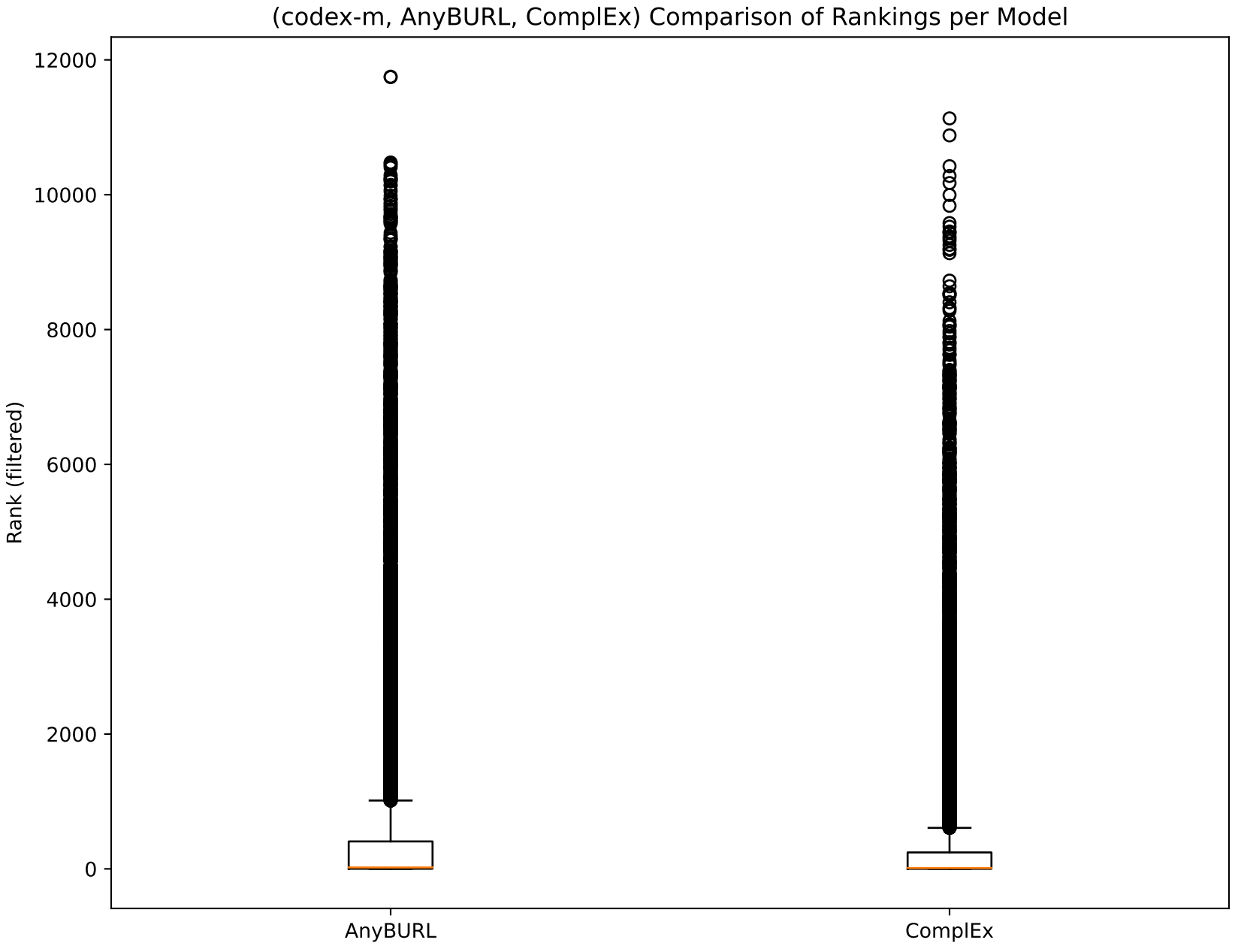
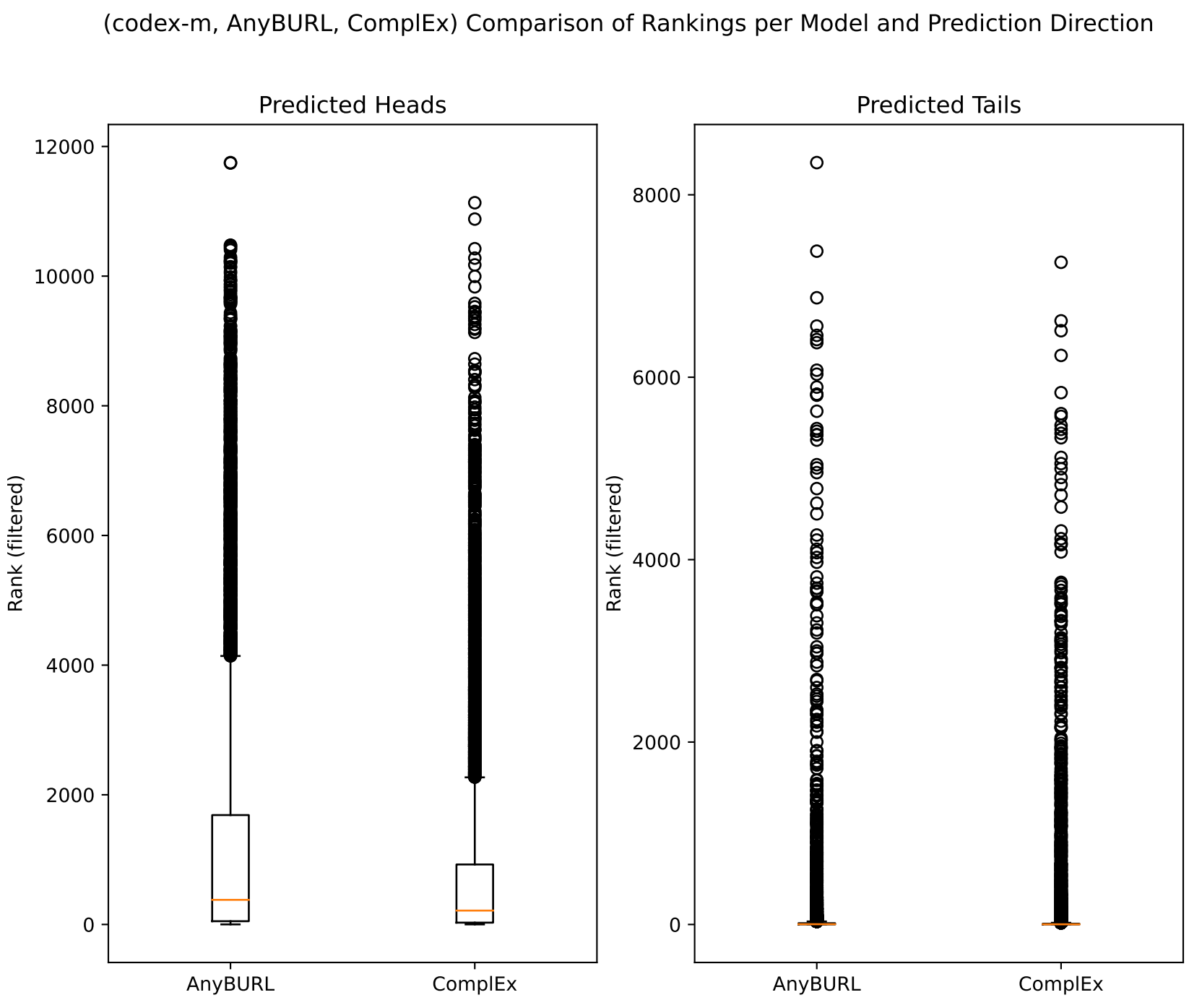
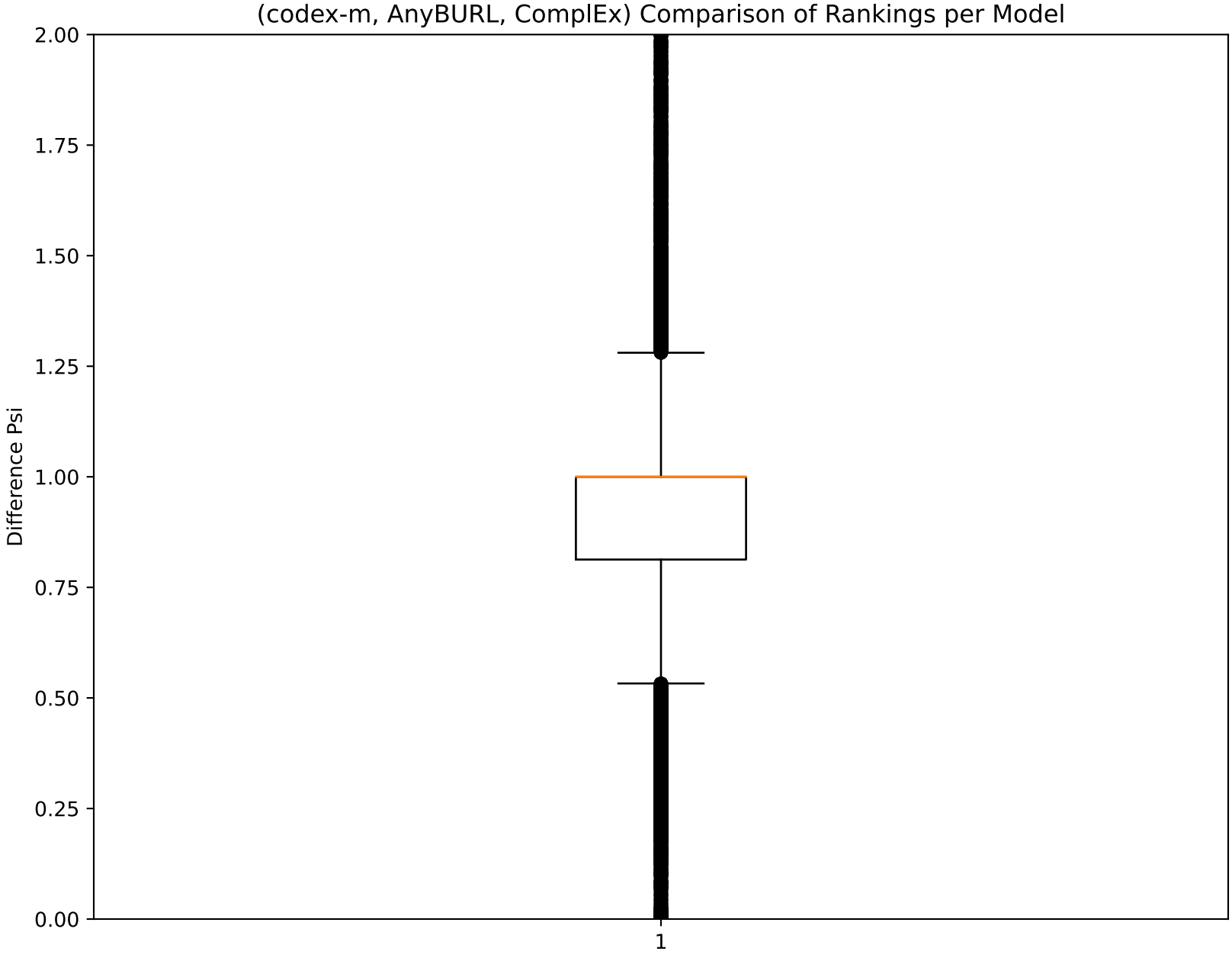
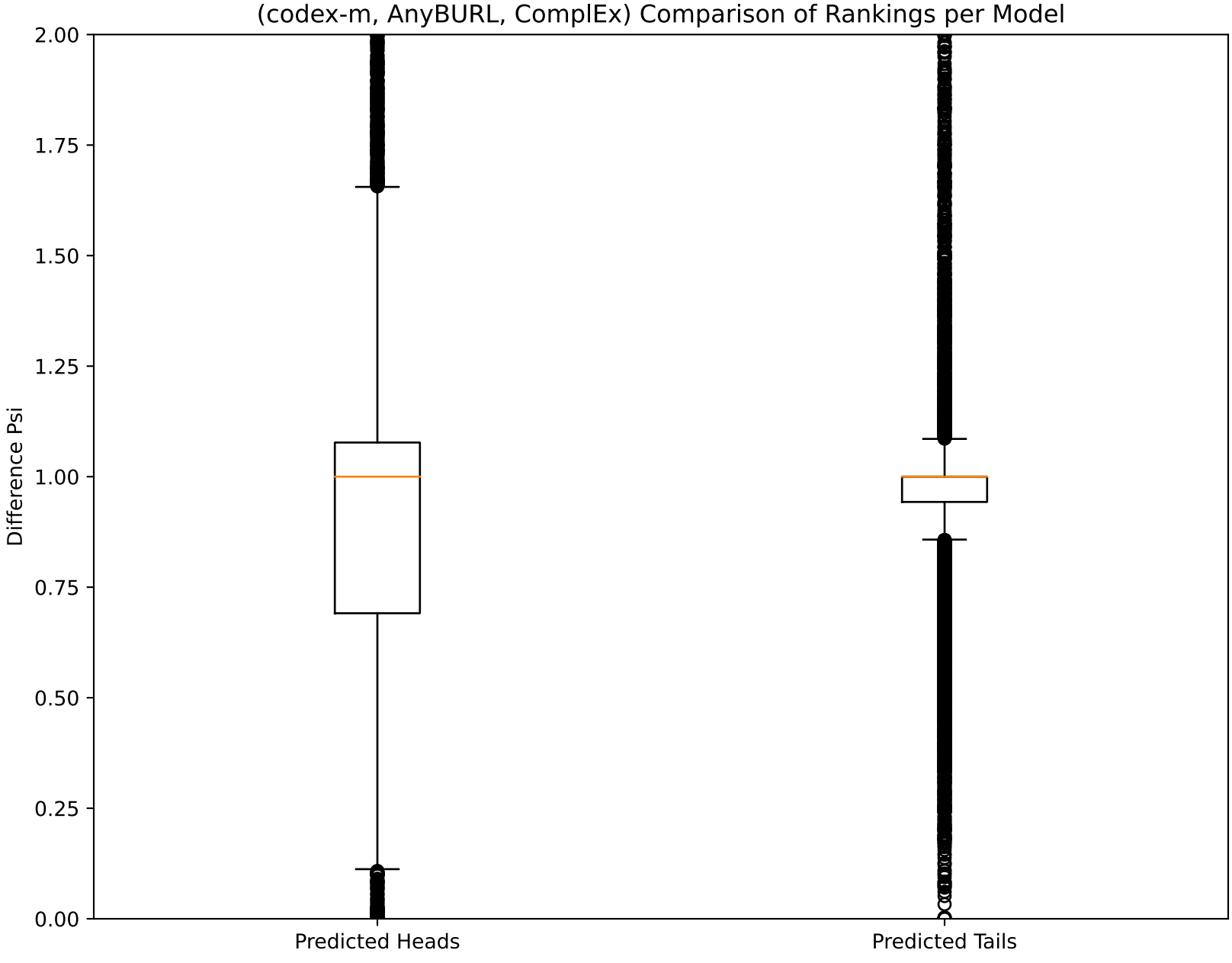
(codex-m, AnyBURL, ComplEx) Metrics

