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Universal Dependencies for Saraiki

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Introduction

- We present the first treebank of the Saraiki/Siraiki [ISO 639-3 skr] language, using the Universal Dependency annotation scheme
- Universal Dependencies (UD) is now a widely used annotation scheme for developing syntactic annotations and parsers for a language.
- It already covers around 220 languages around the world and is growing rapidly. These linguistically annotated corpora are crucial sources for NLP projects of any language.
- Indo-Aryan languages have received little attention in both UD and NLP applications. There currently exist Universal Dependency treebanks for Hindi, and Punjabi (in Gurmukhi script). No lesser studied Indo-Aryan languages are covered in the UD project.

Saraiki

- Saraiki is an Indo-Aryan (IA) language widely used in Pakistan and India. Saraiki is spoken by around 25 million people in Southern and Southwestern Punjab and Northern Sindh.
- Saraiki is written from right to left in Perso-Arabic script.
- Saraiki is head-final and follows a basic Subject-Object-Verb (SOV) structure within clauses
- Saraiki shares some morphological and syntactic features with neighbouring languages like Punjabi, Sindhi and khetrani.

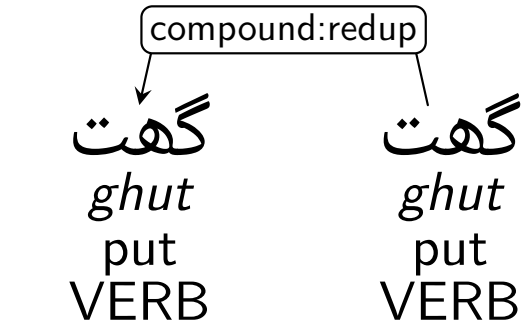
Corpus and Annotation Process

- The Saraiki treebank currently consists of 587 sentences, corresponding to 7 597 tokens in total.
- Our treebank is based on sentences from three different sources: from the Saraiki Common Voice corpus, from the Jhok newspaper, [1]
- We first annotated the corpus for POS. Since there does not exist a standard POS tagging scheme for Saraiki, we left the XPOS category for future work.
- The POS tagged text was used for the development of a Saraiki morphological analyzer.
- The dependency relationships are annotated using Annotatrix, in consultation with all co-authors and UD experts

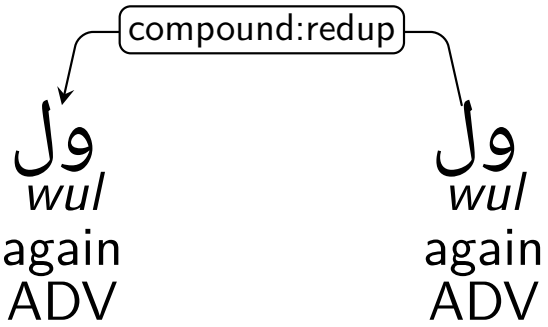
[1] These sentences are used with permission from the newspaper.

Annotation Decisions: Compounds

- Saraiki has a comprehensive system of creating multiword expressions and compounds in open and closed POS categories.
- We discuss an additional type of V-V compounding, reduplication, plus compounds involving nouns, reflexive pronouns, and adverbs



