## **Introducing RPD: Supplementary Results**

Stephen Bothwell, Justin DeBenedetto, Theresa Crnkovich, Hildegund Müller, David Chiang

October 31st, 2023\*

## 1 Prelude

In this document, we provide tables which accumulate the best results from all explored random hyperparameter search settings. We record results across each of the four metrics defined in our paper. The relevant tables are Tables 1 to 12 for the ASP dataset and Tables 13 to 20 for the PSE-I dataset.

For each metric, we italicize the best result for a given model architecture. We instead bold the result if it is the best result for that metric across all models. Note that this means that bold values will only occur once per column (unless ties occur) across the each trio or duo of related tables.

<sup>\*</sup>The date presented here is the "last updated" date.

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	$F_1$
		BIO	Token	0.1588	0.1255	0.1403
		ыо	Branch	0.1118	0.0884	0.0987
		BIOE	Token	0.0474	0.0512	0.0492
		DIOE	Branch	0.0677	0.0605	0.0639
		BIOJ	Token	0.0699	0.0605	0.0648
		DIOJ	Branch	0.1163	0.0930	0.1034
		BIOM	Token	0.0837	0.0837	0.0837
Learned	R <sub>1</sub> L CTM	DIOM	Branch	0.1294	0.1023	0.1143
(Word)		BIOJE	Token	0.0512	0.0512	0.0512
		DIOJE	Branch	0.0534	0.0326	0.0405
		BIOME	Token	0.0588	0.0372	0.0456
		DIONIL	Branch	0.1235	0.0930	0.1061
		BIOMJ	Token	0.1205	0.1860	0.1463
			Branch	0.0927	0.0884	0.0903
		BIOMJE	Token	0.0495	0.0512	0.0503
		DIOMIL	Branch	0.0743	0.0605	0.0667
		BIO	Token	0.0606	0.0651	0.0628
		DIO	Branch	0.0730	0.0605	0.0662
		BIOE	Token	0.0644	0.0698	0.0670
		DIOL	Branch	0.0824	0.0698	0.0756
		BIOJ	Token	0.0524	0.0512	0.0518
		DIOJ	Branch	0.1119	0.0744	0.0894
		BIOM	Token	0.1308	0.0651	0.0870
word2vec	BiLSTM	DIOM	Branch	0.1103	0.0698	0.0855
WOIUZVCC	DILSTWI	BIOJE	Token	0.0750	0.0837	0.0791
		DIOJE	Branch	0.0648	0.0651	0.0650
		BIOME	Token	0.0877	0.0698	0.0777
		DIOME	Branch	0.0779	0.0558	0.0650
		BI∩MI	Token	0.0719	0.0558	0.0628
		BIOMJ	Branch	0.0833	0.0791	0.0811
		BIOMJE	Token	0.1478	0.0791	0.1030
		PIOMIT	Branch	0.2385	0.1209	0.1605

Table 1: Model results on the ASP dataset using the Exact Parallelism Match metric (Part 1).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.0027	0.0047	0.0034
		ыо	Branch	0.0000	0.0000	0.0000
		BIOE	Token	0.0090	0.0140	0.0109
		BIOL	Branch	0.0000	0.0000	0.0000
		BIOJ	Token	0.0030	0.0047	0.0036
		DIOJ	Branch	0.0000	0.0000	0.0000
		BIOM	Token	0.0609	0.0326	0.0424
Learned	Transformer	DIOM	Branch	0.0476	0.0233	0.0313
(Subword)	Transformer	BIOJE	Token	0.0034	0.0093	0.0050
		DIOJE	Branch	0.0000	0.0000	0.0000
		BIOME	Token	0.0145	0.0186	0.0163
		DIOME	Branch	0.0460	0.0186	0.0265
		BIOMJ	Token	0.0578	0.0744	0.0650
			Branch	0.0496	0.0326	0.0393
		BIOMJE	Token	0.0113	0.0093	0.0102
			Branch	0.0280	0.0140	0.0186
		BIO	Token	0.2122	0.2419	0.2261
		ыо	Branch	0.2971	0.1907	0.2323
		BIOE	Token	0.2400	0.2233	0.2313
		DIOL	Branch	0.1863	0.1395	0.1596
		BIOJ	Token	0.1838	0.1581	0.1700
		DIOJ	Branch	0.2083	0.1860	0.1966
		BIOM	Token	0.2245	0.2047	0.2141
Latin BERT	_	DIOM	Branch	0.3558	0.2698	0.3069
Latin BERT		BIOJE	Token	0.1746	0.2047	0.1884
		DIOJE	Branch	0.3611	0.1814	0.2415
		BIOME	Token	0.3846	0.2325	0.2899
		DIOME	Branch	0.3620	0.2744	0.3122
		BIOMJ	Token	0.5147	0.3256	0.3989
			Branch	0.4167	0.2791	0.3343
		BIOMJE	Token	0.3846	0.2326	0.2899
			Branch	0.3111	0.2605	0.2835

Table 2: Model results on the ASP dataset using the Exact Parallelism Match metric (Part 2).