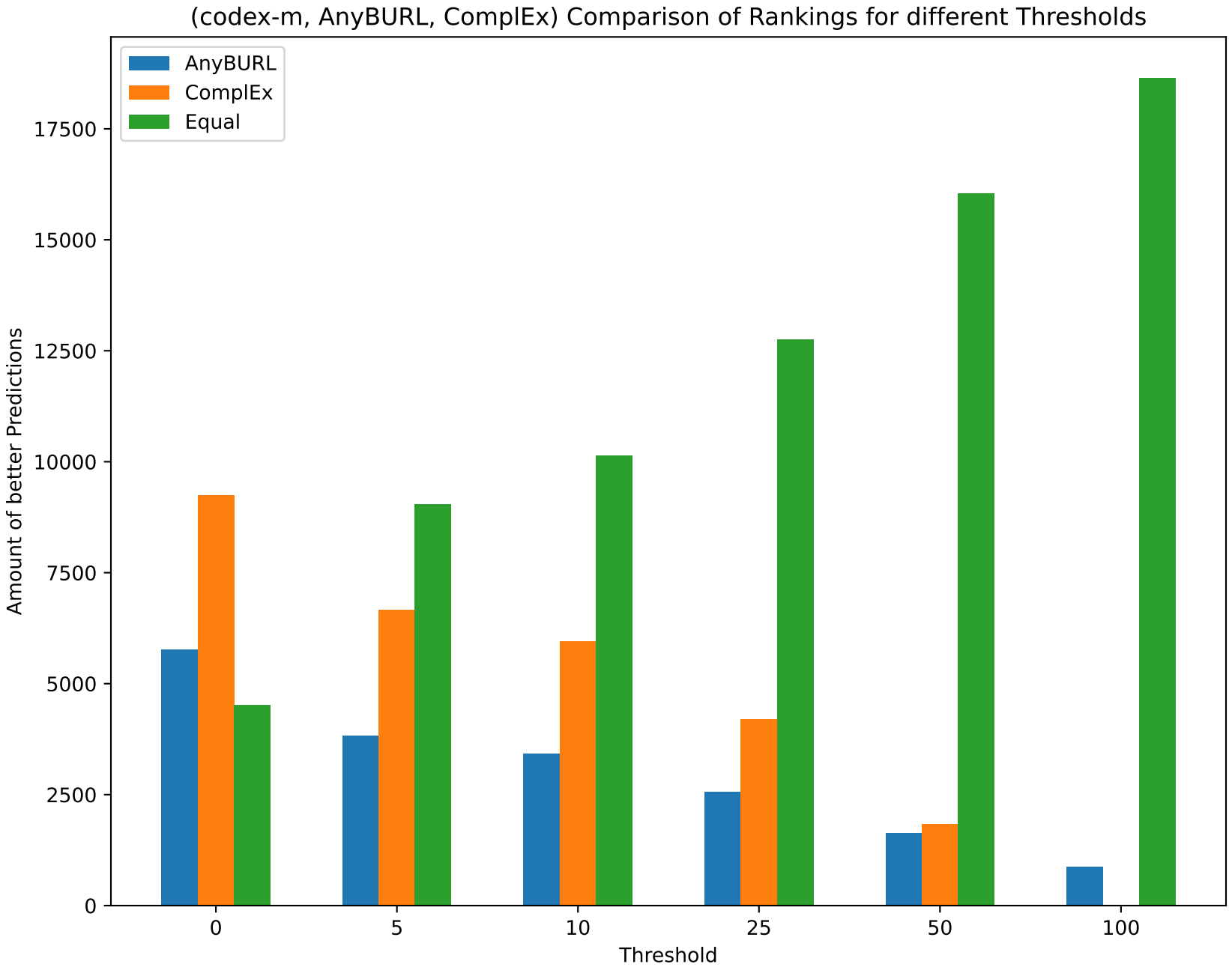
	MRR	Hits@1	Hits@10	Hits@100
AnyBURL	0.302	0.233	0.434	0.639
ComplEx Combined	0.335	0.255	0.483	0.677
ComplEx 1	0.353	0.276	0.502	0.698
ComplEx 2	0.355	0.277	0.502	0.699
ComplEx 3	0.354	0.275	0.505	0.705
ComplEx 4	0.354	0.277	0.500	0.697
ComplEx 5	0.350	0.272	0.498	0.692

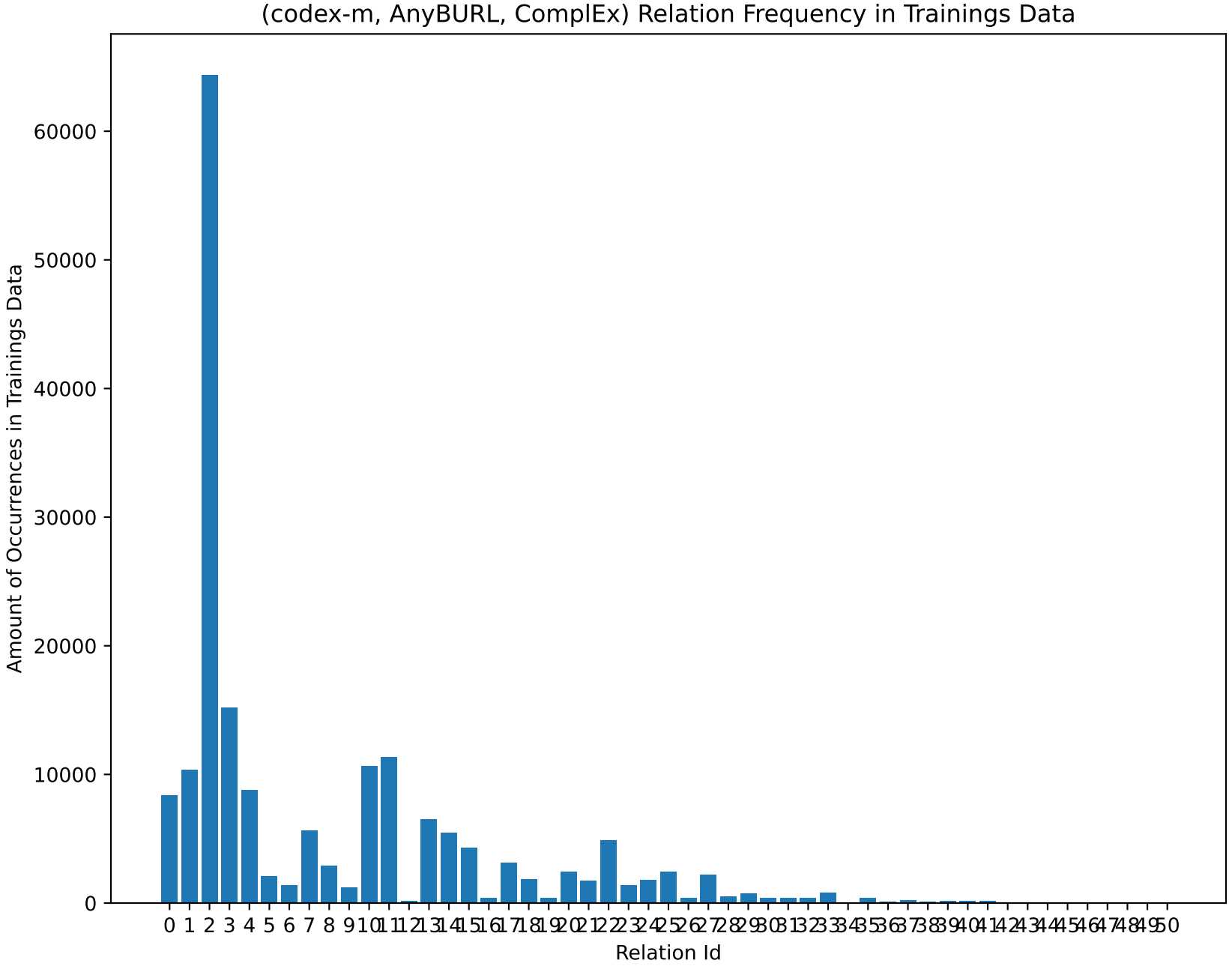

(codex-m, AnyBURL, ComplEx) Comparison of Rankings per Model
Rank (filtered)
12000
10000
8000
6000
4000
2000
0
AnyBURL
ComplEx

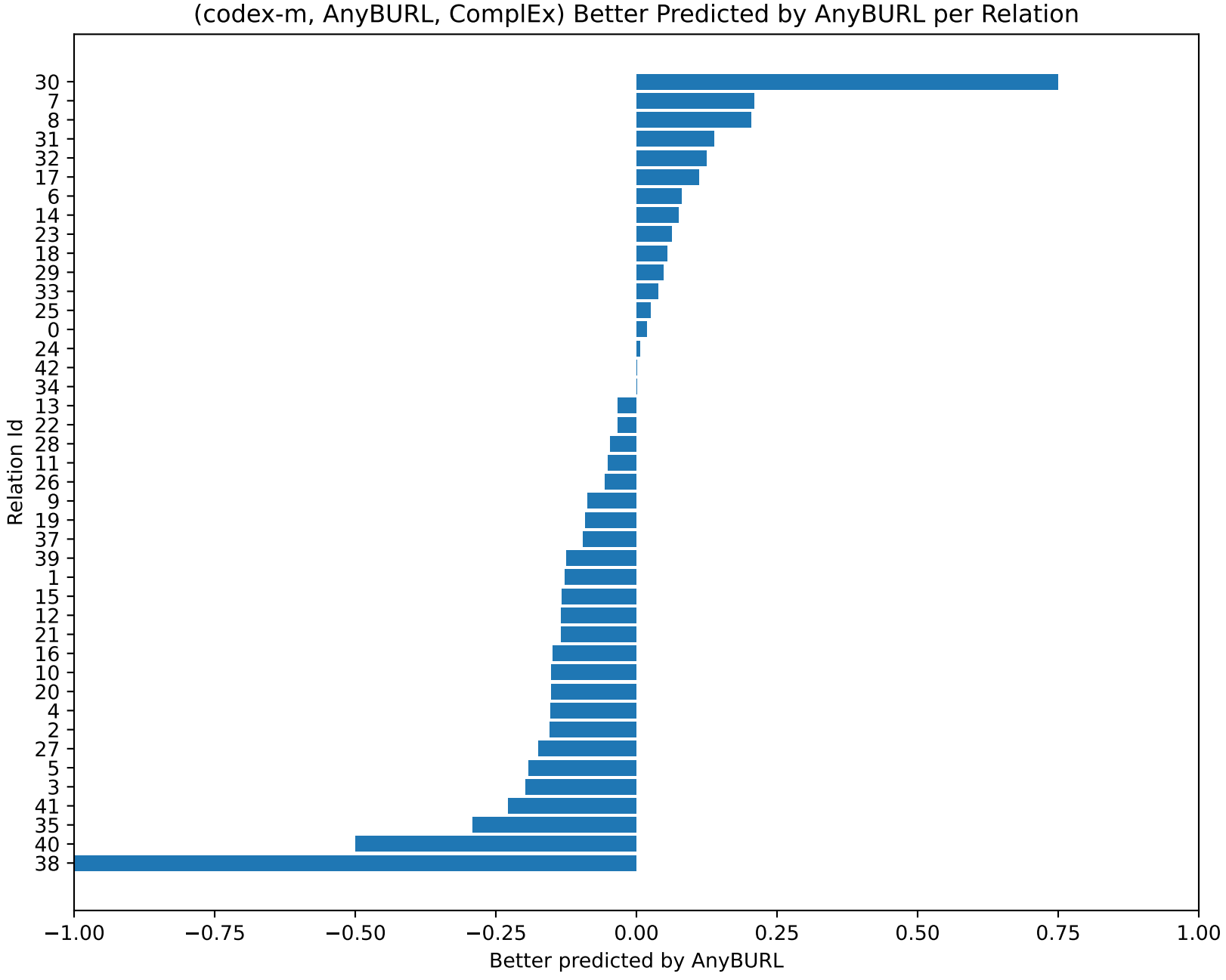

(codex-m, AnyBURL, ComplEx) Comparison of Rankings per Model and Prediction Direction
Predicted Heads
Predicted Tails
Rank (filtered)
Rank (filtered)
0
2000
4000
6000
8000
10000
12000
AnyBURL
ComplEx
AnyBURL
ComplEx

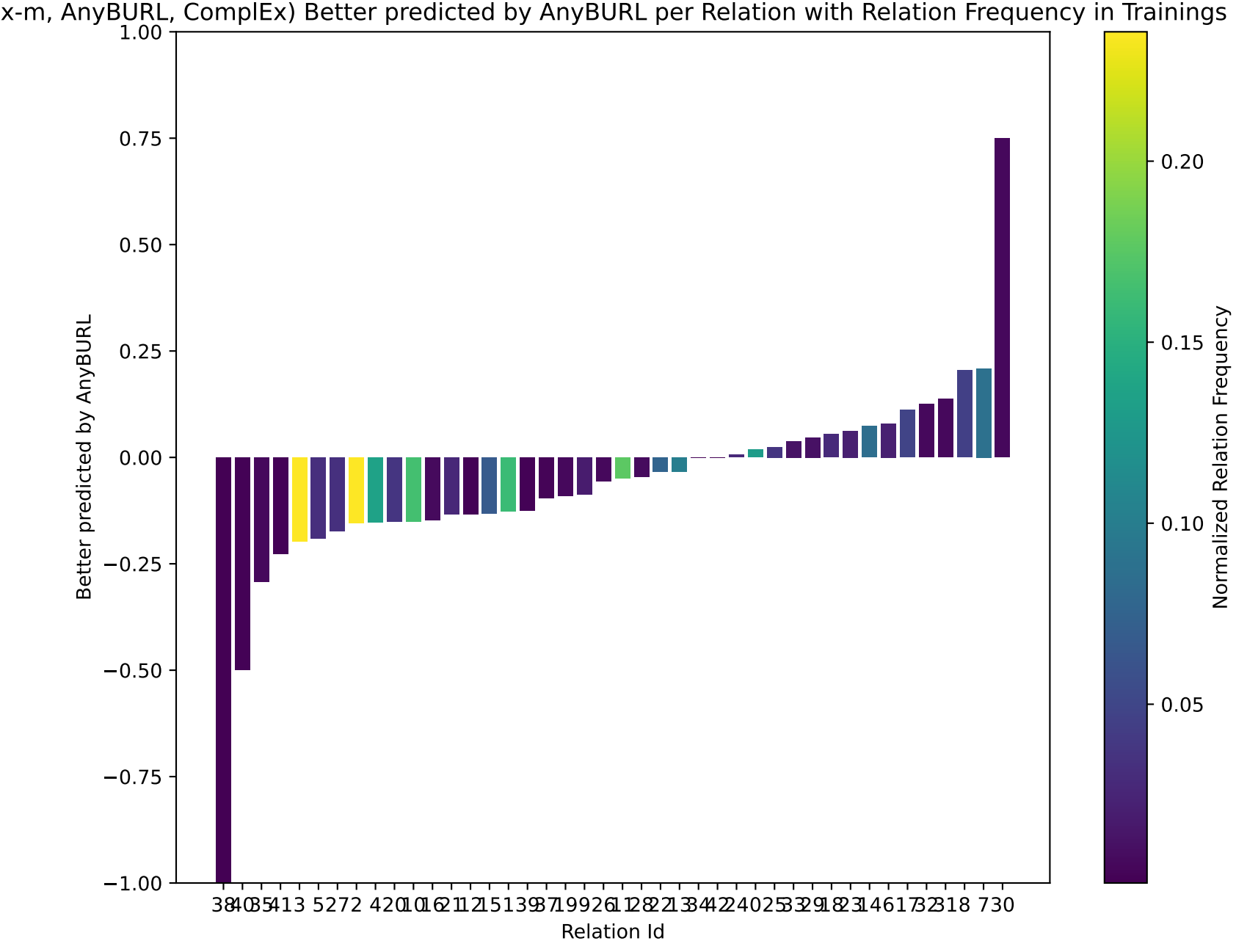

(codex-m, AnyBURL, ComplEx) Comparison of Rankings per Model
Difference Psi
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
1

