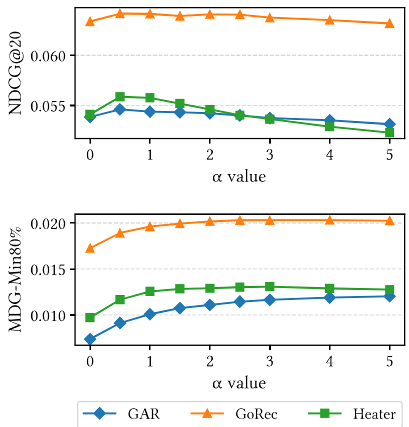
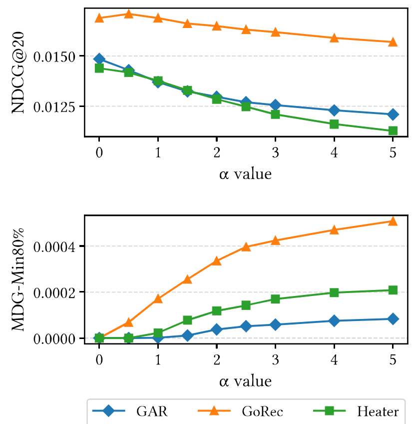
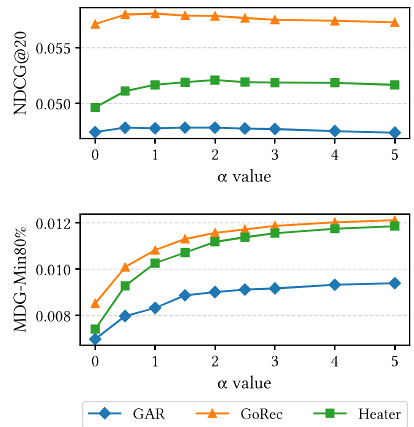


(a) Clothing

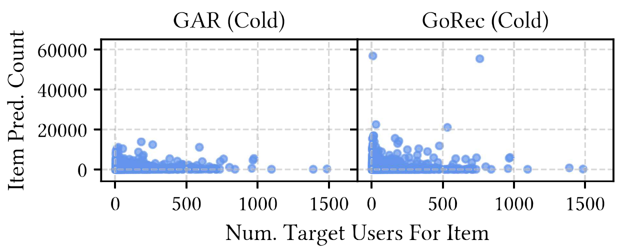


(b) Electronics

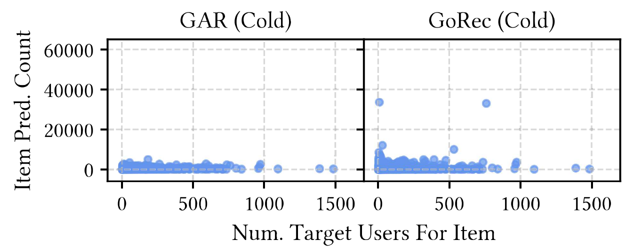


(c) Microlens

Figure 1: Impact of α on cold test set NDCG and MDG-Min80% with $k = 20$.



(a) Pre-magnitude scaling



(b) Post-magnitude scaling

Figure 2: Cold item prediction counts with $k = 20$ against the number of target users for the Electronics dataset before and after magnitude scaling.

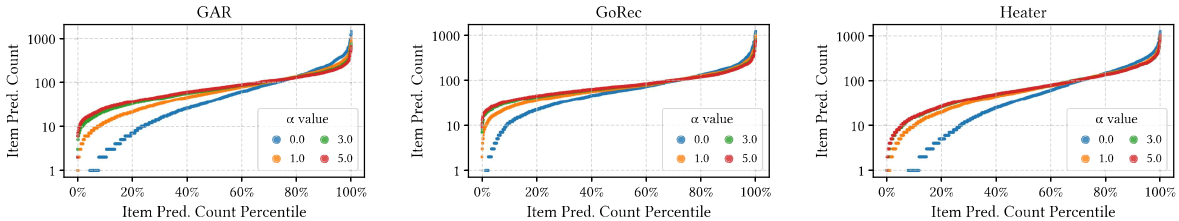
Table 1: Contingency tables for GAR and GoRec on the Electronics dataset (cf. Figure 2 in main paper). The 'Pop. Close Neighbor' class refers to cold items with a warm item neighbor which is in the top 1% of warm items by popularity. The 'Most Predicted' class refers to cold items which are in the top 1% by prediction count. The odds ratio for the corresponding Fisher exact tests are 40.04 (GAR) and 35.80 (GoRec) with $p \ll 1e^{-10}$ in both cases.

	Pop. Close Neighbor	~(Pop. Close Neighbor)
Most Predicted	105	21
~(Most Predicted)	1,385	11,090

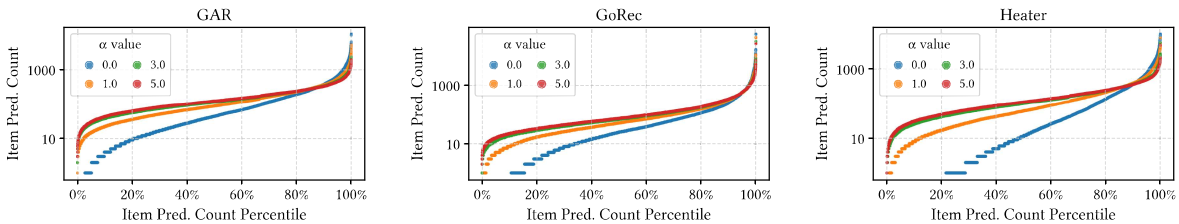
(a) GAR

	Pop. Close Neighbor	~(Pop. Close Neighbor)
Most Predicted	103	23
~(Most Predicted)	1,387	11,088