Bio	Model Co	omponents	Tagging	g Scheme		Scores	
BIO	Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
BIOE   Token   0.3434   0.3163   0.3293			DIO	Token	0.3057	0.3767	0.3375
Latin BERT   BILSTM   BIOM   Branch   0.3588   0.2837   0.3169			ыо	Branch	0.3434	0.3163	0.3293
BIOJ			DIOE	Token	0.3520	0.2930	0.3198
Latin BERT   BiLSTM   BiOM   Branch   0.2807   0.2233   0.2487			DIOE	Branch	0.3588	0.2837	0.3169
Latin BERT   BiLSTM   BIOM   BIOM   Branch   0.2807   0.2233   0.2487			DIOI	Token	0.3439	0.3023	0.3218
Latin BERT         BiLSTM         Branch BIOJE         0.2709 D.2558 D.2632         0.2632 D.3058           BIOJE         Token D.3198 D.2930 D.3058         0.2930 D.3058         0.3023 D.3103         0.2824           BIOME         Branch D.2811 D.2837 D.2824         0.3824 D.2824         0.3186 D.3023 D.3103         0.3103           BIOME         Branch D.3726 D.3674 D.3700 D.3674 D.3700 D.3676 D.3674 D.3676 D.3676 D.3674 D.3676 D			DIOJ	Branch	0.2807	0.2233	0.2487
BIOJE   BIOJE   Branch   0.2709   0.2558   0.2632			DIOM	Token	0.3653	0.2837	0.3194
BIOJE   Token   0.3198   0.2930   0.3058     BIOME   Branch   0.2811   0.2837   0.2824     BIOME   Token   0.3186   0.3023   0.3103     BIOMJE   Token   0.3726   0.3674   0.3700     BIOMJE   Token   0.4650   0.3395   0.3925     BIOMJE   Token   0.3411   0.3395   0.3403     BIOMJE   Token   0.4375   0.2930   0.3510     Branch   0.3209   0.2791   0.2985     BIOE   Branch   0.2849   0.2465   0.2643     Branch   0.2907   0.2326   0.2584     BIOE   Token   0.2798   0.2512   0.2647     Branch   0.2361   0.1581   0.1894     BIOJE   Branch   0.3154   0.1907   0.2377     BIOME   Branch   0.3906   0.2326   0.2915     BIOJE   Branch   0.3906   0.2326   0.2915     BIOME   Branch   0.2609   0.2233   0.2406     BIOME   Branch   0.3802   0.2140   0.2738     BIOMJE   Token   0.4437   0.3116   0.3661     BIOMJE   Token   0.4437   0.3116   0.3661     BIOMJE   Token   0.4286   0.2791   0.3380     BIOMJE   Token   0.4286   0.2791   0.3380     BIOMJE   Token   0.4254   0.2651   0.3266     BIO	Latin DEDT	DH CTM	DIOM	Branch	0.2709	0.2558	0.2632
BIOME   Token   0.2811   0.2837   0.2824	Laun DEKI	DILSTW	DIOIE	Token	0.3198	0.2930	0.3058
BIOME   Branch   0.3726   0.3674   0.3700			DIOJE	Branch	0.2811	0.2837	0.2824
BIOMJ   Token   0.3726   0.3674   0.3700			DIOME	Token	0.3186	0.3023	0.3103
BIOMJE   Branch   D.3411   D.3395   D.3403     BIOMJE   Token   D.4375   D.2930   D.3510     BIOMJE   Token   D.3209   D.2791   D.2985     BIO   Token   D.2849   D.2465   D.2643     BIOE   Branch   D.2907   D.2326   D.2584     BIOE   Branch   D.2798   D.2512   D.2647     BIOE   Branch   D.2361   D.1581   D.1894     BIOJ   Token   D.2760   D.2465   D.2604     Branch   D.3154   D.1907   D.2377     BIOM   Branch   D.3906   D.2326   D.2915     BIOJE   Token   D.3906   D.2326   D.2915     BIOJE   Branch   D.2965   D.2372   D.2636     BIOME   Branch   D.2609   D.2233   D.2406     BIOME   Branch   D.4437   D.3116   D.3661     BIOMJ   Token   D.4874   D.2698   D.3473     BIOMJE   Token   D.4286   D.2791   D.3380     BIOMJE   Token   D.4254   D.2651   D.3266     BIOMJE   Token   D.3266   D.2791   D.3266     BIOMJE   Token   D.4254   D.2651   D.3266     BIOMJE   Token   D.2454   D.2651   D.3266     BIOMJE   Token   D.2454   D.2651   D.3266     BIOMJE   Token   D.2454   D.2651   D.2661     BIOMJE   Token   D.2454   D.2651   D.2			BIOME	Branch	0.3726	0.3674	0.3700
BIOMJE   Branch   0.3411   0.3395   0.3403			BIOMJ	Token	0.4650	0.3395	0.3925
BIOMJE Branch 0.3209 0.2791 0.2985  BIO Token 0.2849 0.2465 0.2643  BIOE Branch 0.2907 0.2326 0.2584  BIOE Branch 0.2798 0.2512 0.2647  BIOJ Branch 0.2361 0.1581 0.1894  BIOJ Branch 0.2760 0.2465 0.2604  BIOJ Branch 0.3154 0.1907 0.2377  Token 0.3830 0.2512 0.3034  BIOM Branch 0.3906 0.2326 0.2915  BIOJE Token 0.2965 0.2372 0.2636  BIOJE Branch 0.2609 0.2233 0.2406  BIOME Branch 0.3802 0.2140 0.2738  BIOME Branch 0.4437 0.3116 0.3661  BIOMJ Token 0.4874 0.2698 0.3473  BIOMIE Token 0.4286 0.2791 0.3380  BIOMIE Token 0.4254 0.2651 0.3266				Branch	0.3411	0.3395	0.3403
BIO Token 0.2849 0.2465 0.2643  BIOE Token 0.2907 0.2326 0.2584  BIOE Token 0.2798 0.2512 0.2647  Branch 0.2361 0.1581 0.1894  BIOJ Token 0.2760 0.2465 0.2604  Branch 0.3154 0.1907 0.2377  BIOM Token 0.3830 0.2512 0.3034  Branch 0.3906 0.2326 0.2915  Token 0.2965 0.2372 0.2636  Branch 0.2609 0.2233 0.2406  BIOME Token 0.3802 0.2140 0.2738  BIOME Branch 0.4437 0.3116 0.3661  BIOMI Token 0.4874 0.2698 0.3473  BIOMI Token 0.4286 0.2791 0.3380  BIOMI Token 0.4254 0.2651 0.3266			BIOMJE	Token	0.4375	0.2930	0.3510
BIO				Branch	0.3209	0.2791	0.2985
BIOE Token 0.2907 0.2326 0.2584    BIOE Token 0.2798 0.2512 0.2647			RIO	Token	0.2849	0.2465	0.2643
BIOE   Branch   0.2361   0.1581   0.1894     BIOJ   Token   0.2760   0.2465   0.2604     Branch   0.3154   0.1907   0.2377     BIOM   Branch   0.3830   0.2512   0.3034     Branch   0.3906   0.2326   0.2915     BIOJE   Token   0.2965   0.2372   0.2636     Branch   0.2609   0.2233   0.2406     Branch   0.3802   0.2140   0.2738     BIOME   Branch   0.4437   0.3116   0.3661     BIOMJ   Branch   0.4286   0.2791   0.3380     BIOMIE   Token   0.4254   0.2651   0.3266     BIOMIE   Token   0.4266   0.2791   0.3266     BIOMIE   Token   0.4266   0.2791   0.3266     BIOMIE   Token   0.4266   0.2791   0.3266     BIOMIE   To			ыо	Branch	0.2907	0.2326	0.2584
BIOJ Token 0.2361 0.1581 0.1894  Token 0.2760 0.2465 0.2604  Branch 0.3154 0.1907 0.2377  Token 0.3830 0.2512 0.3034  Branch 0.3906 0.2326 0.2915  Token 0.2965 0.2372 0.2636  Branch 0.2609 0.2233 0.2406  BIOME Token 0.3802 0.2140 0.2738  BIOME BIOMJ Token 0.4437 0.3116 0.3661  BIOMJ Token 0.4874 0.2698 0.3473  BIOMJ Token 0.4286 0.2791 0.3380  BIOMJ Token 0.4254 0.2651 0.3266			DIOE	Token	0.2798	0.2512	0.2647
BIOJ         Branch         0.3154         0.1907         0.2377           Latin BERT         Transformer         BIOM         Token         0.3830         0.2512         0.3034           Branch         0.3906         0.2326         0.2915           Token         0.2965         0.2372         0.2636           Branch         0.2609         0.2233         0.2406           Branch         0.3802         0.2140         0.2738           Branch         0.4437         0.3116         0.3661           BIOMJ         Token         0.4284         0.2698         0.3473           Branch         0.4286         0.2791         0.3380           BIOMIF         Token         0.4254         0.2651         0.3266			DIOE	Branch	0.2361	0.1581	0.1894
Latin BERT   Transformer   BIOM   Token   0.3830   0.2512   0.3034			DIOI	Token	0.2760	0.2465	0.2604
Latin BERT         Transformer         BIOM         Branch         0.3906         0.2326         0.2915           BIOJE         Token         0.2965         0.2372         0.2636           Branch         0.2609         0.2233         0.2406           BIOME         Token         0.3802         0.2140         0.2738           Branch         0.4437         0.3116         0.3661           BIOMJ         Token         0.4874         0.2698         0.3473           Branch         0.4286         0.2791         0.3380           BIOMIE         Token         0.4254         0.2651         0.3266			ыој	Branch	0.3154	0.1907	0.2377
Latin BERT       Transformer       Branch       0.3906       0.2326       0.2915         Token       0.2965       0.2372       0.2636         Branch       0.2609       0.2233       0.2406         Token       0.3802       0.2140       0.2738         Branch       0.4437       0.3116       0.3661         BIOMJ       Token       0.4874       0.2698       0.3473         Branch       0.4286       0.2791       0.3380         Token       0.4254       0.2651       0.3266			DIOM	Token	0.3830	0.2512	0.3034
BIOJE Token 0.2965 0.2372 0.2636 Branch 0.2609 0.2233 0.2406  BIOME Token 0.3802 0.2140 0.2738 Branch 0.4437 0.3116 0.3661  BIOMJ Token 0.4874 0.2698 0.3473 Branch 0.4286 0.2791 0.3380  BIOMJE Token 0.4254 0.2651 0.3266	Lotin DEDT	Tuonofounoau	DIOM	Branch	0.3906	0.2326	0.2915
BIOME Token 0.2609 0.2233 0.2406  Token 0.3802 0.2140 0.2738  Branch 0.4437 0.3116 0.3661  Token 0.4874 0.2698 0.3473  Branch 0.4286 0.2791 0.3380  Token 0.4254 0.2651 0.3266	Laun DEKI	Transformer	DIOIE	Token	0.2965	0.2372	0.2636
BIOME Branch 0.4437 0.3116 0.3661  BIOMJ Token 0.4874 0.2698 0.3473  Branch 0.4286 0.2791 0.3380  Token 0.4254 0.2651 0.3266			BIOJE	Branch	0.2609	0.2233	0.2406
BIOMJ Branch 0.4437 0.3176 0.3661  Token 0.4874 0.2698 0.3473  Branch 0.4286 0.2791 0.3380  Token 0.4254 0.2651 0.3266			DIOME	Token	0.3802	0.2140	0.2738
BIOMJ Branch 0.4286 0.2791 0.3380  BIOMJE Token 0.4254 0.2651 0.3266			BIOME	Branch	0.4437	0.3116	0.3661
Branch 0.4286 0.2791 0.3380  Token 0.4254 0.2651 0.3266			DIOMI	Token	0.4874	0.2698	0.3473
RIOMIE			BIOMJ	Branch	0.4286	0.2791	0.3380
Branch 0.4380 0.2465 0.3155			DIOMIE	Token	0.4254	0.2651	0.3266
			BIOMJE	Branch	0.4380	0.2465	0.3155

Table 3: Model results on the ASP dataset using the Exact Parallelism Match metric (Part 3).