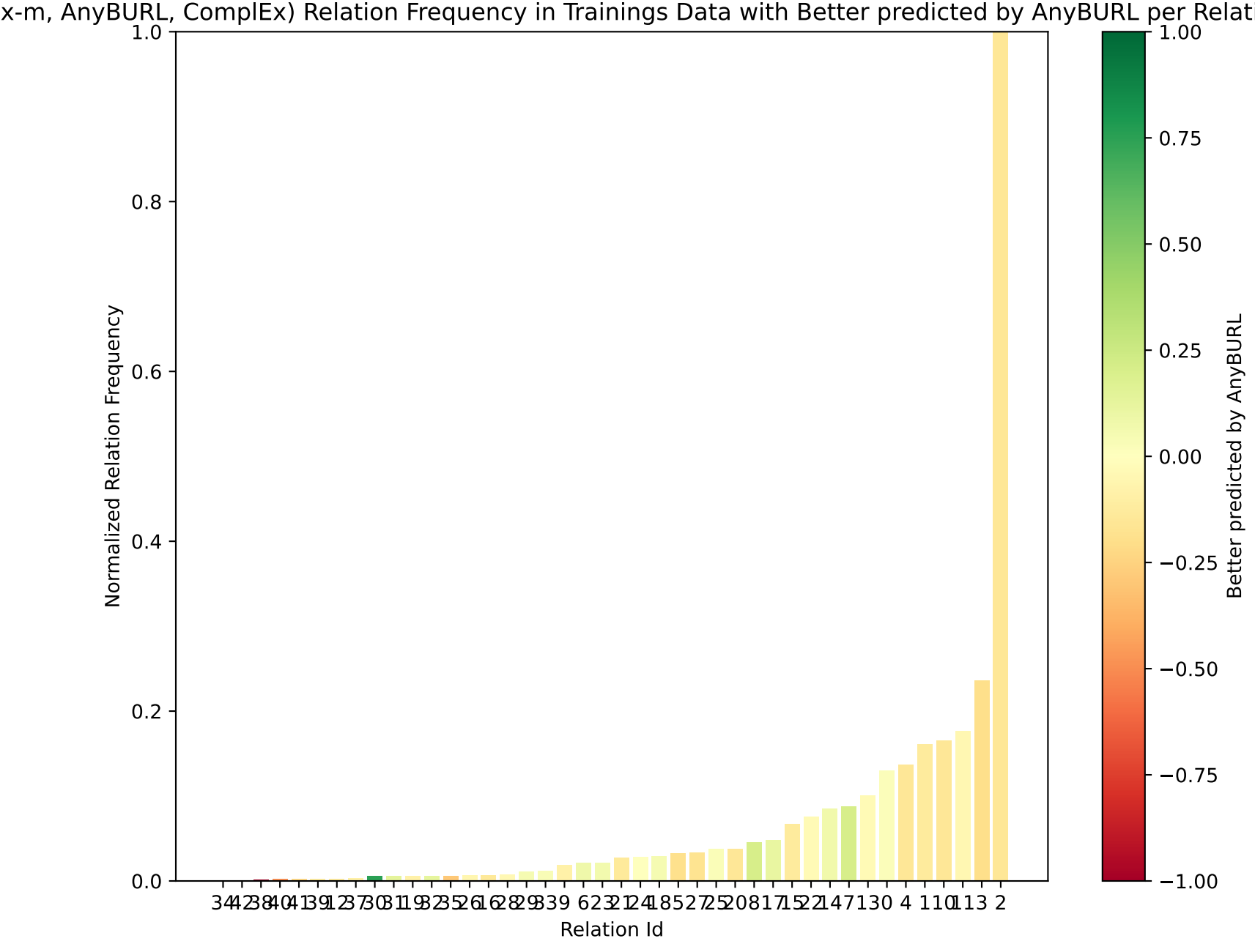

(codex-m, AnyBURL, ComplEx) Comparison of Rankings per Model
Difference Psi
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Predicted Heads
Predicted Tails

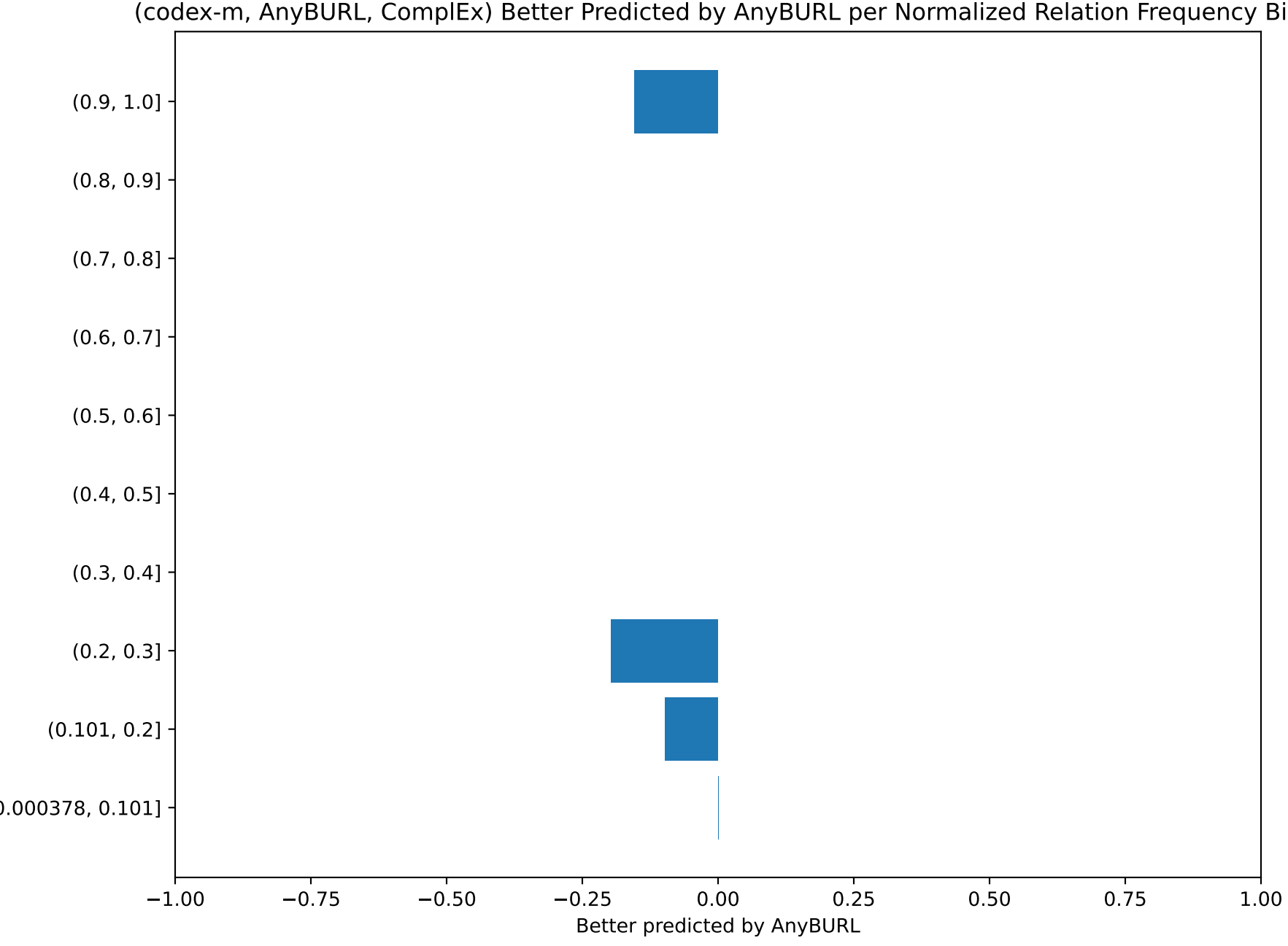

(codex-m, AnyBURL, ComplEx) Comparison of Rankings for different Thresholds
AnyBURL
ComplEx
Equal
Amount of better Predictions
0
2500
5000
7500
10000
12500
15000
17500
0
5
10
25
50
100
Threshold

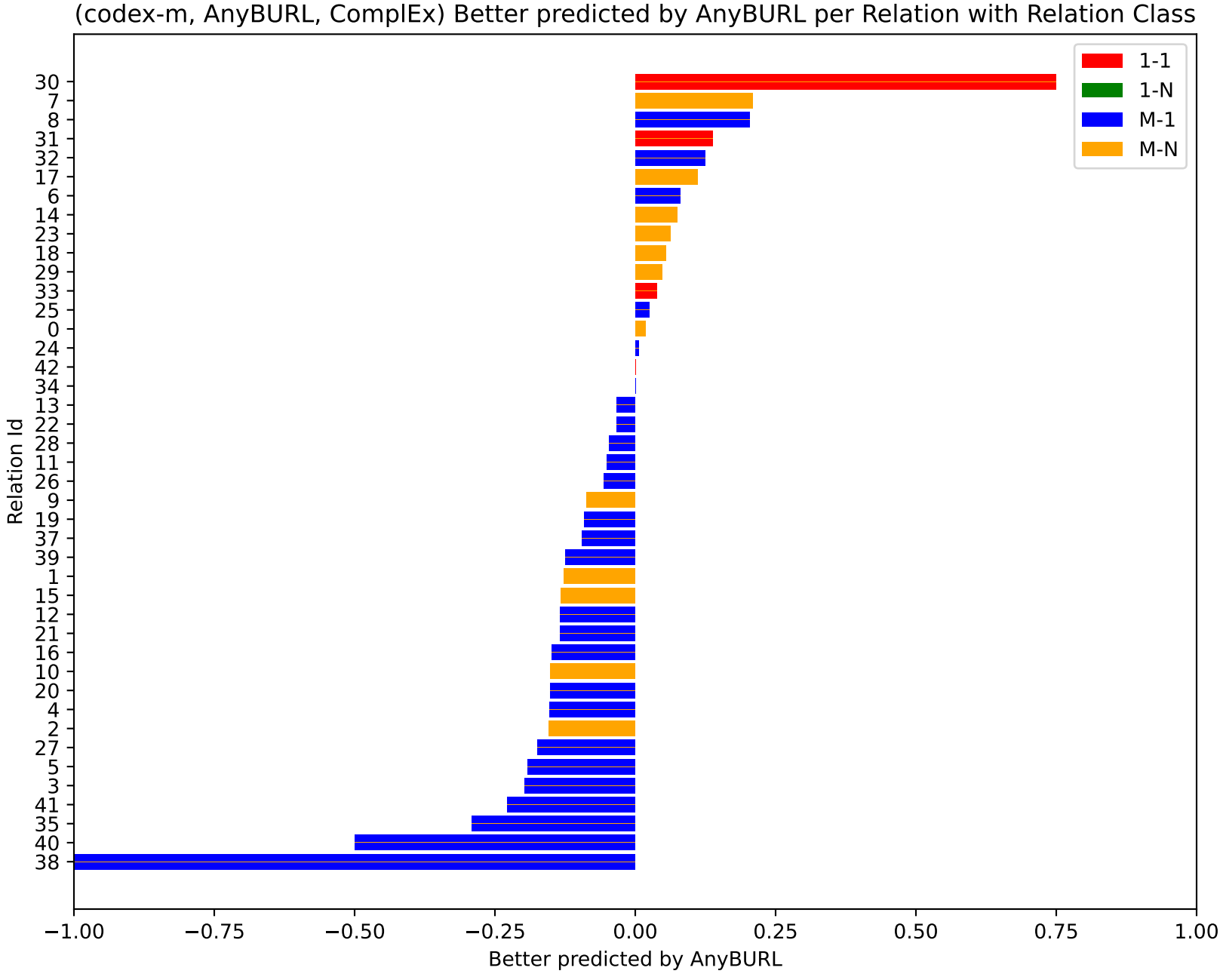

(codex-m, AnyBURL, ComplEx) Relation Frequency in Trainings Data
Amount of Occurrences in Trainings Data
0
10000
20000
30000
40000
50000
60000
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
Relation Id

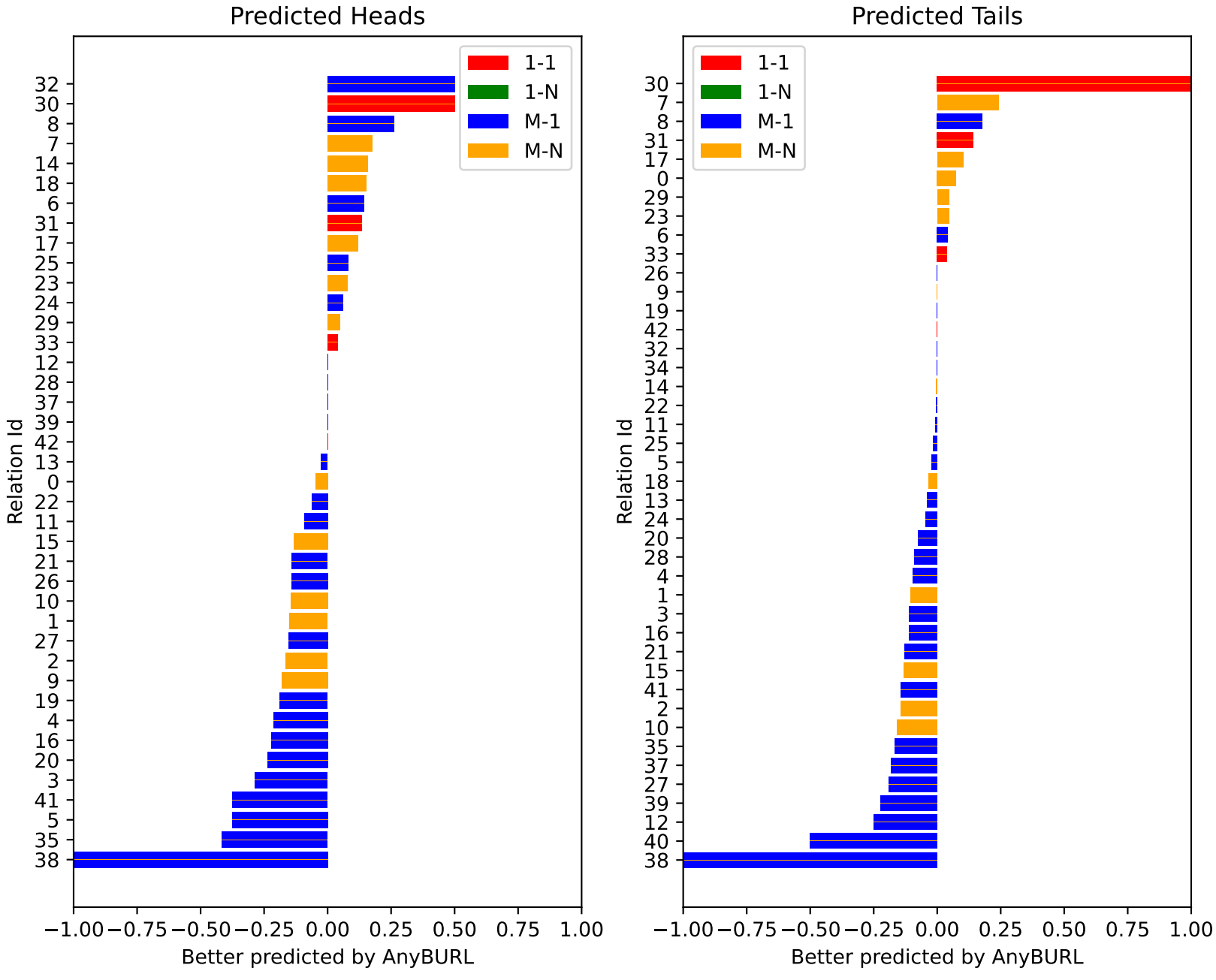

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Relation
Relation Id
30
7
8
31
32
17
6
14
23
18
29
33
25
0
24
42
34
13
22
28
11
26
9
19
37
39
1
15
12
21
16
10
20
4
2
27
5
3
41
35
40
38
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL


x-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Relation with Relation Frequency in Trainings Data
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
Relation Id
38 40 35 41 13 52 72 42 0 10 16 2 11 12 15 1 39 37 19 9 26 6 11 28 22 1 33 44 2 24 0 25 3 32 9 29 18 23 1 46 17 32 31 8 7 30
Normalized Relation Frequency
0.20
0.15
0.10
0.05


x-m, AnyBURL, ComplEx) Relation Frequency in Trainings Data with Better predicted by AnyBURL per Relation
Normalized Relation Frequency
1.0
0.8
0.6
0.4
0.2
0.0
Relation Id
34 42 38 40 41 39 12 37 30 31 19 32 35 26 16 28 29 33 39 6 23 21 24 18 5 27 25 20 8 17 15 22 14 7 13 0 4 1 10 11 3 2
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00


(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Normalized Relation Frequency Bin
(0.9, 1.0]
(0.8, 0.9]
(0.7, 0.8]
(0.6, 0.7]
(0.5, 0.6]
(0.4, 0.5]
(0.3, 0.4]
(0.2, 0.3]
(0.101, 0.2]
0.000378, 0.101]
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL


(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Relation with Relation Class
1-1
1-N
M-1
M-N
Relation Id
30
7
8
31
32
17
6
14
23
18
29
33
25
0
24
42
34
13
22
28
11
26
9
19
37
39
1
15
12
21
16
10
20
4
2
27
5
3
41
35
40
38
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL