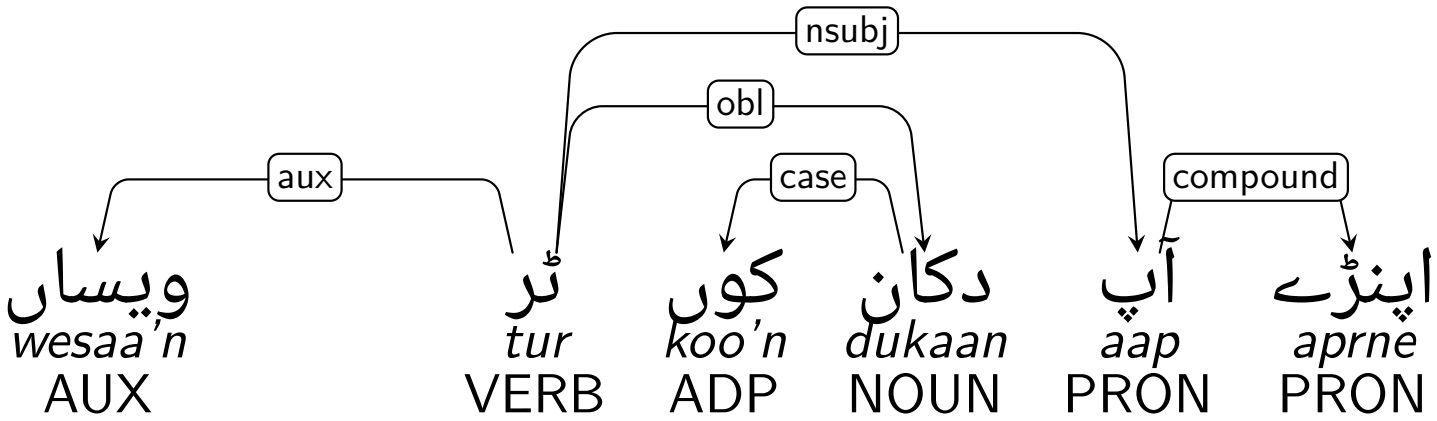
Put quickly.



Again with emphasize.

Annotation Decisions: Reflexive Pronouns

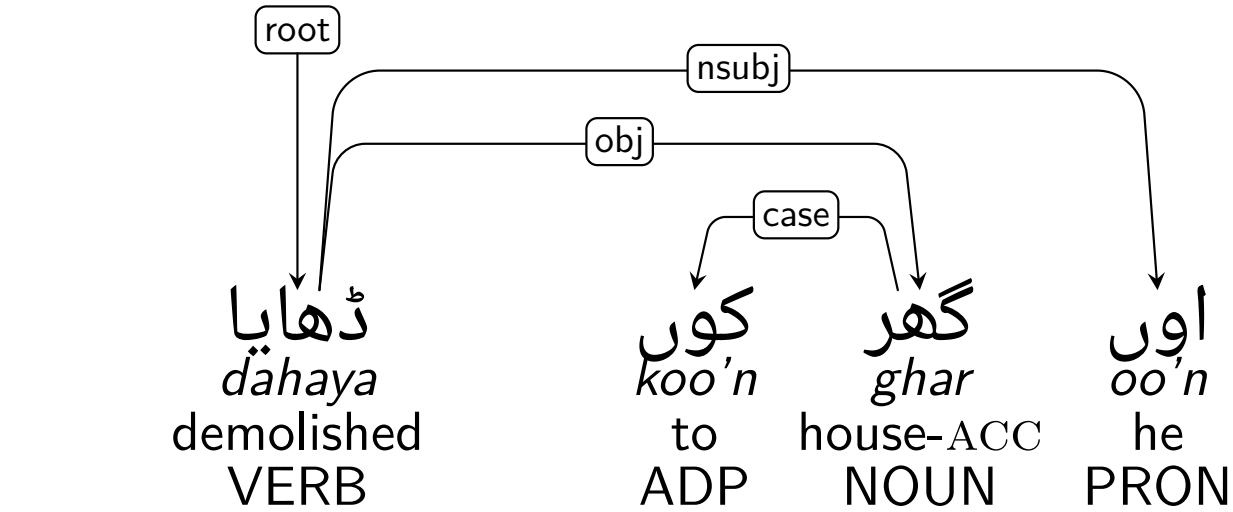
- These are constructed by combining the two words اپنڑے (*apnre* 'own') and آپ (*aap* 'self') in a multi-word expression.
- We follow the UD guidelines and use the `compound` relation to combine those two words.



I will go to shop by myself.

