## Appendix A: Summary of Experimental Conditions

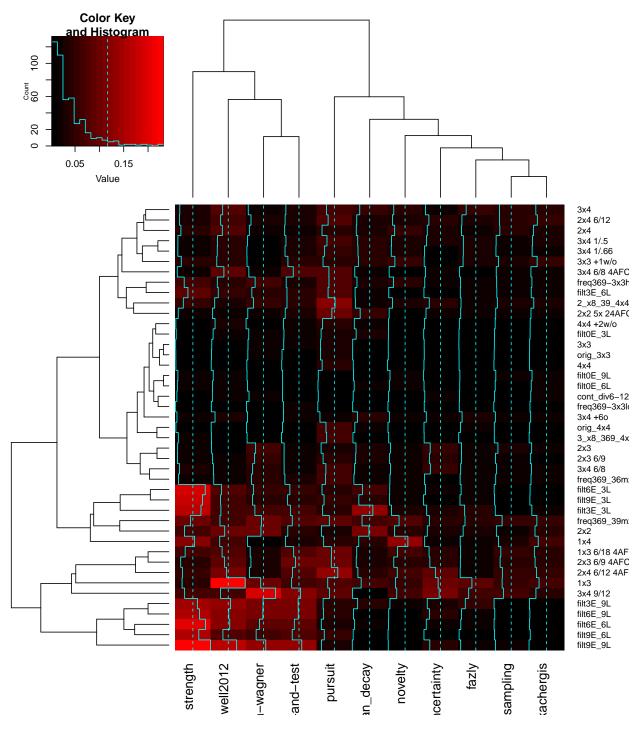
Table 1 describes the 44 experimental conditions included in the model comparison, including the number of trials, the number of words presented per trial (Words/Trial), the number of referents presented per trial (Objects/Trial), the number of to-be-learned word-referent pairs (Items), people's overall mean accuracy (p(o|w) across all intended w-o mappings) in each condition (Accuracy), the standard deviation of performance (SD), and the number of participants per condition (N).

## Appendix B: Clustering experiments and models by misfit

The table below shows cross-validated model fit (SSE; sum of squared error) for each experimental condition.