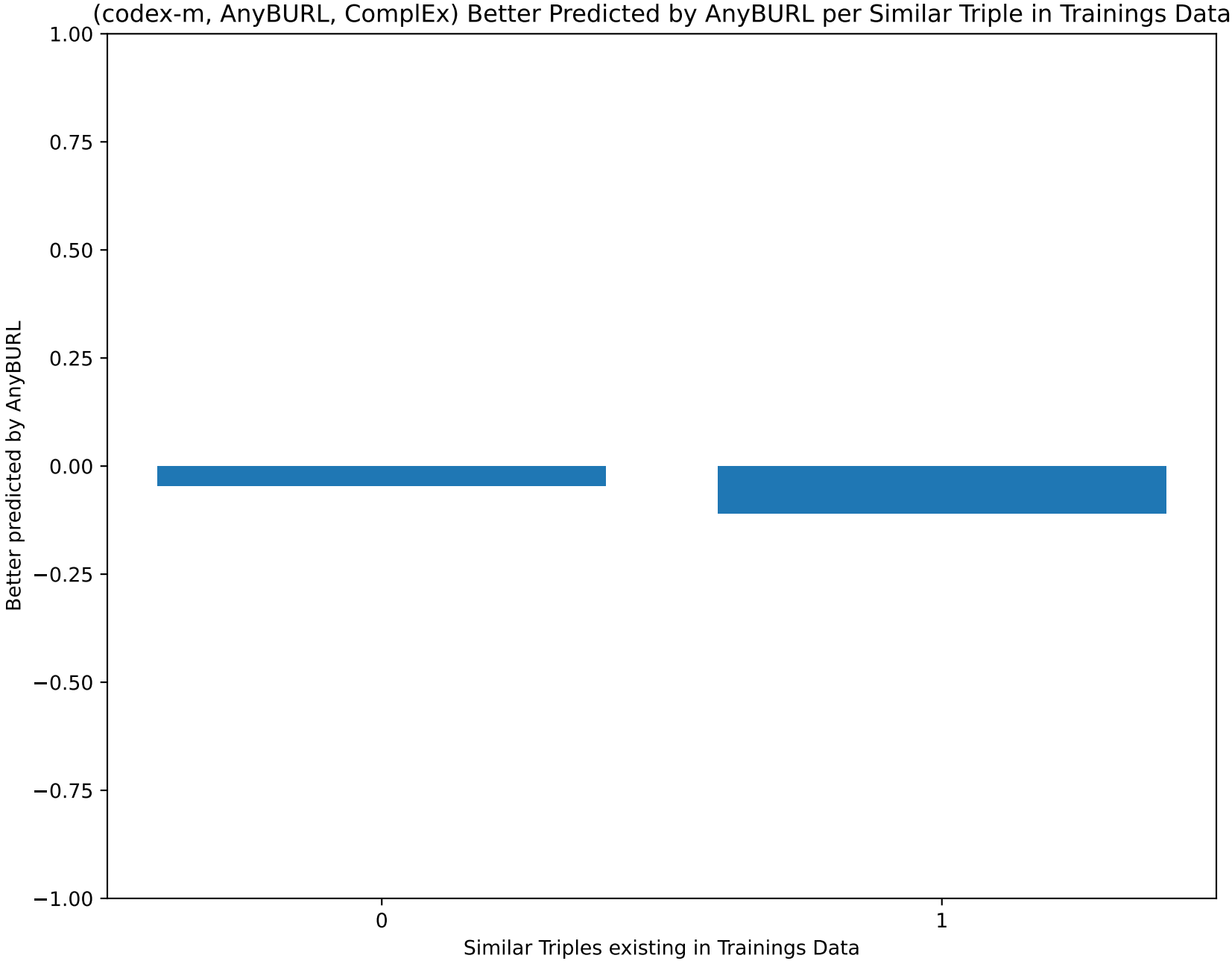

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Relation with Relation Class
Predicted Heads
Predicted Tails
1-1
1-N
M-1
M-N
Relation Id
Better predicted by AnyBURL
−1.00 −0.75 −0.50 −0.25 0.00 0.25 0.50 0.75 1.00

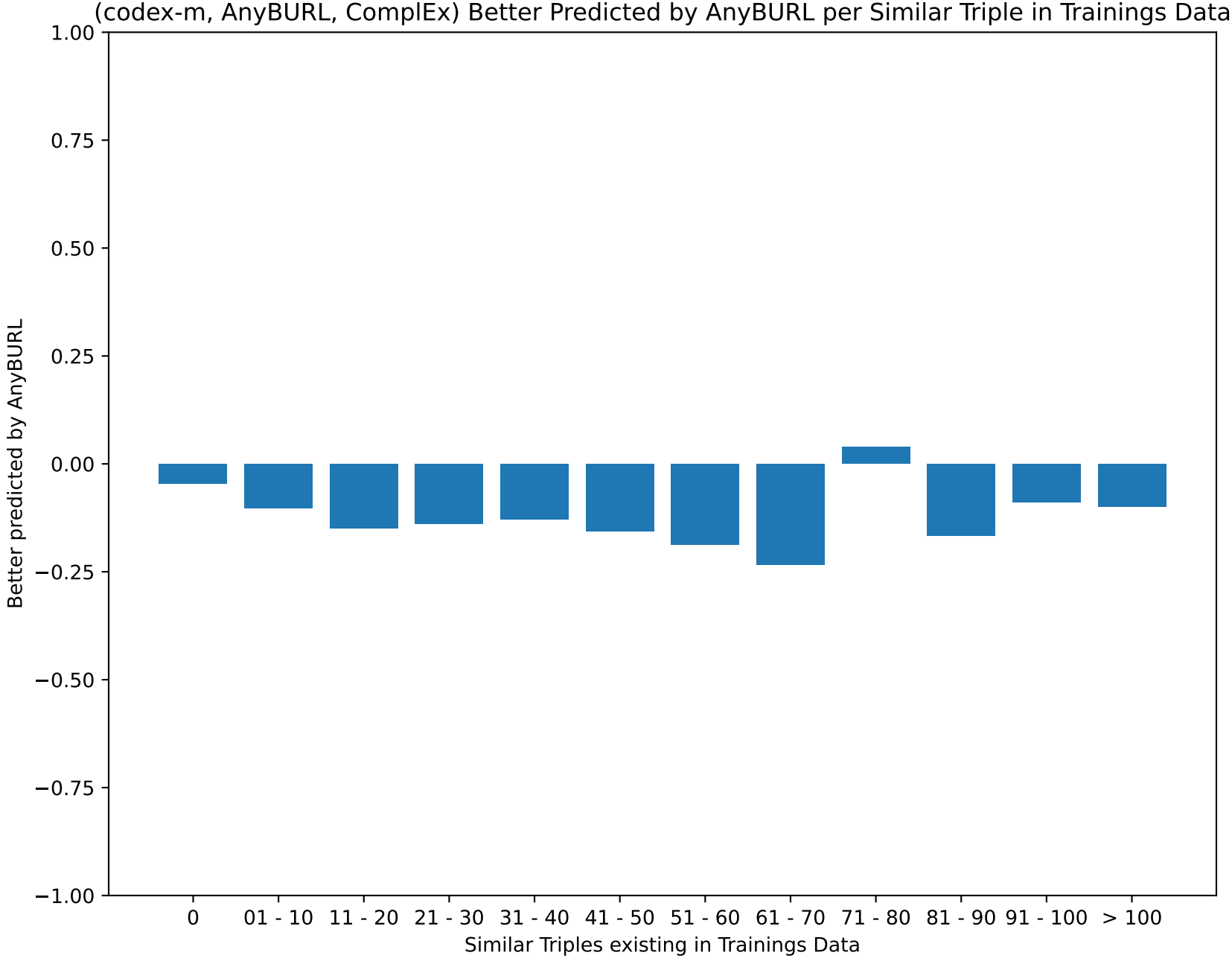
(codex-m, AnyBURL, ComplEx) Better predicted per Relation Class in %

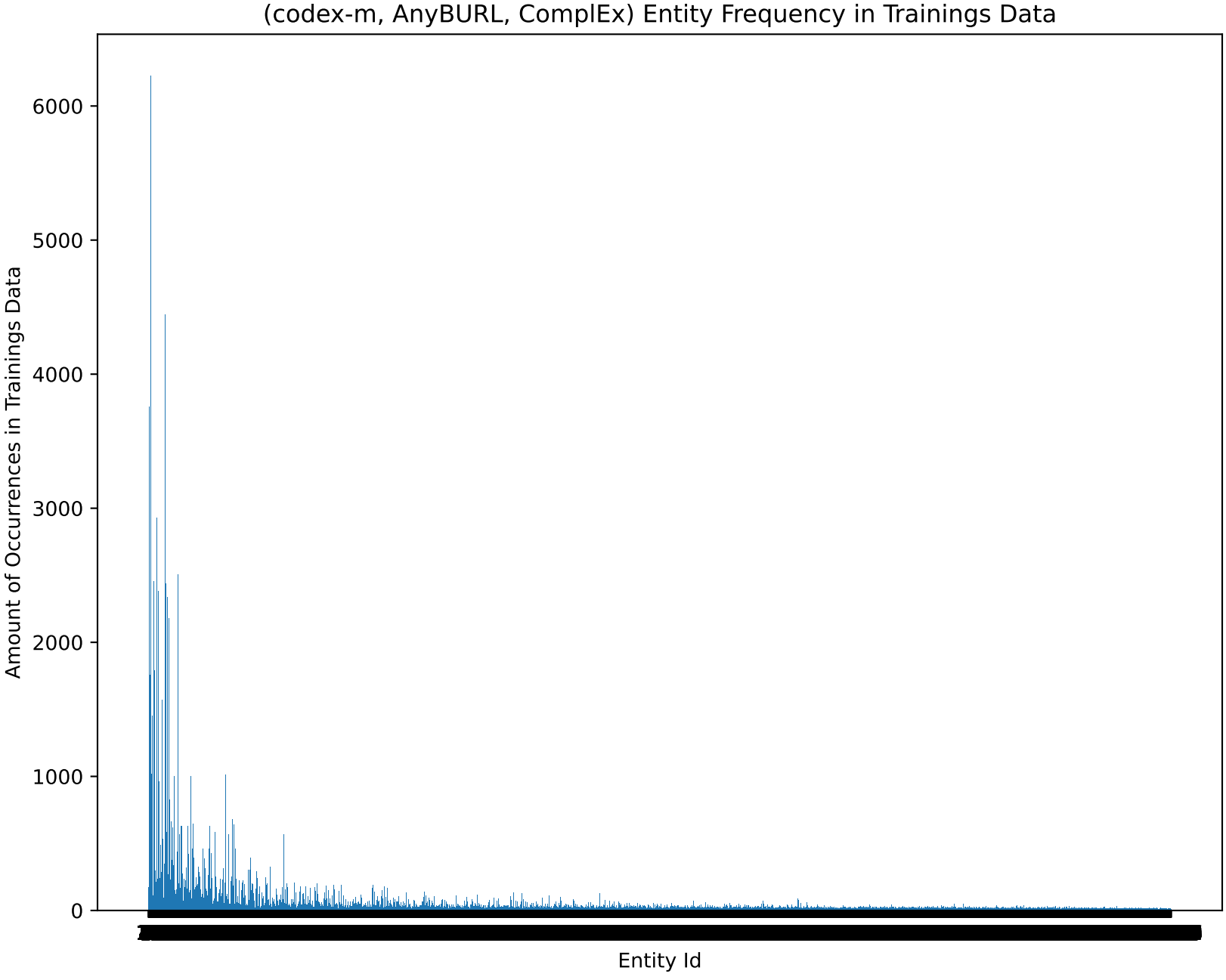
	AnyBURL	ComplEx	Equal
1-1	10.490%	0.699%	88.811%
1-N	0.000%	0.000%	0.000%
M-1	11.444%	21.659%	66.897%
M-N	16.010%	25.815%	58.175%

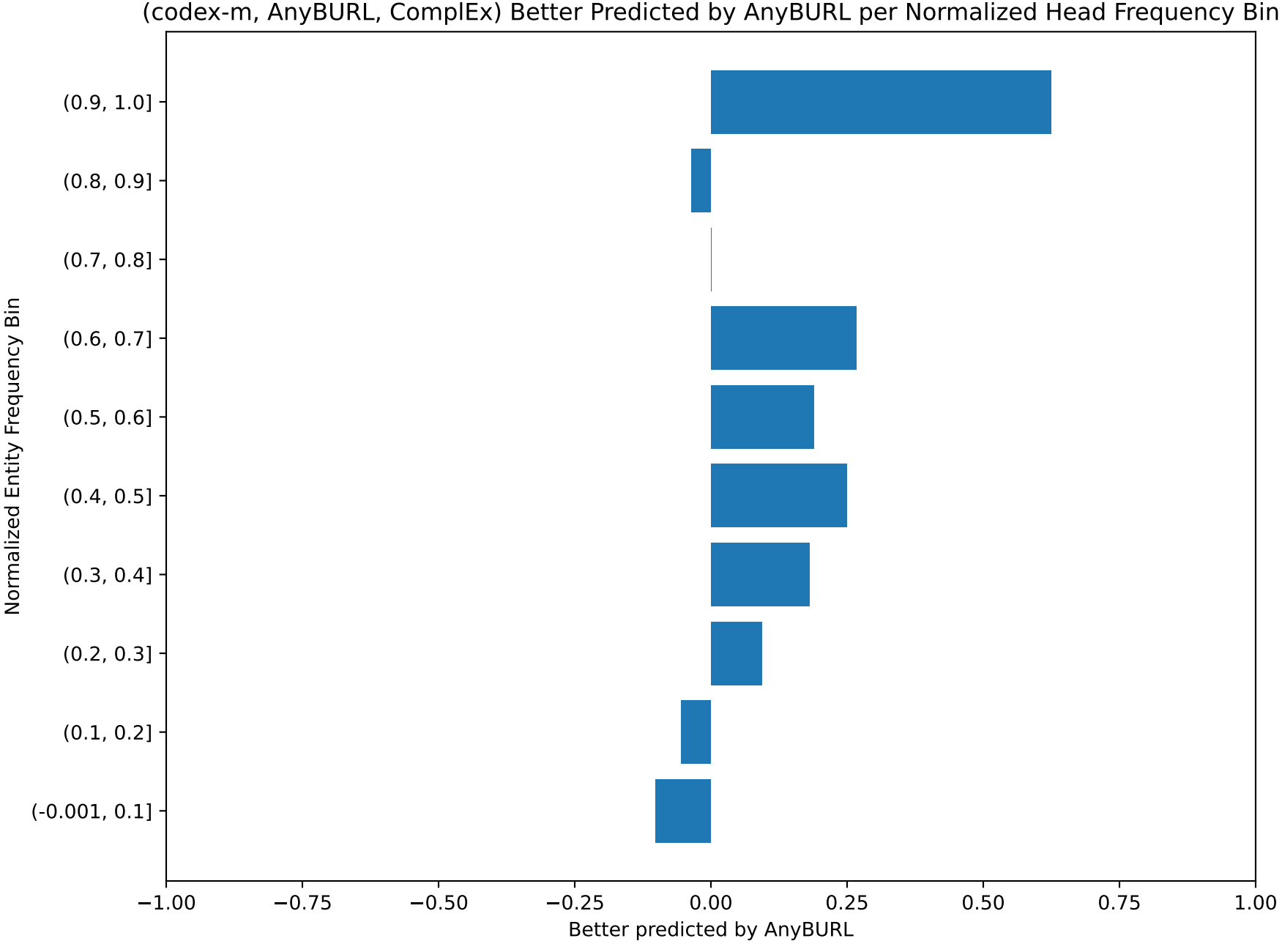
(codex-m, AnyBURL, ComplEx) Better predicted per Relation Class in % (cleaned)

