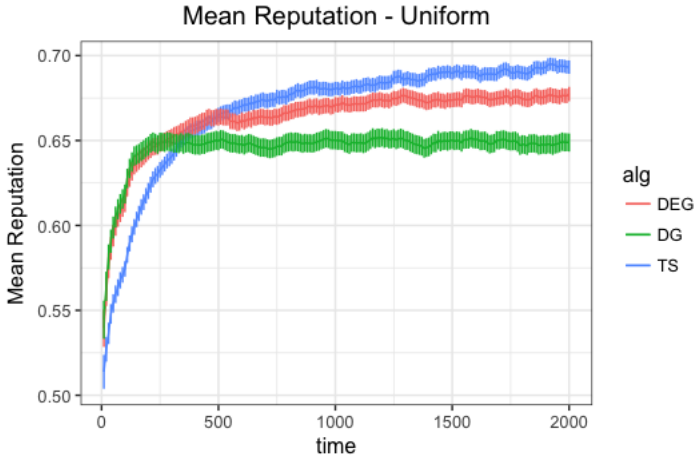
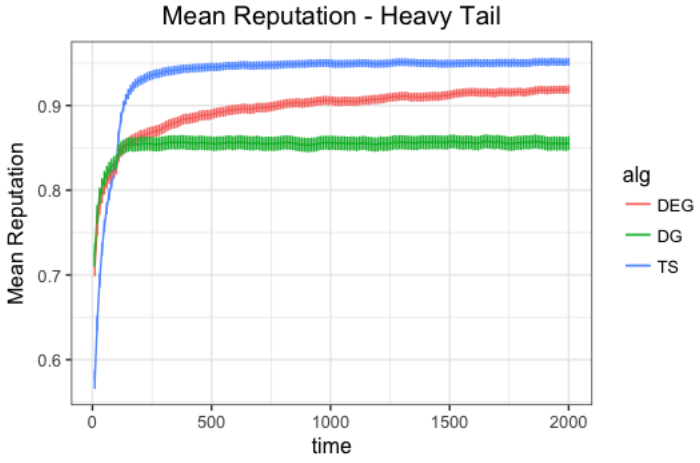
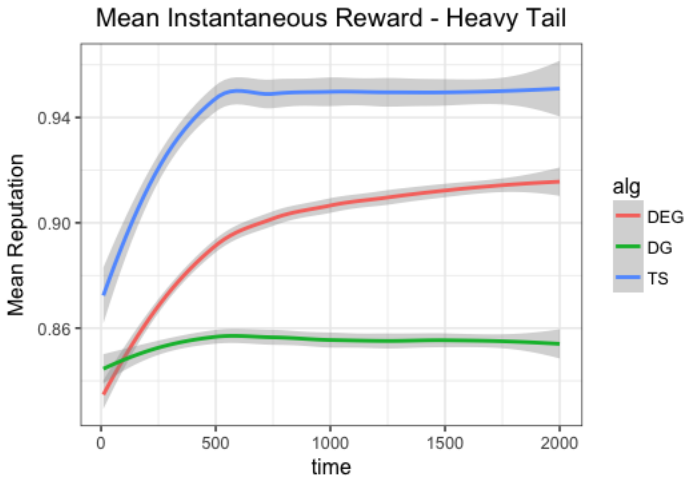
Supplemental Material

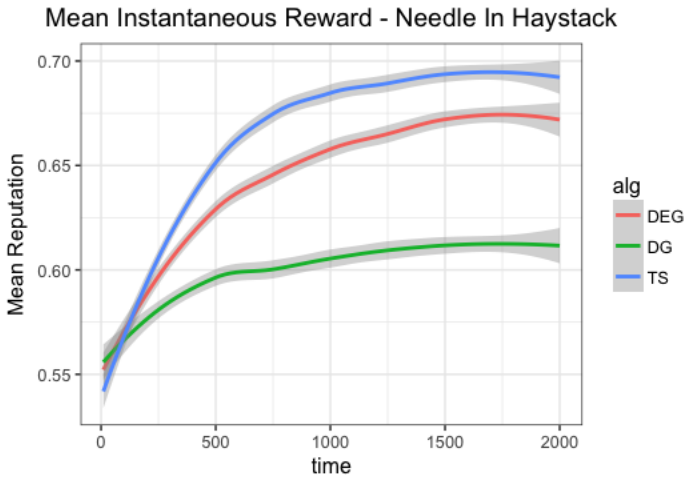
A Additional Isolation Performance Plots

