

What Should/Do/Can LSTMs Learn When Parsing Auxiliary Verb Constructions?

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Overview

1 Auxiliary Verb Constructions

2 Experiments

3 Conclusion

Outline for section 1

1 Auxiliary Verb Constructions

2 Experiments

3 Conclusion

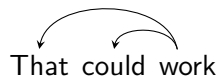
Auxiliary Verb Constructions

Auxiliary Verb Constructions

That could work

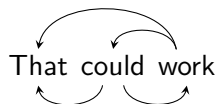
Auxiliary Verb Constructions

Dependency Parsing



Auxiliary Verb Constructions

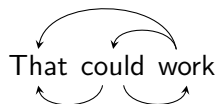
Dependency Parsing



Auxiliary Verb Constructions

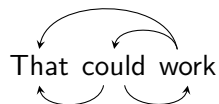
Dependency Parsing

Tesnière

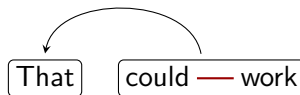


Auxiliary Verb Constructions

Dependency Parsing

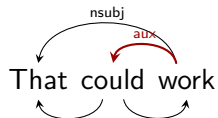


Tesnière

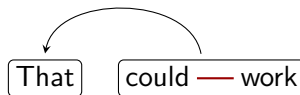


Auxiliary Verb Constructions

Dependency Parsing



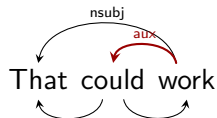
Tesnière



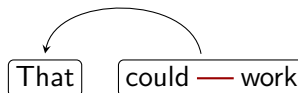
UD compatible with Tesnière

Auxiliary Verb Constructions

Dependency Parsing



Tesnière

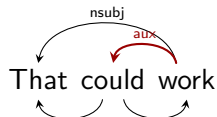


UD compatible with Tesnière

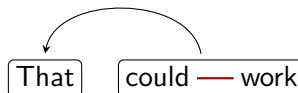
But parsers don't know that

Auxiliary Verb Constructions

Dependency Parsing



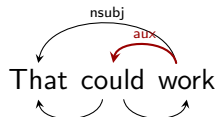
Tesnière



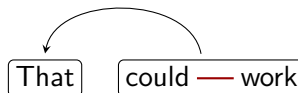
UD compatible with Tesnière
But parsers don't know that
Or do they?

Auxiliary Verb Constructions

Dependency Parsing

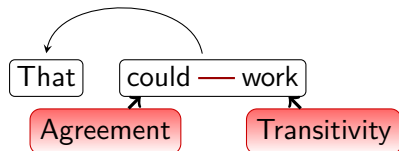


Tesnière



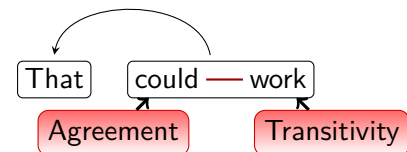
UD compatible with Tesnière
But parsers don't know that
Or do they?
Let's ask with diagnostic classifiers!

Auxiliary Verb Constructions

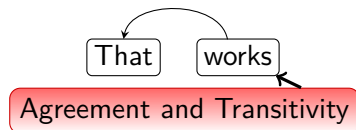


Auxiliary Verb Construction

Auxiliary Verb Constructions

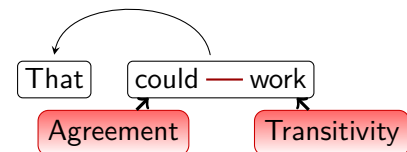


Auxiliary Verb Construction

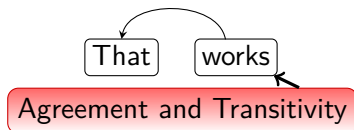


Finite main verb (FMV)

Auxiliary Verb Constructions



Auxiliary Verb Construction



Finite main verb (FMV)