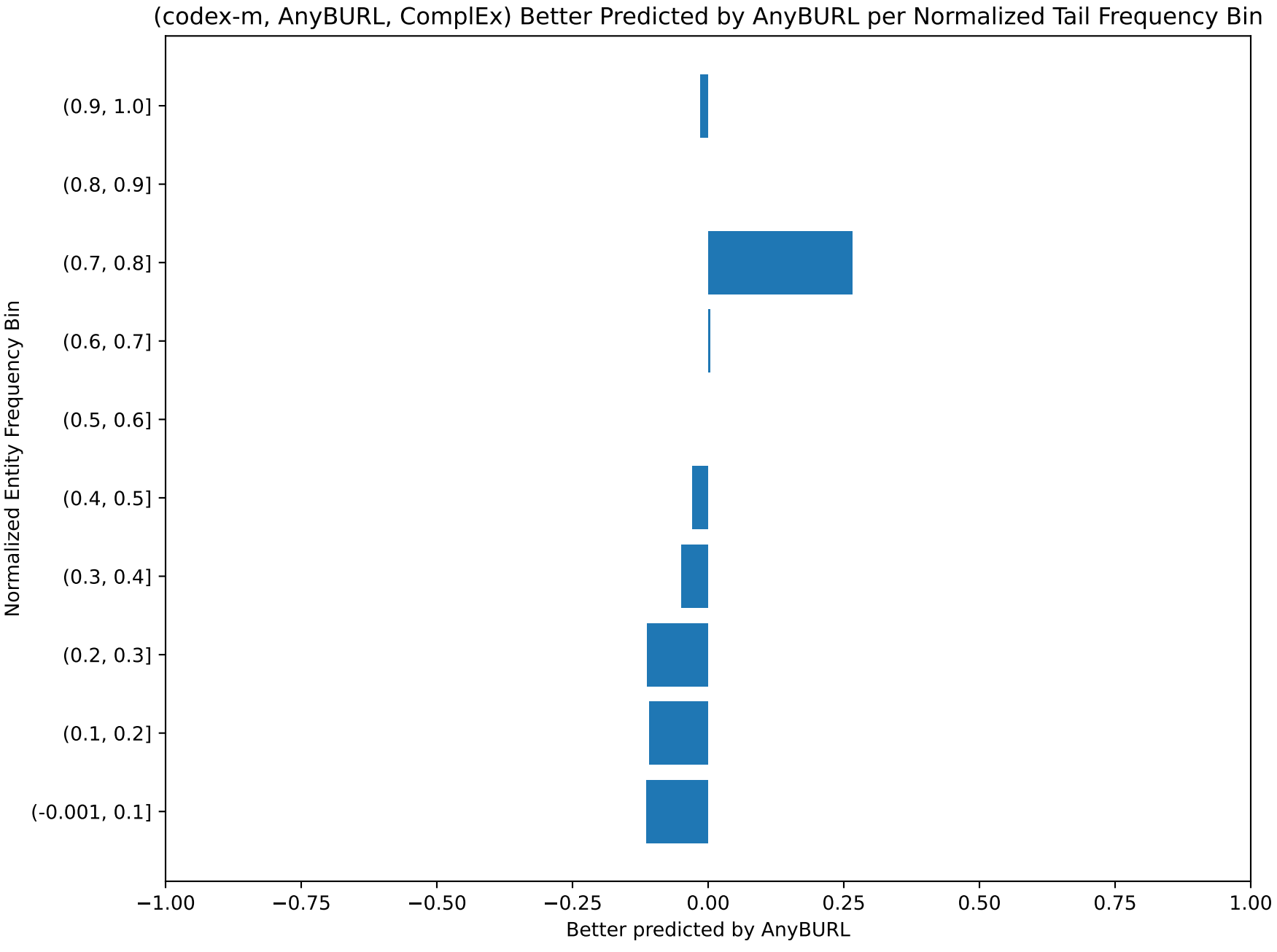
	AnyBURL	ComplEx	Equal
1-1	10.490%	0.699%	88.811%
1-N	16.010%	31.144%	52.846%
M-1	7.236%	12.914%	79.850%
M-N	16.010%	25.815%	58.175%

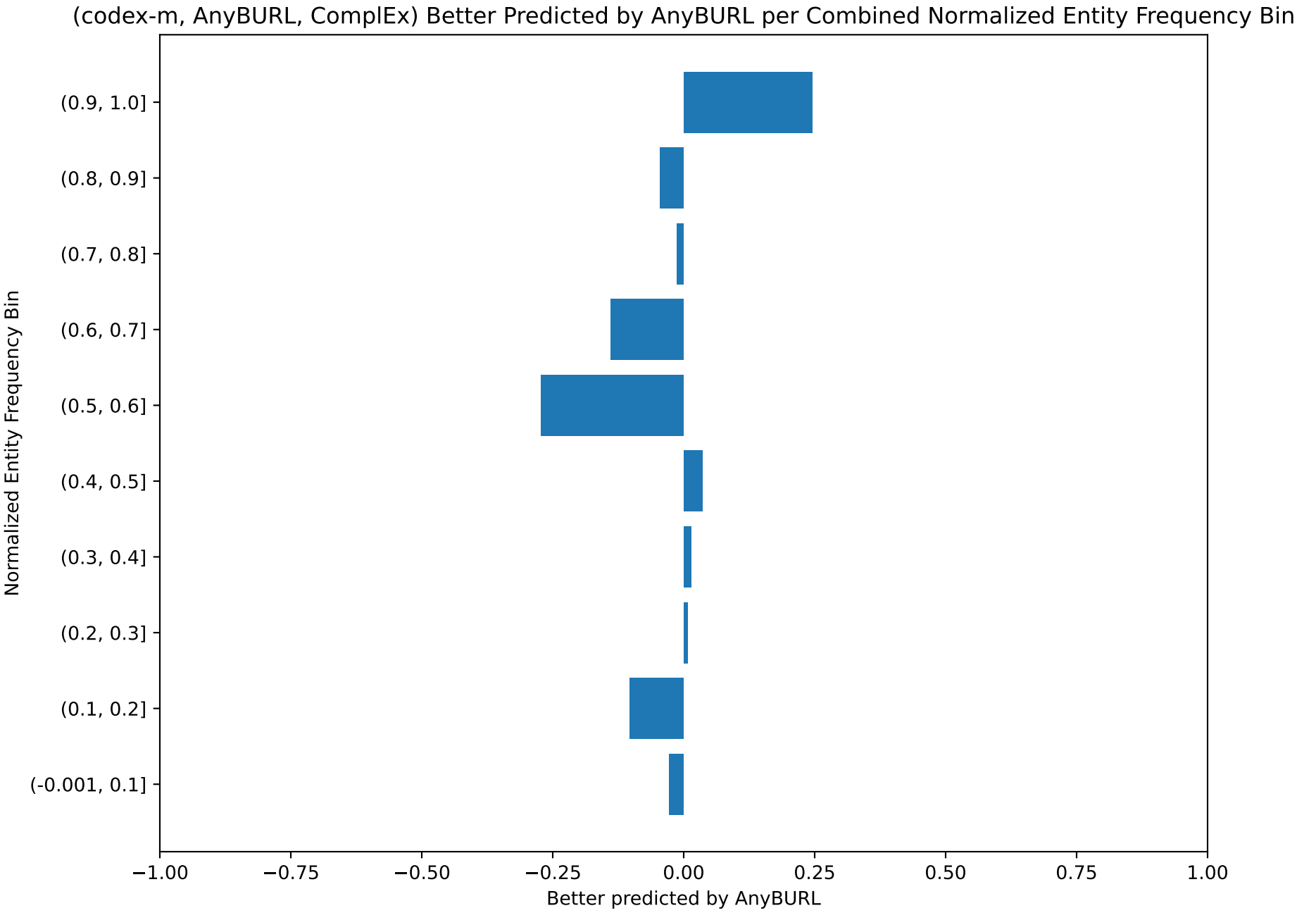

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Similar Triple in Trainings Data
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
1
Similar Triples existing in Trainings Data

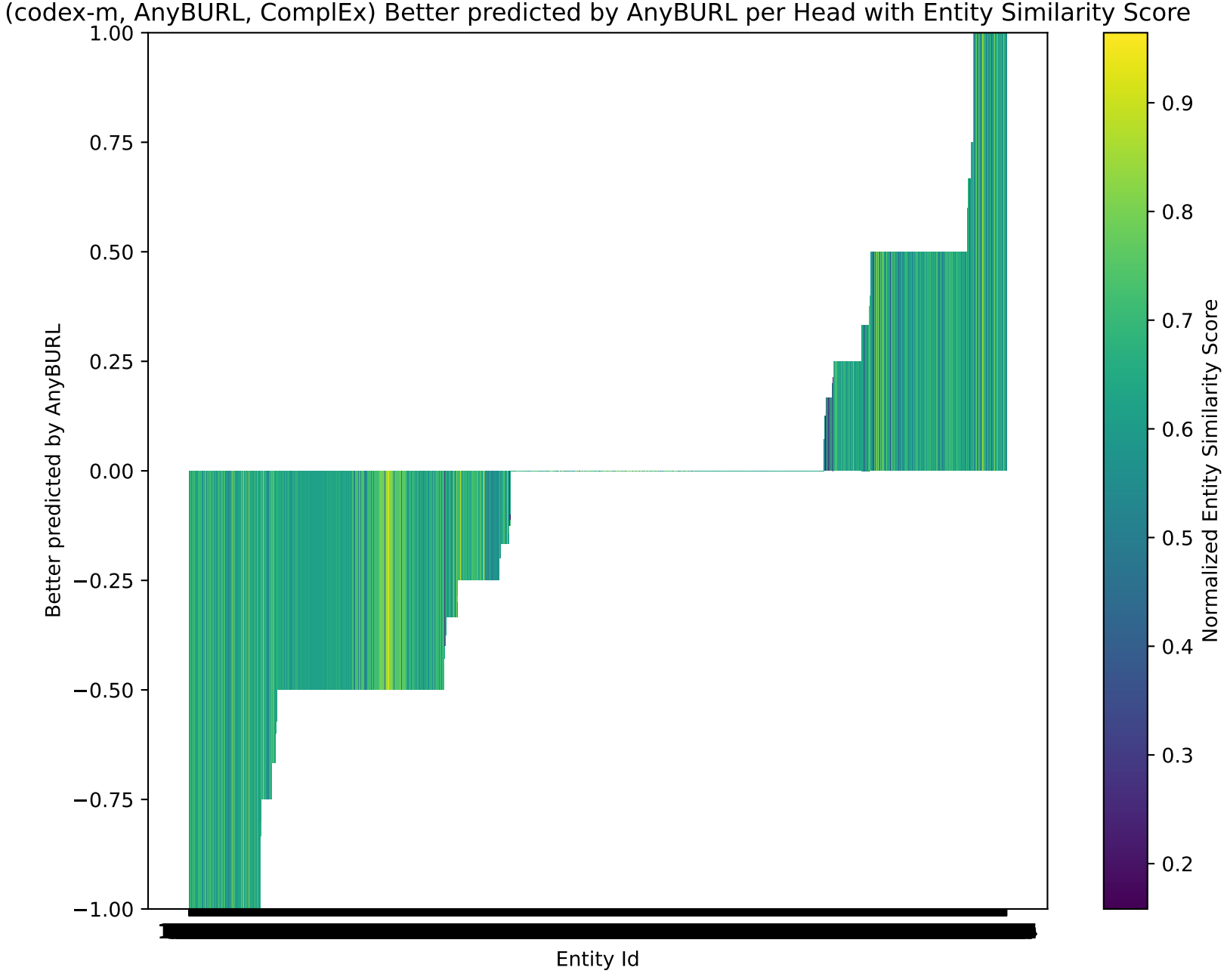

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Similar Triple in Trainings Data
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
01 - 10
11 - 20
21 - 30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
> 100
Similar Triples existing in Trainings Data

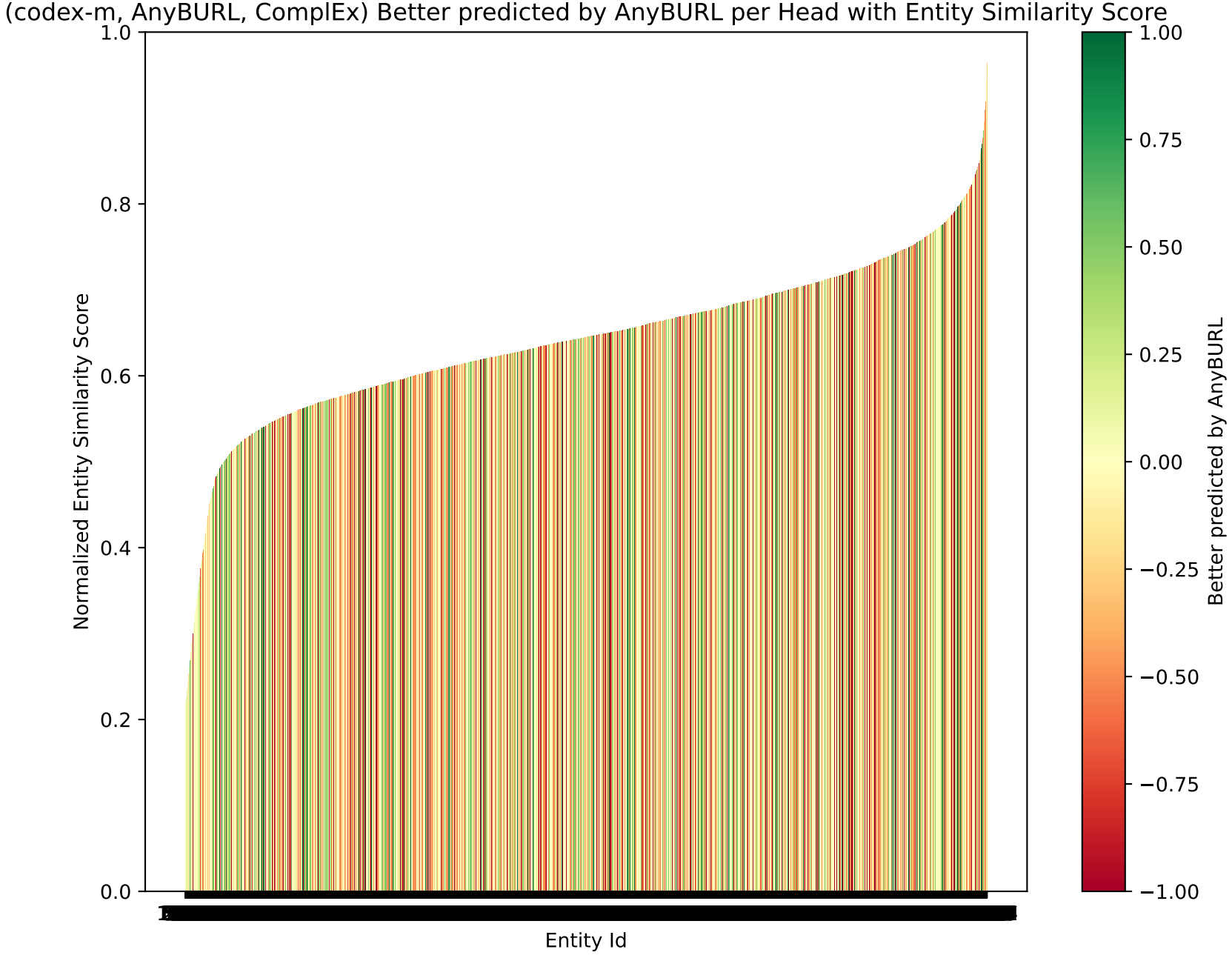

(codex-m, AnyBURL, ComplEx) Entity Frequency in Trainings Data
Amount of Occurrences in Trainings Data
0
1000
2000
3000
4000
5000
6000
Entity Id

