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

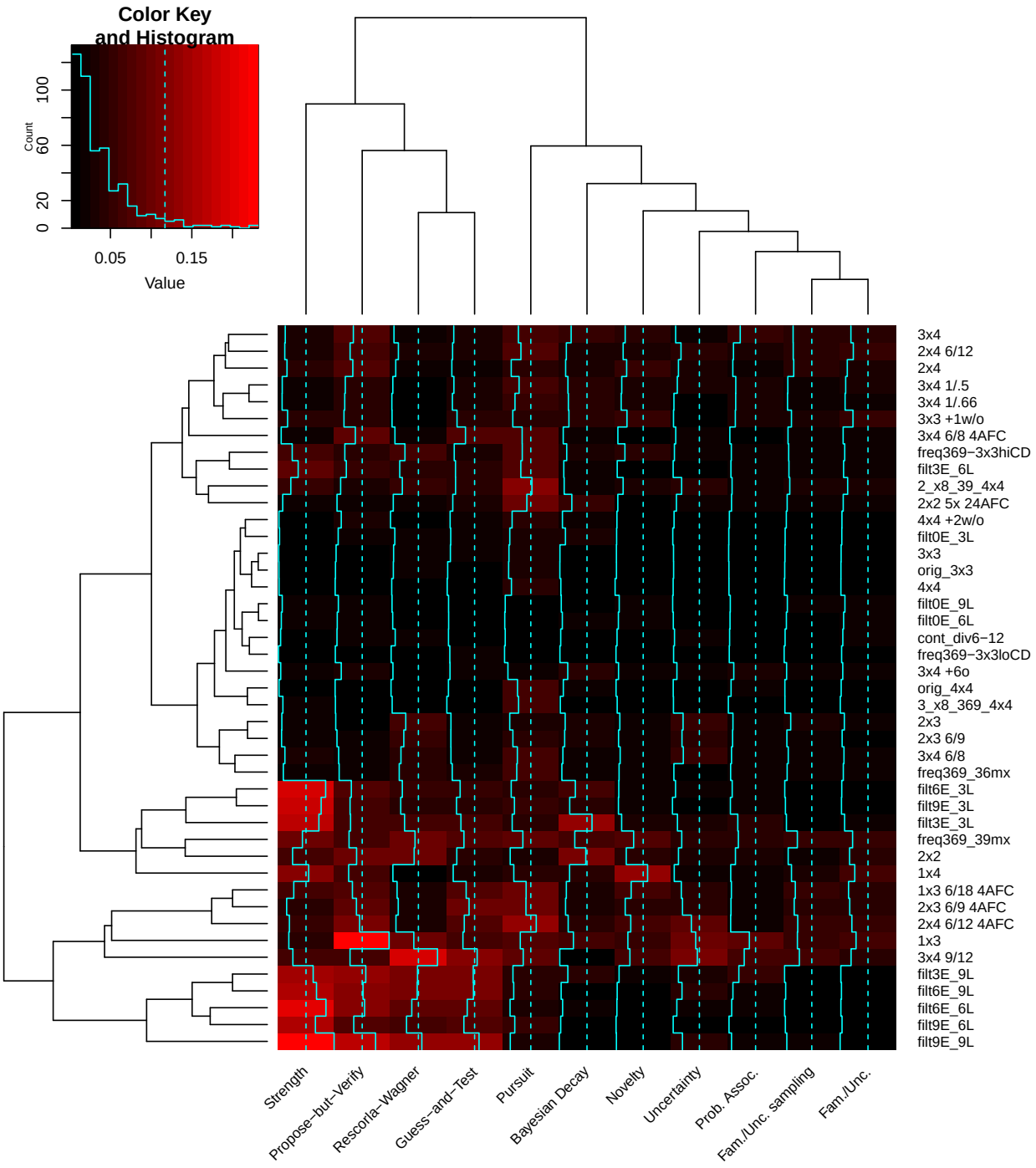
The heatmap below shows cross-validated model fit (SSE; sum of squared error) for each experimental condition. Note that each model has difficulty fitting at least one ore more experimental conditions–and these difficult conditions vary somewhat by model. For example, the strength-biased model has particular 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).

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 and 4x4, although 2x2 presents difficulties for some models).

[1] Except for the `filt0E_` conditions, which consist only of the late-stage pairs, with no early stage.

