Semantics of sentential nominals in view

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Noun phrase semantics

Definiteness/Indefiniteness

(1) a. Ali **ilaç** geliştiriyor.
'Ali is developing drugs.'

b. Ali **bir ilaç** geliştiriyor.
'Ali is developing a drug – a new one.'

c. Ali **bir ilacı** geliştiriyor.
'Ali is imporving a drug.'

d. Ali **ilacı** geliştiriyor.
'Ali is developing the drug.'

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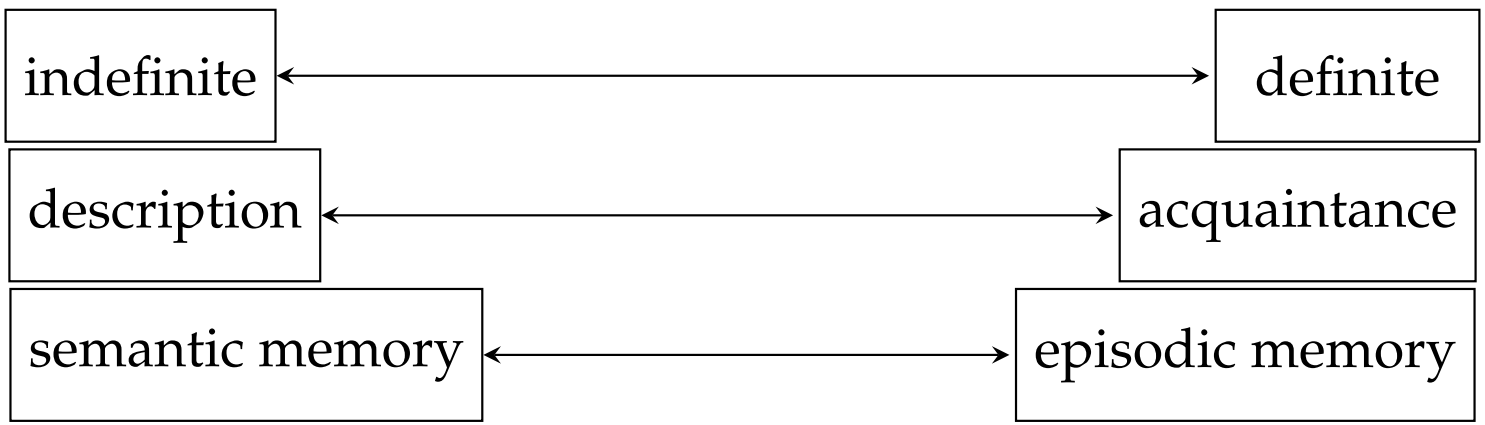
Tense Aspect Mood

Epistemic support

Temürcü (2007:190):

(2) a. Kertenkele-ler karanlık-ta gör-ür.
lizard-Plu darkness-Loc see-Xr
'Lizards see in the dark.'

b. Kertenkele-ler karanlık-ta gör-üyor!
lizard-Plu darkness-Loc see-Xr
'Lizards see in the dark!'



Asher's (1993) abstract object taxonomy

A continuum of world immanence: from events and states with causal, temporal, spatial properties to purely abstract entities like propositions and thoughts.

Sentential nominals

(3) a. Defne-nin arşeyi tut-ma-sı doğru değil. (-mA)
D-Gen bow-Acc tut-mA-Poss doğru not.
'It's not right for Defne to hold the bow.'

b. Defne'nin arşeyi tutuşu doğru değil. (-Hş)
'The way Defne holds the bow is not right.'

c. Defne'nin arşeyi tuttuğu doğru değil. (-K)
'It's not true that Defne held the bow.'