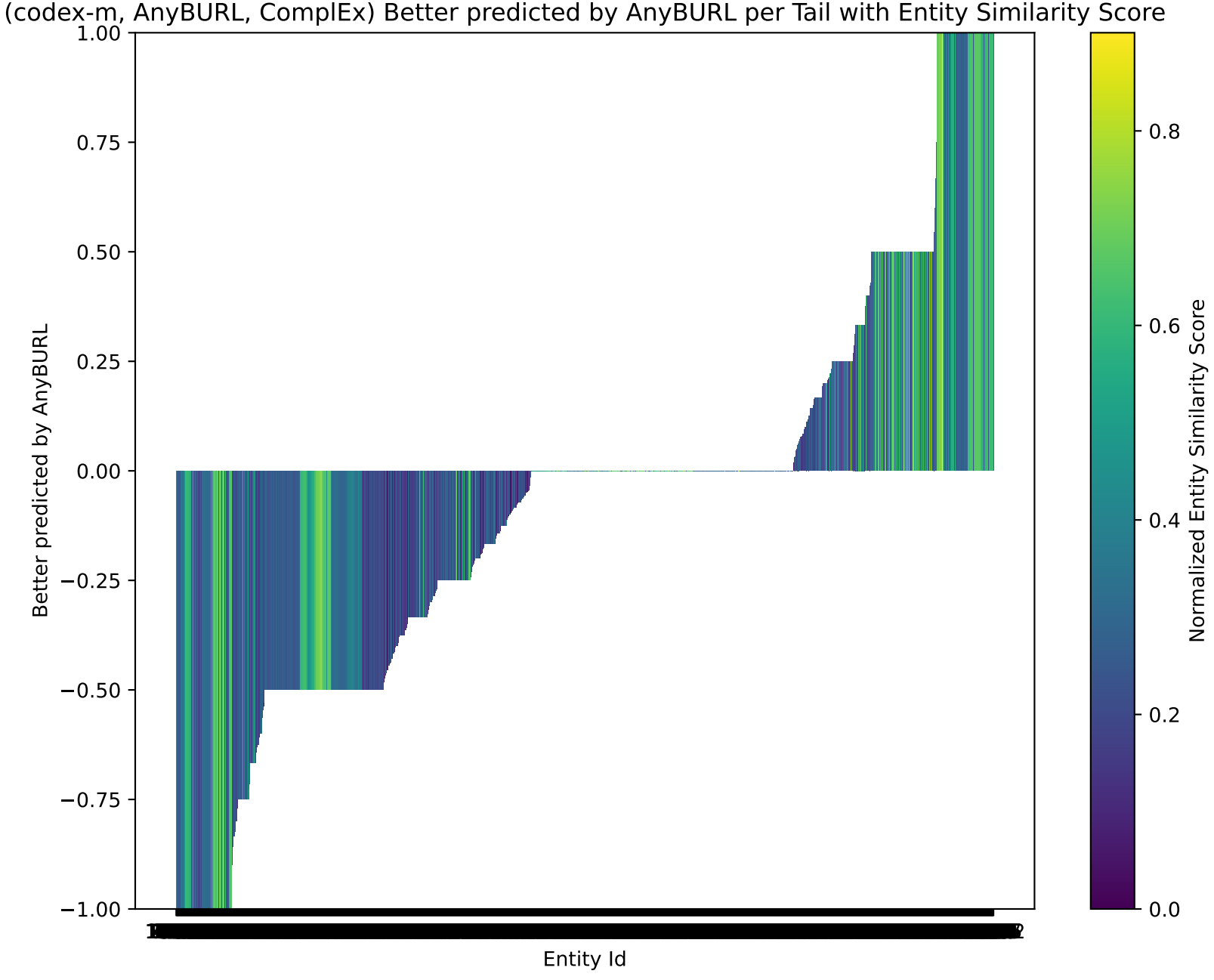

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Normalized Head Frequency Bin
Normalized Entity Frequency Bin
(0.9, 1.0]
(0.8, 0.9]
(0.7, 0.8]
(0.6, 0.7]
(0.5, 0.6]
(0.4, 0.5]
(0.3, 0.4]
(0.2, 0.3]
(0.1, 0.2]
(-0.001, 0.1]
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL

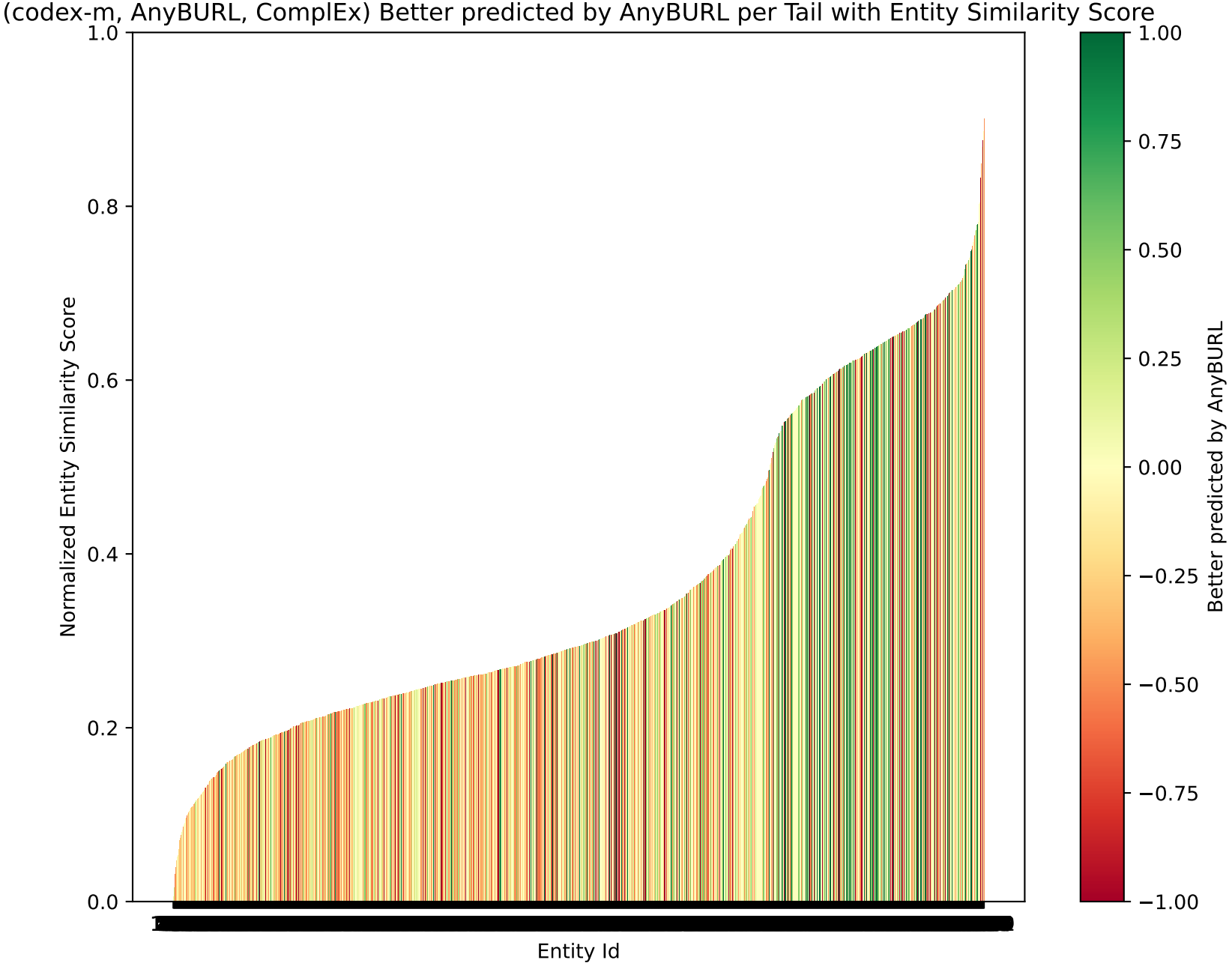

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Normalized Tail Frequency Bin
Normalized Entity Frequency Bin
(0.9, 1.0]
(0.8, 0.9]
(0.7, 0.8]
(0.6, 0.7]
(0.5, 0.6]
(0.4, 0.5]
(0.3, 0.4]
(0.2, 0.3]
(0.1, 0.2]
(-0.001, 0.1]
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL

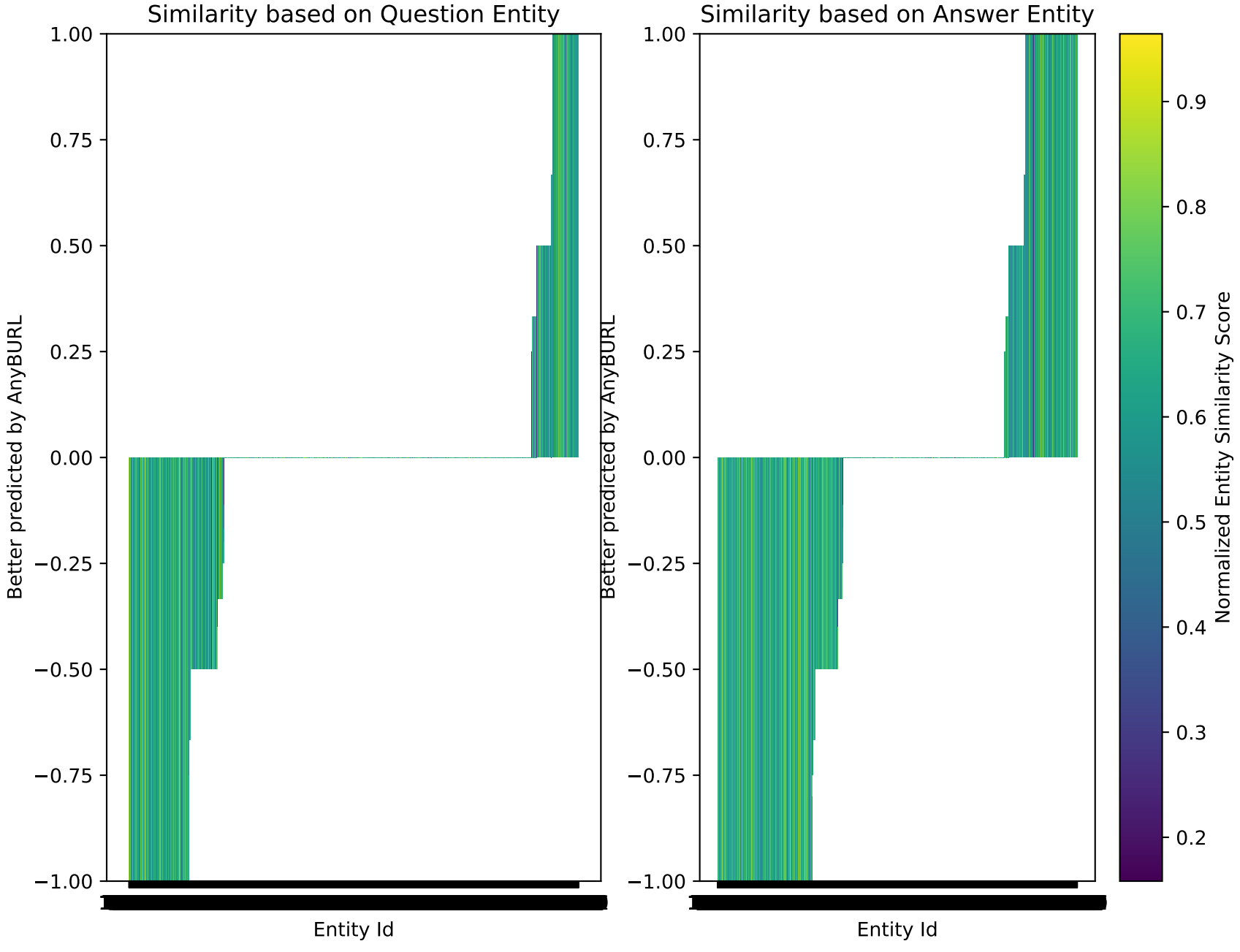

(codex-m, AnyBURL, ComplEx) Better Predicted by AnyBURL per Combined Normalized Entity Frequency Bin
Normalized Entity Frequency Bin
(0.9, 1.0]
(0.8, 0.9]
(0.7, 0.8]
(0.6, 0.7]
(0.5, 0.6]
(0.4, 0.5]
(0.3, 0.4]
(0.2, 0.3]
(0.1, 0.2]
(-0.001, 0.1]
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
Better predicted by AnyBURL

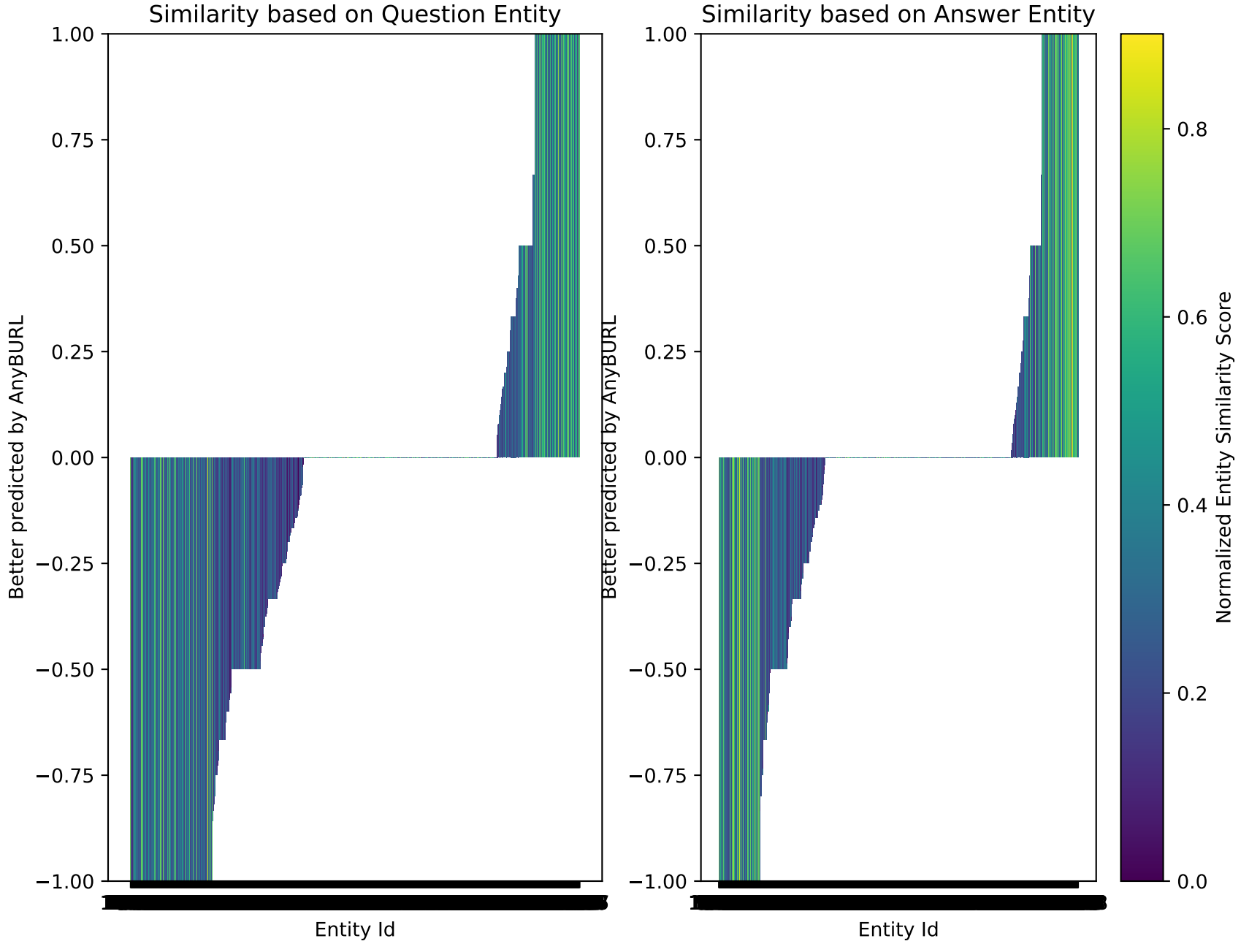

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Head with Entity Similarity Score
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
Entity Id
Normalized Entity Similarity Score
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2