3x4     36     3     4     18     0.19     0.12     25       3x4 1/.66     36     3     4     18     0.22     0.11     25       3x4 1/.66     36     3     4     18     0.27     0.12     20       2x4     54     2     4     18     0.30     0.15     33       3x3 + 1w/o     54     3     3     18     0.17     0.08     39       1x3 6/18 4AFC     54     4     4     18     0.10     0.05     39       1x3 6/18 4AFC     108     1     3     18     0.67     0.10     43       2x3 6/9 4AFC     54     2     3     18     0.67     0.10     43       2x4 6/12 4AFC     54     2     4     18     0.69     0.09     36       1x3     108     1     3     18     0.74     0.11     23       2x4 6/12     54     2     3     18     0.59     0.09	Condition Name	Trials	Words/Trial	Objects/Trial	Items	Accuracy	SD	N
3x4 1/.5     36     3     4     18     0.22     0.11     25       3x4 1/.66     36     3     4     18     0.21     0.09     25       2x4     54     2     4     18     0.27     0.12     20       2x4     54     2     4     18     0.30     0.15     33       3x3 +1w/o     54     4     4     18     0.17     0.08     39       4x4 +2w/o     54     4     4     18     0.10     0.05     39       1x3 6/9 4AFC     108     1     3     18     0.69     0.11     38       2x4 6/12 4AFC     54     2     3     18     0.69     0.11     38       1x3     108     1     3     18     0.69     0.11     38       2x4 6/12 54     2     4     18     0.69     0.09     36       1x3     18     0.55     0.07     23     3     18     0.55     0.07<		36	,	· /	18		0.12	25
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$3x4 \ 1/.5$	36		4	18	0.22	0.11	25
3x4 + 6o     36     3     4     18     0.27     0.12     20       2x4     54     2     4     18     0.30     0.15     33       3x3 + 1 lw/o     54     3     3     18     0.17     0.08     39       4x4 + 2w/o     54     4     4     18     0.10     0.05     39       1x3 6/18 4AFC     108     1     3     18     0.67     0.10     43       2x3 6/9 4AFC     54     2     3     18     0.69     0.11     38       2x4 6/12 4AFC     54     2     4     18     0.69     0.09     36       1x3     108     1     3     18     0.67     0.11     23       2x4 6/12     54     2     3     18     0.55     0.07     23       2x4 6/12     54     2     3     18     0.55     0.07     23       2x4 6/12     54     2     3     18     0.55     0.01	'							
2x4     54     2     4     18     0.30     0.15     33       3x3 + 1w/o     54     3     3     18     0.17     0.08     39       1x3 6/18 4AFC     108     1     3     18     0.10     0.05     39       1x3 6/18 4AFC     108     1     3     18     0.67     0.10     43       2x4 6/12 4AFC     54     2     3     18     0.69     0.11     38       2x4 6/12 4AFC     54     2     4     18     0.62     0.12     31       3x4 6/8 4AFC     36     3     4     18     0.62     0.12     31       2x3     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     3     18     0.55     0.01     13       3x4 6/8     36     3     4     18     0.43     0.08	•	36		4	18	0.27	0.12	20
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		54		4	18	0.30	0.15	33
1x3 6/18 4AFC	3x3 + 1w/o	54	3	3	18	0.17	0.08	39
1x3 6/18 4AFC		54	4	4	18	0.10	0.05	39
2x4 6/12 4AFC     54     2     4     18     0.62     0.12     31       3x4 6/8 4AFC     36     3     4     18     0.69     0.09     36       1x3     108     1     3     18     0.74     0.11     23       2x3     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     4     18     0.33     0.18     14       3x4 6/8     36     3     4     18     0.42     0.14     13       2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.69     0.08     33       1x4     108     1     3     18     0.43     0.09     0.12     40       4x4     27     4     4     18     0.31     0.07 <t< td=""><td></td><td>108</td><td>1</td><td>3</td><td>18</td><td>0.67</td><td>0.10</td><td>43</td></t<>		108	1	3	18	0.67	0.10	43
3x4 6/8 4AFC     36     3     4     18     0.69     0.09     36       1x3     108     1     3     18     0.74     0.11     23       2x3     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     4     18     0.33     0.18     14       3x4 6/8     36     3     4     18     0.42     0.14     13       2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.49     0.08     33       1x4     18     0.19     0.10     40     44     18     0.19     0.10     40       4x4     27     4     4     18     0.31     0.02 </td <td>2x3 6/9 4AFC</td> <td>54</td> <td>2</td> <td>3</td> <td>18</td> <td>0.69</td> <td>0.11</td> <td>38</td>	2x3 6/9 4AFC	54	2	3	18	0.69	0.11	38
1x3     108     1     3     18     0.74     0.11     23       2x3     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     4     18     0.42     0.14     13       3x4 6/8     36     3     4     18     0.42     0.14     13       2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.39     0.12     40       4x4     27     4     4     18     0.31     0.07     77       3x3     36     3     3     18     0.43     0.08     36       2x2     5x     24     2     2     18     0.79     0.11     19	2x4 6/12 4AFC	54	2	4	18	0.62	0.12	31