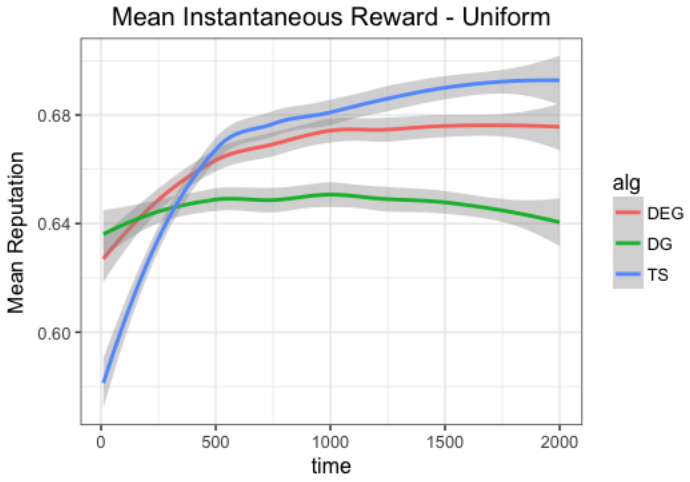
In this section we present the additional mean reputation graphs that were omitted from the main text. Additionally, we provide graphs of the smoothed mean instantaneous reward for each of the family of instances that we consider.





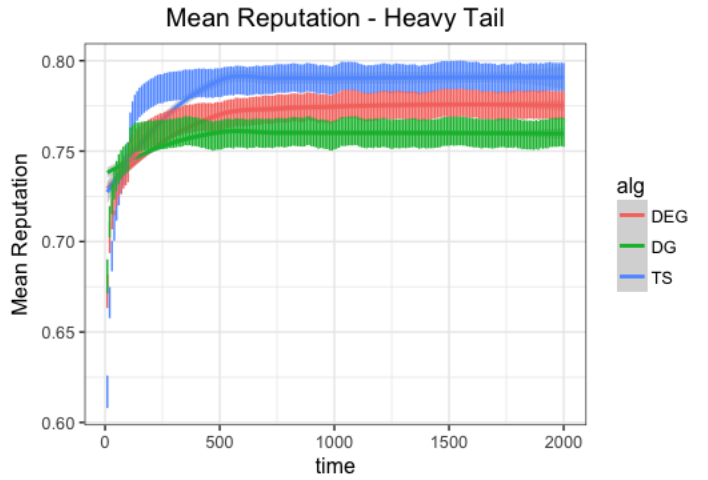

Mean Instantaneous Reward - Heavy Tail
Mean Reputation
0.94
0.90
0.86
0
500
1000
1500
2000
time
alg
DEG
DG
TS


Mean Instantaneous Reward - Needle In Haystack
Mean Reputation
0.70
0.65
0.60
0.55
0
500
1000
1500
2000
time
alg
DEG
DG
TS


Mean Instantaneous Reward - Uniform
Mean Reputation
0.68
0.64
0.60
0
500
1000
1500
2000
time
alg
DEG
DG
TS

B Reversal between Mean Reputation and Relative Reputation

In this section we present the results in isolation and in competition over the "Heavy Tail" prior discussed in the text for $K = 3$. We demonstrate evidence that $DEG > DG$ according to the mean reputation metric but that $DG > DEG$ according to the relative reputation proportion statistic and in the competition game. As shown in the text, the same results also hold for $K = 10$ for the warm starts that we consider.