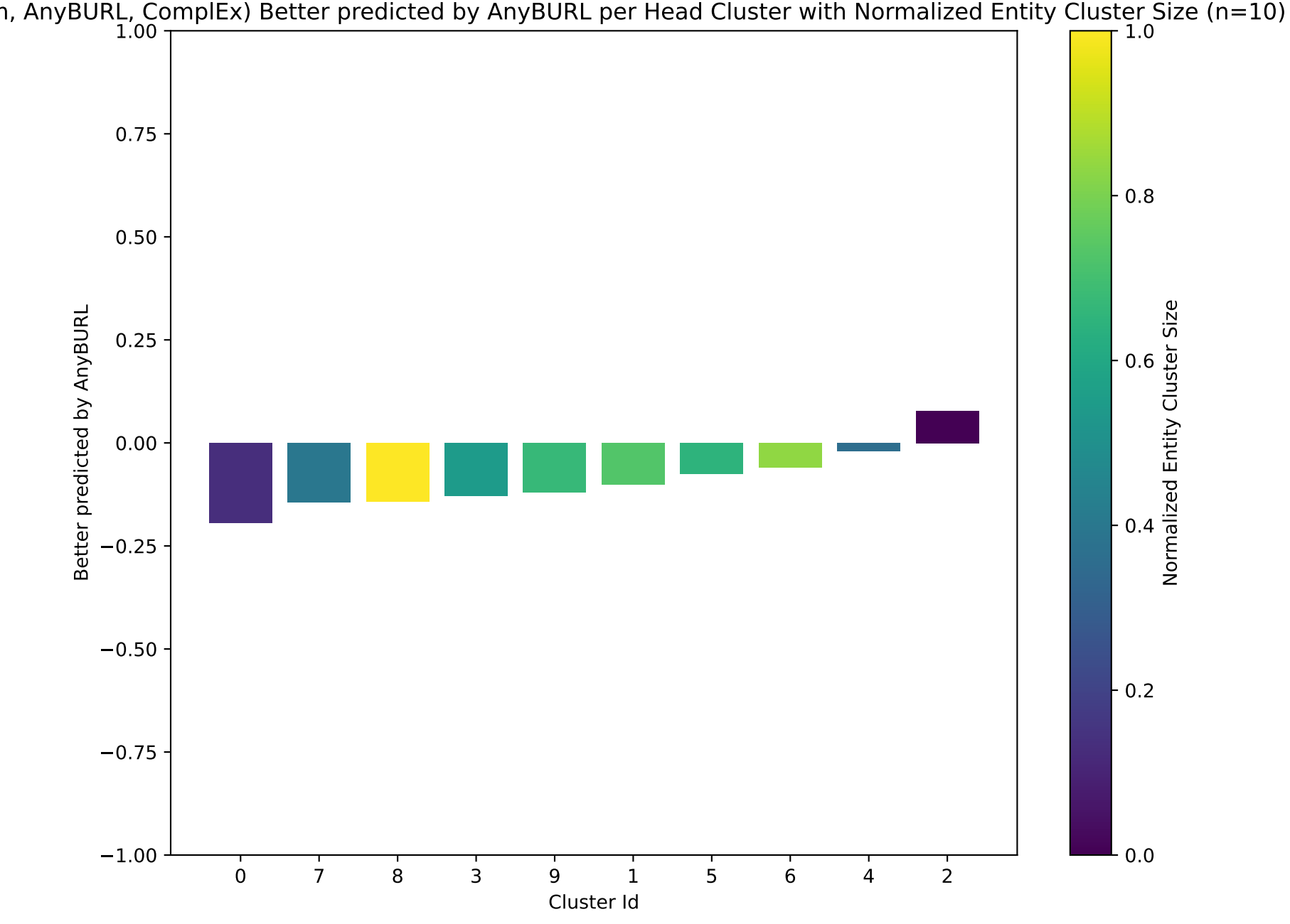

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Head with Entity Similarity Score
Normalized Entity Similarity Score
1.0
0.8
0.6
0.4
0.2
0.0
Entity Id
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

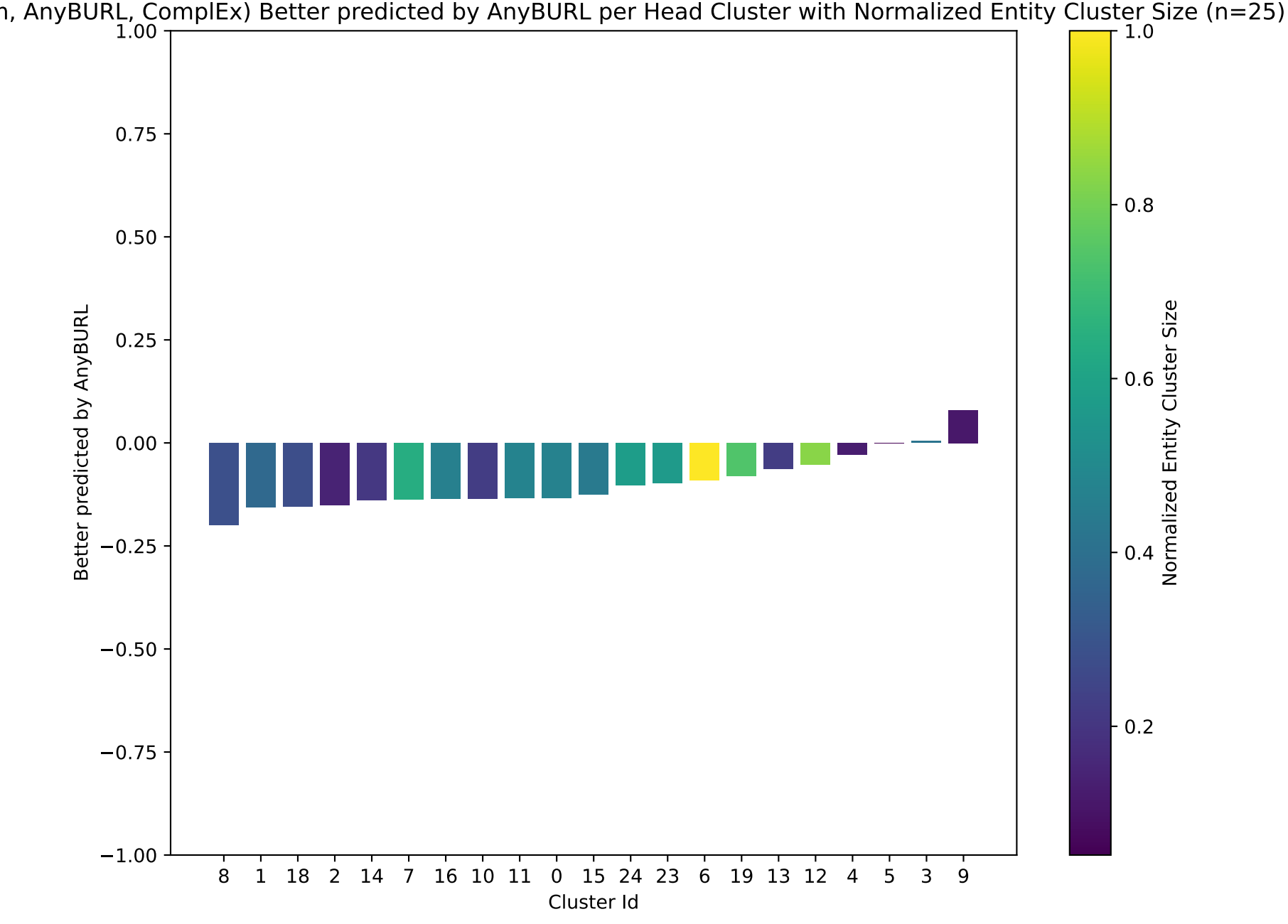

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail with Entity Similarity Score
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
Entity Id
Normalized Entity Similarity Score
0.8
0.6
0.4
0.2
0.0

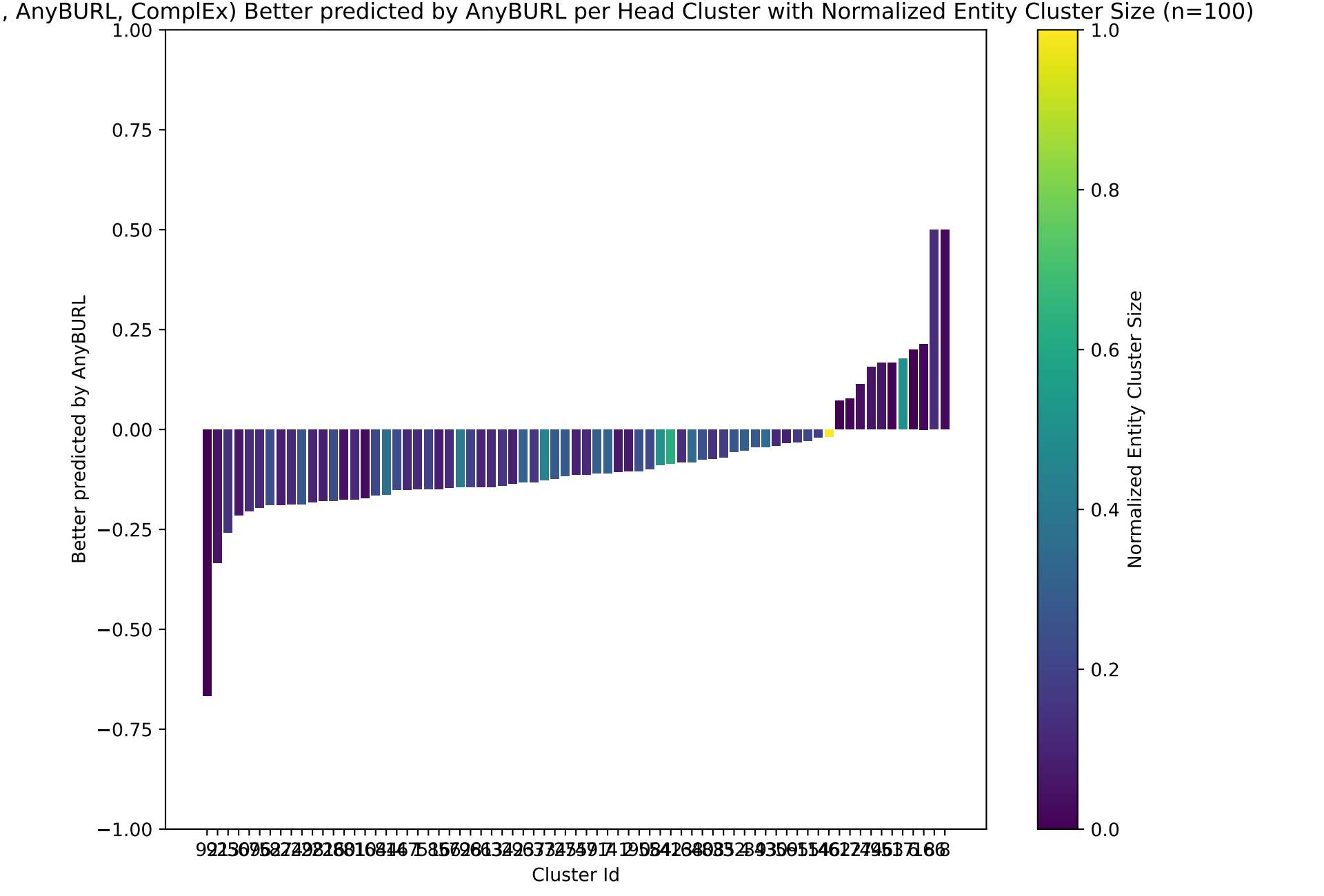

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail with Entity Similarity Score
Normalized Entity Similarity Score
1.0
0.8
0.6
0.4
0.2
0.0
Entity Id
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

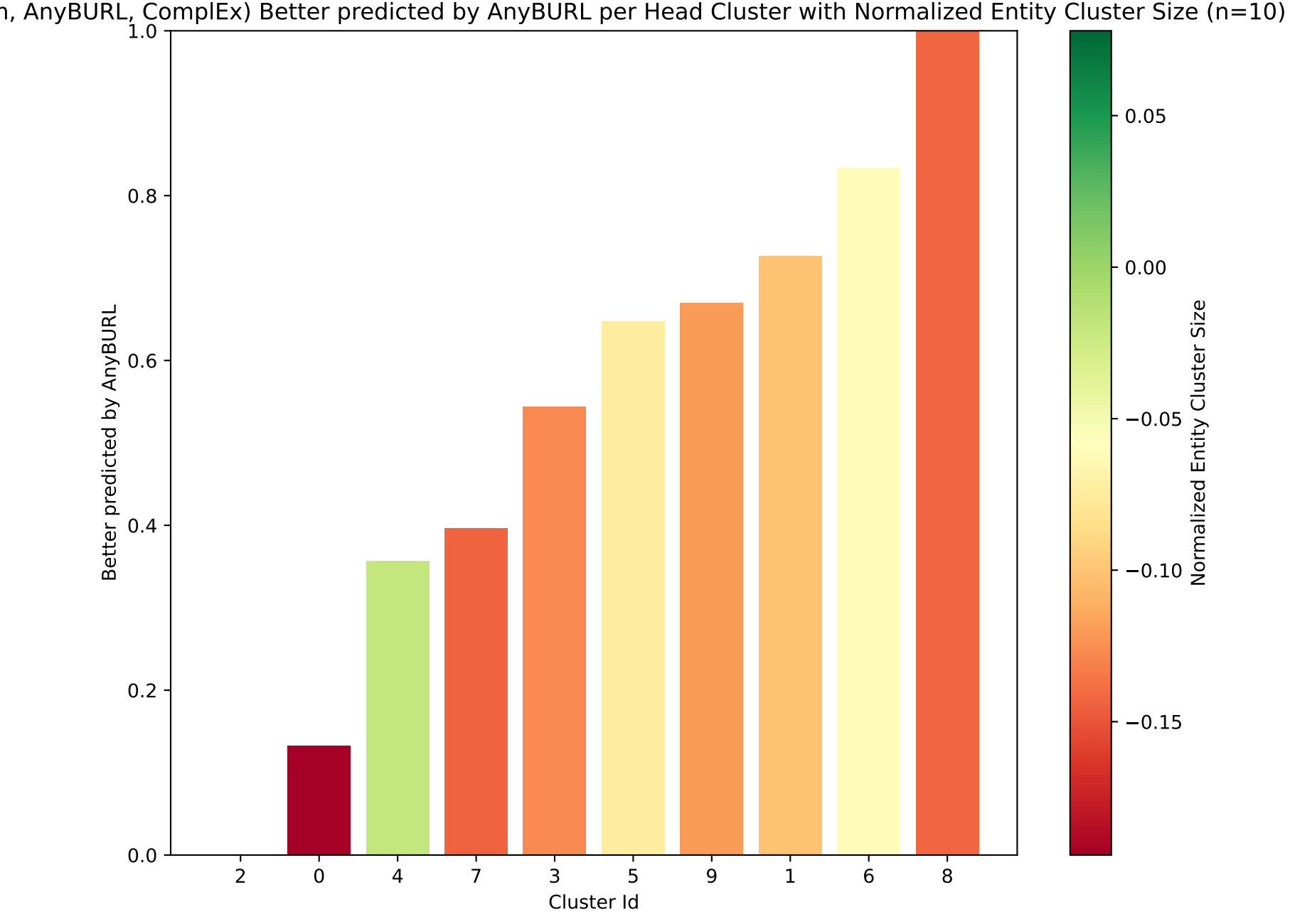

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Head with Entity Similarity Score
Similarity based on Question Entity
Similarity based on Answer Entity
Better predicted by AnyBURL
Entity Id
Normalized Entity Similarity Score
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2