Schumacher

(4) a. Schumacher'in Alonso'yu geçişi tehlikeliydi.
'Schumacher's taking Alonso was dangerous' (S. took A.)
b. Schumacher'in Alonso'yu geçmesi tehlikeliydi.
'Schumacher's taking Alonso was dangerous' (no entailment)

(5) a. Ahmet'in yerine imza atışın ilerde problem olabilir.
'Your signing the document in place of Ahmet may cause a problem.' (document signed)
b. Ahmet'in yerine imza atman ilerde problem olabilir.
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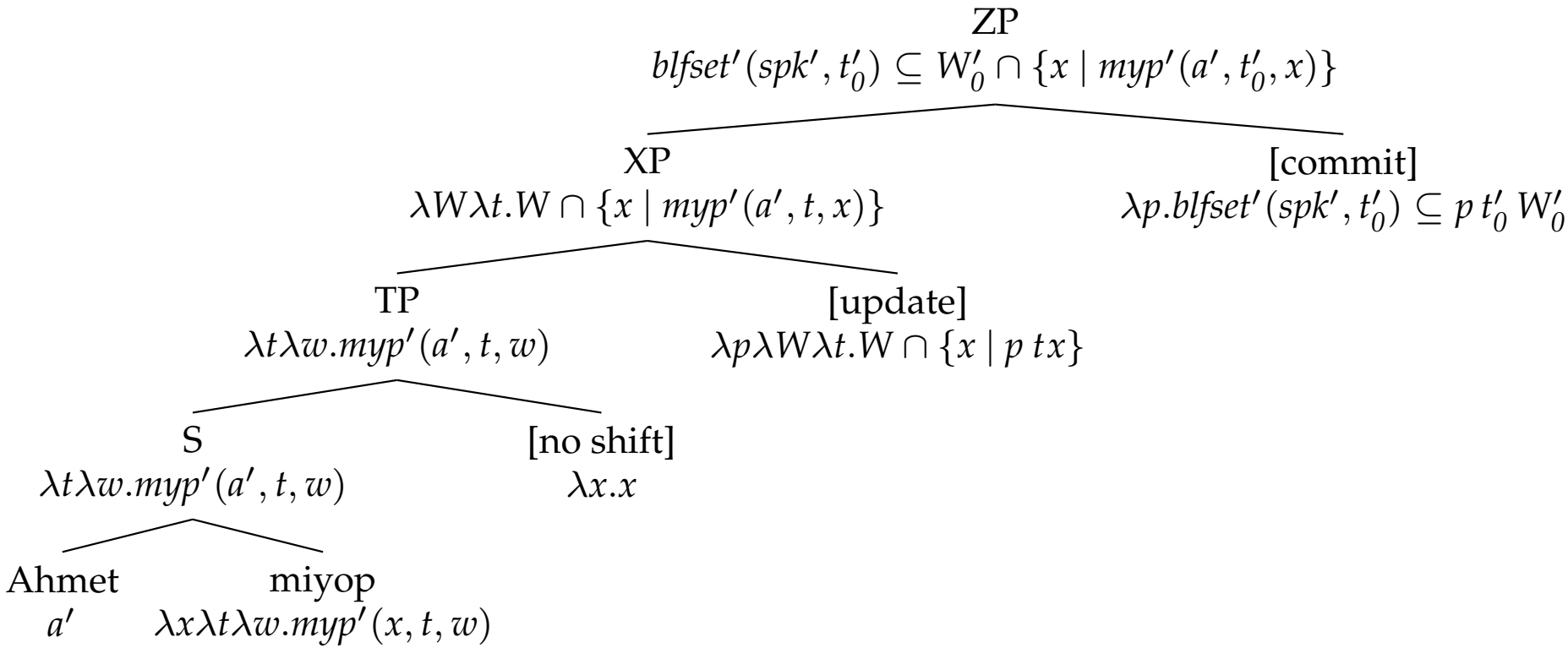
A basic toolbox

- A timeline.
- World (or history): a complete description of what is the case along the timeline.
- Collect all the (logically possible) worlds into a set W.
- Agent: a sequence of subsets of W; a collection of belief worlds, wish worlds, moral worlds, alter-ego worlds...