Dissociated nucleus \sim nucleus

Outline for section 2

1 Auxiliary Verb Constructions

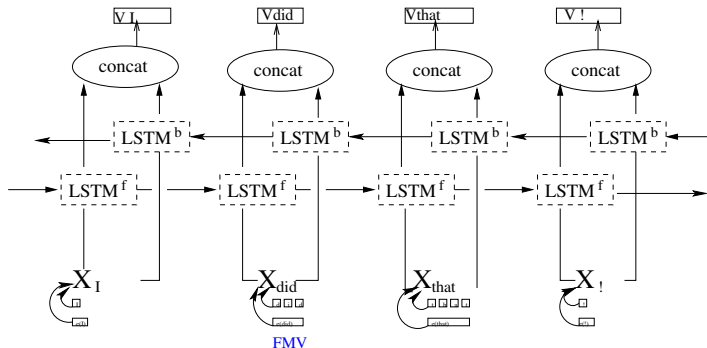
2 Experiments

3 Conclusion

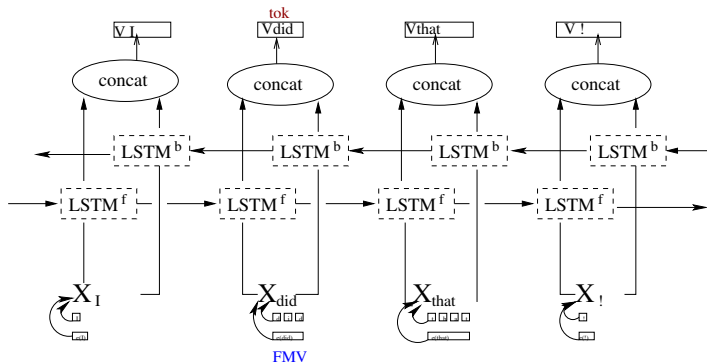
Dataset

		FMV		punct		AVC	
		train	dev	train	dev	train	dev
T	Catalan	14K	2K	7K	964	12K	2K
	Croatian	6K	803	4K	491	5K	653
	Dutch	9K	618	6K	516	5K	251
	Finnish	12K	1K	9K	1K	4K	458
A	Catalan	14K	2K	7K	964	12K	2K
	Croatian	6K	803	4K	491	5K	653
	Dutch	9K	618	6K	516	5K	246
	Finnish	10K	1K	8K	850	4K	443

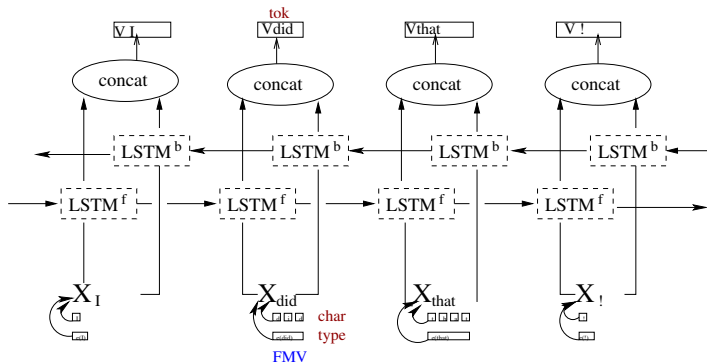
Vectors



Vectors



Vectors



Agreement and Transitivity in FMVs

Agreement



did
FMV

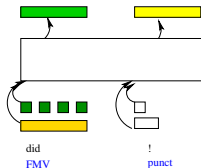
Transitivity



did
FMV

Agreement and Transitivity in FMVs

Agreement



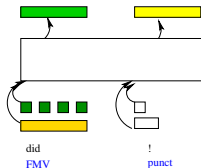
Transitivity



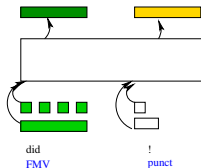
did
FMV

Agreement and Transitivity in FMVs

Agreement



Transitivity



Agreement and Transitivity in AVCs vs FMVs

Agreement



did
FMV

Transitivity



did
FMV

Agreement and Transitivity in AVCs vs FMVs

Agreement



did
FMV

done
NFMV

Transitivity



did
FMV

Agreement and Transitivity in AVCs vs FMVs

Agreement



did
FMV

done
NFMV

Transitivity

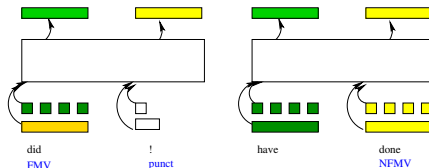


did
FMV

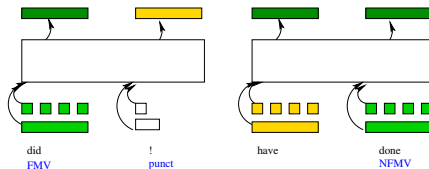
done
NFMV

Agreement and Transitivity in AVCs vs FMVs

Agreement

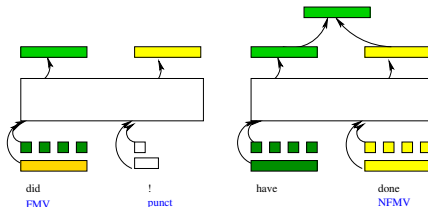


Transitivity

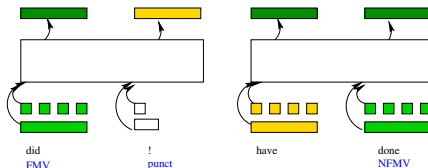


Agreement and Transitivity in AVCs vs FMVs

Agreement

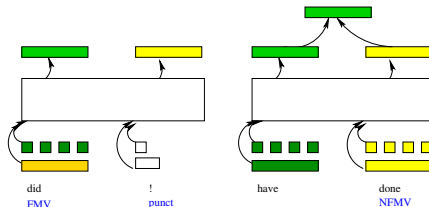


Transitivity

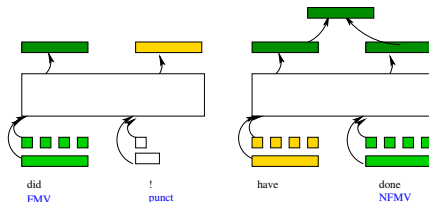


Agreement and Transitivity in AVCs vs FMVs

Agreement



Transitivity



Outline for section 3

1 Auxiliary Verb Constructions

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Conclusions

- An LSTM-based parser does not learn the notion of dissociated nucleus

Conclusions

- An LSTM-based parser does not learn the notion of dissociated nucleus
- A tree layer helps learning this

Sara Stymne and Joakim Nivre



Thanks

Thanks for your attention!