

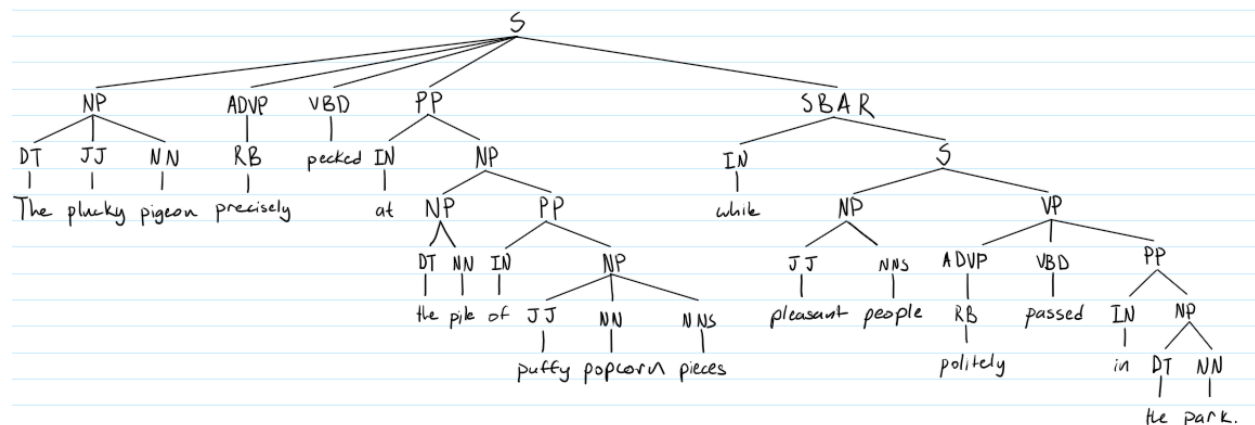
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Sentence Parsing

Here are three ways to parse the sentence:

“The plucky pigeon precisely pecked at the pile of puffy popcorn pieces while pleasant people politely passed in the park.”

Phrase structure grammar (PSG)/Constituency parse



This PSG parse tree was made with the help of AllenNLP [1]. The parser identified a declarative clause “the plucky pigeon precisely pecked at the pile of puffy popcorn pieces” and a dependent clause “while pleasant people politely passed in the park” as well as the parts of speech and phrases. Here are the definitions of the abbreviations [2]:

S: A declarative clause

NP: A noun phrase

ADVP: An adverb phrase

VBD: A verb word in the past tense

PP: A prepositional phrase

SBAR: A dependent clause or a clause introduced by subordinating conjunction

DT: A determiner word

JJ: An adjective word

NN: A singular noun word

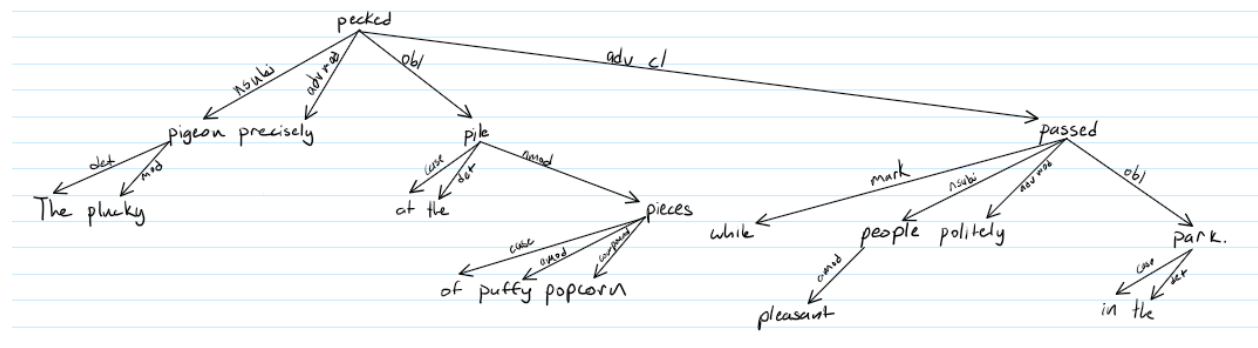
RB: An adverb word

IN: A preposition word or subordinating conjunction

VP: A verb phrase

NNS: A plural noun word

Dependency parse



This dependency parse tree was made with the help of Stanford's Core NLP [3]. The verb "pecked" was chosen as the root all other phrases and words depend on. It makes sense to pick "pecked" over "passed" since "passed" is part of the dependent clause which would not make sense without the declarative clause. Here are the definitions of the abbreviations [4]:

advcl: adverbial clause modifier, modifies a verb or predicate

nmod: nominal modifier, corresponds to an attribute of a noun

obl: oblique nominal, corresponds to an adverbial attached to a verb, adjective, or other adverb

case: case marking, dependent on the noun it introduces

mark: marker, marks a clause as subordinate to another clause

det: determiner such as "the"

nsubj: nominal subject, the subject of the clause

amod: adjectival modifier, modifies a noun or pronoun

advmod: adverbial modifier, modifies a predicate or another modifier

compound: connects parts of a compound noun

Semantic role label (SRL) parse

The sentence has two predicates.

PREDICATE: pecked

- The main action verb of the clause

ARG0: The plucky pigeon

- The agent of the action

ARG1: at the pile of puffy popcorn pieces

- The passive element or target of the action

ARGM-MNR: precisely

- Modifies the manner of the action

ARGM-TMP: while pleasant people politely passed in the park

- Modifies the temporal sense of the action

PREDICATE: passed

- The main action verb of the clause

ARG1: pleasant people

- ARG1 is usually the passive element of the action although arguably the people are active in the act of passing

ARGM-MNR: politely

- Modifies the manner of the action

ARGM-LOC: in the park

- Modifies of the location of the action

This SRL parse was also made with the help of AllenNLP [5].

Summary

The PSG and dependency parsing of sentences both produce hierarchical organization of the text. The PSG method specifically has the advantage of identifying the parts of speech of the words, how these words combine into phrases, and how the phrases combine into clauses. The disadvantage of this method is that while it identifies which words go together, it does not define how they relate to each other within the group. The dependency tree, on the other hand, defines the relationship between words such as if a word is a subject or modifier of another word. The trade-off here is the dependency tree does not identify structures like phrases and clauses. Like the dependency tree, the SRL parse can identify relationships where a word or phrase modifies a predicate. The disadvantage of SRL is that there can be ambiguity in what type of argument a predicate's modifier is.

References

- [1] The Allen Institute for Artificial Intelligence, "Constituency Parsing," [Online]. Available: <https://demo.allennlp.org/constituency-parsing>.
- [2] nlothian, "Penn Treebank II Tags.md," [Online]. Available: <https://gist.github.com/nlothian/9240750>
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