Model Co	omponents	Tagging Scheme			Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.2681	0.2062	0.2331
		ыо	Branch	0.1808	0.1588	0.1690
		BIOE	Token	0.1399	0.1258	0.1325
		BIOL	Branch	0.1836	0.1526	0.1667
		BIOJ	Token	0.2149	0.1546	0.1799
		DIOJ	Branch	0.1966	0.1649	0.1794
		BIOM	Token	0.2064	0.2000	0.2031
Learned	BiLSTM	DIOM	Branch	0.2112	0.1794	0.1940
(Word)	DILSTM	BIOJE	Token	0.1405	0.1216	0.1304
		DIOJE	Branch	0.1697	0.1155	0.1374
		BIOME	Token	0.1897	0.1526	0.1691
		BIOME	Branch	0.2243	0.2021	0.2126
		BIOMJ	Token	0.1769	0.2722	0.2145
		DIONIJ	Branch	0.1578	0.1464	0.1519
		BIOMJE	Token	0.1313	0.1340	0.1327
		DIOMIJE	Branch	0.1213	0.1196	0.1205
		BIO	Token	0.1554	0.1464	0.1507
		DIO	Branch	0.1547	0.1464	0.1504
		BIOE	Token	0.1646	0.1340	0.1477
		DIOL	Branch	0.1974	0.1588	0.1760
		BIOJ	Token	0.1772	0.1443	0.1591
		DIOJ	Branch	0.2507	0.1856	0.2132
		BIOM	Token	0.2279	0.1278	0.1638
word2vec	BiLSTM	DIONI	Branch	0.2773	0.2412	0.2580
WOIUZVCC	DILSTWI	BIOJE	Token	0.1422	0.1340	0.1380
		DIOJE	Branch	0.1989	0.2144	0.2063
		BIOME	Token	0.1806	0.1340	0.1538
		DIOME	Branch	0.1892	0.1814	0.1853
		BIOMI	Token	0.2037	0.1794	0.1908
		BIOMJ	Branch	0.2060	0.1979	0.2019
		BIOMJE	Token	0.2718	0.1608	0.2021
		DIOMIE	Branch	0.3693	0.1835	0.2452

Table 4: Model results on the ASP dataset using the Maximum Parallelism Branch Match metric (Part 1).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.0103	0.0082	0.0092
		ыо	Branch	0.0163	0.0124	0.0141
		BIOE	Token	0.0169	0.0124	0.0143
		DIOE	Branch	0.0127	0.0124	0.0126
		BIOJ	Token	0.0116	0.0082	0.0096
		DIOJ	Branch	0.0037	0.0041	0.0039
		BIOM	Token	0.1728	0.0680	0.0976
Learned	Transformer	DIOM	Branch	0.1372	0.2144	0.1673
(Subword)	Transformer	BIOJE	Token	0.0060	0.0082	0.0069
		DIOJE	Branch	0.0095	0.0082	0.0088
		BIOME	Token	0.0996	0.1402	0.1164
		DIOME	Branch	0.1612	0.1320	0.1451
		BIOMJ	Token	0.1316	0.1381	0.1348
			Branch	0.1389	0.0928	0.1112
		BIOMJE	Token	0.1270	0.1134	0.1198
		DIONIJE	Branch	0.1111	0.1052	0.1081
		BIO	Token	0.3711	0.2907	0.3260
		ыо	Branch	0.4534	0.3010	0.3618
		BIOE	Token	0.4497	0.2948	0.3562
		DIOL	Branch	0.3717	0.2928	0.3276
		BIOJ	Token	0.3763	0.2165	0.2749
		DIOJ	Branch	0.3480	0.3093	0.3275
		BIOM	Token	0.3729	0.2784	0.3188
Latin BERT	_	DIOM	Branch	0.4248	0.3670	0.3938
Latin DERT		BIOJE	Token	0.3315	0.2433	0.2806
		DIOJE	Branch	0.5490	0.2887	0.3784
		BIOME	Token	0.5104	0.3031	0.3803
		DIONIE	Branch	0.4270	0.3979	0.4120
		BIOMJ	Token	0.6090	0.3629	0.4548
			Branch	0.4969	0.3320	0.3980
		BIOMJE	Token	0.5694	0.3299	0.4178
		DIOMIJE	Branch	0.4005	0.3237	0.3580

Table 5: Model results on the ASP dataset using the Maximum Parallelism Branch Match metric (Part 2).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.3901	0.4536	0.4194
		ыо	Branch	0.4274	0.4309	0.4292
		BIOE	Token	0.5095	0.3876	0.4403
		DIOE	Branch	0.4653	0.3876	0.4229
		BIOJ	Token	0.4885	0.3959	0.4374
		DIOJ	Branch	0.4315	0.3897	0.4095
		BIOM	Token	0.4762	0.4124	0.4420
Latin BERT	BiLSTM	DIOM	Branch	0.3464	0.4186	0.3791
Latin DEKI	Laun BERT BILSTM	BIOJE	Token	0.4797	0.3649	0.4145
		DIOJE	Branch	0.4017	0.3918	0.3967
		BIOME	Token	0.4045	0.4454	0.4239
		DIOME	Branch	0.4458	0.4495	0.4476
		BIOMJ	Token	0.5562	0.4082	0.4709
			Branch	0.4224	0.4268	0.4246
		ВІОМЈЕ	Token	0.5208	0.3876	0.4444
			Branch	0.4020	0.4103	0.4061
		BIO	Token	0.4683	0.3196	0.3799
		ыо	Branch	0.4675	0.3258	0.3840
		BIOE	Token	0.4644	0.3093	0.3713
		BIOL	Branch	0.4104	0.3258	0.3632
		BIOJ	Token	0.4863	0.3299	0.3931
		DIOJ	Branch	0.4571	0.3299	0.3832
		BIOM	Token	0.5089	0.3546	0.4180
Latin BERT	Transformer	DION	Branch	0.4802	0.3505	0.4052
Latin DEKI	Transformer	BIOJE	Token	0.4932	0.2990	0.3723
		DIOJE	Branch	0.4005	0.3526	0.3750
		BIOME	Token	0.5385	0.3031	0.3879
		DIONIL	Branch	0.5241	0.4268	0.4705
		BIOMJ	Token	0.6030	0.3320	0.4282
		DIOMI	Branch	0.5112	0.3753	0.4328
		BIOMJE	Token	0.5290	0.3196	0.3985
		DIOMIJE	Branch	0.5140	0.3402	0.4094

Table 6: Model results on the ASP dataset using the Maximum Parallelism Branch Match metric (Part 3).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	$F_1$
		BIO	Token	0.2980	0.1971	0.2373
		ыо	Branch	0.2686	0.1831	0.2176
		BIOE	Token	0.1804	0.1686	0.1743
		DIOL	Branch	0.2304	0.1841	0.2046
		BIOJ	Token	0.2682	0.1478	0.1906
		DIOJ	Branch	0.2720	0.2014	0.2315
		BIOM	Token	0.2688	0.2222	0.2433
Learned	BiLSTM	DION	Branch	0.2385	0.1734	0.2008
(Word)	DILSTWI	BIOJE	Token	0.1755	0.1493	0.1613
		DIOJL	Branch	0.2334	0.1411	0.1759
		BIOME	Token	0.2680	0.1884	0.2213
		DIONIL	Branch	0.3327	0.2512	0.2863
		BIOMJ	Token	0.2129	0.2894	0.2452
			Branch	0.2409	0.1749	0.2026
		BIOMJE	Token	0.2455	0.2184	0.2311
		DIONIJE	Branch	0.1839	0.2087	0.1955
		BIO	Token	0.2257	0.1826	0.2019
		DIO	Branch	0.1953	0.1952	0.1952
		BIOE	Token	0.2252	0.1493	0.1795
		DIOL	Branch	0.2639	0.1990	0.2269
		BIOJ	Token	0.1994	0.1222	0.1515
		DIOJ	Branch	0.2625	0.1700	0.2064
		BIOM	Token	0.3249	0.1618	0.2161
word2vec	BiLSTM	DION	Branch	0.3432	0.2164	0.2655
Word2vec	DILSTW	BIOJE	Token	0.2006	0.1792	0.1893
		DIOJE	Branch	0.2420	0.2159	0.2282
		BIOME	Token	0.2850	0.1821	0.2222
		DIOME	Branch	0.2578	0.2184	0.2365
		BIOMI	Token	0.2886	0.1995	0.2359
		BIOMJ	Branch	0.2378	0.2232	0.2303
		BIOMJE	Token	0.3294	0.1502	0.2064
		DIOMIJE	Branch	0.4260	0.1696	0.2426