A maximally simple example

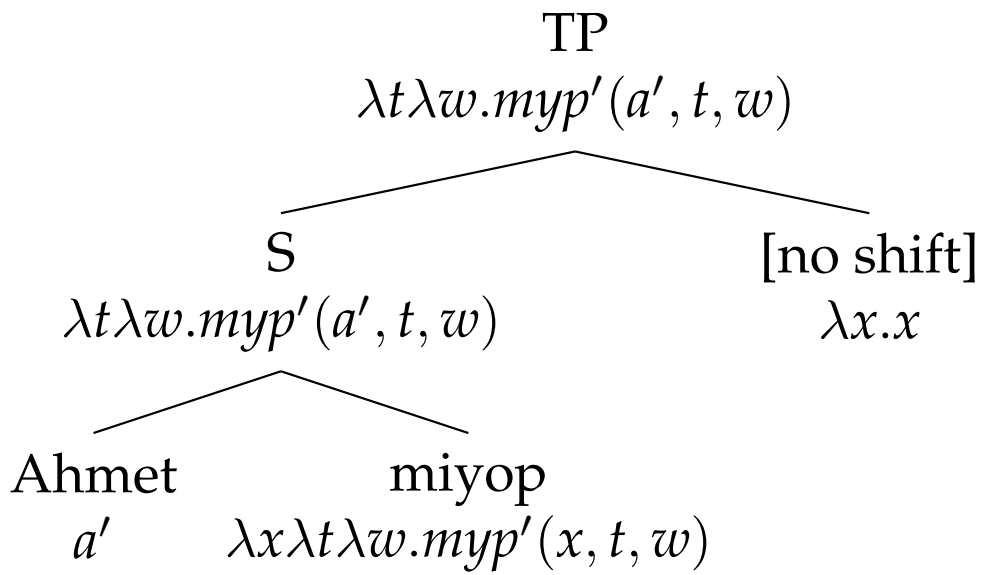
(6) Ahmet miyop. = 'Ahmet is myopic.'



where W'_0 is the common ground (= what we jointly believe to be jointly believed before starting to talk); t'_0 is the speech time; spk' is the speaker; all looked-up from a conversational scoreboard ala Lewis (1979).

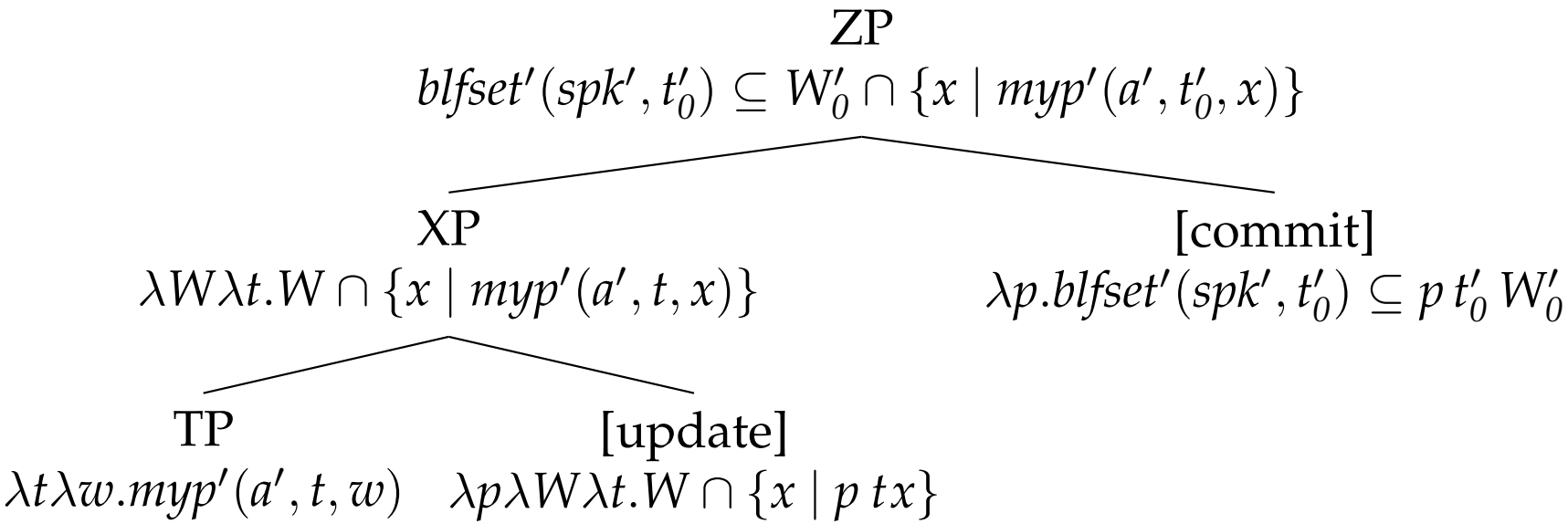
A maximally simple example

(7) Ahmet miyop. = 'Ahmet is myopic.'