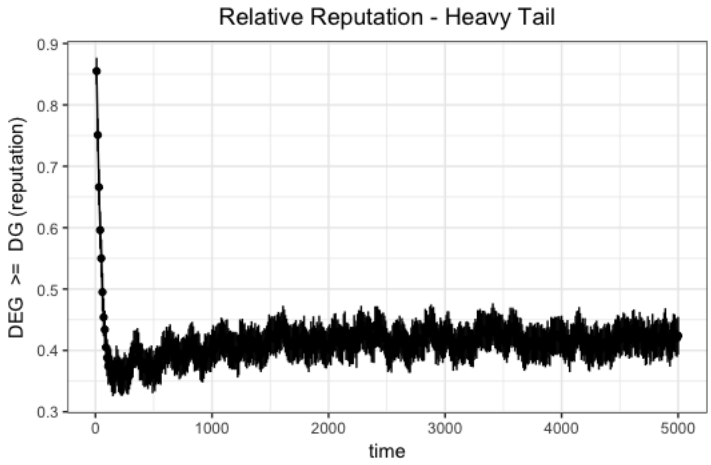


Table 1: Duopoly Experiment Heavy Tail K=3, t=5000

	k = 20	k = 250	k = 500
TS vs DG	**0.4** ±0.02 eeog avg: 770 med: 0	**0.59** ±0.01 eeog avg: 2700 med: 2979.5	**0.6** ±0.01 eeog avg: 2700 med: 3018
TS vs DEG	**0.46** ±0.02 eeog avg: 830 med: 0	**0.73** ±0.01 eeog avg: 2500 med: 2576.5	**0.72** ±0.01 eeog avg: 2700 med: 2862
DG vs DEG	**0.61** ±0.01 eeog avg: 1400 med: 556	**0.61** ±0.01 eeog avg: 2400 med: 2538.5	**0.6** ±0.01 eeog avg: 2400 med: 2587.5

C Additional Permanent Duopoly Experiments

We present all of the results for the permanent duopoly experiments across the family of instances that we consider. The results displayed in the table are the same contain the same information as those in the text and are the average over $N = 1000$ simulations.

Table 2: Duopoly Experiment Needle In Haystack

	$T_0 = 20$	$T_0 = 250$	$T_0 = 500$
TS vs DG	**0.64** ±0.03 eeog avg: 200 med: 27	**0.6** ±0.03 eeog avg: 370 med: 0	**0.64** ±0.03 eeog avg: 580 med: 121.5
TS vs DEG	**0.57** ±0.03 eeog avg: 150 med: 14	**0.52** ±0.03 eeog avg: 460 med: 78.5	**0.56** ±0.02 eeog avg: 740 med: 627.5
DG vs DEG	**0.46** ±0.03 eeog avg: 340 med: 128.5	**0.42** ±0.02 eeog avg: 650 med: 408	**0.42** ±0.02 eeog avg: 690 med: 466.5

Table 3: Duopoly Experiment Heavy Tail

	$T_0 = 20$	$T_0 = 250$	$T_0 = 500$
TS vs DG	**0.29** ±0.03 eeog avg: 55 med: 0	**0.72** ±0.02 eeog avg: 570 med: 0	**0.76** ±0.02 eeog avg: 620 med: 98.5
TS vs DEG	**0.3** ±0.03 eeog avg: 37 med: 0	**0.88** ±0.01 eeog avg: 480 med: 0	**0.9** ±0.01 eeog avg: 570 med: 113.5
DG vs DEG	**0.62** ±0.03 eeog avg: 410 med: 7	**0.6** ±0.02 eeog avg: 790 med: 762	**0.57** ±0.03 eeog avg: 730 med: 608

Table 4: Duopoly Experiment Uniform

	$T_0 = 20$	$T_0 = 250$	$T_0 = 500$
TS vs DG	**0.46** ±0.03 eeog avg: 230 med: 0	**0.52** ±0.02 eeog avg: 800 med: 754	**0.6** ±0.02 eeog avg: 910 med: 906.5
TS vs DEG	**0.41** ±0.03 eeog avg: 180 med: 0	**0.51** ±0.02 eeog avg: 810 med: 734	**0.55** ±0.02 eeog avg: 970 med: 987
DG vs DEG	**0.51** ±0.03 eeog avg: 470 med: 57.5	**0.48** ±0.02 eeog avg: 1000 med: 1088	**0.45** ±0.02 eeog avg: 1000 med: 1142

D Additional Temporary Monopoly Experiments

We present results for the temporary monopoly experiment across the family of instances that we consider for varying values of X. These results confirm the claim in the text that, for sufficiently large X, Thompson Sampling is preferred over all other algorithms for the incumbent. However, it also shows that, for smaller values of X it is not necessarily the case that Thompson Sampling is the preferred algorithm. We provide many different parameterizations in order to check the robustness of the results. The results displayed in the table are the same contain the same information as those in the text and are the average over $N = 1000$ simulations.

