 0.0042, zval = -2.8619$$
$$KStest2 : Conc3 : h = 1, p = 0.0323, ks2stat = 0.5606$$
$$RStest : Conc3 : h = 1, p = 0.0106, zval = -2.5541$$
$$KStest2 : Conc4 : h = 0, p = 0.1213, ks2stat = 0.4621$$
$$RStest : Conc4 : h = 0, p = 0.1481, zval = -1.4463$$

1.10 Figure 2g (With approach trials)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 1.1834e-12.
p-value for gender: 0.21917.
kstest2 results: h=0, p=4.3505e-01, ks2stat=0.1793 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.9769e-01, \quad 2\% : 5.3803e-01, \quad 5\% : 4.1293e-01, \quad 9\% : 1.8367e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.3744, ks2stat = 0.3636$$
$$RStest : Conc1 : h = 0, p = 0.1486$$
$$KStest2 : Conc2 : h = 0, p = 0.8286, ks2stat = 0.2500$$
$$RStest : Conc2 : h = 0, p = 0.9212$$
$$KStest2 : Conc3 : h = 0, p = 0.4268, ks2stat = 0.3500$$
$$RStest : Conc3 : h = 0, p = 0.1985$$
$$KStest2 : Conc4 : h = 0, p = 0.1328, ks2stat = 0.4545$$
$$RStest : Conc4 : h = 0, p = 0.1661$$

1.11 Figure 2h

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 3.0392e-07.
p-value for gender: 2.3301e-01.
kstest2 results: h=0, p=3.3508e-01, ks2stat=0.1913 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 2.6980e-01, \quad 2\% : 7.5679e-01, \quad 5\% : 8.5789e-02, \quad 9\% : 3.0110e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.8067, ks2stat = 0.2500$$
$$RStest : Conc1 : h = 0, p = 0.4044, zval = 0.8338$$
$$KStest2 : Conc2 : h = 0, p = 0.9982, ks2stat = 0.1515$$
$$RStest : Conc2 : h = 0, p = 0.8292, zval = 0.2157$$
$$KStest2 : Conc3 : h = 0, p = 0.1006, ks2stat = 0.4773$$
$$RStest : Conc3 : h = 1, p = 0.0483, zval = 1.9743$$
$$KStest2 : Conc4 : h = 0, p = 0.4595, ks2stat = 0.3333$$
$$RStest : Conc4 : h = 0, p = 0.4219, zval = 0.8031$$

1.12 Figure 2h (With approach trials)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 11).
p-value for concentration: 0.00030532.
p-value for gender: 0.88032.
kstest2 results: h=0, p=7.5063e-01, ks2stat=0.1393 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 6.6119e-01, \quad 2\% : 4.6695e-01, \quad 5\% : 5.8985e-01, \quad 9\% : 6.5657e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.9852, ks2stat = 0.1818$$
$$RStest : Conc1 : h = 0, p = 0.8422$$
$$KStest2 : Conc2 : h = 0, p = 0.8848, ks2stat = 0.2333$$
$$RStest : Conc2 : h = 0, p = 0.3834$$
$$KStest2 : Conc3 : h = 0, p = 0.5564, ks2stat = 0.3167$$
$$RStest : Conc3 : h = 0, p = 0.4681$$
$$KStest2 : Conc4 : h = 0, p = 0.9610, ks2stat = 0.1970$$
$$RStest : Conc4 : h = 0, p = 0.5588$$

2 Figure 3

2.1 Figure 3e

Statistical significance was determined by one-way analysis of variance. (group 1 = 60, group 2 = 61, group 3 = 58, group 4 = 64, group 5 = 22, group 6 = 22, group 7 = 25, group 8 = 18)
p-value for significance of difference between the groups (utility): 0.0429.

Post-hoc analysis by Tukey's HSD method:

No group difference is statistically significant.

2.2 Figure 3f

Statistical significance was determined by one-way analysis of variance. (group 1 = 60, group 2 = 61, group 3 = 58, group 4 = 64)

p-value for significance of difference between the groups (concentration): 0.9599.

Post-hoc analysis by Tukey's HSD method:

No group difference is statistically significant.

2.3 Figure 3g

Statistical significance was determined by one-way analysis of variance. (group 1 = 22, group 2 = 22, group 3 = 25, group 4 = 18)
p-value for significance of difference between the groups (concentration): 0.5523.

Post-hoc analysis by Tukey's HSD method:

No group difference is statistically significant.

2.4 Figure 3h

Statistical significance was determined by one-way analysis of variance. (group 1 = 243, group 2 = 87)
p-value for significance of difference between the groups (concentration): 0.0012.

