Appendix A: Summary of Experimental Conditions

The table below 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).

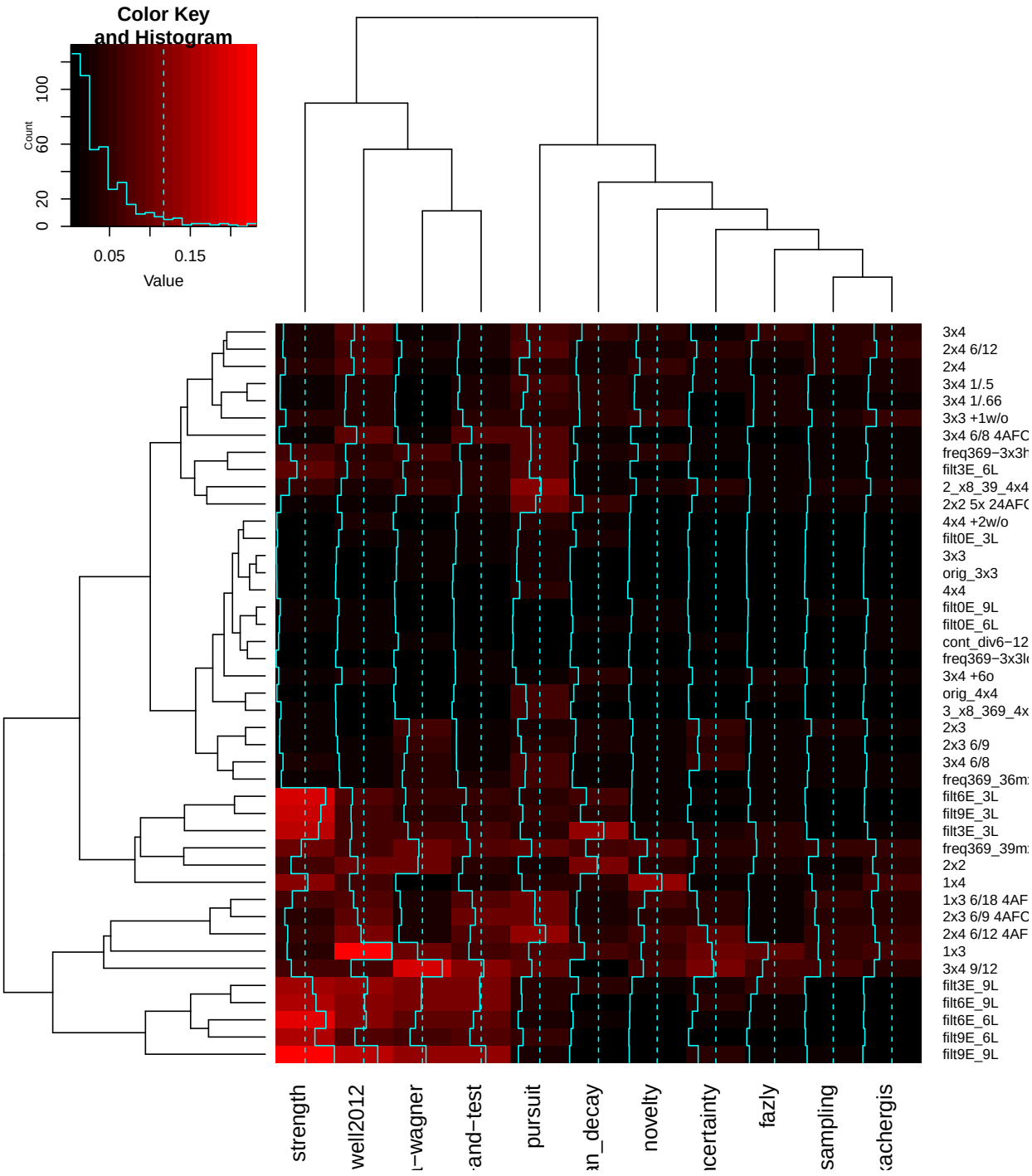
Appendix B: Clustering experiments and models by misfit

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

Model fit x Experiment table? maybe clustered. . . ? (to show most similar models, and most similar experiments?)

Condition Name	Trials	Words/Trial	Objects/Trial	Items	Accuracy	SD	N
3x4	36	3	4	18	0.19	0.12	25
3x4 1/.5	36	3	4	18	0.22	0.11	25
3x4 1/.66	36	3	4	18	0.21	0.09	25
3x4 +6o	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
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	0.62	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	0.19	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	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	0.79	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
freq369-3x3loCD	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
orig_3x3	36	3	3	18	0.43	0.08	104
cont_div6-12	36	3	3	18	0.43	0.11	40

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[1] (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).

[1]Except for the `filtOE_` conditions, which consist only of the late-stage pairs, with no early stage.