Heavy Tail Prior

Table 5: Temporary Monopoly Experiment Heavy Tail X = 50

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.054** ±0.01 Var:0.05 ES:100%	**0.16** ±0.02 Var:0.1 ES:97%	**0.18** ±0.02 Var:0.1 ES:95%
	DEG	**0.33** ±0.03 Var:0.2 ES:95%	**0.31** ±0.02 Var:0.2 ES:76%	**0.26** ±0.02 Var:0.1 ES:79%
	DG	**0.39** ±0.03 Var:0.2 ES:95%	**0.41** ±0.03 Var:0.2 ES:76%	**0.33** ±0.02 Var:0.2 ES:67%

Table 6: Temporary Monopoly Experiment Heavy Tail X = 200

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.003** ±0.003 Var:0.002 ES:100%	**0.083** ±0.02 Var:0.07 ES:97%	**0.17** ±0.02 Var:0.1 ES:95%
	DEG	**0.045** ±0.01 Var:0.03 ES:92%	**0.25** ±0.02 Var:0.1 ES:75%	**0.23** ±0.02 Var:0.1 ES:78%
	DG	**0.12** ±0.02 Var:0.08 ES:88%	**0.36** ±0.03 Var:0.2 ES:76%	**0.3** ±0.02 Var:0.1 ES:64%

Table 7: Temporary Monopoly Experiment Heavy Tail X = 300

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.0017** ±0.002 Var:0.001 ES:100%	**0.059** ±0.01 Var:0.05 ES:99%	**0.16** ±0.02 Var:0.1 ES:95%
	DEG	**0.029** ±0.007 Var:0.01 ES:93%	**0.23** ±0.02 Var:0.1 ES:74%	**0.23** ±0.02 Var:0.1 ES:78%
	DG	**0.097** ±0.02 Var:0.06 ES:89%	**0.34** ±0.03 Var:0.2 ES:76%	**0.29** ±0.02 Var:0.1 ES:66%

Table 8: Temporary Monopoly Experiment Heavy Tail X = 500

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.002** ±0.003 Var:0.002 ES:100%	**0.043** ±0.01 Var:0.04 ES:98%	**0.16** ±0.02 Var:0.1 ES:94%
	DEG	**0.03** ±0.007 Var:0.01 ES:92%	**0.21** ±0.02 Var:0.1 ES:76%	**0.24** ±0.02 Var:0.1 ES:78%
	DG	**0.091** ±0.01 Var:0.05 ES:87%	**0.32** ±0.03 Var:0.2 ES:78%	**0.3** ±0.02 Var:0.1 ES:65%

Needle In Haystack Prior

Table 9: Temporary Monopoly Experiment Needle In Haystack X = 50

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.34** ±0.03 Var:0.2 ES:92%	**0.4** ±0.03 Var:0.2 ES:90%	**0.48** ±0.03 Var:0.2 ES:85%
	DEG	**0.22** ±0.02 Var:0.1 ES:93%	**0.34** ±0.03 Var:0.2 ES:83%	**0.42** ±0.03 Var:0.2 ES:75%
	DG	**0.18** ±0.02 Var:0.1 ES:89%	**0.28** ±0.02 Var:0.2 ES:78%	**0.37** ±0.03 Var:0.2 ES:70%

Table 10: Temporary Monopoly Experiment Needle In Haystack X = 200

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.17** ±0.02 Var:0.1 ES:95%	**0.31** ±0.03 Var:0.2 ES:90%	**0.41** ±0.03 Var:0.2 ES:86%
	DEG	**0.13** ±0.02 Var:0.1 ES:95%	**0.26** ±0.02 Var:0.2 ES:85%	**0.36** ±0.03 Var:0.2 ES:78%
	DG	**0.093** ±0.02 Var:0.07 ES:94%	**0.23** ±0.02 Var:0.1 ES:83%	**0.33** ±0.03 Var:0.2 ES:74%

