**Supplemental Data and Analyses**

**Table S1**

*Response time and Accuracy by Problem in Experiment 1*

| Accuracy\* | RT | | SDN size | Number of different digits | Size | Problem |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | SD | Mean |  |  |  |  |  |
| 100 | 329.91 | 1338.72 | 26 | 2 | 4 | 2 x 2 = | 1 |
| 100 | 398.80 | 1380.18 | 26 | 2 | 4 | 2 x 2 = | 2 |
| 100 | 818.30 | 1884.01 | 31 | 3 | 6 | 2 x 3 = | 3 |
| 97.43 | 636.13 | 1764.69 | 31 | 3 | 6 | 3 x 2 = | 4 |
| 100 | 302.03 | 1698.52 | 29 | 3 | 8 | 2 x 4 = | 5 |
| 94.87 | 330.96 | 1644.52 | 29 | 3 | 8 | 4 x 2 = | 6 |
| 100 | 452.88 | 2026.04 | 28 | 4 | 10 | 2 x 5 = | 7 |
| 100 | 489.15 | 1729.07 | 28 | 4 | 10 | 5 x 2 = | 8 |
| 100 | 735.30 | 2135.04 | 30 | 3 | 12 | 2 x 6 = | 9 |
| 100 | 647.82 | 1791.33 | 30 | 3 | 12 | 6 x 2 = | 10 |
| 100 | 777.67 | 2084.63 | 32 | 4 | 14 | 2 x 7 = | 11 |
| 100 | 472.90 | 1763.55 | 32 | 4 | 14 | 7 x 2 = | 12 |
| 100 | 713.67 | 2130.22 | 31 | 4 | 16 | 2 x 8 = | 13 |
| 97.43 | 529.69 | 1972.54 | 31 | 4 | 16 | 8 x 2 = | 14 |
| 100 | 455.13 | 1910.92 | 32 | 4 | 18 | 2 x 9 = | 15 |
| 97.43 | 406.91 | 1768.45 | 32 | 4 | 18 | 9 x 2 = | 16 |
| 100 | 305.35 | 1519.34 | 17 | 2 | 9 | 3 x 3 = | 17 |
| 100 | 696.09 | 1837.33 | 17 | 2 | 9 | 3 x 3 = | 18 |
| 100 | 475.86 | 1716.21 | 34 | 4 | 12 | 3 x 4 = | 19 |
| 92.30 | 675.36 | 1952.66 | 34 | 4 | 12 | 4 x 3 = | 20 |
| 100 | 438.36 | 1747.05 | 26 | 3 | 15 | 3 x 5 = | 21 |
| 94.87 | 589.64 | 1945.92 | 26 | 3 | 15 | 5 x 3 = | 22 |
| 92.30 | 740.15 | 2452.89 | 30 | 4 | 18 | 3 x 6 = | 23 |
| 100 | 621.78 | 1953.22 | 30 | 4 | 18 | 6 x 3 = | 24 |
| 94.87 | 725.14 | 1899.06 | 30 | 4 | 21 | 3 x 7 = | 25 |
| 100 | 741.30 | 1937.54 | 30 | 4 | 21 | 7 x 3 = | 26 |
| 87.17 | 902.94 | 2520.6 | 35 | 4 | 24 | 3 x 8 = | 27 |
| 87.17 | 887.19 | 2516.74 | 35 | 4 | 24 | 8 x 3 = | 28 |
| 84.61 | 675.74 | 2488.47 | 31 | 4 | 27 | 3 x 9 = | 29 |
| 71.79 | 763.08 | 2564.51 | 31 | 4 | 27 | 9 x 3 = | 30 |
| 97.43 | 405.96 | 1944.63 | 30 | 3 | 16 | 4 x 4 = | 31 |
| 100 | 610.97 | 1962.03 | 30 | 3 | 16 | 4 x 4 = | 32 |
| 97.43 | 546.54 | 1931.64 | 30 | 4 | 20 | 4 x 5 = | 33 |
| 97.43 | 471.84 | 1969.37 | 30 | 4 | 20 | 5 x 4 = | 34 |
| 94.87 | 906.46 | 2493.79 | 31 | 3 | 24 | 4 x 6 = | 35 |
| 100 | 810.50 | 2191.93 | 31 | 3 | 24 | 6 x 4 = | 36 |
| 84.61 | 720.83 | 2579.95 | 31 | 4 | 28 | 4 x 7 = | 37 |
| 89.74 | 687.43 | 2506.85 | 31 | 4 | 28 | 7 x 4 = | 38 |
| 71.79 | 856.49 | 2708.93 | 35 | 4 | 32 | 4 x 8 = | 39 |
| 74.35 | 941.93 | 2813.27 | 35 | 4 | 32 | 8 x 4 = | 40 |
|  | SD | Mean |  |  |  |  |  |
| 84.61 | 842.92 | 2890.30 | 33 | 4 | 36 | 4 x 9 = | 41 |
| 71.79 | 867.74 | 3005.59 | 33 | 4 | 36 | 9 x 4 = | 42 |
| 100 | 616.61 | 2019.20 | 25 | 2 | 25 | 5 x 5 = | 43 |
| 100 | 434.02 | 1776.08 | 25 | 2 | 25 | 5 x 5 = | 44 |
| 92.30 | 818.91 | 2353.49 | 27 | 4 | 30 | 5 x 6 = | 45 |
| 97.43 | 736.04 | 2280.57 | 27 | 4 | 30 | 6 x 5 = | 46 |
| 84.61 | 713.15 | 2640.59 | 26 | 3 | 35 | 5 x 7 = | 47 |
| 97.43 | 917.24 | 2647.03 | 26 | 3 | 35 | 7 x 5 = | 48 |
| 92.30 | 757.49 | 2395.81 | 28 | 4 | 40 | 5 x 8 = | 49 |
| 92.30 | 740.41 | 2252.21 | 28 | 4 | 40 | 8 x 5 = | 50 |
| 97.43 | 855.55 | 2713.91 | 29 | 3 | 45 | 5 x 9 = | 51 |
| 94.87 | 894.08 | 2596.45 | 29 | 3 | 45 | 9 x 5 = | 52 |
| 97.43 | 624.45 | 2309.89 | 22 | 2 | 36 | 6 x 6 = | 53 |
| 92.30 | 591.70 | 2129.82 | 22 | 2 | 36 | 6 x 6 = | 54 |
| 66.6 7 | 1936.79 | 3114.46 | 32 | 4 | 42 | 6 x 7 = | 55 |
| 61.53 | 904.46 | 2602.23 | 32 | 4 | 42 | 7 x 6 = | 56 |
| 66.6 7 | 1028.88 | 2729.84 | 28 | 3 | 48 | 6 x 8 = | 57 |
| 61.53 | 3494.80 | 3515.72 | 28 | 3 | 48 | 8 x 6 = | 58 |
| 56.41 | 2241.52 | 3923.83 | 34 | 4 | 54 | 6 x 9 = | 59 |
| 76.92 | 867.66 | 2993.33 | 34 | 4 | 54 | 9 x 6 = | 60 |
| 87.17 | 666.31 | 2293.73 | 26 | 3 | 49 | 7 x 7 = | 61 |
| 94.87 | 815.06 | 2421.77 | 26 | 3 | 49 | 7 x 7 = | 62 |
| 58.97 | 989.05 | 2710.11 | 31 | 4 | 56 | 7 x 8 = | 63 |
| 69.23 | 944.04 | 2562.65 | 31 | 4 | 56 | 8 x 7 = | 64 |
| 66.6 7 | 987.18 | 3353.03 | 29 | 4 | 63 | 7 x 9 = | 65 |
| 66.6 7 | 1017.94 | 3013.55 | 29 | 4 | 63 | 9 x 7 = | 66 |
| 82.05 | 514.53 | 2225.07 | 28 | 3 | 64 | 8 x 8 = | 67 |
| 76.92 | 852.46 | 2463.80 | 28 | 3 | 64 | 8 x 8 = | 68 |
| 76.92 | 2682.05 | 3634.37 | 31 | 4 | 72 | 8 x 9 = | 69 |
| 58.97 | 669.53 | 2486.66 | 31 | 4 | 72 | 9 x 8 = | 70 |
| 94.87 | 508.27 | 2059.73 | 26 | 3 | 81 | 9 x 9 = | 71 |
| 94.87 | 568.78 | 2047.27 | 26 | 3 | 81 | 9 x 9 = | 72 |