3 Figure 5

3.1 Figure 5a

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 1.0842e-55
p-value for BL vs FD: 8.0411e-05.
kstest2 results: h=1, p=1.0816e-02, ks2stat=0.2386 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 6.8154e-01, \quad 2\% : 5.2118e-01, \quad 5\% : 5.0500e-04, \quad 9\% : 4.8848e-03$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.1746, ks2stat = 0.3182 \\ RStest : Conc1 : h = 0, p = 0.3038, zval = 1.0283 \\ KStest2 : Conc2 : h = 0, p = 0.3320, ks2stat = 0.2727 \\ RStest : Conc2 : h = 0, p = 0.3820, zval = 0.8743 \\ KStest2 : Conc3 : h = 1, p = 0.0138, ks2stat = 0.4545 \\ RStest : Conc3 : h = 1, p = 0.0011, zval = -3.2659 \\ KStest2 : Conc4 : h = 1, p = 0.0000, ks2stat = 0.6818 \\ RStest : Conc4 : h = 1, p = 0.0003, zval = -3.6583 \end{aligned}$$

3.2 Figure 5b

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 12, FD N = 9).
p-value for concentration: 1.3979e-09
p-value for BL vs FD: 4.2358e-01.

kstest2 results: h=0, p=1.0000e+00, ks2stat=0.0556 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 4.2051e-01, \quad 2\% : 1.2090e-02, \quad 5\% : 8.9340e-01, \quad 9\% : 8.4742e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.7495, ks2stat = 0.2778 \\ RStest : Conc1 : h = 0, p = 0.5274 \\ KStest2 : Conc2 : h = 1, p = 0.0065, ks2stat = 0.6944 \\ RStest : Conc2 : h = 1, p = 0.0034 \\ KStest2 : Conc3 : h = 0, p = 0.1417, ks2stat = 0.4722 \\ RStest : Conc3 : h = 0, p = 0.5421 \\ KStest2 : Conc4 : h = 0, p = 0.1915, ks2stat = 0.4444 \\ RStest : Conc4 : h = 0, p = 0.2015 \end{aligned}$$

3.3 Figure 5c

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 6.3645e-10.
p-value for BL vs FD: 1.9462e-01.
kstest2 results: h=0, p=3.5436e-01, ks2stat=0.1435 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 1.0418e-02, \quad 2\% : 3.2611e-01, \quad 5\% : 7.3375e-01, \quad 9\% : 1.0336e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.0647, ks2stat = 0.4286 \\ RStest : Conc1 : h = 1, p = 0.0127, zval = -2.4921 \\ KStest2 : Conc2 : h = 1, p = 0.0395, ks2stat = 0.4286 \\ RStest : Conc2 : h = 0, p = 0.0883, zval = -1.7044 \\ KStest2 : Conc3 : h = 0, p = 0.7388, ks2stat = 0.1991 \\ RStest : Conc3 : h = 0, p = 0.6885, zval = 0.4009 \\ KStest2 : Conc4 : h = 0, p = 0.3320, ks2stat = 0.2727 \\ RStest : Conc4 : h = 0, p = 0.1625, zval = 1.3966 \end{aligned}$$

3.4 Figure 5d

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 2.8777e-07.
p-value for BL vs FD: 1.6989e-03
kstest2 results: h=1, p=7.5537e-08, ks2stat=0.4318 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 3.7073e-04, \quad 2\% : 7.5759e-04, \quad 5\% : 3.3233e-02, \quad 9\% : 1.3234e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0015, ks2stat = 0.5455$$
$$RStest : Conc1 : h = 1, p = 0.0008, zval = -3.3683$$
$$KStest2 : Conc2 : h = 1, p = 0.0356, ks2stat = 0.4091$$
$$RStest : Conc2 : h = 1, p = 0.0028, zval = -2.9928$$
$$KStest2 : Conc3 : h = 1, p = 0.0138, ks2stat = 0.4545$$
$$RStest : Conc3 : h = 1, p = 0.0151, zval = -2.4294$$
$$KStest2 : Conc4 : h = 1, p = 0.0356, ks2stat = 0.4091$$
$$RStest : Conc4 : h = 1, p = 0.0151, zval = -2.4294$$

3.5 Figure 5e

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 2.7791e-01.
p-value for BL vs FD: 4.3141e-02
kstest2 results: h=1, p=7.5537e-08, ks2stat=0.4318 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 3.9999e-02, \quad 2\% : 3.3272e-02, \quad 5\% : 5.5036e-02, \quad 9\% : 5.9155e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0001, ks2stat = 0.6364$$
$$RStest : Conc1 : h = 1, p = 0.0003, zval = 3.6265$$
$$KStest2 : Conc2 : h = 1, p = 0.0138, ks2stat = 0.4545$$
$$RStest : Conc2 : h = 1, p = 0.0028, zval = 2.9928$$
$$KStest2 : Conc3 : h = 0, p = 0.0828, ks2stat = 0.3636$$
$$RStest : Conc3 : h = 1, p = 0.0109, zval = 2.5468$$
$$KStest2 : Conc4 : h = 1, p = 0.0138, ks2stat = 0.4545$$
$$RStest : Conc4 : h = 1, p = 0.0032, zval = 2.9458$$