Table 11: Temporary Monopoly Experiment Needle In Haystack X = 300

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.1** ±0.02 Var:0.07 ES:95%	**0.28** ±0.03 Var:0.2 ES:91%	**0.39** ±0.03 Var:0.2 ES:87%
	DEG	**0.089** ±0.02 Var:0.06 ES:94%	**0.23** ±0.02 Var:0.2 ES:88%	**0.36** ±0.03 Var:0.2 ES:80%
	DG	**0.05** ±0.01 Var:0.03 ES:96%	**0.21** ±0.02 Var:0.1 ES:83%	**0.33** ±0.03 Var:0.2 ES:74%

Table 12: Temporary Monopoly Experiment Needle In Haystack X = 500

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.053** ±0.01 Var:0.04 ES:95%	**0.23** ±0.02 Var:0.2 ES:92%	**0.37** ±0.03 Var:0.2 ES:88%
	DEG	**0.051** ±0.01 Var:0.04 ES:97%	**0.2** ±0.02 Var:0.1 ES:89%	**0.33** ±0.03 Var:0.2 ES:80%
	DG	**0.031** ±0.009 Var:0.02 ES:98%	**0.18** ±0.02 Var:0.1 ES:88%	**0.31** ±0.02 Var:0.2 ES:76%

Uniform Prior

Table 13: Temporary Monopoly Experiment Uniform X = 50

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.27** ±0.03 Var:0.2 ES:91%	**0.21** ±0.02 Var:0.1 ES:88%	**0.26** ±0.02 Var:0.2 ES:83%
	DEG	**0.39** ±0.03 Var:0.2 ES:84%	**0.3** ±0.03 Var:0.2 ES:80%	**0.34** ±0.03 Var:0.2 ES:73%
	DG	**0.39** ±0.03 Var:0.2 ES:85%	**0.31** ±0.02 Var:0.2 ES:74%	**0.33** ±0.02 Var:0.2 ES:70%

Table 14: Temporary Monopoly Experiment Uniform X = 200

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.12** ±0.02 Var:0.08 ES:89%	**0.16** ±0.02 Var:0.1 ES:87%	**0.2** ±0.02 Var:0.1 ES:84%
	DEG	**0.25** ±0.02 Var:0.1 ES:81%	**0.24** ±0.02 Var:0.1 ES:77%	**0.29** ±0.02 Var:0.1 ES:71%
	DG	**0.23** ±0.02 Var:0.1 ES:80%	**0.24** ±0.02 Var:0.1 ES:76%	**0.29** ±0.02 Var:0.1 ES:69%

Table 15: Temporary Monopoly Experiment Uniform X = 300

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.094** ±0.02 Var:0.06 ES:90%	**0.15** ±0.02 Var:0.1 ES:86%	**0.2** ±0.02 Var:0.1 ES:85%
	DEG	**0.2** ±0.02 Var:0.1 ES:80%	**0.23** ±0.02 Var:0.1 ES:74%	**0.29** ±0.02 Var:0.1 ES:70%
	DG	**0.21** ±0.02 Var:0.1 ES:79%	**0.23** ±0.02 Var:0.1 ES:74%	**0.29** ±0.02 Var:0.1 ES:70%

Table 16: Temporary Monopoly Experiment Uniform X = 500

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.061** ±0.01 Var:0.03 ES:91%	**0.12** ±0.02 Var:0.08 ES:88%	**0.2** ±0.02 Var:0.1 ES:84%
	DEG	**0.17** ±0.02 Var:0.09 ES:79%	**0.21** ±0.02 Var:0.1 ES:75%	**0.29** ±0.02 Var:0.1 ES:73%
	DG	**0.18** ±0.02 Var:0.1 ES:78%	**0.22** ±0.02 Var:0.1 ES:75%	**0.29** ±0.02 Var:0.1 ES:70%

E Reputation and Information Erased Experiment

This section contains the results on all of the family of instances for the reputation and information erased experiment discussed in the "Data and Reputation as Barriers to Entry" section of the paper.