**\***Percent of participants correctly solving the problem**.**

**Table S2**

*Response Time and Accuracy by the Number of Different Digits, Five and Tie Problems in Experiment 1*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RT | | Accuracy  (percent correct) | |
|  | Mean | SD | Mean | SD |
| Two different digits | 1784.66 | 293.73 | 98.71 | 3.79 |
| Three different digits | 2215.14 | 406.01 | 92.52 | 7.96 |
| Four different digits | 2392.42 | 387.8 | 85.25 | 10.09 |
| Five problems | 2189.03 | 330.12 | 96.15 | 4.05 |
| Tie problems | 1983.04 | 333.35 | 94.87 | 6.84 |

**Supplemental Analyses of the Five and Tie effects in Experiment 1 data**

To look for the five and tie effects, we calculated the mean RT and the mean accuracy rate for five, non-five, tie, and non-tie problems for each participant. Repeated measures ANOVAs showed that participants solved five-problems more quickly, F (1, 38) = 6.71, MSE = 20297.01, p = .014, partial η2 = .15, and more accurately, F (1, 38) = 37.37, MSE = 43.32, p < .001, partial η2 = .49, than non-five problems. In addition, participants solved tie-problems more quickly, F (1, 38) = 95.33, MSE = 27142.44, p < .001, partial η2 = .71, and more accurately, F (1, 38) = 27.83, MSE = 39.03, p < .001, partial η2 = .42, than non-tie problems. These results show that our data replicated the typical five and tie effects.