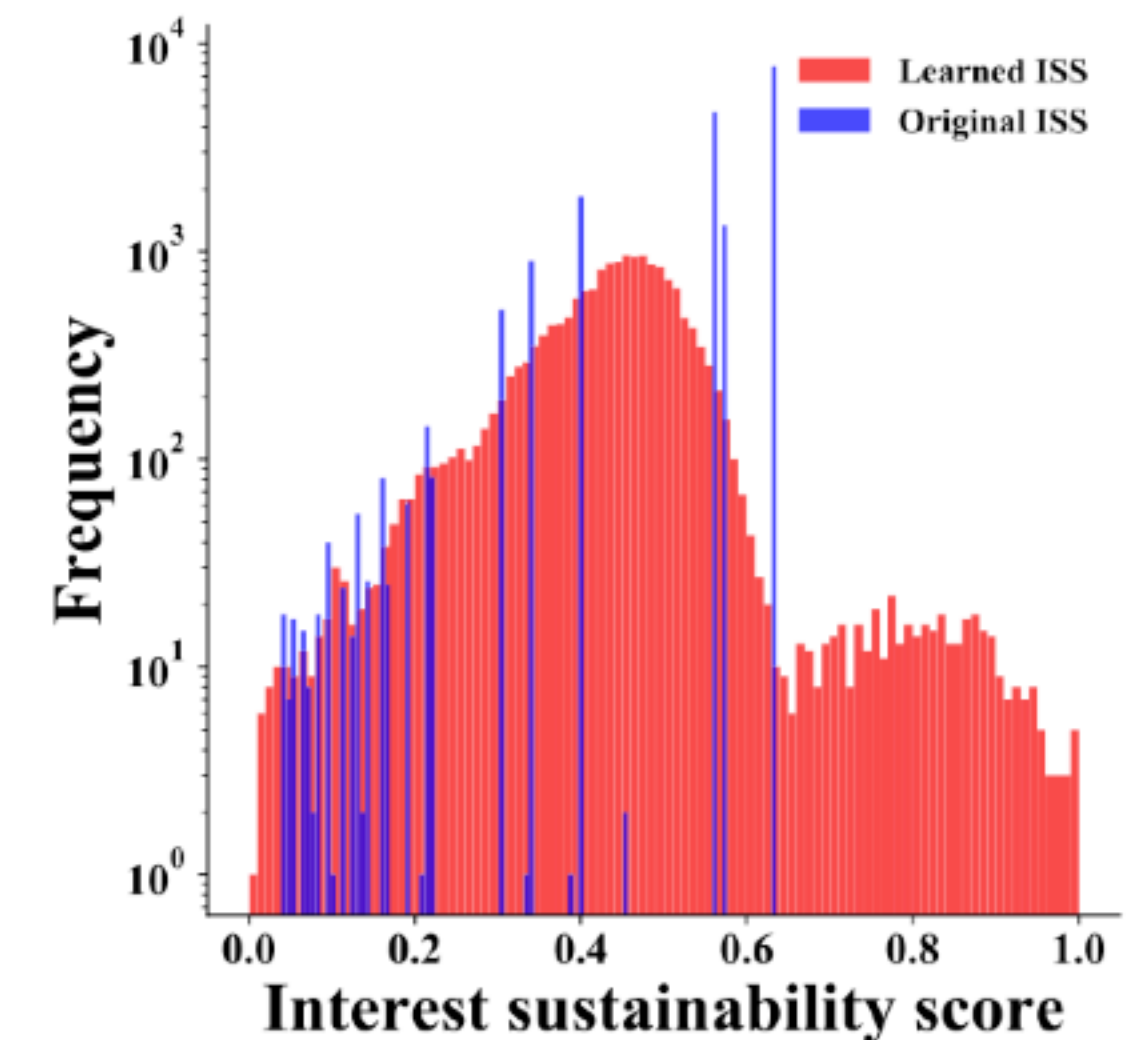# Experiments
Recommendation Performance Analysis–Comparison with Variants of CRIS

- In Fig(b), compare the original ISSs (p_i) and the ISSs learned by CRIS ($\hat{p}_i$).

- To obtain $\hat{p}_i$, first compute the distance $d(\mathsf{S}, \mathsf{T}_{u,i})$ between the S (interest-sustainability prototype) and $\mathsf{T}_{u,i}$ (all pairs of users and items).

- Then average the distances for each item and take min-max normalization on the averaged distances for items to ensure within $x_i \in [0,1]$.

- Lastly, take the complement of the values ($\hat{p}_i \leftarrow 1 - x_i$) to obtain the ISSs learned by CRIS tend to follow the original ISSs, but smoother than the original.

- Conjecture the original ISSs can be inaccurate, thus consequently CRIS learns to reduce the noise. Therefore, CRIS is more robust to the the noise of the ISSs than the CRIS$^{wt.}$.

(b) Histogram of original and learned ISSs.

Experiments
Ablation Study

Dataset	Metric	Only $\mathcal{C}$	Only $\mathcal{S}$	Rand.	Oracle	NN	CRIS
Toys	H@10	0.385	0.352	0.361	0.652	0.401	0.460
	N@10	0.233	0.175	0.199	0.377	0.219	0.273
Clothing	H@10	0.401	0.320	0.371	0.543	0.291	0.447
	N@10	0.240	0.157	0.207	0.309	0.158	0.265
Health	H@10	0.460	0.237	0.411	0.538	0.414	0.499
	N@10	0.279	0.132	0.249	0.325	0.235	0.306
Movies	H@10	0.705	0.554	0.678	0.793	0.690	0.725
	N@10	0.458	0.299	0.446	0.518	0.433	0.469
Yelp	H@10	0.887	0.429	0.890	0.961	0.879	0.906
	N@10	0.632	0.193	0.629	0.738	0.617	0.657

- Only C is trained only the consumption-based loss L_C^P, shows similar performance of CML.

- Only S is trained only on the ISS-based loss L_S^P, shows the consistent degradation in the accuracy of recommendations.

- This result indicates that should utilize the ISSs along with the consumption-based objective, since modeling the ISS alone can't capture user's personalized preferences.

- Randomly ISSs (Rand.) hurt the model performance in all the cases as the representations of users and items will be wrongly learned by random ISSs.

- As oracle, set ISS p_i as 1 if item i appear in the test data and 0 else. It's provides the upper bound of the performance of CRIS.