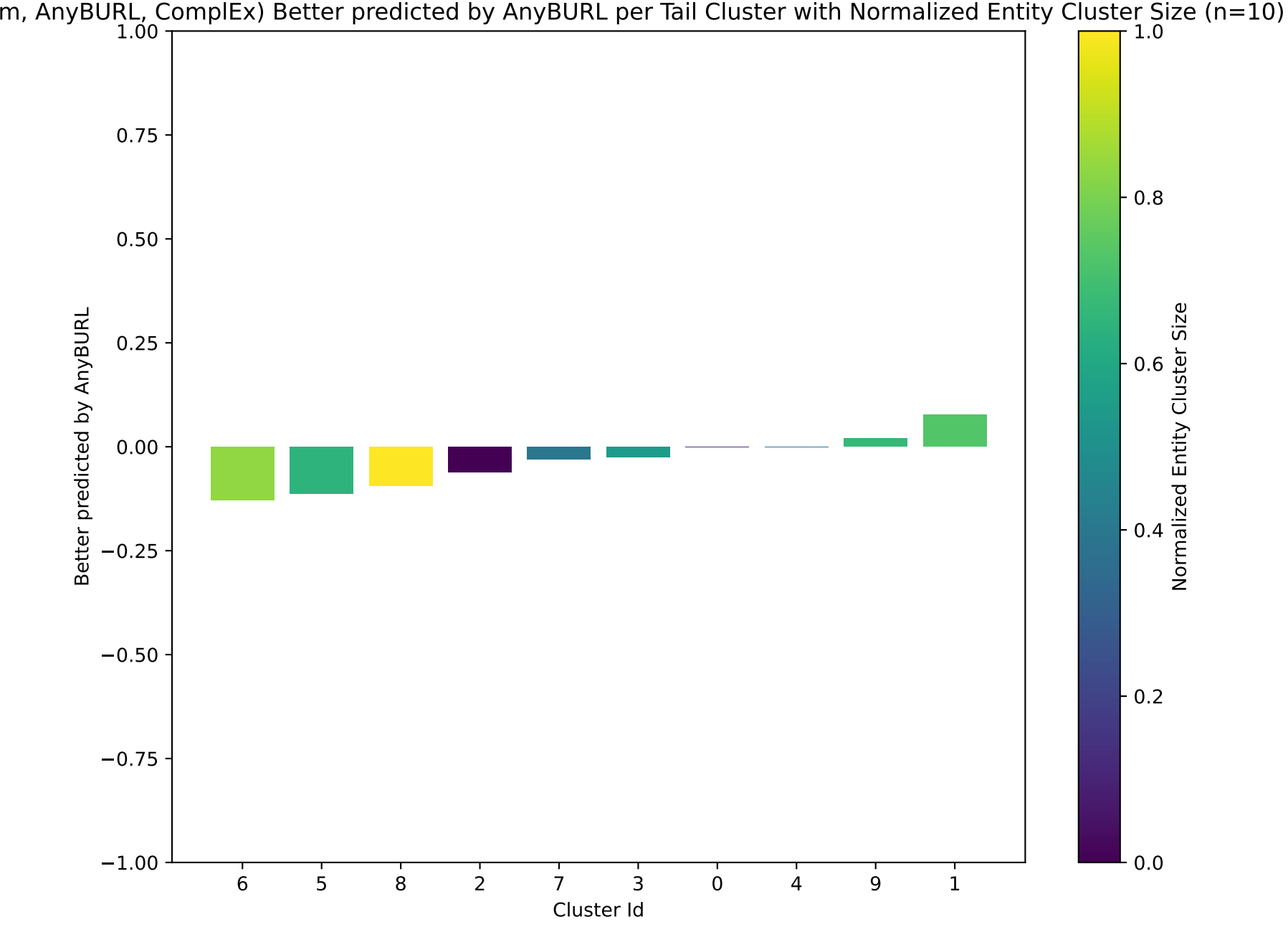

(codex-m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail with Entity Similarity Score
Similarity based on Question Entity
Similarity based on Answer Entity
Better predicted by AnyBURL
Entity Id
Normalized Entity Similarity Score
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0.0
0.2
0.4
0.6
0.8

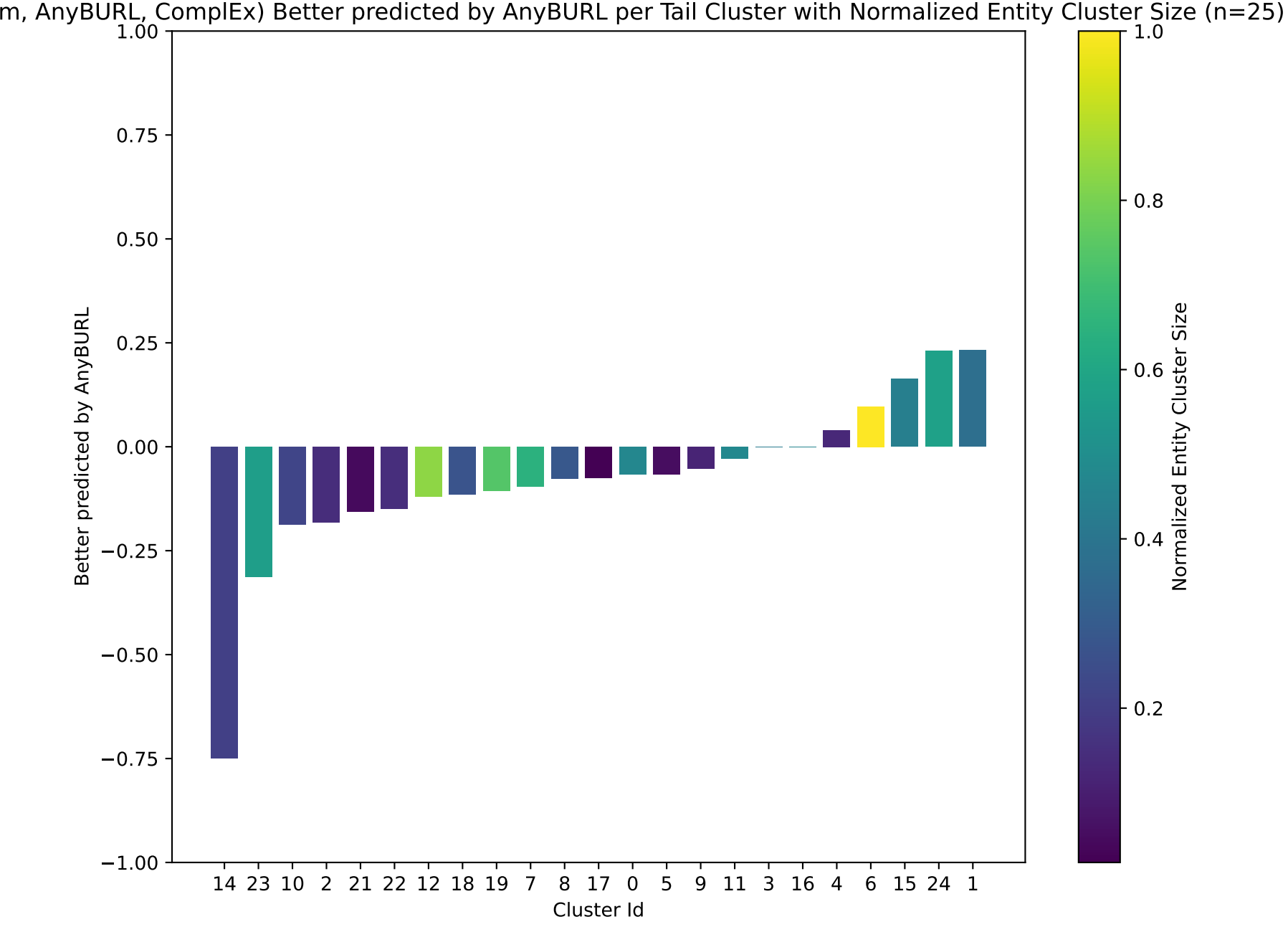

n, AnyBURL, ComplEx) Better predicted by AnyBURL per Head Cluster with Normalized Entity Cluster Size (n=10)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
7
8
3
9
1
5
6
4
2
Cluster Id
Normalized Entity Cluster Size
1.0
0.8
0.6
0.4
0.2
0.0

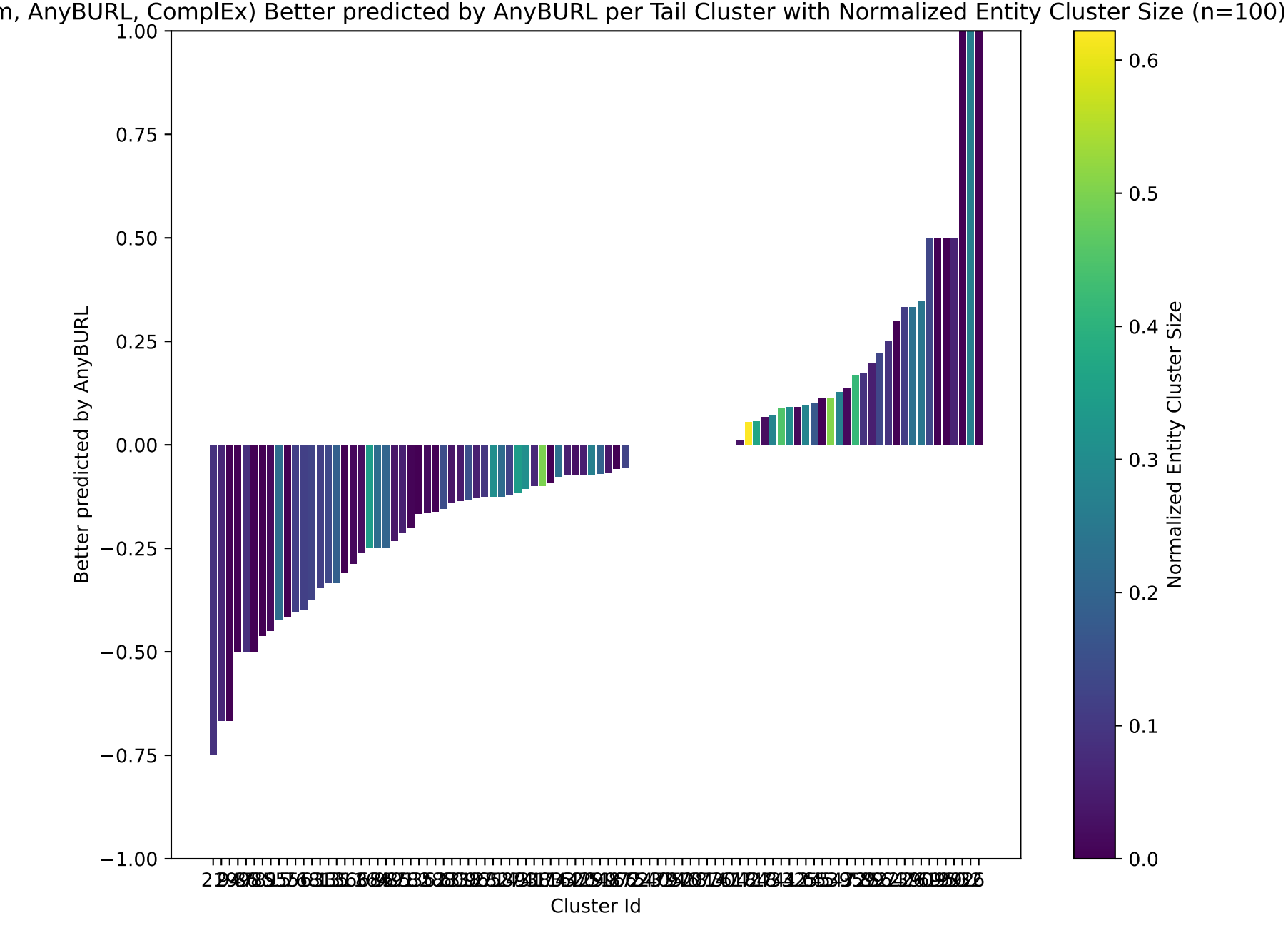

n, AnyBURL, ComplEx) Better predicted by AnyBURL per Head Cluster with Normalized Entity Cluster Size (n=25)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
8 1 18 2 14 7 16 10 11 0 15 24 23 6 19 13 12 4 5 3 9
Cluster Id
Normalized Entity Cluster Size
1.0
0.8
0.6
0.4
0.2

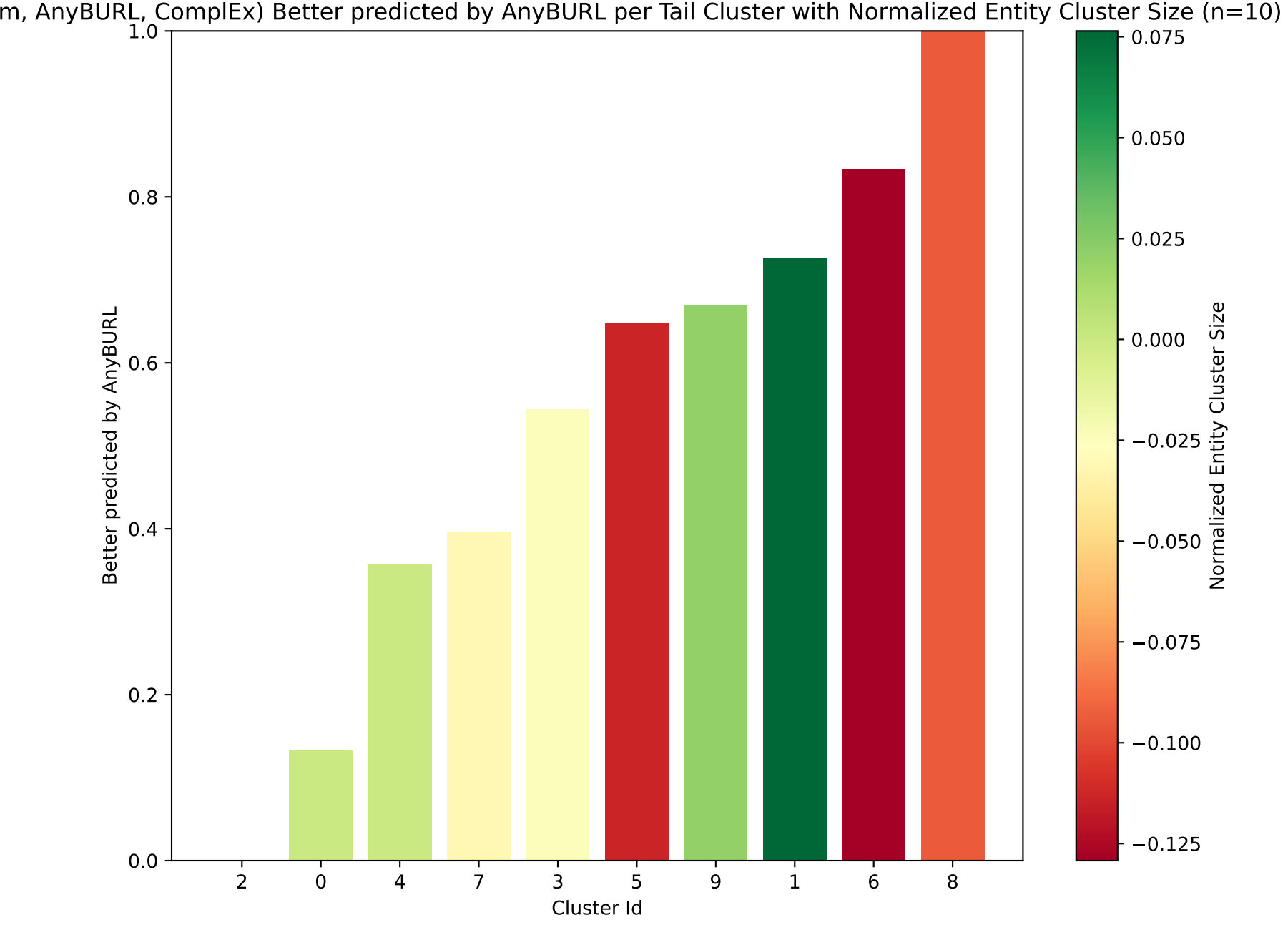

, AnyBURL, ComplEx) Better predicted by AnyBURL per Head Cluster with Normalized Entity Cluster Size (n=100)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
Cluster Id
Normalized Entity Cluster Size
1.0
0.8
0.6
0.4
0.2
0.0


n, AnyBURL, ComplEx) Better predicted by AnyBURL per Head Cluster with Normalized Entity Cluster Size (n=10)
Better predicted by AnyBURL
1.0
0.8
0.6
0.4
0.2
0.0
2
0
4
7
3
5
9
1
6
8
Cluster Id
0.05
0.00
−0.05
−0.10
−0.15
Normalized Entity Cluster Size


m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail Cluster with Normalized Entity Cluster Size (n=10)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
6
5
8
2
7
3
0
4
9
1
Cluster Id
Normalized Entity Cluster Size
1.0
0.8
0.6
0.4
0.2
0.0


m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail Cluster with Normalized Entity Cluster Size (n=25)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
14 23 10 2 21 22 12 18 19 7 8 17 0 5 9 11 3 16 4 6 15 24 1
Cluster Id
Normalized Entity Cluster Size
1.0
0.8
0.6
0.4
0.2


m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail Cluster with Normalized Entity Cluster Size (n=100)
Better predicted by AnyBURL
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
Cluster Id
Normalized Entity Cluster Size
0.6
0.5
0.4
0.3
0.2
0.1
0.0


m, AnyBURL, ComplEx) Better predicted by AnyBURL per Tail Cluster with Normalized Entity Cluster Size (n=10)
Better predicted by AnyBURL
1.0
0.8
0.6
0.4
0.2
0.0
2
0
4
7
3
5
9
1
6
8
Cluster Id
Normalized Entity Cluster Size
0.075
0.050
0.025
0.000
−0.025
−0.050
−0.075
−0.100
−0.125