Annotation Decisions: Verbs

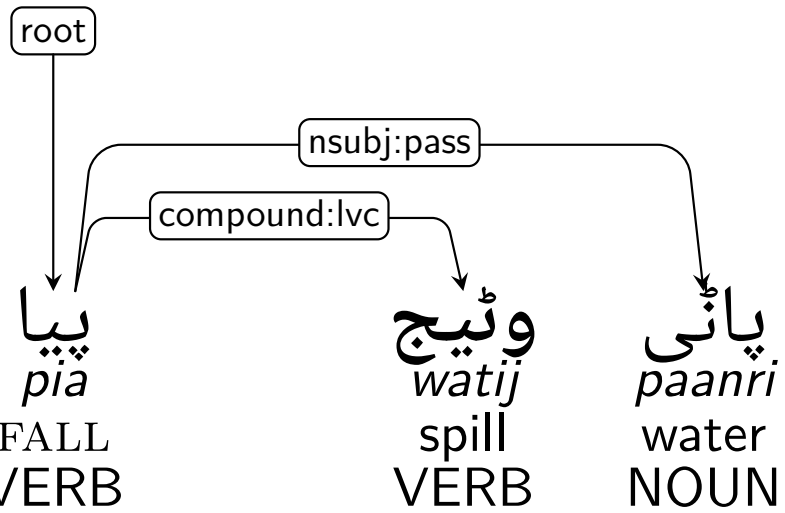
- In Saraiki, the verb system is more complex than in the neighbouring languages Punjabi, Urdu, and Hindko.
  - Split Ergative Alignment
  - Pronominal Suffixation
  - Light Verb Constructions
  - Serial Verb Constructions.



He demolished the house.

Verbs:Light Verb Constructions

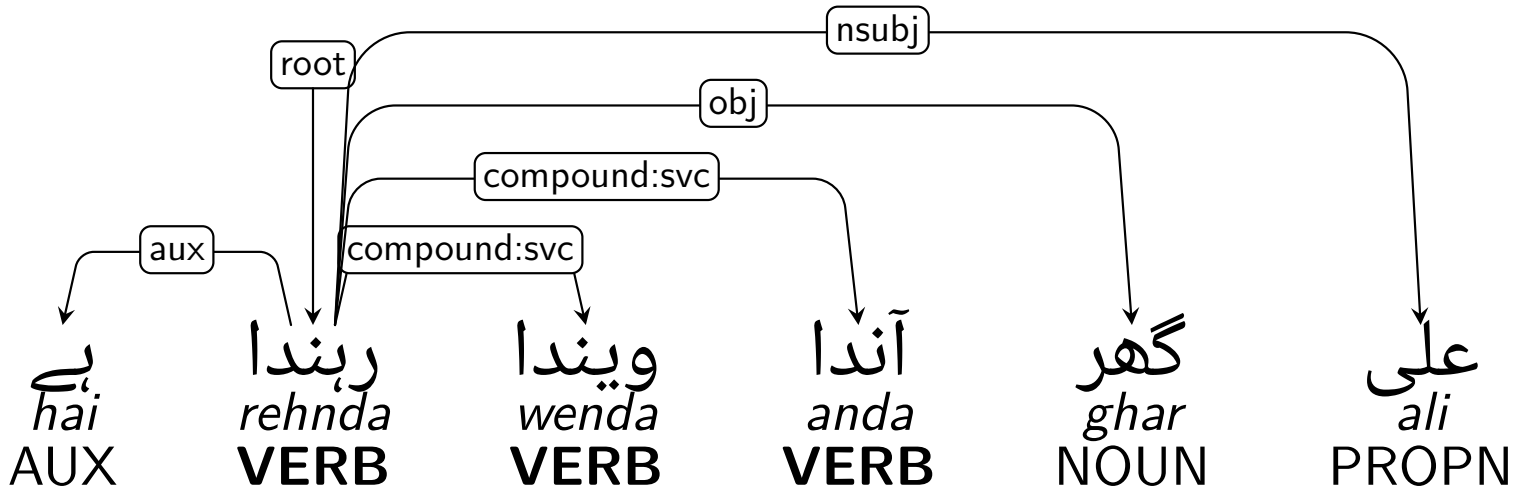
- We found sequences of verbs where the main verb is followed by another 'light' verb, in addition to constructions in which a light verb is followed by a noun or adjective.
- All such constructions have been given the dependency of `compound:lvc`



The water was spilled

Verbs:Serial Verb Constructions

- As Saraiki is a head final language (written from right to left), we mark the last verb as the head of the clause and create `compound:lvc` relations with other verbs. We anticipate changes to these annotations in the future once we have a better understanding of this construction.