3.6 Figure 5f

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 6.6926e-20
p-value for BL vs FD: 2.4891e-02
kstest2 results: h=1, p=1.0816e-02, ks2stat=0.2386 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 7.3584e-04, \quad 2\% : 1.0250e-01, \quad 5\% : 2.0052e-01, \quad 9\% : 1.2278e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0015, ks2stat = 0.5455$$
$$RStest : Conc1 : h = 1, p = 0.0012, zval = 3.2275$$
$$KStest2 : Conc2 : h = 0, p = 0.0828, ks2stat = 0.3636$$
$$RStest : Conc2 : h = 0, p = 0.0689, zval = 1.8191$$
$$KStest2 : Conc3 : h = 0, p = 0.3320, ks2stat = 0.2727$$
$$RStest : Conc3 : h = 0, p = 0.4455, zval = 0.7629$$
$$KStest2 : Conc4 : h = 0, p = 0.1746, ks2stat = 0.3182$$
$$RStest : Conc4 : h = 0, p = 0.1424, zval = 1.4670$$

3.7 Figure 5g

Statistical significance was determined by Repeated measures analysis of variance. (BL N = 22, FD N = 22).
p-value for concentration: 8.1104e-22
p-value for BL vs FD: 1.2044e-01
kstest2 results: h=1, p=1.7572e-02, ks2stat=0.2273 (overall difference in BL vs FD)

Post-hoc analysis:

$$0.5\% : 5.6817e-03, \quad 2\% : 1.9624e-02, \quad 5\% : 5.4119e-01, \quad 9\% : 7.4789e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0049, ks2stat = 0.5000$$
$$RStest : Conc1 : h = 1, p = 0.0068, zval = -2.7047$$
$$KStest2 : Conc2 : h = 1, p = 0.0356, ks2stat = 0.4091$$
$$RStest : Conc2 : h = 1, p = 0.0186, zval = -2.3536$$
$$KStest2 : Conc3 : h = 0, p = 0.3320, ks2stat = 0.2727$$
$$RStest : Conc3 : h = 0, p = 0.2485, zval = 1.1541$$
$$KStest2 : Conc4 : h = 0, p = 0.3320, ks2stat = 0.2727$$
$$RStest : Conc4 : h = 0, p = 0.9156, zval = -0.1059$$

3.8 Figure 5i (Left)

Statistical significance was determined using **SPSS** software package (F = 12, M = 9)
p-value for gender: <0.001)
p-value for acceptance rate: 0.723

3.9 Figure 5i (Right)

Statistical significance was determined using **SPSS** software package (F = 12, M = 10)
p-value for gender: 0.873)
p-value for acceptance rate: 0.018

4 Figure 6

4.1 Figure 6b (Left)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).

p-value for concentration: 2.5457e-16.
p-value for gender: 4.7989e-01.
kstest2 results: h=0, p=8.0438e-01, ks2stat=0.1333 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 8.0114e-01, \quad 2\% : 8.8708e-01, \quad 5\% : 5.7254e-01, \quad 9\% : 5.0164e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.8848, ks2stat = 0.2333 \\ RStest : Conc1 : h = 0, p = 0.8621, zval = 0.1736 \\ KStest2 : Conc2 : h = 0, p = 1.0000, ks2stat = 0.1167 \\ RStest : Conc2 : h = 0, p = 1.0000, zval = -0.0000 \\ KStest2 : Conc3 : h = 0, p = 0.9304, ks2stat = 0.2167 \\ RStest : Conc3 : h = 0, p = 0.9467, zval = 0.0668 \\ KStest2 : Conc4 : h = 0, p = 0.8848, ks2stat = 0.2333 \\ RStest : Conc4 : h = 0, p = 1.0000, zval = -0.0000 \end{aligned}$$

4.2 Figure 6b (Right)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 10, Male N = 10).
p-value for concentration: 6.1134e-18.
p-value for gender: 2.4633e-02.
kstest2 results: h=0, p=3.6131e-01, ks2stat=0.2000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 8.8484e-01, \quad 2\% : 1.0123e-01, \quad 5\% : 7.5526e-02, \quad 9\% : 3.3494e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.9748, ks2stat = 0.2000 \\ RStest : Conc1 : h = 0, p = 0.5004, zval = 0.6739 \\ KStest2 : Conc2 : h = 0, p = 0.3129, ks2stat = 0.4000 \\ RStest : Conc2 : h = 0, p = 0.1315, zval = 1.5083 \\ KStest2 : Conc3 : h = 0, p = 0.6751, ks2stat = 0.3000 \\ RStest : Conc3 : h = 0, p = 0.1233, zval = 1.5411 \\ KStest2 : Conc4 : h = 0, p = 0.9748, ks2stat = 0.2000 \\ RStest : Conc4 : h = 0, p = 0.4201, zval = 0.8062 \end{aligned}$$