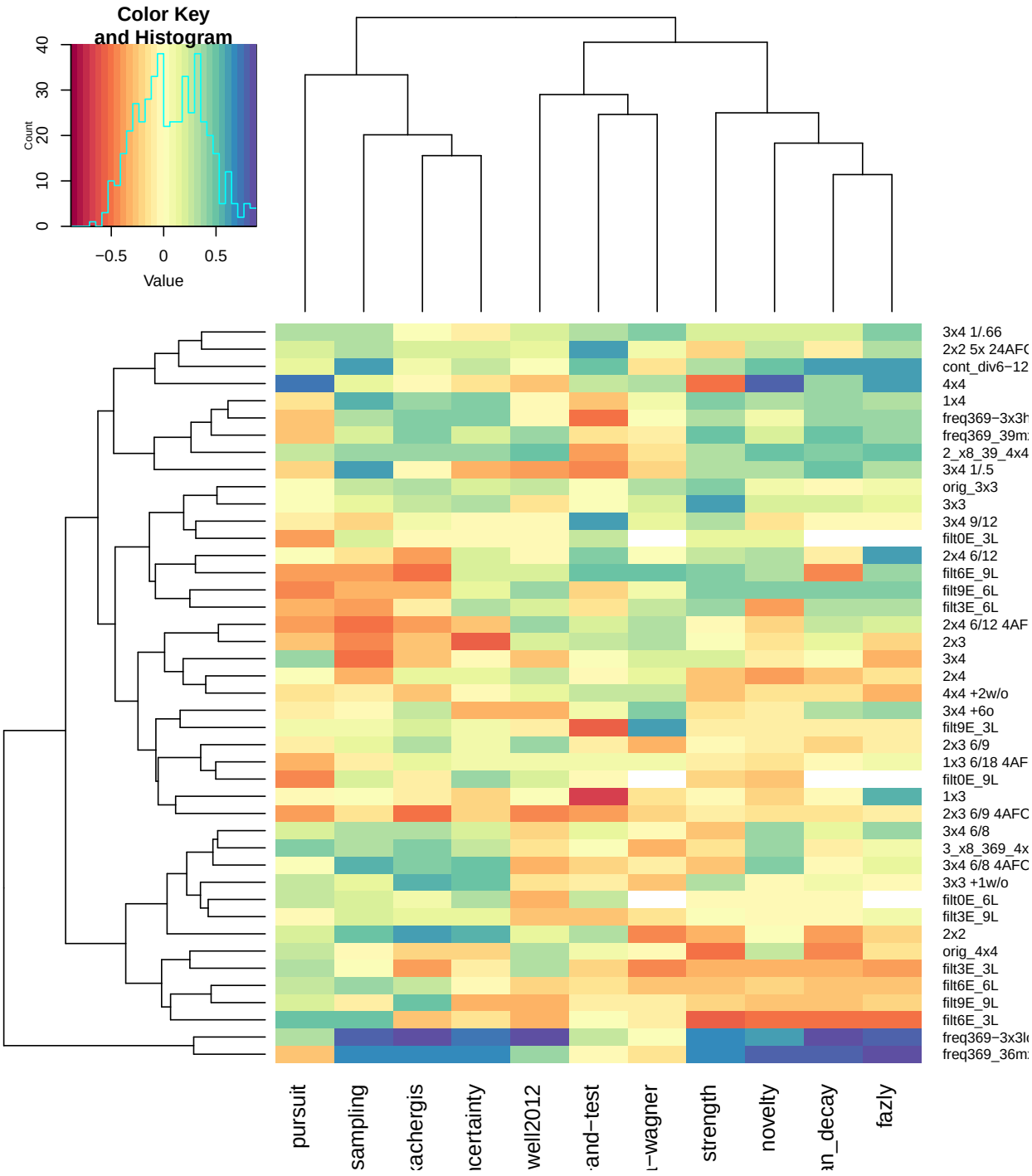
On the other hand, many experimental conditions are nearly equally well fit by all models, especially those that have a fixed number of repetitions per word-referent pair (e.g., 3x3, 4x4,)

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 a



How many experiments is each model a best fit for? Worst fit?

```
##
##    2x2 5x 24AFC             4x4       filt9E_3L    freq369_36mx freq369-3x3loCD
##               1               1               1               2               6

##
##          1x3          2x2          2x3          3x4    filt0E_9L 2x3 6/9 4AFC
##            1            1            1            1            1            2
##    filt6E_3L
```

```
##           4

##
##            novelty     Bayesian_decay        uncertainty     guess-and-test
##                  1                  3                  3                  4
##          kachergis            pursuit    rescorla-wagner           strength
##                  4                  4                  4                  4
## kachergis_sampling      trueswell2012              fazly
##                  5                  5                  6

##
##     Bayesian_decay              fazly            novelty          kachergis
##                  1                  1                  2                  3
## kachergis_sampling        uncertainty      trueswell2012           strength
##                  3                  3                  4                  5
##            pursuit     guess-and-test    rescorla-wagner
##                  6                  7                  8
```