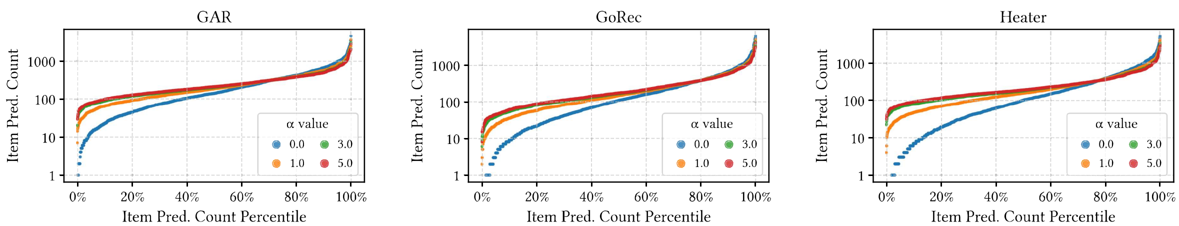
(b) GoRec



(a) Clothing



(b) Electronics



(c) Microlens

Figure 3: Cold test set item prediction counts at $k = 20$ against item prediction count percentiles (i.e. each item's position in the sorted list of prediction counts). Only items predicted at least once are plotted.

Table 2: User and item-oriented accuracy metrics along with exposure-based diversity across all datasets and models. Values where magnitude scaling provides a statistically significant (p < 0.01) improvement in performance over the base models are marked with asterisks (*), while statistically significant losses in performance are marked with daggers (†). Values are bolded where magnitude scaling improves performance by at least 10%.

		$k = 20$						$k = 50$					
		User Acc.		*Item Acc. (MDG)*			*Exposure*	*User Acc.*		*Item Acc. (MDG)*			*Exposure*
Dataset	Method	NDCG	Recall	Min80%	Max5%	All	Gini-Div.	NDCG	Recall	Min80%	Max5%	All	Gini-Div.
Clothing	KNN	0.0738	0.1429	0.0270	0.3093	0.0604	0.6090	0.0825	0.1826	0.0349	0.3204	0.0689	0.5734
	Heater	0.0549	0.1216	0.0095	0.2873	0.0389	0.3612	0.0686	0.1847	0.0193	0.3001	0.0507	0.4666
	Heater+MS	0.0554	0.1210	**0.0127***	0.2766†	0.0412*	**0.5225***	0.0689	0.1835	**0.0228***	0.2921†	0.0533*	**0.6152***
	GAR	0.0539	0.1145	0.0075	0.2921	0.0366	0.3573	0.0677	0.1785	0.0167	0.3073	0.0482	0.4643
	GAR+MS	0.0541	0.1148	**0.0117***	0.2785†	0.0402*	**0.5930***	0.0675	0.1771†	**0.0213***	0.2925†	0.0517*	**0.6773***
	GoRec	0.0640	0.1394	0.0177	0.3065	0.0499	0.4832	0.0777	0.2028	0.0283	0.3200	0.0619	0.5626
	GoRec+MS	0.0639	0.1371	**0.0205***	0.2973†	0.0520*	**0.6431***	0.0776	0.2001†	**0.0312***	0.3114†	0.0639*	**0.6904***
Electronics	KNN	0.0188	0.0362	0.0030	0.1536	0.0179	0.4313	0.0215	0.0474	0.0051	0.1622	0.0209	0.3350
	Heater	0.0144	0.0324	0.0000	0.0986	0.0070	0.1355	0.0206	0.0605	0.0005	0.1194	0.0109	0.2044
	Heater+MS	0.0132†	0.0298†	**0.0003***	0.1011	**0.0092***	**0.4821***	0.0188†	0.0553†	**0.0025***	0.1173	**0.0137***	**0.5635***
	GAR	0.0150	0.0326	0.0000	0.1015	0.0074	0.2460	0.0206	0.0578	0.0008	0.1194	0.0112	0.3443
	GAR+MS	0.0131†	0.0289†	**0.0001***	0.1003	**0.0084***	**0.5030***	0.0181†	0.0519†	**0.0016***	0.1153†	0.0122*	**0.5773***
	GoRec	0.0175	0.0377	0.0000	0.1212	0.0092	0.1496	0.0241	0.0675	0.0013	0.1420	0.0138	0.2159
	GoRec+MS	0.0166†	0.0359†	**0.0004***	0.1210	**0.0110***	**0.3254***	0.0228†	0.0641†	**0.0027***	0.1392†	**0.0158***	**0.3836***
Microlens	KNN	0.0567	0.1143	0.0171	0.3287	0.0511	0.5340	0.0657	0.1554	0.0242	0.3405	0.0597	0.5013
	Heater	0.0500	0.1186	0.0073	0.3266	0.0386	0.3255	0.0672	0.1983	0.0173	0.3426	0.0523	0.4293
	Heater+MS	0.0517	0.1202	**0.0113***	0.3106†	0.0420*	**0.5711***	0.0687	0.1989	**0.0221***	0.3286	0.0560*	**0.6491***
	GAR	0.0470	0.1124	0.0069	0.3034	0.0356	0.4160	0.0647	0.1938	0.0162	0.3211	0.0491	0.5299
	GAR+MS	0.0473	0.1114	**0.0092***	0.2904†	0.0369*	**0.6223***	0.0644	0.1901	**0.0187***	0.3096†	0.0503*	**0.7085***
	GoRec	0.0564	0.1284	0.0084	0.3563	0.0445	0.3208	0.0768	0.2217	0.0190	0.3729	0.0594	0.4078
	GoRec+MS	0.0574*	0.1302	**0.0119***	0.3412†	0.0470*	**0.4936***	0.0771	0.2204	**0.0226***	0.3592†	0.0617*	**0.5613***