4.3 Figure 6c

After Alcohol Analysis: Statistical significance was determined by Repeated measures analysis of variance. (Female N = 10, Male N = 10).
p-value for concentration: 3.374e-25.
p-value for gender: 0.13625.
kstest2 results: h=0, p=1.0000e+00, ks2stat=0.0000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 8.1246e-01, \quad 2\% : 8.0739e-01, \quad 5\% : 1.3206e-01, \quad 9\% : 3.5295e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.1108, ks2stat = 0.5000$$
$$RStest : Conc1 : h = 0, p = 0.5648$$
$$KStest2 : Conc2 : h = 0, p = 0.1108, ks2stat = 0.5000$$
$$RStest : Conc2 : h = 0, p = 0.5648$$
$$KStest2 : Conc3 : h = 0, p = 0.1108, ks2stat = 0.5000$$
$$RStest : Conc3 : h = 0, p = 0.7882$$
$$KStest2 : Conc4 : h = 0, p = 0.1108, ks2stat = 0.5000$$
$$RStest : Conc4 : h = 0, p = 0.0713$$

Before and After Alcohol Analysis of Female: Statistical significance was determined by Repeated measures analysis of variance. (Before Alcohol N = 12, After Alcohol N = 10).
p-value for concentration: 6.4554e-17.
p-value for before and after alcohol: 0.11585.
kstest2 results: h=0, p=9.8992e-01, ks2stat=0.0917 (overall difference in before and after alcohol)

Post-hoc analysis:

$$0.5\% : 6.8311e-04, \quad 2\% : 3.1640e-03, \quad 5\% : 2.8801e-01, \quad 9\% : 1.8980e-05$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0017, ks2stat = 0.7500$$
$$RStest : Conc1 : h = 1, p = 0.0016$$
$$KStest2 : Conc2 : h = 1, p = 0.0076, ks2stat = 0.6667$$
$$RStest : Conc2 : h = 1, p = 0.0059$$
$$KStest2 : Conc3 : h = 1, p = 0.0282, ks2stat = 0.5833$$
$$RStest : Conc3 : h = 0, p = 0.0789$$
$$KStest2 : Conc4 : h = 1, p = 0.0001, ks2stat = 0.9167$$
$$RStest : Conc4 : h = 1, p = 0.0002$$

Before and After Alcohol Analysis of Male: Statistical significance was determined by Repeated measures analysis of variance. (Before Alcohol N = 12, After Alcohol N = 10).
p-value for concentration: 3.6982e-15.
p-value for before and after alcohol: 0.76845.
kstest2 results: h=0, p=1.0000e+00, ks2stat=0.0472 (overall difference in before and after alcohol)

Post-hoc analysis:

$$0.5\% : 1.1779e-01, \quad 2\% : 9.7611e-01, \quad 5\% : 6.6111e-01, \quad 9\% : 8.3969e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.1273, ks2stat = 0.5000$$
$$RStest : Conc1 : h = 0, p = 0.0884$$
$$KStest2 : Conc2 : h = 0, p = 0.5732, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.9681$$
$$KStest2 : Conc3 : h = 0, p = 0.2031, ks2stat = 0.4556$$
$$RStest : Conc3 : h = 0, p = 0.7785$$
$$KStest2 : Conc4 : h = 0, p = 0.0667, ks2stat = 0.5556$$
$$RStest : Conc4 : h = 0, p = 0.0762$$

4.4 Figure 6d (Left)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 5.4017e-02.
p-value for gender: 4.0729e-01.
kstest2 results: h=0, p=4.6263e-01, ks2stat=0.2016 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 7.1363e-01, \quad 2\% : 7.6787e-01, \quad 5\% : 7.5464e-02, \quad 9\% : 6.6465e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.2141, ks2stat = 0.5000 \\ RStest : Conc1 : h = 0, p = 0.3462 \\ KStest2 : Conc2 : h = 0, p = 0.3180, ks2stat = 0.5000 \\ RStest : Conc2 : h = 0, p = 0.3701 \\ KStest2 : Conc3 : h = 1, p = 0.0032, ks2stat = 0.7167 \\ RStest : Conc3 : h = 1, p = 0.0192 \\ KStest2 : Conc4 : h = 0, p = 0.2503, ks2stat = 0.4545 \\ RStest : Conc4 : h = 0, p = 0.5360 \end{aligned}$$

4.5 Figure 6d (Right)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 10, Male N = 10).
p-value for concentration: 3.8602e-01.
p-value for gender: 7.0494e-01.
kstest2 results: h=0, p=1.7336e-01, ks2stat=0.2745 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 5.2868e-01, \quad 2\% : 4.4209e-01, \quad 5\% : 5.2319e-01, \quad 9\% : 4.8906e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0204, ks2stat = 0.8000 \\ RStest : Conc1 : h = 1, p = 0.0303 \\ KStest2 : Conc2 : h = 0, p = 0.5070, ks2stat = 0.4250 \\ RStest : Conc2 : h = 0, p = 0.2844 \\ KStest2 : Conc3 : h = 0, p = 0.4892, ks2stat = 0.3556 \\ RStest : Conc3 : h = 0, p = 0.3562 \\ KStest2 : Conc4 : h = 0, p = 0.1076, ks2stat = 0.5417 \\ RStest : Conc4 : h = 1, p = 0.0274 \end{aligned}$$