1x3     108     1     3     18     0.74     0.11     23       2x3     54     2     3     18     0.58     0.07     23       2x4 6/12     54     2     4     18     0.33     0.18     14       3x4 6/8     36     3     4     18     0.42     0.14     13       2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.39     0.12     40       4x4     27     4     4     18     0.31     0.07     77       3x3     36     3     3     18     0.43     0.08     36       2x2     54     2     2     18     0.79     0.11     19	3x46/84AFC	36	3	4	18	0.69	0.09	36
2x4 6/12     54     2     4     18     0.33     0.18     14       3x4 6/8     36     3     4     18     0.42     0.14     13       2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.39     0.12     40       4x4     27     4     4     18     0.31     0.07     77       3x3     36     3     3     18     0.43     0.08     36       2x2     54     2     2     18     0.79     0.11     19       2x2 5x 24AFC     60     2     2     2     4     0.51     0.12     46       filt3E_3L     18     2     2     12     0.72     0.12     30	•	108	1	3	18	0.74	0.11	23
3x4 6/8   36   3   4   18   0.42   0.14   13     2x3 6/9   54   2   3   18   0.55   0.11   32     3x4 9/12   54   3   4   18   0.69   0.08   33     1x4   108   1   4   18   0.19   0.10   40     1x3   108   1   3   18   0.39   0.12   40     4x4   27   4   4   18   0.31   0.07   77     3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   18   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.70   0.08   31	2x3	54	2	3	18	0.58	0.07	23
2x3 6/9     54     2     3     18     0.55     0.11     32       3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.39     0.12     40       4x4     27     4     4     18     0.31     0.07     77       3x3     36     3     3     18     0.43     0.08     36       2x2     54     2     2     18     0.79     0.11     19       2x2 5x 24AFC     60     2     2     24     0.51     0.12     46       filt0E_3L     18     2     2     12     0.38     0.09     31       filt3E_3L     18     2     2     12     0.72     0.12     30       filt6E_3L     36     2     2     12     0.71     0.09     31	2x4 6/12	54	2	4	18	0.33	0.18	14
3x4 9/12   54   3   4   18   0.69   0.08   33     1x4   108   1   4   18   0.19   0.10   40     1x3   108   1   3   18   0.39   0.12   40     4x4   27   4   4   18   0.31   0.07   77     3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   18   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.70   0.08   31 </td <td>3x46/8</td> <td>36</td> <td>3</td> <td>4</td> <td>18</td> <td>0.42</td> <td>0.14</td> <td>13</td>	3x46/8	36	3	4	18	0.42	0.14	13
3x4 9/12     54     3     4     18     0.69     0.08     33       1x4     108     1     4     18     0.19     0.10     40       1x3     108     1     3     18     0.39     0.12     40       4x4     27     4     4     18     0.31     0.07     77       3x3     36     3     3     18     0.43     0.08     36       2x2     54     2     2     18     0.79     0.11     19       2x2 5x 24AFC     60     2     2     24     0.51     0.12     46       filt0E_3L     18     2     2     12     0.38     0.09     31       filt3E_3L     18     2     2     12     0.72     0.12     30       filt6E_3L     18     2     2     12     0.71     0.09     31       filt9E_3L     45     2     2     12     0.70     0.08     31	2x3 6/9	54	2	3	18	0.55	0.11	32
1x4   108   1   4   18   0.19   0.10   40     1x3   108   1   3   18   0.39   0.12   40     4x4   27   4   4   18   0.31   0.07   77     3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   18   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_6L   36   2   2   12   0.77   0.08   31     filt6E_6L   54   2   2   12   0.67   0.11   27 <	'	54		4	18	0.69	0.08	33
4x4   27   4   4   18   0.31   0.07   77     3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   27   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.70   0.08   31     filt6E_6L   45   2   2   12   0.67   0.11   27     filt6E_9L   54   2   2   12   0.75   0.09   27<	•	108	1	4	18	0.19	0.10	40
3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   27   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt9E_9L   54   2   2   12   0.54   0.09   <	1x3	108	1	3	18	0.39	0.12	40
3x3   36   3   3   18   0.43   0.08   36     2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   27   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   <	4x4	27	4	4	18	0.31	0.07	
2x2   54   2   2   18   0.79   0.11   19     2x2 5x 24AFC   60   2   2   24   0.51   0.12   46     filt0E_3L   18   2   2   12   0.38   0.09   31     filt3E_3L   27   2   2   12   0.72   0.12   30     filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.71   0.09   30     filt9E_6L   36   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08	3x3	36	3	3		0.43	0.08	
2x2 5x 24AFC 60 2 2 24 0.51 0.12 46   filt0E_3L 18 2 2 12 0.38 0.09 31   filt3E_3L 27 2 2 12 0.72 0.12 30   filt6E_3L 36 2 2 12 0.71 0.09 30   filt9E_3L 45 2 2 12 0.70 0.08 31   filt0E_6L 36 2 2 12 0.47 0.11 27   filt3E_6L 45 2 2 12 0.67 0.11 27   filt6E_6L 54 2 2 12 0.67 0.11 27   filt6E_6L 54 2 2 12 0.79 0.09 27   filt0E_9L 63 2 2 12 0.54 0.09 31   filt3E_9L 63 2 2 12 0.83 0.08 31   filt6E_9L 72 2 2 12 0.82 0.09 31   filt9E_9L 81 2 2 12 0.86 0.06 31   2_x8_39_4x4 27 4	2x2	54	2		18	0.79	0.11	19
