A Appendices

A.1 Datasets

We train the closed-world and open-world models on the closed-world training sets (Table 3) and validate/test on the open-world triples. The missing entities in the open-world and closed-world datasets do not overlap.

				Number of Triples			Open World Triples	
Dataset	$\|E\|$	$\|E^{open}\|$	$\|R\|$	Train	Valid	Test	Valid	Test
FB20k	14,904	5,019	1,341	472,860	48,991	57,803	-	11,586
DBPedia50k	24,624	2,139	351	32,388	123	2,095	164	4,320
FB15k-237-OWE	12,324	13,857	235	242,489	12,806	-	9,424	22,393

Table 3: Datasets used for training closed- and open-world KGC models. $|E^{open}|$ is the number of open-world entities that are present in these datasets.

A.2 Hyperparameters

The ComplEx-RST and ComplEx-RCT models are trained on a workstation with Intel Core i7 6700k and a single Nvidia GTX1080 GPU for DBPedia50k and FB15k-237-OWE datasets. The models on FB20k dataset are trained on a Nvidia Quadro P6000. These models are trained in around 1-2 hours on average.

We provide all hyperparameters that are used for the experiments in Table 4. Additionally, we provide code, data and configs for the experiments at `https://github.com/haseebs/RST-OWE`. For all our experiments, we ran a hyperparameter sweep over batch size: {128, 256}, distance metric: {Euclidean, Cosine} (see Equation 4) and learning rate: {0.01, 0.001, 0.0001}. The final values were selected by tuning on the validation set with the value of *filtered MRR* as the criterion. For the clustering parameters η and $\mathcal{S}$ we conducted a grid search too. The resulting values were chosen to produce meaningful clusters based on a manual inspection in addition of achieving the greatest reduction in number of clusters at a negligible negative impact on accuracy.

Hyperparameter	DBPedia50k	FB15k-237-OWE	FB20k
Learning Rate	0.001	0.001	0.001
Optimizer	Adam	Adam	Adam
Embedding Dim	300	300	300
Batch Size	128	256	128
Distance Metric	Euclidean	Euclidean	Cosine
Number of Iterations (η)	6	6	6
Similarity factor ($\mathcal{S}$)	0.8	0.8	0.8

Table 4: Hyperparameters used in the ComplEx-RCT and ComplEx-RST experiments.