Table 7: Model results on the ASP dataset using the Maximum Branch-Aware Word Overlap metric (Part 1).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	$F_1$
		BIO	Token	0.0287	0.0237	0.0260
		ыо	Branch	0.0644	0.0454	0.0533
		BIOE	Token	0.0379	0.0256	0.0305
		BIOL	Branch	0.0844	0.0633	0.0723
		BIOJ	Token	0.0254	0.0179	0.0210
		DIOJ	Branch	0.0445	0.0502	0.0472
		BIOM	Token	0.1965	0.0763	0.1100
Learned	Transformer	DIOM	Branch	0.1746	0.2449	0.2039
(Subword)	Transformer	BIOJE	Token	0.0364	0.0585	0.0449
		DIOJE	Branch	0.0373	0.0338	0.0355
		BIOME	Token	0.1685	0.1874	0.1775
		BIOME	Branch	0.2637	0.1763	0.2113
		BIOMJ	Token	0.2076	0.1705	0.1873
			Branch	0.2328	0.1324	0.1688
		BIOMJE	Token	0.2069	0.1512	0.1747
		DIOMIJE	Branch	0.2189	0.1937	0.2055
		BIO	Token	0.4209	0.3135	0.3594
		DIO	Branch	0.4862	0.3396	0.3999
		BIOE	Token	0.4952	0.3005	0.3740
		DIOL	Branch	0.4110	0.3256	0.3633
		BIOJ	Token	0.4247	0.2222	0.2918
		DIOJ	Branch	0.4064	0.3618	0.3828
		BIOM	Token	0.4853	0.3024	0.3644
Latin BERT		DIOM	Branch	0.5186	0.4184	0.4631
Latin DEKI	_	BIOJE	Token	0.4254	0.2657	0.3271
		DIOJE	Branch	0.5795	0.3063	0.4008
		BIOME	Token	0.6034	0.3213	0.4193
		DIOME	Branch	0.5097	0.4560	0.4814
		BIOMJ	Token	0.6904	0.3976	0.5046
			Branch	0.6407	0.3773	0.4749
		BIOMJE	Token	0.5761	0.3440	0.4307
		DIOMIJE	Branch	0.5540	0.4111	0.4720

Table 8: Model results on the ASP dataset using the Maximum Branch-Aware Word Overlap metric (Part 2).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.4420	0.5063	0.4720
		ыо	Branch	0.4963	0.4507	0.4724
		BIOE	Token	0.5759	0.3928	0.4667
		DIOE	Branch	0.4887	0.4169	0.4499
		BIOJ	Token	0.5611	0.3884	0.4590
		DIOJ	Branch	0.4749	0.4208	0.4462
		BIOM	Token	0.5289	0.4333	0.4764
Latin BERT	BiLSTM	DIOM	Branch	0.4617	0.4947	0.4776
Laun DEKI	DILSTWI	BIOJE	Token	0.5170	0.4029	0.4529
		DIOJE	Branch	0.4335	0.4270	0.4303
		BIOME	Token	0.4964	0.5010	0.4987
		BIOME	Branch	0.5111	0.4768	0.4934
		BIOMJ	Token	0.5855	0.4251	0.4926
			Branch	0.4943	0.4599	0.4765
		BIOMJE	Token	0.5926	0.3816	0.4643
		DIONIJE	Branch	0.4875	0.4884	0.4879
		BIO	Token	0.5040	0.3329	0.4009
		ыо	Branch	0.4875	0.3382	0.3993
		BIOE	Token	0.4933	0.3391	0.4019
		DIOL	Branch	0.4390	0.3425	0.3848
		BIOJ	Token	0.4713	0.3377	0.3935
		DIOJ	Branch	0.4773	0.3551	0.4072
		BIOM	Token	0.5728	0.3841	0.4598
Latin BERT	Transformer	DIOM	Branch	0.5831	0.4101	0.4816
Latin DEKI	Transformer	BIOJE	Token	0.4631	0.3092	0.3708
		DIOJE	Branch	0.4648	0.3865	0.4221
		BIOME	Token	0.6022	0.3401	0.4347
		DIONIE	Branch	0.5943	0.4522	0.5136
		RIOMI	Token	0.5976	0.3609	0.4500
		BIOMJ	Branch	0.6318	0.4285	0.5107
		BIOMJE	Token	0.5945	0.3662	0.4532
		DIOMIJE	Branch	0.6168	0.4019	0.4867

Table 9: Model results on the ASP dataset using the Maximum Branch-Aware Word Overlap metric (Part 3).

Model Co	mponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	$F_1$
		BIO	Token	0.3923	0.2594	0.3123
		ыо	Branch	0.3522	0.2401	0.2856
		BIOE	Token	0.3003	0.2807	0.2901
		DIOE	Branch	0.3150	0.2517	0.2798
		BIOJ	Token	0.3970	0.2188	0.2822
		DIOJ	Branch	0.3640	0.2696	0.3097
Learned		BIOM	Token	0.3571	0.2952	0.3232
	BiLSTM	DIOM	Branch	0.3369	0.2449	0.2836
(Word)	DILSTNI	BIOJE	Token	0.3095	0.2633	0.2845
		DIOJE	Branch	0.3677	0.2222	0.2770
		BIOME	Token	0.3560	0.2502	0.2939
		DIOME	Branch	0.4063	0.3068	0.3496
		BIOMJ	Token	0.2878	0.3913	0.3317
			Branch	0.3307	0.2401	0.2782
		BIOMJE	Token	0.3259	0.2899	0.3068
		DIOMIL	Branch	0.2644	0.3000	0.2811
		BIO	Token	0.3403	0.2754	0.3044
		ыо	Branch	0.2934	0.2932	0.2933
		BIOE	Token	0.3608	0.2391	0.2876
		DIOL	Branch	0.3594	0.2710	0.3090
		BIOJ	Token	0.3215	0.1971	0.2444
		DIOJ	Branch	0.3497	0.2266	0.2750
		BIOM	Token	0.4093	0.2039	0.2721
word2vec	BiLSTM	DIOM	Branch	0.4207	0.2652	0.3253
wordzvec	DILSTWI	BIOJE	Token	0.3196	0.2855	0.3016
		DIOJE	Branch	0.3346	0.2986	0.3155
		BIOME	Token	0.3953	0.2527	0.3083
		DIOME	Branch	0.3331	0.2821	0.3055
		BIOMJ	Token	0.3648	0.2522	0.2982
		BIOMJ	Branch	0.3201	0.3005	0.3100
		BIOMJE	Token	0.4227	0.1928	0.2648
		DIOMIL	Branch	0.5024	0.2000	0.2861

Table 10: Model results on the ASP dataset using the Maximum Word Overlap metric (Part 1).