Table 17: Reputation Erased Experiment Heavy Tail

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.0096** ± 0.006 Var: 0.009 ES: 100 %	**0.11** ± 0.02 Var: 0.09 ES: 98 %	**0.18** ± 0.02 Var: 0.1 ES: 95 %
	DEG	**0.073** ± 0.01 Var: 0.05 ES: 93 %	**0.29** ± 0.02 Var: 0.2 ES: 78 %	**0.25** ± 0.02 Var: 0.1 ES: 79 %
	DG	**0.15** ± 0.02 Var: 0.1 ES: 89 %	**0.39** ± 0.03 Var: 0.2 ES: 78 %	**0.33** ± 0.02 Var: 0.2 ES: 66 %

Table 18: Information Erased Experiment Heavy Tail

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.021** ± 0.009 Var: 0.02 ES: 100 %	**0.16** ± 0.02 Var: 0.1 ES: 97 %	**0.21** ± 0.02 Var: 0.2 ES: 95 %
	DEG	**0.26** ± 0.03 Var: 0.2 ES: 95 %	**0.3** ± 0.02 Var: 0.2 ES: 74 %	**0.26** ± 0.02 Var: 0.1 ES: 76 %
	DG	**0.34** ± 0.03 Var: 0.2 ES: 94 %	**0.4** ± 0.03 Var: 0.2 ES: 74 %	**0.33** ± 0.02 Var: 0.1 ES: 58 %

Table 19: Reputation Erased Experiment Needle In Haystack

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.25** ± 0.03 Var: 0.2 ES: 96 %	**0.36** ± 0.03 Var: 0.2 ES: 93 %	**0.45** ± 0.03 Var: 0.2 ES: 89 %
	DEG	**0.21** ± 0.02 Var: 0.1 ES: 93 %	**0.32** ± 0.03 Var: 0.2 ES: 89 %	**0.41** ± 0.03 Var: 0.2 ES: 83 %
	DG	**0.18** ± 0.02 Var: 0.1 ES: 92 %	**0.29** ± 0.03 Var: 0.2 ES: 86 %	**0.4** ± 0.03 Var: 0.2 ES: 78 %

Table 20: Information Erased Experiment Needle In Haystack

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.35** ± 0.03 Var: 0.2 ES: 93 %	**0.43** ± 0.03 Var: 0.2 ES: 88 %	**0.52** ± 0.03 Var: 0.2 ES: 82 %
	DEG	**0.26** ± 0.03 Var: 0.2 ES: 90 %	**0.36** ± 0.03 Var: 0.2 ES: 80 %	**0.43** ± 0.03 Var: 0.2 ES: 71 %
	DG	**0.19** ± 0.02 Var: 0.1 ES: 85 %	**0.3** ± 0.02 Var: 0.1 ES: 73 %	**0.36** ± 0.02 Var: 0.2 ES: 64 %

Table 21: Reputation Erased Experiment Uniform

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.2** ± 0.02 Var: 0.1 ES: 89 %	**0.22** ± 0.02 Var: 0.1 ES: 88 %	**0.27** ± 0.03 Var: 0.2 ES: 87 %
	DEG	**0.33** ± 0.03 Var: 0.2 ES: 81 %	**0.32** ± 0.03 Var: 0.2 ES: 79 %	**0.35** ± 0.03 Var: 0.2 ES: 75 %
	DG	**0.32** ± 0.03 Var: 0.2 ES: 80 %	**0.31** ± 0.03 Var: 0.2 ES: 77 %	**0.35** ± 0.03 Var: 0.2 ES: 73 %

Table 22: Information Erased Experiment Uniform

		Incumbent Algorithm		
		TS	DEG	DG
Entrant Algorithm	TS	**0.27** ± 0.03 Var: 0.2 ES: 91 %	**0.23** ± 0.02 Var: 0.1 ES: 87 %	**0.27** ± 0.02 Var: 0.2 ES: 84 %
	DEG	**0.4** ± 0.03 Var: 0.2 ES: 86 %	**0.3** ± 0.02 Var: 0.2 ES: 72 %	**0.32** ± 0.02 Var: 0.2 ES: 69 %
	DG	**0.36** ± 0.03 Var: 0.2 ES: 83 %	**0.29** ± 0.02 Var: 0.1 ES: 69 %	**0.3** ± 0.02 Var: 0.1 ES: 60 %