4.6 Figure 6e

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 4.1083e-02.
p-value for gender: 8.2510e-01.
kstest2 results: h=0, p=7.7095e-01, ks2stat=0.2000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 8.0968e-01, \quad 2\% : 2.1173e-01, \quad 5\% : 4.2256e-01, \quad 9\% : 2.2622e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.6974, ks2stat = 0.4000 \\ RStest : Conc1 : h = 0, p = 0.6429 \\ KStest2 : Conc2 : h = 0, p = 0.2090, ks2stat = 0.6000 \\ RStest : Conc2 : h = 0, p = 0.2063 \\ KStest2 : Conc3 : h = 0, p = 0.6974, ks2stat = 0.4000 \\ RStest : Conc3 : h = 0, p = 0.6349 \\ KStest2 : Conc4 : h = 0, p = 0.6974, ks2stat = 0.4000 \\ RStest : Conc4 : h = 0, p = 0.3016 \end{aligned}$$

4.7 Figure 6f

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 8.1732e-01.
p-value for gender: 1.2629e-01.
kstest2 results: h=1, p=8.1617e-03, ks2stat=0.5000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 2.1755e-01, \quad 2\% : 9.1185e-02, \quad 5\% : 1.8516e-01, \quad 9\% : 9.4228e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.6974, ks2stat = 0.4000 \\ RStest : Conc1 : h = 0, p = 0.2222 \\ KStest2 : Conc2 : h = 1, p = 0.0361, ks2stat = 0.8000 \\ RStest : Conc2 : h = 1, p = 0.0317 \\ KStest2 : Conc3 : h = 0, p = 0.2090, ks2stat = 0.6000 \\ RStest : Conc3 : h = 0, p = 0.1508 \\ KStest2 : Conc4 : h = 0, p = 0.2090, ks2stat = 0.6000 \\ RStest : Conc4 : h = 0, p = 0.0952 \end{aligned}$$

4.8 Figure 6g

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 2.6307e-07.
p-value for gender: 6.6366e-01.
kstest2 results: h=0, p=6.2161e-01, ks2stat=0.2083 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 7.5735e-01, \quad 2\% : 3.7013e-01, \quad 5\% : 8.0930e-01, \quad 9\% : 6.4244e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc1 : h = 0, p = 1.0000$$
$$KStest2 : Conc2 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc2 : h = 0, p = 0.3095$$
$$KStest2 : Conc3 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc3 : h = 0, p = 0.8182$$
$$KStest2 : Conc4 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc4 : h = 0, p = 0.5887$$

4.9 Figure 6h

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 4.2378e-01.
p-value for gender: 3.0986e-01.
kstest2 results: h=1, p=9.3124e-04, ks2stat=0.5417 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 3.2581e-01, \quad 2\% : 3.9929e-01, \quad 5\% : 2.7256e-01, \quad 9\% : 2.6367e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.0766, ks2stat = 0.6667$$
$$RStest : Conc1 : h = 0, p = 0.1320$$
$$KStest2 : Conc2 : h = 1, p = 0.0122, ks2stat = 0.8333$$
$$RStest : Conc2 : h = 0, p = 0.0649$$
$$KStest2 : Conc3 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc3 : h = 0, p = 0.3095$$
$$KStest2 : Conc4 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc4 : h = 0, p = 0.2403$$

4.10 Figure 6k

Statistical significance was determined by one-way analysis of variance. (Female BL = 10, Male BL = 10, Female Oxy = 5, Male Oxy = 5, Female Incub = 6, Male Incub = 6, Female PA = 10, Male PA = 10)
p-value for significance of difference between the groups: 1.0469e-09.

Post-hoc analysis by Tukey's HSD method:

$$FemaleBLandMaleBL : 0.9981$$
$$FemaleBLandFemaleOxy : 6.5947e-06$$
$$FemaleBLandFemaleIncub : 0.0132$$
$$FemaleBLandFemalePA : 0.9993$$
$$MaleBLandMaleOxy : 4.0017e-06$$
$$MaleBLandMaleIncub : 3.3984e-04$$
$$MaleBLandMalePA : 0.3631$$

5 Supplemental Figure 1

5.1 Figure S.1i

statistical significance was determined by paired t-test using **SPSS** software package (F = 12, M = 11).
p-vale for gender difference: 0.01.

6 Supplemental Figure 2

6.1 Figure S.2a

Statistical significance was determined by one-way analysis of variance. (N = 5).
p-value for light level: 0.0011.

6.2 Figure S.2b

Statistical significance was determined by one-way analysis of variance. (N = 23).
p-value for light level: 0.0028.

7 Supplemental Figure 4

7.1 Figure S.4d

statistical significance was determined by chi-squared test using **SPSS** software package (F = 12, M = 11).
p-value for Sigmoidal and U-shape for initial 1-3 months: 0.016.
p-value for Sigmoidal and U-shape after a year: 0.0009.