filtoE_3L     18     2     2     12     0.38     0.09     31       filt3E_3L     27     2     2     12     0.72     0.12     30       filt6E_3L     36     2     2     12     0.71     0.09     30       filt9E_3L     45     2     2     12     0.70     0.08     31       filt0E_6L     36     2     2     12     0.70     0.08     31       filt0E_6L     36     2     2     12     0.47     0.11     27       filt6E_6L     45     2     2     12     0.67     0.11     27       filt6E_6L     54     2     2     12     0.79     0.09     27       filt9E_6L     63     2     2     12     0.75     0.09     27       filt0E_9L     54     2     2     12     0.54     0.09     31       filt3E_9L     63     2     2     12     0.83     0.08	2x2 5x 24AFC	60			24	0.51	0.12	46
filt6E_3L   36   2   2   12   0.71   0.09   30     filt9E_3L   45   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.79   0.09   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_3x3loCD   36   3   3   18   0.33 <td< td=""><td><math>filt0E\_3L</math></td><td>18</td><td>2</td><td>2</td><td>12</td><td>0.38</td><td>0.09</td><td>31</td></td<>	$filt0E\_3L$	18	2	2	12	0.38	0.09	31
filt9E_3L   45   2   2   12   0.70   0.08   31     filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.79   0.09   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.08   102     freq369_3x3hiCD   36   3   3   18   0.45	$filt3E\_3L$	27	2	2	12	0.72	0.12	30
filtoE_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.79   0.09   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369_3x3hiCD   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62	$filt6E\_3L$	36	2	2	12	0.71	0.09	30
filt0E_6L   36   2   2   12   0.47   0.11   27     filt3E_6L   45   2   2   12   0.67   0.11   27     filt6E_6L   54   2   2   12   0.79   0.09   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369_3x3hiCD   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.45	filt9E 3L	45	2	2	12	0.70	0.08	31
filt6E_6L   54   2   2   12   0.79   0.09   27     filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3liCD   36   3   3   18   0.33   0.08   102     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27	$filt0E\_6L$	36	2	2	12	0.47	0.11	27
filt9E_6L   63   2   2   12   0.75   0.09   27     filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   3   18   0.33   0.08   102     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$filt3E\_6L$	45	2	2	12	0.67	0.11	27
filt0E_9L   54   2   2   12   0.54   0.09   31     filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   3   18   0.33   0.08   102     freq369-3s3hiCD   36   3   3   18   0.56   0.12   26     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$\mathrm{filt}6\mathrm{E}\_6\mathrm{L}$	54	2	2	12	0.79	0.09	27
filt3E_9L   63   2   2   12   0.83   0.08   31     filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   3   18   0.33   0.08   102     freq369-3x3hiCD   36   3   3   18   0.56   0.12   26     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$filt9E\_6L$	63	2	2	12	0.75	0.09	27
filt6E_9L   72   2   2   12   0.82   0.09   31     filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   3   18   0.33   0.08   102     freq369-3x3hiCD   36   3   3   18   0.56   0.12   26     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$filt0E\_9L$	54	2	2	12	0.54	0.09	31
filt9E_9L 81 2 2 12 0.86 0.06 31   2_x8_39_4x4 27 4 4 18 0.41 0.16 30   3_x8_369_4x4 27 4 4 18 0.33 0.06 74   freq369-3x3loCD 36 3 18 0.33 0.08 102   freq369-3x3hiCD 36 3 18 0.56 0.12 26   freq369_36mx 36 3 18 0.45 0.16 62   freq369_39mx 36 3 18 0.62 0.14 66   orig_4x4 27 4 4 18 0.27 0.07 88	$filt3E\_9L$	63	2	2	12	0.83	0.08	31
filt9E_9L   81   2   2   12   0.86   0.06   31     2_x8_39_4x4   27   4   4   18   0.41   0.16   30     3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   3   18   0.33   0.08   102     freq369-3x3hiCD   36   3   3   18   0.56   0.12   26     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$filt6E\_9L$	72	2	2	12	0.82	0.09	31
3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   18   0.33   0.08   102     freq369-3x3hiCD   36   3   18   0.56   0.12   26     freq369_36mx   36   3   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	$filt9E\_9L$	81	2		12	0.86	0.06	31
3_x8_369_4x4   27   4   4   18   0.33   0.06   74     freq369-3x3loCD   36   3   18   0.33   0.08   102     freq369-3x3hiCD   36   3   18   0.56   0.12   26     freq369_36mx   36   3   18   0.45   0.16   62     freq369_39mx   36   3   3   18   0.62   0.14   66     orig_4x4   27   4   4   18   0.27   0.07   88	2_x8_39_4x4	27	4	4	18	0.41	0.16	30
freq369-3x3hiCD 36 3 18 0.56 0.12 26   freq369_36mx 36 3 18 0.45 0.16 62   freq369_39mx 36 3 18 0.62 0.14 66   orig_4x4 27 4 4 18 0.27 0.07 88		27	4	4	18	0.33	0.06	74
freq369-3x3hiCD 36 3 18 0.56 0.12 26   freq369_36mx 36 3 18 0.45 0.16 62   freq369_39mx 36 3 18 0.62 0.14 66   orig_4x4 27 4 4 18 0.27 0.07 88		36	3	3				102
freq369_36mx 36 3 3 18 0.45 0.16 62   freq369_39mx 36 3 3 18 0.62 0.14 66   orig_4x4 27 4 4 18 0.27 0.07 88	•							
freq369_39mx 36 3 3 18 0.62 0.14 66 orig_4x4 27 4 4 18 0.27 0.07 88								
orig_4x4 27 4 4 18 0.27 0.07 88	$freq369\_39mx$							
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cont_div6-12								