Model Co	omponents	Tagging	g Scheme		Scores	
Embedding	Encoder	Tagset	Link Type	Precision	Recall	$F_1$
		BIO	Token	0.1817	0.1498	0.1642
		ыо	Branch	0.1227	0.0865	0.1014
		BIOE	Token	0.2000	0.1353	0.1614
		BIOE	Branch	0.1282	0.0961	0.1099
		BIOJ	Token	0.1816	0.1275	0.1498
		DIOJ	Branch	0.1578	0.1783	0.1674
		BIOM	Token	0.2637	0.1024	0.1475
Learned	Transformer	DIOM	Branch	0.2012	0.2821	0.2349
(Subword)	Transformer	BIOJE	Token	0.1603	0.2575	0.1976
		DIOJE	Branch	0.1454	0.1319	0.1383
		BIOME	Token	0.2328	0.2589	0.2452
		BIOME	Branch	0.3085	0.2063	0.2472
		BIOMJ	Token	0.2824	0.2319	0.2546
			Branch	0.2583	0.1469	0.1872
		BIOMJE	Token	0.2776	0.2029	0.2344
			Branch	0.2533	0.2242	0.2378
		BIO	Token	0.5156	0.3841	0.4402
		ыо	Branch	0.5539	0.3870	0.4556
		BIOE	Token	0.6178	0.3749	0.4666
		DIOL	Branch	0.4774	0.3783	0.4221
		BIOJ	Token	0.5983	0.3130	0.4110
		DIOJ	Branch	0.4710	0.4193	0.4436
		BIOM	Token	0.5183	0.3420	0.4121
Latin BERT		DIOM	Branch	0.5569	0.4493	0.4973
Latin DEKI	_	BIOJE	Token	0.5862	0.3662	0.4508
		DIOJE	Branch	0.6325	0.3343	0.4374
		BIOME	Token	0.6343	0.3377	0.4407
		DIOME	Branch	0.5491	0.4913	0.5186
		BIOMJ	Token	0.7164	0.4126	0.5236
			Branch	0.6628	0.3903	0.4913
	ח	BIOMJE	Token	0.6205	0.3705	0.4640
		DIOMIJE	Branch	0.6022	0.4469	0.5130

Table 11: Model results on the ASP dataset using the Maximum Word Overlap metric (Part 2).