8 Supplemental Figure 6

8.1 Figure S.6a

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 4.3911e-30.
p-value for gender: 1.5870e-01.
kstest2 results: h=0, p=9.3097e-01, ks2stat=0.1125 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 7.8880e-01, \quad 2\% : 2.2787e-01, \quad 5\% : 2.6929e-01, \quad 9\% : 7.6084e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.9636, ks2stat = 0.2000$$
$$RStest : Conc1 : h = 0, p = 0.5631$$
$$KStest2 : Conc2 : h = 0, p = 0.8286, ks2stat = 0.2500$$
$$RStest : Conc2 : h = 0, p = 0.2840$$
$$KStest2 : Conc3 : h = 0, p = 0.6961, ks2stat = 0.2833$$
$$RStest : Conc3 : h = 0, p = 0.2892$$
$$KStest2 : Conc4 : h = 0, p = 0.8848, ks2stat = 0.2333$$
$$RStest : Conc4 : h = 0, p = 0.8391$$

8.2 Figure S.6b

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 2.6791e-06.
p-value for gender: 1.6014e-04.
kstest2 results: h=1, p=1.3139e-08, ks2stat=0.6375 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 4.0070e-04, \quad 2\% : 1.4910e-05, \quad 5\% : 9.2678e-03, \quad 9\% : 2.5464e-03$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0076, ks2stat = 0.6667 \\ RStest : Conc1 : h = 1, p = 0.0033 \\ KStest2 : Conc2 : h = 1, p = 0.0001, ks2stat = 0.9167 \\ RStest : Conc2 : h = 1, p = 0.0003 \\ KStest2 : Conc3 : h = 0, p = 0.0567, ks2stat = 0.5333 \\ RStest : Conc3 : h = 1, p = 0.0229 \\ KStest2 : Conc4 : h = 1, p = 0.0076, ks2stat = 0.6667 \\ RStest : Conc4 : h = 1, p = 0.0051 \end{aligned}$$

8.3 Figure S.6c

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 1.1616e-02.
p-value for gender: 7. 3997e-03.
kstest2 results: h=1, p=1.8518e-05, ks2stat=0.5000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.8703e-02, \quad 2\% : 4.5455e-04, \quad 5\% : 2.3150e-01, \quad 9\% : 1.1937e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0076, ks2stat = 0.6667 \\ RStest : Conc1 : h = 1, p = 0.0111 \\ KStest2 : Conc2 : h = 1, p = 0.0003, ks2stat = 0.8333 \\ RStest : Conc2 : h = 1, p = 0.0014 \\ KStest2 : Conc3 : h = 0, p = 0.2270, ks2stat = 0.4167 \\ RStest : Conc3 : h = 0, p = 0.4098 \\ KStest2 : Conc4 : h = 1, p = 0.0452, ks2stat = 0.5500 \\ RStest : Conc4 : h = 1, p = 0.0092 \end{aligned}$$

8.4 Figure S.6d

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 7.6444e-13.
p-value for gender: 2.4455e-02.
kstest2 results: h=1, p=6.8336e-03, ks2stat=0.3500 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.1326e-02, \quad 2\% : 1.2677e-04, 5\% : 9.3261e-01, \quad 9\% : 1.6538e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 1, p = 0.0358, ks2stat = 0.5667 \\ RStest : Conc1 : h = 1, p = 0.0111 \\ KStest2 : Conc2 : h = 1, p = 0.0001, ks2stat = 0.9167 \\ RStest : Conc2 : h = 1, p = 0.0003 \\ KStest2 : Conc3 : h = 0, p = 0.9989, ks2stat = 0.1500 \\ RStest : Conc3 : h = 0, p = 0.9212 \\ KStest2 : Conc4 : h = 0, p = 0.5564, ks2stat = 0.3167 \\ RStest : Conc4 : h = 0, p = 0.2485 \end{aligned}$$

8.5 Figure S.6e

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 2.3011e-15.
p-value for gender: 3.8916e-01.
kstest2 results: h=0, p=2.6677e-01, ks2stat=0.2083 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 2.8309e-01, \quad 2\% : 1.3761e-02, \quad 5\% : 8.4288e-01, \quad 9\% : 5.6653e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$\begin{aligned} KStest2 : Conc1 : h = 0, p = 0.4896, ks2stat = 0.3333 \\ RStest : Conc1 : h = 0, p = 0.3891 \\ KStest2 : Conc2 : h = 0, p = 0.0567, ks2stat = 0.5333 \\ RStest : Conc2 : h = 1, p = 0.0149 \\ KStest2 : Conc3 : h = 0, p = 0.9636, ks2stat = 0.2000 \\ RStest : Conc3 : h = 0, p = 0.8940 \\ KStest2 : Conc4 : h = 0, p = 0.3689, ks2stat = 0.3667 \\ RStest : Conc4 : h = 0, p = 0.5716 \end{aligned}$$