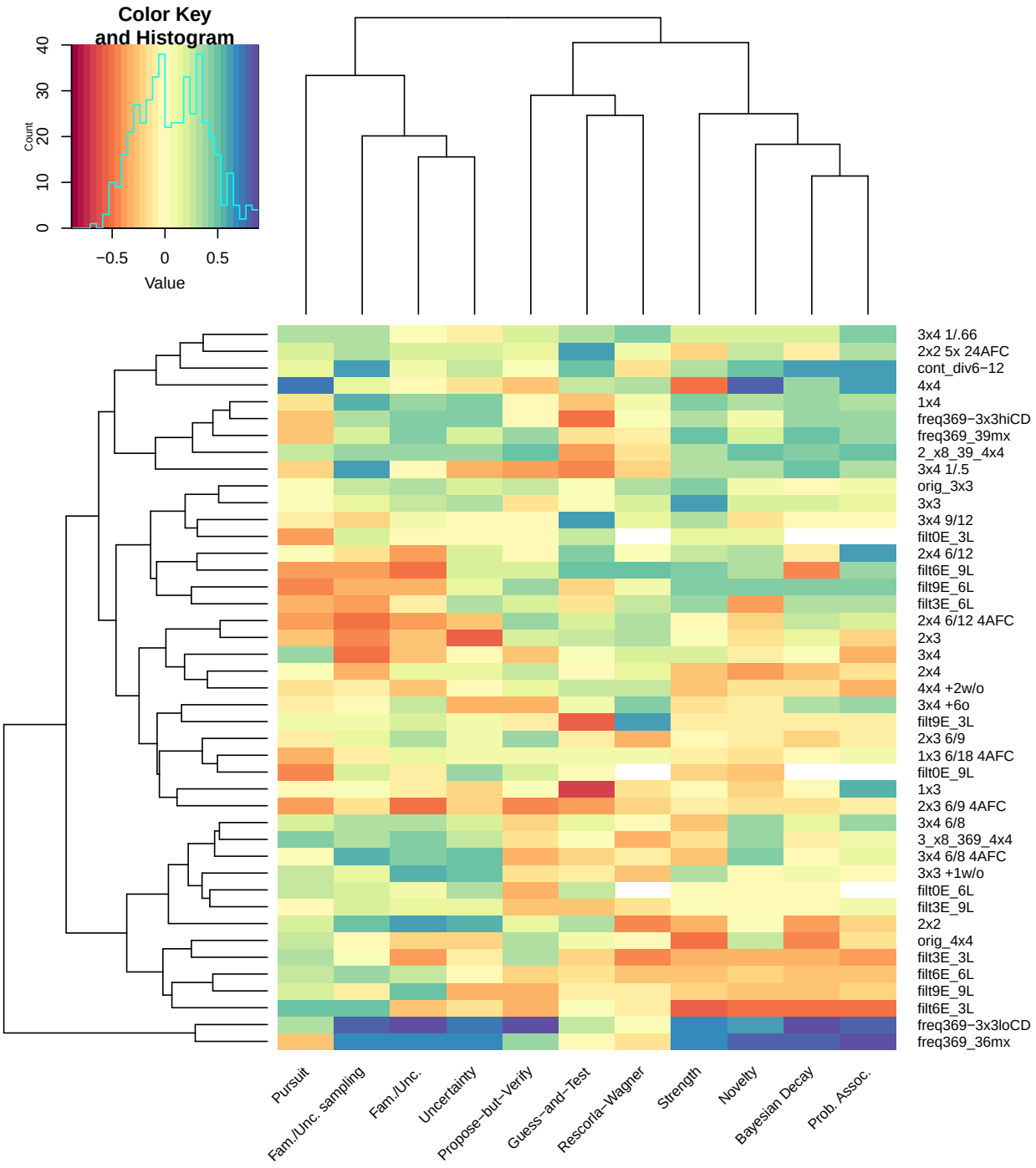
Condition Name	Trials	Words/Trial	Objects/Trial	Items	Accuracy	SD	N
3x4	36	3	4	18	0.19	0.12	25
3x4 1/.5	36	3	4	18	0.22	0.11	25
3x4 1/.66	36	3	4	18	0.21	0.09	25
3x4 +6o	36	3	4	18	0.27	0.12	20
2x4	54	2	4	18	0.30	0.15	33
3x3 +1w/o	54	3	3	18	0.17	0.08	39
4x4 +2w/o	54	4	4	18	0.10	0.05	39
1x3 6/18 4AFC	108	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.



Correlation of model vs. human item-level performance 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

Table 2 summarizes for each model, what experimental condition is best fit by that model (in terms of correlation, `best` and `best_cond`), and what condition has the worst fit for that model (`worst` and `worst_cond`). For six models, `freq369-3x3loC` was the easiest to fit. For four models, `filt6E_3Lfazly` was the most difficult to fit.

Model	best	worst	best_cond	worst_cond
Bayesian Decay	0.88	-0.53	freq369-3x3loCD	filt6E_3L
Prob. Assoc.	0.88	-0.52	freq369_36mx	filt6E_3L
Fam./Unc.	0.84	-0.52	freq369-3x3loCD	2x3 6/9 4AFC
Propose-but-Verify	0.84	-0.43	freq369-3x3loCD	2x3 6/9 4AFC
Novelty	0.78	-0.52	freq369_36mx	filt6E_3L
Fam./Unc. 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.