Bio	Model Co	omponents	Tagging	g Scheme		Scores	
BIO	Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
Biox			DIO	Token	0.4964	0.5686	0.5301
Latin BERT   BiLSTM   Bilost   Bilost   Bilost   Bilost   Token   0.5340   0.4556   0.4917			ыо	Branch	0.5362	0.4870	0.5104
Latin BERT   BiLSTM   BiOJ   Token   0.5340   0.4556   0.4917			DIOE	Token	0.6298	0.4290	0.5103
Latin BERT         BiLSTM         Bilost         Branch Biom         0.5300         0.4696         0.4980           Latin BERT         BiLSTM         BIOM         Token Token D.5690         0.4662         0.5125           BIOME         Branch D.5041         0.5401         0.5215         0.5913         0.4623         0.5197           BIOME         Branch D.5993         0.4623         0.5197         0.5401         0.5039         0.5233           BIOME         Branch D.5209         0.5348         0.5323         0.4623         0.5223           BIOME         Branch D.5401         0.5039         0.5214         0.5039         0.5214           BIOMJE         Token D.6228         0.4522         0.5239         0.5208         0.5101           BIOMJE         Token D.6362         0.4097         0.4984         0.5101         0.5108         0.5208         0.5203           BIOME         Branch D.5571         0.3865         0.4655         0.4655         0.4655         0.4665         0.4664         0.4848         0.3783         0.4250         0.4824         0.4848         0.3783         0.4250         0.4627         0.4824         0.5031         0.4627         0.4627         0.4627         0.4627         0.4621			DIOE	Branch	0.5340	0.4556	0.4917
Latin BERT         BiLSTM         BIOM BIOM BIOM Branch D.5090 D.4662 D.5125         0.5690 D.4662 D.5125         0.4920 D.4662 D.5125           BIOJE Branch D.5041 D.5401 D.5215 Branch D.5933 D.4623 D.5197 Branch D.4929 D.4855 D.4892 D.5233 D.4623 D.5197 Branch D.5299 D.5348 D.5323         0.5299 D.5348 D.5323 D.5233         0.5299 D.5348 D.5323 D.5214 D.5401 D.5039 D.5208 D.52			DIOI	Token	0.6182	0.4280	0.5059
Latin BERT         BiLSTM         BIOM BIOJE         Branch O.5941 0.5041 0.5401 0.5215         0.5215 0.5197           BIOJE         Token 0.5933 0.4623 0.5197         0.5197 0.4855 0.4892         0.4855 0.4892         0.4855 0.4892           BIOME         Token 0.5299 0.5348 0.5323         0.5233 0.523         0.5203 0.5214         0.5401 0.5039 0.5214           BIOMJE         Token 0.6228 0.4522 0.5239         0.4928 0.5101         0.5296 0.4928 0.5101         0.5198 0.5208 0.5203           BIOMJE         Token 0.5198 0.5208 0.5203         0.5208 0.5203         0.5208 0.5203         0.5208 0.5203           BIOM         Token 0.5852 0.3865 0.4655         0.4607 0.5875 0.4039 0.4787         0.4787         0.4848 0.3783 0.4250           BIOM         Token 0.5875 0.4039 0.4787         0.5875 0.4039 0.4787         0.5875 0.4039 0.4787         0.4627 0.4824           BIOJ         Token 0.5543 0.3971 0.4627         0.5292 0.3937 0.4515         0.5208 0.5031         0.5292 0.3937 0.4515           BIOJE         Token 0.6009 0.4029 0.4285 0.5031         0.5031 0.4762         0.5948 0.3971 0.4762         0.4762           BIOME         Branch 0.6621 0.3739 0.4779         0.5328 0.4648         0.60621 0.3739 0.4779         0.5328 0.4916           BIOMI         Token 0.6528 0.3942 0.4916 0.5285 0.5285         0.6001 0.6538 0.4435 0.5285         0.4771 <td></td> <td></td> <td>DIOJ</td> <td>Branch</td> <td>0.5300</td> <td>0.4696</td> <td>0.4980</td>			DIOJ	Branch	0.5300	0.4696	0.4980
Biloye   B			DIOM	Token	0.5690	0.4662	0.5125
BIOJE   Token   0.5933   0.4623   0.5197     Branch   0.4929   0.4855   0.4892     BIOME   Token   0.5299   0.5348   0.5323     BIOMJE   Token   0.6228   0.4522   0.5239     BIOMJE   Token   0.6228   0.4522   0.5239     BIOMJE   Token   0.6362   0.4097   0.4984     BIOMJE   Token   0.5198   0.5208   0.5203     BIO   Branch   0.5198   0.5208   0.5203     BIO   Branch   0.5852   0.3865   0.4655     Branch   0.5875   0.4039   0.4787     Branch   0.4848   0.3783   0.4250     BROJE   Token   0.5543   0.3971   0.4627     Branch   0.5292   0.3937   0.4515     BIOJE   Branch   0.6009   0.4029   0.4824     BIOJE   Branch   0.5948   0.3971   0.4762     BIOME   Branch   0.5119   0.4256   0.4648     BIOME   Branch   0.6621   0.3739   0.4779     BIOMJE   Token   0.6528   0.3942   0.4916     BROMJE   Token   0.6538   0.4435   0.5285     BIOMJE   Token   0.66259   0.3855   0.4771     BROMJE   Token   0.6259   0.3855   0.4771	Lotin DEDT	DH CTM	DIOM	Branch	0.5041	0.5401	0.5215
BIOME   Token   0.5299   0.5348   0.5323     BIOME   Branch   0.5401   0.5039   0.5214     BIOMJ   Token   0.6228   0.4522   0.5239     BIOMJE   Branch   0.5296   0.4928   0.5101     BIOMJE   Token   0.6362   0.4097   0.4984     Branch   0.5198   0.5208   0.5203     BIOM   Branch   0.5852   0.3865   0.4655     BIOE   Branch   0.5875   0.4039   0.4787     BIOJ   Branch   0.5875   0.4039   0.4787     BIOJ   Branch   0.5543   0.3971   0.4627     BIOJ   Branch   0.5292   0.3937   0.4515     BIOJE   Branch   0.6009   0.4029   0.4824     BIOJE   Branch   0.5948   0.3971   0.4762     BIOME   Branch   0.5119   0.4256   0.4648     BIOME   Branch   0.6621   0.3739   0.4779     BIOMJ   Branch   0.6528   0.3942   0.4916     BIOMJ   Branch   0.6538   0.34435   0.5285     BIOMJE   Token   0.6259   0.3855   0.4771	Lauii DEKI	Laun BERT BILSTM	BIOIE	Token	0.5933	0.4623	0.5197
BIOME   Branch   0.5401   0.5039   0.5214			DIOJE	Branch	0.4929	0.4855	0.4892
BIOMJ   Token   0.5401   0.5039   0.5214			DIOME	Token	0.5299	0.5348	0.5323
BIOMJE   Branch   0.5296   0.4928   0.5101     BIOMJE   Token   0.6362   0.4097   0.4984     BIOMJE   Token   0.5198   0.5208   0.5203     BIO   Token   0.5852   0.3865   0.4655     Branch   0.5571   0.3865   0.4564     BIOE   Branch   0.5875   0.4039   0.4787     Branch   0.4848   0.3783   0.4250     Branch   0.543   0.3971   0.4627     Branch   0.5292   0.3937   0.4515     BIOM   Branch   0.6009   0.4029   0.4824     BIOJE   Token   0.6009   0.4029   0.4824     BIOJE   Branch   0.5948   0.3971   0.4762     BIOME   Branch   0.5119   0.4256   0.4648     BIOME   Branch   0.6621   0.3739   0.4779     BIOMJ   Token   0.6628   0.3942   0.4916     BROMJE   Token   0.6538   0.4435   0.5285     BIOMJE   Token   0.6659   0.3855   0.4771     BIOMJE   Token   0.6259   0.3855   0.4771     BIOMJE   Token   0.66259   0.3855   0.4771     BIOMJE   Token   0.6259   0.3855   0.4771			DIOME	Branch	0.5401	0.5039	0.5214
BIOMJE   Branch   0.5296   0.4928   0.5101			BIOMJ	Token	0.6228	0.4522	0.5239
BIOMJE Branch 0.5198 0.5208 0.5203  BIO Token 0.5852 0.3865 0.4655 Branch 0.5571 0.3865 0.4564  BIOE Token 0.5875 0.4039 0.4787 Branch 0.4848 0.3783 0.4250 BIOJ Token 0.5543 0.3971 0.4627 Branch 0.5292 0.3937 0.4515 BIOM Branch 0.6009 0.4029 0.4824 BIOJE Token 0.5948 0.3971 0.4762 BIOJE Branch 0.5119 0.4256 0.4648 BIOME Branch 0.6165 0.4691 0.5328 BIOMJ Token 0.6538 0.3942 0.4916 BIOMJ Token 0.6538 0.4435 0.5285 BIOMJE Token 0.6259 0.3855 0.4771				Branch	0.5296	0.4928	0.5101
BIO Token 0.5198 0.5208 0.5203  BIO Token 0.5852 0.3865 0.4655  Branch 0.5571 0.3865 0.4564  BIOE Token 0.5875 0.4039 0.4787  Branch 0.4848 0.3783 0.4250  BIOJ Token 0.5543 0.3971 0.4627  Branch 0.5292 0.3937 0.4515  BIOM Token 0.6009 0.4029 0.4824  Branch 0.6009 0.4029 0.4824  Branch 0.5948 0.3971 0.4762  Branch 0.5119 0.4256 0.4648  BIOME Token 0.6621 0.3739 0.4779  Branch 0.6165 0.4691 0.5328  BIOMI Token 0.6528 0.3942 0.4916  BROMIE Token 0.6538 0.4435 0.5285  BIOMIE Token 0.6259 0.3855 0.4771			DIOMIE	Token	0.6362	0.4097	0.4984
BIO			DIOMIL	Branch	0.5198	0.5208	0.5203
BIOE Token 0.5875 0.4039 0.4787  BIOJ Token 0.5543 0.3971 0.4627  Branch 0.5543 0.3971 0.4627  Branch 0.5292 0.3937 0.4515  BIOM Token 0.6009 0.4029 0.4824  BIOJE Token 0.6009 0.4029 0.4824  BIOJE Token 0.5948 0.3971 0.4762  Branch 0.5119 0.4256 0.4648  BIOME Branch 0.6165 0.4691 0.5328  BIOMJ Token 0.6528 0.3942 0.4916  BROMJE Token 0.6538 0.4435 0.5285  BIOMJE Token 0.6259 0.3855 0.4771			RIO	Token	0.5852	0.3865	0.4655
BIOE   Branch   0.4848   0.3783   0.4250     BIOJ   Token   0.5543   0.3971   0.4627     Branch   0.5292   0.3937   0.4515     BIOM   Branch   0.6009   0.4029   0.4824     BIOJE   Token   0.6092   0.4285   0.5031     BIOJE   Token   0.5948   0.3971   0.4762     Branch   0.5119   0.4256   0.4648     BIOME   Branch   0.6621   0.3739   0.4779     Branch   0.6165   0.4691   0.5328     BIOMJ   Token   0.6528   0.3942   0.4916     Branch   0.6538   0.4435   0.5285     BIOMJE   Token   0.6259   0.3855   0.4771     BIOMJE   Toke			ыо	Branch	0.5571	0.3865	0.4564
BIOJ Token 0.5543 0.3971 0.4627 Branch 0.5292 0.3937 0.4515  BIOM Token 0.6009 0.4029 0.4824 Branch 0.6092 0.4285 0.5031 BIOJE Token 0.5948 0.3971 0.4762 Branch 0.5119 0.4256 0.4648 BIOME Token 0.6621 0.3739 0.4779 Branch 0.6165 0.4691 0.5328 BIOMJ Token 0.6528 0.3942 0.4916 Branch 0.6538 0.4435 0.5285 BIOMIE Token 0.6259 0.3855 0.4771			RIOE	Token	0.5875	0.4039	0.4787
BIOJ         Branch         0.5292         0.3937         0.4515           Latin BERT         Transformer         BIOM         Token         0.6009         0.4029         0.4824           Branch         0.6092         0.4285         0.5031           Token         0.5948         0.3971         0.4762           Branch         0.5119         0.4256         0.4648           BIOME         Token         0.6621         0.3739         0.4779           Branch         0.6165         0.4691         0.5328           BIOMJ         Token         0.6528         0.3942         0.4916           Branch         0.6259         0.3855         0.4771			BIOL	Branch	0.4848	0.3783	0.4250
Branch         0.5292         0.3937         0.4515           Latin BERT         Transformer         Token         0.6009         0.4029         0.4824           Branch         0.6092         0.4285         0.5031           Token         0.5948         0.3971         0.4762           Branch         0.5119         0.4256         0.4648           Branch         0.6621         0.3739         0.4779           Branch         0.6165         0.4691         0.5328           BIOMJ         Token         0.6528         0.3942         0.4916           Branch         0.6538         0.4435         0.5285           BIOMIF         Token         0.6259         0.3855         0.4771			RI∩I	Token	0.5543	0.3971	0.4627
Latin BERT         Transformer         BIOM Branch         0.6092         0.4285         0.5031           BIOJE         Token D.5948         0.3971         0.4762           Branch D.5119         0.4256         0.4648           BIOME Branch D.6621         0.3739         0.4779           Branch D.6165         0.4691         0.5328           BIOMJ Branch D.6538         0.3942         0.4916           Branch D.6538         0.4435         0.5285           BIOMIE Token D.66259         0.3855         0.4771			DIOJ	Branch	0.5292	0.3937	0.4515
Latin BERT         Transformer         Branch			BIOM	Token	0.6009	0.4029	
BIOJE Token 0.5948 0.3971 0.4762 Branch 0.5119 0.4256 0.4648  BIOME Token 0.6621 0.3739 0.4779 Branch 0.6165 0.4691 0.5328  BIOMJ Token 0.6528 0.3942 0.4916 Branch 0.6538 0.4435 0.5285  BIOMJE Token 0.6259 0.3855 0.4771	Latin RERT	Transformer	DIOM	Branch	0.6092	0.4285	0.5031
BIOME Branch 0.5119 0.4256 0.4648  Token 0.6621 0.3739 0.4779  Branch 0.6165 0.4691 0.5328  BIOMJ Token 0.6528 0.3942 0.4916  Branch 0.6538 0.4435 0.5285  Token 0.6259 0.3855 0.4771	Laun DEKI	Transformer	DIOIE	Token	0.5948	0.3971	0.4762
BIOME Branch 0.6165 0.4691 0.5328  BIOMJ Token 0.6528 0.3942 0.4916  Branch 0.6538 0.4435 0.5285  Token 0.6259 0.3855 0.4771			DIOJE	Branch	0.5119	0.4256	0.4648
BIOMJ Token 0.6528 0.3942 0.4916 Branch 0.6538 0.4435 0.5285  BIOMJE Token 0.6259 0.3855 0.4771			DIOME	Token	0.6621	0.3739	0.4779
BIOMJ Branch 0.6538 0.4435 0.5285  BIOMJE Token 0.6259 0.3855 0.4771			DIOME	Branch	0.6165	0.4691	0.5328
Branch 0.6538 0.4435 0.5285  Token 0.6259 0.3855 0.4771			ріомі	Token	0.6528	0.3942	0.4916
RIOMIE			BIOMJ	Branch	0.6538	0.4435	0.5285
Branch 0.6353 0.4140 0.5013			DIOMIE	Token	0.6259	0.3855	0.4771
Branch 0.0000 0.1140 0.0010			DIUNIJE	Branch	0.6353	0.4140	0.5013

Table 12: Model results on the ASP dataset using the Maximum Word Overlap metric (Part 3).