9 Supplemental Figure 7

9.1 Figure S.7a (Left)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 1.4050e-01.
p-value for gender: 3.6754e-01.
kstest2 results: h=0, p=1.2139e-01, ks2stat=0.2458 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 7.7450e-01, \quad 2\% : 9.1269e-01, \quad 5\% : 3.6064e-03, \quad 9\% : 5.6181e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.9304, ks2stat = 0.2167$$
$$RStest : Conc1 : h = 0, p = 0.7667$$
$$KStest2 : Conc2 : h = 0, p = 0.8286, ks2stat = 0.2500$$
$$RStest : Conc2 : h = 0, p = 0.7667$$
$$KStest2 : Conc3 : h = 1, p = 0.0101, ks2stat = 0.6500$$
$$RStest : Conc3 : h = 1, p = 0.0111$$
$$KStest2 : Conc4 : h = 0, p = 0.1072, ks2stat = 0.4833$$
$$RStest : Conc4 : h = 0, p = 0.3734$$

9.2 Figure S.7a (Right)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 10, Male N = 10).
p-value for concentration: 6.8275e-01.
p-value for gender: 1.9427e-01.
kstest2 results: h=0, p=1.3925e-01, ks2stat=0.2500 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 4.4173e-01, \quad 2\% : 1.5443e-01, \quad 5\% : 4.3851e-01, \quad 9\% : 8.8666e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.3129, ks2stat = 0.4000$$
$$RStest : Conc1 : h = 0, p = 0.3075$$
$$KStest2 : Conc2 : h = 0, p = 0.6751, ks2stat = 0.3000$$
$$RStest : Conc2 : h = 0, p = 0.1620$$
$$KStest2 : Conc3 : h = 0, p = 0.6751, ks2stat = 0.3000$$
$$RStest : Conc3 : h = 0, p = 0.9698$$
$$KStest2 : Conc4 : h = 0, p = 0.1108, ks2stat = 0.5000$$
$$RStest : Conc4 : h = 0, p = 0.0890$$

9.3 Figure S.7b (Left)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 12, Male N = 10).
p-value for concentration: 7.3371e-02.
p-value for gender: 4.0968e-04.
kstest2 results: h=1, p=2.4759e-06, ks2stat=0.5417 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.2714e-02, \quad 2\% : 5.9126e-02, \quad 5\% : 8.5187e-04, \quad 9\% : 1.1225e-03$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0220, ks2stat = 0.6000$$
$$RStest : Conc1 : h = 1, p = 0.0092$$
$$KStest2 : Conc2 : h = 0, p = 0.0567, ks2stat = 0.5333$$
$$RStest : Conc2 : h = 0, p = 0.0806$$
$$KStest2 : Conc3 : h = 1, p = 0.0076, ks2stat = 0.6667$$
$$RStest : Conc3 : h = 1, p = 0.0022$$
$$KStest2 : Conc4 : h = 1, p = 0.0076, ks2stat = 0.6667$$
$$RStest : Conc4 : h = 1, p = 0.0041$$

9.4 Figure S.7b (Right)

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 10, Male N = 10).
p-value for concentration: 5.5161e-01.
p-value for gender: 4.4971e-02.
kstest2 results: h=1, p=1.0793e-02, ks2stat=0.3500 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 9.3255e-02, \quad 2\% : 8.9902e-02, \quad 5\% : 5.4953e-01, \quad 9\% : 6.7305e-03$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0310, ks2stat = 0.6000$$
$$RStest : Conc1 : h = 0, p = 0.0890$$
$$KStest2 : Conc2 : h = 0, p = 0.3129, ks2stat = 0.4000$$
$$RStest : Conc2 : h = 0, p = 0.1212$$
$$KStest2 : Conc3 : h = 0, p = 0.3129, ks2stat = 0.4000$$
$$RStest : Conc3 : h = 0, p = 0.6232$$
$$KStest2 : Conc4 : h = 1, p = 0.0069, ks2stat = 0.7000$$
$$RStest : Conc4 : h = 1, p = 0.0113$$

9.5 Figure S.7d

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 8.7784e-02.
p-value for gender: 3.1525e-02.
kstest2 results: h=1, p=2.3213e-02, ks2stat=0.4500 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 3.1246e-03, \quad 2\% : 5.8901e-01, \quad 5\% : 3.6169e-02, \quad 9\% : 9.2633e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 1, p = 0.0038, ks2stat = 1.0000$$
$$RStest : Conc1 : h = 1, p = 0.0079$$
$$KStest2 : Conc2 : h = 0, p = 0.9996, ks2stat = 0.2000$$
$$RStest : Conc2 : h = 0, p = 0.6905$$
$$KStest2 : Conc3 : h = 1, p = 0.0361, ks2stat = 0.8000$$
$$RStest : Conc3 : h = 0, p = 0.0556$$
$$KStest2 : Conc4 : h = 0, p = 0.6974, ks2stat = 0.4000$$
$$RStest : Conc4 : h = 0, p = 1.0000$$

9.6 Figure S.7e

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 6.8473e-01.
p-value for gender: 1.5292e-01.
kstest2 results: h=1, p=2.3213e-02, ks2stat=0.4500 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 3.2600e-01, \quad 2\% : 1.2515e-01, \quad 5\% : 3.5598e-01, \quad 9\% : 1.0995e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc1 : h = 0, p = 0.3095$$
$$KStest2 : Conc2 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc2 : h = 0, p = 0.2222$$
$$KStest2 : Conc3 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc3 : h = 0, p = 0.3968$$
$$KStest2 : Conc4 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc4 : h = 0, p = 0.2222$$