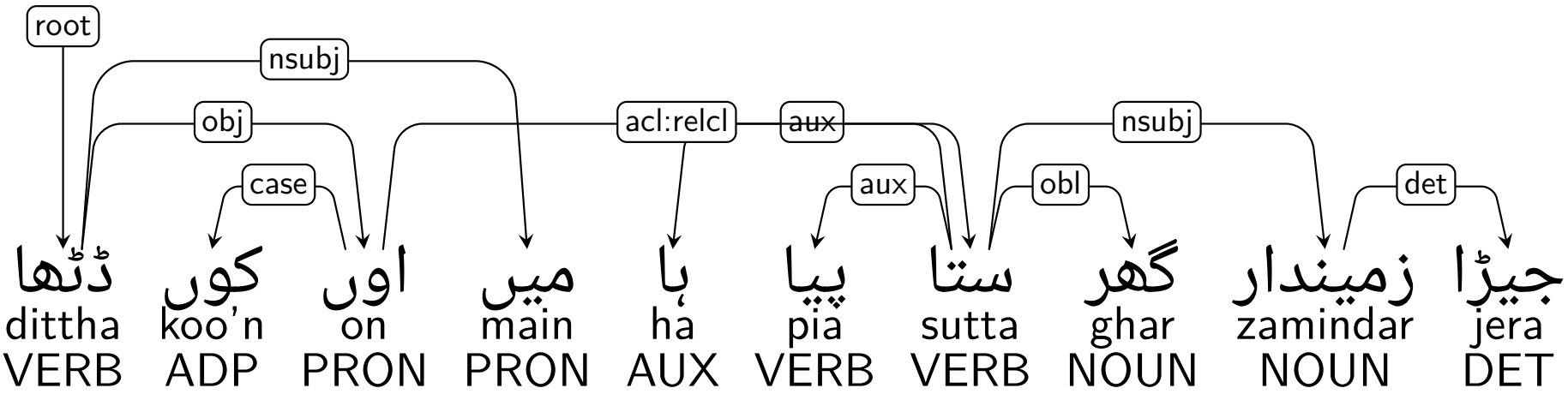
Ali used to come and go home

Annotation Decisions: Relative Clauses

- Saraiki uses جیڑا (*jera* 'that, which') as a relativizer, which agrees with its head noun in number, gender, and case.
- In the Saraiki treebank, we found both finite and non-finite relative clauses. According to Elena Bashir and Corners, both types of clauses are used freely in Saraiki.
  - Externally headed relative clauses
  - Internally headed relative clauses
  - Correlative Relative Clauses

Relative Clauses: Correlatives

- Correlative relative clauses are famous in IA languages and are a variant of internally headed relative clauses where the relative clause is dependent on, and in an anaphoric relation to, a pronoun in the matrix clause.
- In example, the distal pronoun اوں (*oun* 'that') serves as the correlative.
- We annotated it as the direct object of the matrix clause.



I saw the man who was sleeping in the house.

Conclusion and Future Work

- We have presented a treebank for Saraiki, annotated using Universal Dependencies. We discussed the textual basis of the treebank and a range of language specific syntactic phenomena.
- The treebank is work in progress, it currently comprises 587 sentences. We will we will keep extending it and release it once we reach 1 000 sentences.
- For future work, we will need to have a closer look at the relative clauses
- Additionally, we plan to automatically annotate the morphological features using the Apertium morphological analyzer for Saraiki.
- We also plan to train a syntactic parser, and investigate zero-shot techniques to extend our work to other regional languages such as Punjabi (Shahmukhi), Hindko, and Khetrani.

Acknowledgements

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