Model Co	Model Components		Tagging Scheme		Scores			
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>		
		BIO	Token	0.2404	0.3086	0.2703		
		ыо	Branch	0.1262	0.1605	0.1413		
		BIOE	Token	0.1590	0.3457	0.2179		
		BIOL	Branch	0.1826	0.2593	0.2143		
		BIOJ	Token	0.1569	0.2963	0.2051		
		DIOJ	Branch	0.1011	0.1111	0.1059		
		BIOM	Token	0.1984	0.3086	0.2415		
Chinese	_	DIOM	Branch	0.3009	0.4198	0.3505		
BERT		BIOJE	Token	0.1622	0.2222	0.1875		
		DIOJL	Branch	0.1607	0.2222	0.1865		
		BIOME	Token	0.2414	0.3457	0.2843		
		DIONIL	Branch	0.3250	0.3210	0.3230		
		BIOMJ	Token	0.2286	0.2963	0.2581		
		DIONIJ	Branch	0.3250	0.3210	0.3230		
		ВІОМЈЕ	Token	0.1606	0.2716	0.2018		
			Branch	0.2364	0.3210	0.2723		
		BIO	Token	0.3333	0.4321	0.3763		
			Branch	0.2807	0.3951	0.3282		
		BIOE	Token	0.3415	0.3457	0.3436		
			Branch	0.3000	0.3333	0.3158		
		BIOJ	Token	0.3119	0.4198	0.3579		
		DIOJ	Branch	0.2857	0.2963	0.2909		
		BIOM	Token	0.4444	0.3457	0.3889		
Chinese	BiLSTM	DIOM	Branch	0.3636	0.3457	0.3544		
BERT	DIESTIVI	BIOJE	Token	0.2844	0.3827	0.3263		
		DIOJE	Branch	0.3017	0.4321	0.3553		
		BIOME	Token	0.3820	0.4198	0.4000		
		DIONIL	Branch	0.3690	0.3827	0.3758		
		BIOMJ	Token	0.3796	0.5062	0.4339		
		2101113	Branch	0.3824	0.4815	0.4262		
		BIOMJE	Token	0.3421	0.3210	0.3312		
		DIOMIL	Branch	0.3402	0.4074	0.3708		

Table 13: Model results on the PSE-I dataset using the Exact Parallelism Match metric (Part 1).

Model Components		Tagging Scheme		Scores			
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>	
		DIO	Token	0.2609	0.2963	0.2775	
		BIO	Branch	0.2500	0.2346	0.2420	
		BIOE	Token	0.2388	0.3951	0.2977	
		DIOE	Branch	0.2532	0.2469	0.2500	
		BIOJ	Token	0.2381	0.3704	0.2899	
		DIOJ	Branch	0.1972	0.1728	0.1842	
		BIOM	Token	0.3261	0.3704	0.3468	
Chinese	Transformer		Branch	0.2976	0.3086	0.3030	
BERT	Transformer	BIOJE	Token	0.2832	0.3951	0.3299	
		DIOJE	Branch	0.2391	0.2716	0.2543	
		BIOME	Token	0.3973	0.3580	0.3766	
		DIONIL	Branch	0.3500	0.3457	0.3478	
		BIOMJ	Token	0.2621	0.3333	0.2935	
		DIONI	Branch	0.3048	0.3951	0.3441	
		BIOMIE	Token	0.3784	0.3457	0.3613	
		BIOMJE	Branch	0.2892	0.2963	0.2927	

Table 14: Model results on the PSE-I dataset using the Exact Parallelism Match metric (Part 2).

Model Co	Model Components		Tagging Scheme		Scores			
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>		
		BIO	Token	0.4495	0.4045	0.4258		
		ыо	Branch	0.3014	0.3864	0.3386		
		BIOE	Token	0.3248	0.4636	0.3820		
		DIOE	Branch	0.3435	0.4591	0.3930		
		BIOJ	Token	0.3569	0.4136	0.3832		
		DIOJ	Branch	0.2941	0.2955	0.2948		
		BIOM	Token	0.3488	0.5136	0.4154		
Chinese		DIOM	Branch	0.4020	0.5591	0.4677		
BERT	_	BIOJE	Token	0.4010	0.3591	0.3789		
		DIOJE	Branch	0.2941	0.3864	0.3340		
		BIOME	Token	0.3785	0.5455	0.4469		
		DIONE	Branch	0.4612	0.4591	0.4601		
		BIOMJ	Token	0.3946	0.4682	0.4283		
		DIONIJ	Branch	0.4397	0.4636	0.4513		
		BIOMJE	Token	0.3202	0.4818	0.3848		
			Branch	0.3616	0.5227	0.4275		
		BIO	Token	0.4425	0.5772	0.5010		
			Branch	0.4063	0.5818	0.4785		
		BIOE	Token	0.5482	0.4909	0.5180		
			Branch	0.4815	0.5318	0.5054		
		BIOJ	Token	0.4627	0.5636	0.5082		
		DIOJ	Branch	0.4657	0.5864	0.5191		
		BIOM	Token	0.5369	0.4955	0.5154		
Chinese	BiLSTM	DIOM	Branch	0.4571	0.5091	0.4817		
BERT	DILSTWI	BIOJE	Token	0.4672	0.5500	0.5052		
		DIOJE	Branch	0.4132	0.6272	0.4982		
		BIOME	Token	0.4767	0.5591	0.5146		
		DIONIE	Branch	0.4842	0.5591	0.5190		
		BIOMJ	Token	0.4751	0.6500	0.5489		
		DIOMI	Branch	0.4530	0.6136	0.5212		
		BIOMJE	Token	0.5236	0.5045	0.5139		
		DIOMIT	Branch	0.4513	0.5682	0.5030		

Table 15: Model results on the PSE-I dataset using the Maximum Parallelism Branch Match metric (Part 1).

Model Components		Tagging Scheme		Scores		
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.4944	0.4045	0.4450
		ыо	Branch	0.4718	0.4182	0.4434
		BIOE	Token	0.4574	0.5364	0.4937
		DIOE	Branch	0.3958	0.4318	0.4130
		BIOJ	Token	0.4638	0.4955	0.4791
		DIOJ	Branch	0.4000	0.3909	0.3954
		BIOM	Token	0.4321	0.5500	0.4840
Chinese	Transformer	DIOM	Branch	0.4190	0.4818	0.4482
BERT	Transformer	BIOJE	Token	0.5270	0.5318	0.5294
		DIOJE	Branch	0.4146	0.4636	0.4378
		BIOME	Token	0.5729	0.5000	0.5340
		DIONIL	Branch	0.4176	0.5182	0.4625
		BIOMJ	Token	0.4079	0.5136	0.4547
		DIONI	Branch	0.4202	0.5836	0.4896
		BIOMIE	Token	0.5111	0.5227	0.5169
		BIOMJE	Branch	0.4195	0.5090	0.4600

Table 16: Model results on the PSE-I dataset using the Maximum Parallelism Branch Match metric (Part 2).

