

Proposition Bank (PropBank)

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unless otherwise stated

The Proposition Bank

- Deep-syntactic annotation of the **predicate-argument structure**
- A deep layer over the **constituents** of the Penn Treebank (English)
- Goal: “consistent argument labels across different syntactic realizations of the same verb”
 - *[John]_{ARG0} [broke]_{break.01} [the window]_{ARG1}*
 - *[The window]_{ARG1} [was broken]_{break.01} [by John]_{ARG0}*
 - *[The window]_{ARG1} [broke]_{break.01}*

Numbered Arguments

- Numbered arguments:
 - required for the valency of a predicate (e.g., agent, patient, benefactive)
 - or not required but occurring with high frequency in actual usage
- The semantic roles slightly differ given the usage of each predicate, but in general they correspond to the following:
 - ARG0 ... agent
 - ARG1 ... patient
 - ARG2 ... instrument, benefactive, attribute
 - ARG3 ... starting point, benefactive, attribute
 - ARG4 ... ending point
 - ARGM ... modifier

Functional Tags for Modifiers

Semantic classification of modifiers of predicates:

- ARGM-COM ... comitative
- ARGM-LOC ... locative
- ARGM-DIR ... directional
- ARGM-GOL ... goal
- ARGM-MNR ... manner
- ARGM-TMP ... temporal
- ARGM-EXT ... extent
- ARGM-REC ... reciprocals
- ARGM-PRD ... secondary predication
- ARGM-PRP ... purpose
- ARGM-CAU ... cause
- ARGM-DIS ... discourse
- ARGM-ADV ... adverbials
- ARGM-ADJ ... adjectival
- ARGM-MOD ... modal
- ARGM-NEG ... negation
- ARGM-DSP ... direct speech
- ARGM-LVB ... light verb
- ARGM-CXN ... construction

Semantic Roles of Arguments

Semantic roles of arguments in the predicate dictionary
(sentence annotation refers to dictionary entry and arguments are just numbered):

- ARG_n-PAG ... proto-agent
- ARG_n-PPT ... proto-patient
- ARG_n-PRD ... secondary predication
- ARG_n-GOL ... goal, recipient, beneficiary
- ARG_n-DIR ... direction
- ARG_n-MNR ... manner, instrument
- ARG_n-PRP ... purpose
- ARG_n-VSP ... verb-specific

Verb Senses (Frames, Role Sets)

- Predicate: *break*
 - Roleset id: **break.01** (*break, cause not to be whole*)
 - Roleset id: **break.02** (*break in, gain entry*)
 - Roleset id: **break.13** (*happen, come to light, onset, beginning*)
 - Roleset id: **break.16** (*separate one entity from another*)
 - Roleset id: **break.18** (*violate (the law, an oath, trust etc)*)
 - Roleset id: **break.19** (*to suspend an action, take a break from something, pause, musical interlude*)
 - Roleset id: **break.20** (*break into motion, for a goal or from a source location*)
 - Roleset id: **break.21** (*notable occurrence, point at which one's luck turns (bad break, lucky break)*)

- Predicate: *break_away*
 - Roleset id: **break_away.14** (*separate, withdraw, secede*)
 - ...

Verb Senses (Frames, Role Sets)

- Predicate: *break*
 - Roleset id: **break.01** (*break, cause not to be whole*)
 - ARG0-PAG: *breaker*
 - ARG1-PPT: *thing broken*
 - ARG2-MNR: *instrument*
 - ARG3-PRD: *pieces*
 - ARG4-DIR: *arg1 broken away from what?*
 - Roleset id: **break.02** (*break in, gain entry*)
 - Roleset id: **break.13** (*happen, come to light, onset, beginning*)
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 - ARG0-PAG: *enterer*
 - ARG1-GOL: *place/domain broken into*
 - Roleset id: **break.13** (*happen, come to light, onset, beginning*)
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 - ARG0-PAG: *causal agent*
 - ARG1-PPT: *thing coming to light*
 - Roleset id: **break.16** (*separate one entity from another*)
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 - Roleset id: **break.16** (*separate one entity from another*)
 - ARG0-PPT: *entity in motion*
 - ARG1-DIR: *movement away from what*
 - ARG2-PRD: *secondary predication on arg0 (free, loose etc)*
 - Roleset id: **break.18** (*violate (the law, an oath, trust etc)*)
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 - Roleset id: **break.16** (*separate one entity from another*)
 - Roleset id: **break.18** (*violate (the law, an oath, trust etc)*)
 - ARG0-PAG: *scofflaw, violator*
 - ARG1-PPT: *law, oath, trust, thing violated*
 - ARG2-MNR: *violation committed*
 - Roleset id: **break.19** (*to suspend an action, take a break from something, pause, musical interlude*)
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 - Roleset id: **break.19** (*to suspend an action, take a break from something, pause, musical interlude*)
 - ARG0-PAG: *person taking/causing break/pause*
 - ARG1-PPT: *activity interrupted*
 - ARG2-PRP: *purpose of pause, interrupted for or with what*
 - Roleset id: **break.20** (*break into motion, for a goal or from a source location*)