Table 1: Summary of modeled datasets.



Takeaways: Some experimental conditions are hard for particular models to fit. For example, the strength-biased model has particular difficulty with the filt conditions<sup>1</sup> (Kachergis et al., 2012), which present a group of word-referent pairs early in training which then systematically co-occur with particular novel late-stage word-referent pairs, testing how strictly learners will maintain a mutual exclusivity (ME) constraint. The Trueswell2012 model also shows greater misfit in most of these conditions (except for the filtXE\_3L conditions, which have only 3 repetitions of the late-stage pairings, and thus do not overwhelm learners' ME bias).

 $<sup>^1\</sup>mathrm{Except}$  for the  $\mathtt{filt0E}$ \_ conditions, which consist only of the late-stage pairs, with no early stage.

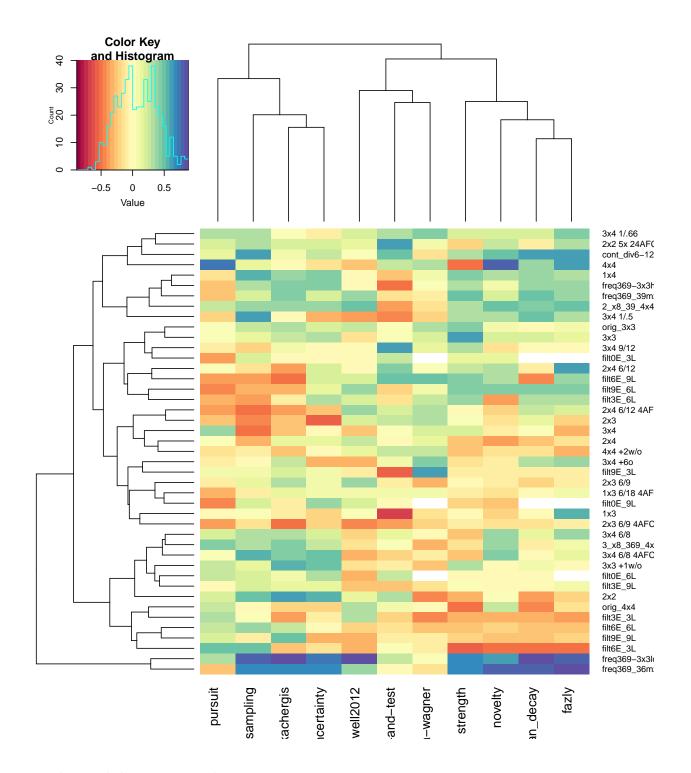
On the other hand, many experimental conditions are nearly equally well fit by all models, especially those that have a fixed number of repetitions per word-referent pair (e.g., 3x3, 4x4, )

#### Other ideas:

- Find experiment with maximal discrimination between the models? (highest SD of fit?)
- Find experiment that each model best predicts? and worst predicts?

# Correlation of model predictions with item perforance per condition

Each cell displays the correlation coefficient of model vs. human item-level performance in a given experimental condition.



### Each Model's Best- and Worst-Fitting Experiment

Which experiments are models best fitting?

### Best and worst fitting models per experiment

(Could order conditions by how much they discriminate models?)

Model	best	worst	best_cond	worst_cond
Bayesian_decay	0.88	-0.53	freq369-3x3loCD	$filt6E\_3L$
fazly	0.88	-0.52	$freq369\_36mx$	$filt6E\_3L$
kachergis	0.84	-0.52	freq369-3x3loCD	2x3 6/9 4AFC
trueswell 2012	0.84	-0.43	freq369-3x3loCD	2x3 6/9 4AFC
novelty	0.78	-0.52	$freq369\_36mx$	$filt6E\_3L$
kachergis_sampling	0.78	-0.52	freq369-3x3loCD	3x4
uncertainty	0.76	-0.56	freq369-3x3loCD	2x3
pursuit	0.72	-0.44	4x4	$filt0E\_9L$
strength	0.69	-0.53	freq369-3x3loCD	$filt6E\_3L$
guess-and-test	0.62	-0.70	2x2 5x 24AFC	1x3
rescorla-wagner	0.61	-0.46	filt9E_3L	2x2

Table 2: Each model's best- and worst-fitting experiment.

Model	$best\_fits$	$worst\_fits$
Bayesian_decay	3	1
fazly	6	1
guess-and-test	4	7
kachergis	4	3
kachergis_sampling	5	3
novelty	1	2
pursuit	4	6
rescorla-wagner	4	8
strength	4	5
trueswell 2012	5	4
uncertainty	3	3

Table 3: Number of experiments that each model fits best, and worst.