9.7 Figure S.7f

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 6.2169e-01.
p-value for gender: 8.7263e-02.
kstest2 results: h=1, p=8.1617e-03, ks2stat=0.5000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.9249e-01, \quad 2\% : 1.3288e-01, \quad 5\% : 5.9820e-02, \quad 9\% : 5.9578e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.6974, ks2stat = 0.4000$$
$$RStest : Conc1 : h = 0, p = 0.2222$$
$$KStest2 : Conc2 : h = 0, p = 0.6974, ks2stat = 0.4000$$
$$RStest : Conc2 : h = 0, p = 0.2222$$
$$KStest2 : Conc3 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc3 : h = 0, p = 0.0952$$
$$KStest2 : Conc4 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc4 : h = 0, p = 0.0952$$

9.8 Figure S.7g

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 5, Male N = 5).
p-value for concentration: 4.5703e-01.
p-value for gender: 6.3326e-02.
kstest2 results: h=1, p=7.2529e-04, ks2stat=0.6000 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 1.7344e-01, \quad 2\% : 9.6526e-02, \quad 5\% : 5.1225e-02, \quad 9\% : 4.6853e-02$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc1 : h = 0, p = 0.2222$$
$$KStest2 : Conc2 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc2 : h = 0, p = 0.0952$$
$$KStest2 : Conc3 : h = 1, p = 0.0361, ks2stat = 0.8000$$
$$RStest : Conc3 : h = 0, p = 0.0556$$
$$KStest2 : Conc4 : h = 0, p = 0.2090, ks2stat = 0.6000$$
$$RStest : Conc4 : h = 0, p = 0.0952$$

9.9 Figure S.7h

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 3.0232e-04.
p-value for gender: 4.9003e-01.
kstest2 results: h=0, p=8.6076e-01, ks2stat=0.1667 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 6.9253e-01, \quad 2\% : 6.3994e-01, \quad 5\% : 6.0961e-01, \quad 9\% : 7.4470e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc1 : h = 0, p = 0.5887$$
$$KStest2 : Conc2 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.6991$$
$$KStest2 : Conc3 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc3 : h = 0, p = 0.4848$$
$$KStest2 : Conc4 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc4 : h = 0, p = 0.8182$$

9.10 Figure S.7i

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 1.1029e-03.
p-value for gender: 3.4076e-01.
kstest2 results: h=0, p=5.0588e-02, ks2stat=0.3750 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 5.1260e-01, \quad 2\% : 3.1392e-01, \quad 5\% : 2.5092e-01, \quad 9\% : 3.6439e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 1.0000, ks2stat = 0.1667$$
$$RStest : Conc1 : h = 0, p = 0.8182$$
$$KStest2 : Conc2 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc2 : h = 0, p = 0.2403$$
$$KStest2 : Conc3 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc3 : h = 0, p = 0.1797$$
$$KStest2 : Conc4 : h = 1, p = 0.0122, ks2stat = 0.8333$$
$$RStest : Conc4 : h = 1, p = 0.0411$$

9.11 Figure S.7j

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 1.8477e-06.
p-value for gender: 3.2473e-01.
kstest2 results: h=0, p=2.1598e-01, ks2stat=0.2917 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 4.5320e-01, \quad 2\% : 4.5178e-01, \quad 5\% : 3.0428e-01, \quad 9\% : 2.1404e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc1 : h = 0, p = 0.4848$$
$$KStest2 : Conc2 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.4848$$
$$KStest2 : Conc3 : h = 0, p = 0.0766, ks2stat = 0.6667$$
$$RStest : Conc3 : h = 0, p = 0.3939$$
$$KStest2 : Conc4 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc4 : h = 0, p = 0.2403$$

9.12 Figure S.7k

Statistical significance was determined by Repeated measures analysis of variance. (Female N = 6, Male N = 6).
p-value for concentration: 5.9005e-04.
p-value for gender: 1.4048e-01.
kstest2 results: h=0, p=2.1598e-01, ks2stat=0.2917 (overall gender difference)

Post-hoc analysis:

$$0.5\% : 3.2825e-01, \quad 2\% : 4.1626e-01, \quad 5\% : 5.1375e-02, \quad 9\% : 3.6430e-01$$

KStest2 and Wilcoxon rank sum test Results (complementary to post-hoc analysis)

$$KStest2 : Conc1 : h = 0, p = 0.3180, ks2stat = 0.5000$$
$$RStest : Conc1 : h = 0, p = 0.3939$$
$$KStest2 : Conc2 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc2 : h = 0, p = 0.5887$$
$$KStest2 : Conc3 : h = 0, p = 0.0766, ks2stat = 0.6667$$
$$RStest : Conc3 : h = 0, p = 0.0649$$
$$KStest2 : Conc4 : h = 0, p = 0.8096, ks2stat = 0.3333$$
$$RStest : Conc4 : h = 0, p = 0.4848$$