BIO Token 0.5273 Branch 0.4724  BIOE Token 0.4370 Branch 0.4794  BIOJ Token 0.4813 Branch 0.5268  BIOM Token 0.4813 Branch 0.5268  Token 0.4477 Branch 0.5042  BIOM Token 0.5042  BIOM Token 0.5176	Recall 0.5215 0.5517 0.5989 0.6249 0.5333 0.4866 0.7069 0.7080 0.4567 0.6226	F <sub>1</sub> 0.5244 0.5090 0.5053 0.5426 0.5060 0.5059 0.5482 0.5890 0.4852
BIOE Branch 0.4724  BIOE Token 0.4370  Branch 0.4794  BIOJ Token 0.4813  Branch 0.5268  BIOM Token 0.4477  Chinese BERT Token 0.5042  BIOM Token 0.5042  BIOM Branch 0.5042  BIOM Token 0.5176	0.5517 0.5989 0.6249 0.5333 0.4866 0.7069 0.7080 0.4567	0.5090 0.5053 0.5426 0.5060 0.5059 0.5482 0.5890
Bioe Branch 0.4724 Token 0.4370 Branch 0.4794 Token 0.4794 Token 0.4813 Branch 0.5268 Branch 0.5268 Token 0.4477 Branch 0.5042 BERT Token 0.5176	0.5989 0.6249 0.5333 0.4866 0.7069 0.7080 0.4567	0.5053 0.5426 0.5060 0.5059 0.5482 0.5890
BIOE Branch 0.4794  BIOJ Token 0.4813  Branch 0.5268  BIOM Token 0.4477  Chinese BIOM Branch 0.5042  BERT BIOIF Token 0.5176	0.6249 0.5333 0.4866 0.7069 0.7080 0.4567	0.5426 0.5060 0.5059 0.5482 0.5890
Bioj Branch 0.4794 Token 0.4813 Branch 0.5268 Branch 0.5268 Token 0.4477 Branch 0.5042 Branch 0.5042 Branch 0.5042 Branch 0.5176	0.5333 0.4866 0.7069 0.7080 0.4567	0.5060 0.5059 0.5482 0.5890
BIOJ Branch 0.5268  BIOM Token 0.4477  Chinese BERT BIOM Branch 0.5042  BROJE Token 0.5176	0.4866 0.7069 0.7080 0.4567	0.5059 0.5482 0.5890
Branch 0.5268 Token 0.4477 Chinese BERT BIOM Branch 0.5042 BERT Token 0.5176	0.7069 0.7080 0.4567	0.5482 0.5890
Chinese BIOM Branch 0.5042 BERT Token 0.5176	0.7080 0.4567	0.5890
BERT BIOLE Token 0.5042  BERT BIOLE Token 0.5176	0.4567	
RIOIE		0.4852
DIOJE - ,	0.6226	
Branch 0.5112		0.5614
BIOME Token 0.5312	0.6851	0.5984
Branch 0.6049	0.5766	0.5904
BIOMJ Token 0.5460	0.6295	0.5848
Branch 0.5824	0.6092	0.5955
BIOMJE Token 0.5000	0.6640	0.5704
Branch 0.5072	0.6475	0.5688
BIO Token 0.5227	0.7161	0.6043
Branch 0.5067	0.7881	0.6168
BIOE Token 0.5826	0.6042	0.5932
Branch 0.5425	0.6939	0.6089
BIOJ Token 0.5733	0.7011	0.6308
Branch 0.5503	0.6962	0.6147
RIOM	0.6243	0.6342
Chinese BiLSTM Branch 0.5628	0.6628	0.6087
BERT BIOJE Token 0.5630	0.6605	0.6079
Branch 0.5332	0.7927	0.6376
BIOME Token 0.5872	0.7352	0.6529
Branch 0.5/6/	0.7215	0.6410
BIOMI	0.7912	0.6501
Branch 0.5526	0.7000	0.6176
RIOMIE	0.6073	0.6164
Branch 0.5463	0.7551	0.6340

Table 17: Model results on the PSE-I dataset using the Maximum Branch-Aware Word Overlap metric (Part 1).

Model Components		Tagging Scheme		Scores		
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		BIO	Token	0.5547	0.5031	0.5276
		ыо	Branch	0.5816	0.5268	0.5529
		BIOE	Token	0.5437	0.6889	0.6077
		DIOE	Branch	0.5443	0.5881	0.5654
		BIOJ	Token	0.5673	0.6544	0.6077
		DIOJ	Branch	0.5144	0.5877	0.5486
		BIOM BIOJE	Token	0.5334	0.6670	0.5928
Chinese	Transformer		Branch	0.5201	0.6303	0.5699
BERT	Transformer		Token	0.5839	0.6663	0.6224
			Branch	0.4778	0.6073	0.5348
		BIOME	Token	0.7030	0.6674	0.6847
		DIONIL	Branch	0.5435	0.6939	0.6096
		BIOMJ	Token	0.5705	0.6839	0.6221
		DIONI	Branch	0.5570	0.7651	0.6447
		BIOMJE	Token	0.6155	0.6778	0.6541
			Branch	0.5554	0.6379	0.5938

Table 18: Model results on the PSE-I dataset using the Maximum Branch-Aware Word Overlap metric (Part 2).

Model Co	Model Components		Tagging Scheme		Scores			
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>		
		BIO	Token	0.6238	0.6169	0.6203		
		ыо	Branch	0.5046	0.5893	0.5437		
		BIOE	Token	0.4957	0.6793	0.5731		
		DIOL	Branch	0.5071	0.6609	0.5739		
		BIOJ	Token	0.5584	0.6188	0.5871		
		DIOJ	Branch	0.5753	0.5314	0.5525		
		BIOM	Token	0.4773	0.7536	0.5845		
Chinese	_	DIOM	Branch 0.5277 0.7410 Token 0.6162 0.5437	0.6164				
BERT	_	BIOJE				0.5777		
		DIOJE	Branch	0.5420	0.6602	0.5953		
		BIOME	Token	0.5469	0.7054	0.6161		
		DIONIL	Branch	0.6387	0.6088	0.6234		
		BIOMJ	Token	0.5846	0.6739	0.6261		
			Branch	0.6022	0.6299	0.6157		
		BIOMJE	Token	0.5415	0.7192	0.6178		
			Branch	0.5243	0.6693	0.5880		
		BIO	Token	0.5394	0.7391	0.6237		
			Branch	0.5217	0.8115	0.6351		
		BIOE	Token	0.6232	0.6464	0.6346		
			Branch	0.5812	0.7433	0.6523		
		BIOJ	Token	0.5887	0.7199	0.6477		
		DIOJ	Branch	0.5678	0.7184	0.6343		
		BIOM	Token	0.6535	0.6352	0.6443		
Chinese	BiLSTM	DIOM	Branch	0.5934	0.6989	0.6418		
BERT	BILSTM	BIOJE	Token	0.5895	0.6916	0.6365		
		DIOJE	Branch	0.5559	0.8264	0.6647		
		BIOME	Token	0.6126	0.7670	0.6812		
		DIOME	Branch	0.5896	0.7375	0.6553		
		BIOMJ	Token	0.5664	0.8123	0.6674		
		2101113	Branch	0.5629	0.7130	0.6291		
		BIOMJE	Token	0.6336	0.6149	0.6241		
		DIOMIJE	Branch	0.5671	0.7839	0.6581		

Table 19: Model results on the PSE-I dataset using the Maximum Word Overlap metric (Part 1).

Model Components		Tagging Scheme		Scores		
Embedding	Encoder	Tagset	Link Type	Precision	Recall	F <sub>1</sub>
		DIO	Token	0.6417	0.5820	0.6104
		BIO	Branch	0.6201	0.5617	0.5895
		BIOE	Token	0.5845	0.7406	0.6534
		DIOE	Branch	0.5911	0.6387	0.6140
		BIOJ BIOM BIOJE	Token	0.6204	0.7157	0.6647
			Branch	0.5523	0.6310	0.5891
			Token	0.5515	0.6897	0.6129
Chinese	Transformer		Branch	0.5710	0.6920	0.6257
BERT	Transformer		Token	0.6367	0.7264	0.6786
			Branch	0.5300	0.6736	0.5932
		BIOME	Token	0.7389	0.7015	0.7197
		DIONIL	Branch	0.5651	0.7215	0.6338
		BIOMJ	Token	0.5893	0.7065	0.6426
		DIONI	Branch	0.5699	0.7828	0.6596
		BIOMJE	Token	0.6357	0.7000	0.6663
			Branch	0.5811	0.6674	0.6212

Table 20: Model results on the PSE-I dataset using the Maximum Word Overlap metric (Part 2).