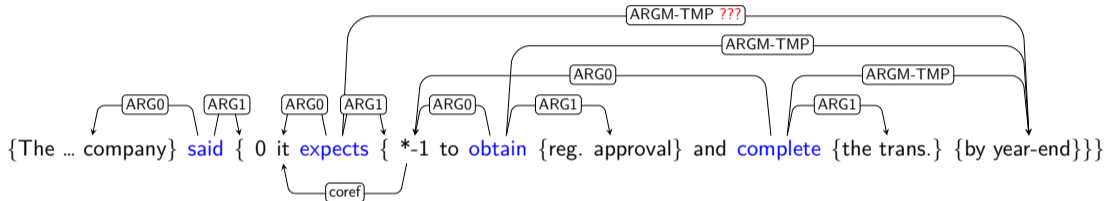
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 - ARG0-PAG: *mover*
 - ARG1-DIR: *place left, broke from*
 - ARG2-GOL: *destination*

Grammatical Coreference

- Find antecedents for empty arguments of the verbs
- Missing or moved constituents are represented as empty categories [***] in the Penn Treebank
- Empty categories that can be coreferred with a NP within the same sentence are linked in coreference chains in PropBank
 - *I made a decision [**PRO**] to leave.*
 - REL: leave
 - ARG0: [**PRO**] * [I]
- Note: *textual* coreference is not resolved

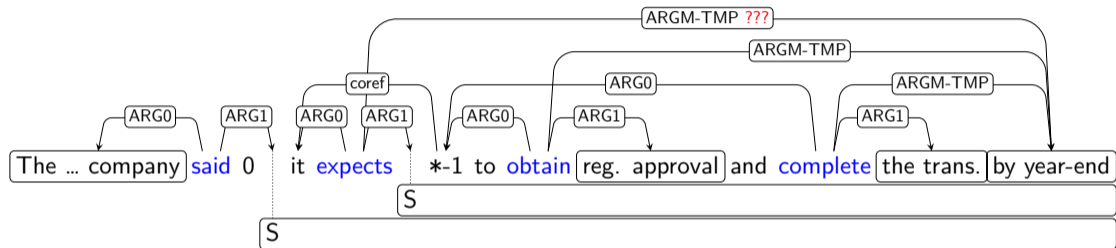
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“The thrift holding company said it expects to obtain regulatory approval and complete the transaction by year-end.”

Note that the textual coreference between *it* and *the thrift holding company* is not annotated.

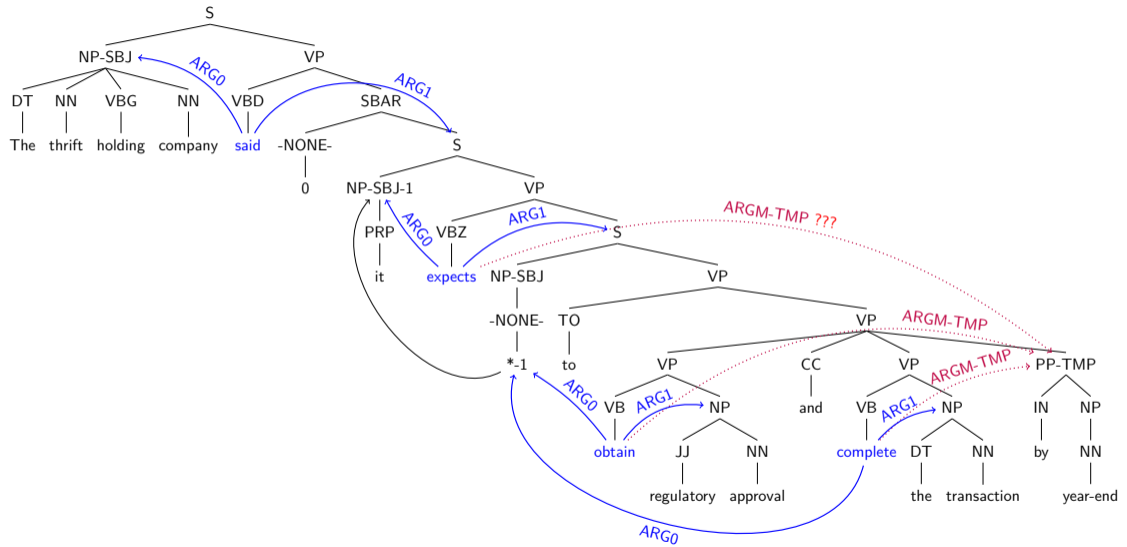
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Constituent Structure in the Penn Treebank



PropBanks for Other Languages

- Use of the English Propbank on other languages:
 - IBM Universal Proposition Banks
- Propbank annotations with language-specific lexicons:
 -  Hindi Propbank
 -  Urdu Propbank
 -  Persian Propbank
 -  Arabic Propbank
 -  Chinese Propbank
 -  Finnish Propbank
 -  Portuguese Propbank
 -  Basque Verb-Index
 -  Turkish Propbank
- Some of them are annotated over **dependency** rather than constituency **trees**