A maximally simple example

(8) Ahmet miyop. = 'Ahmet is myopic.'



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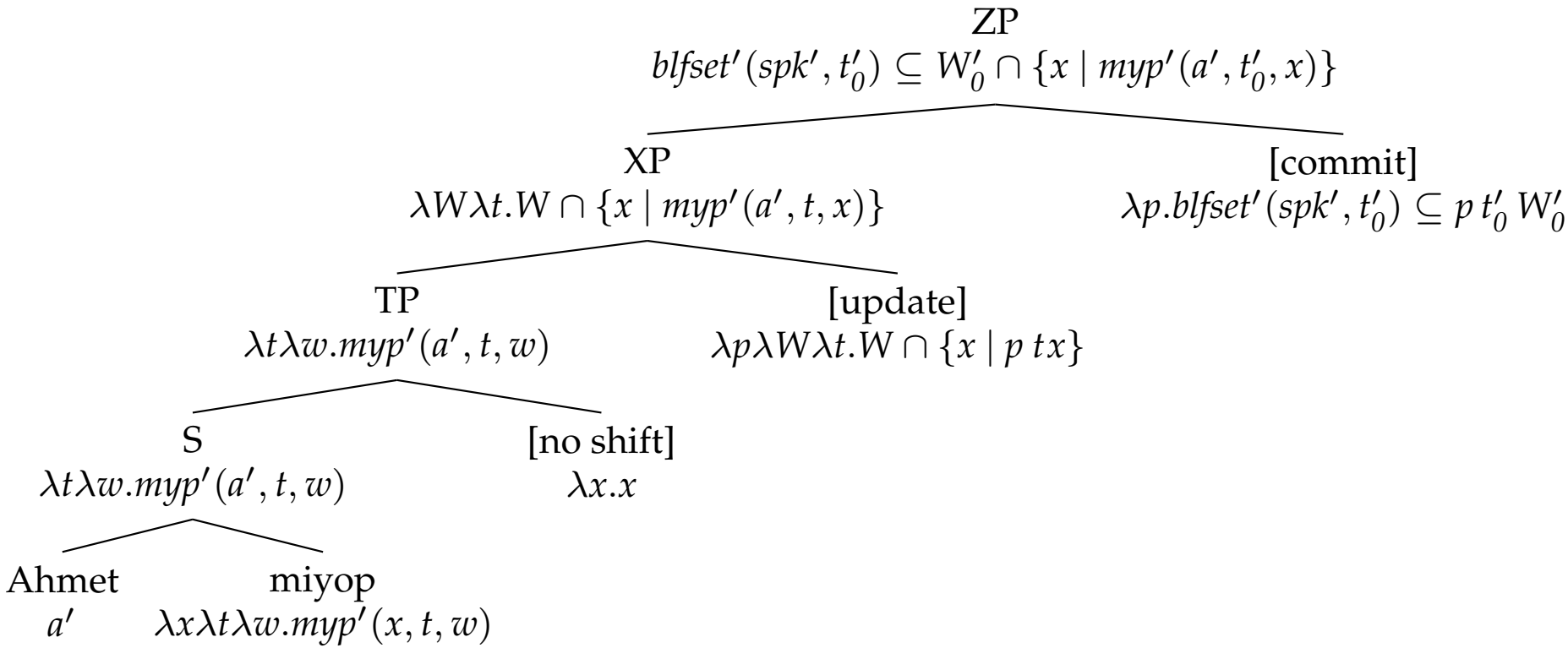

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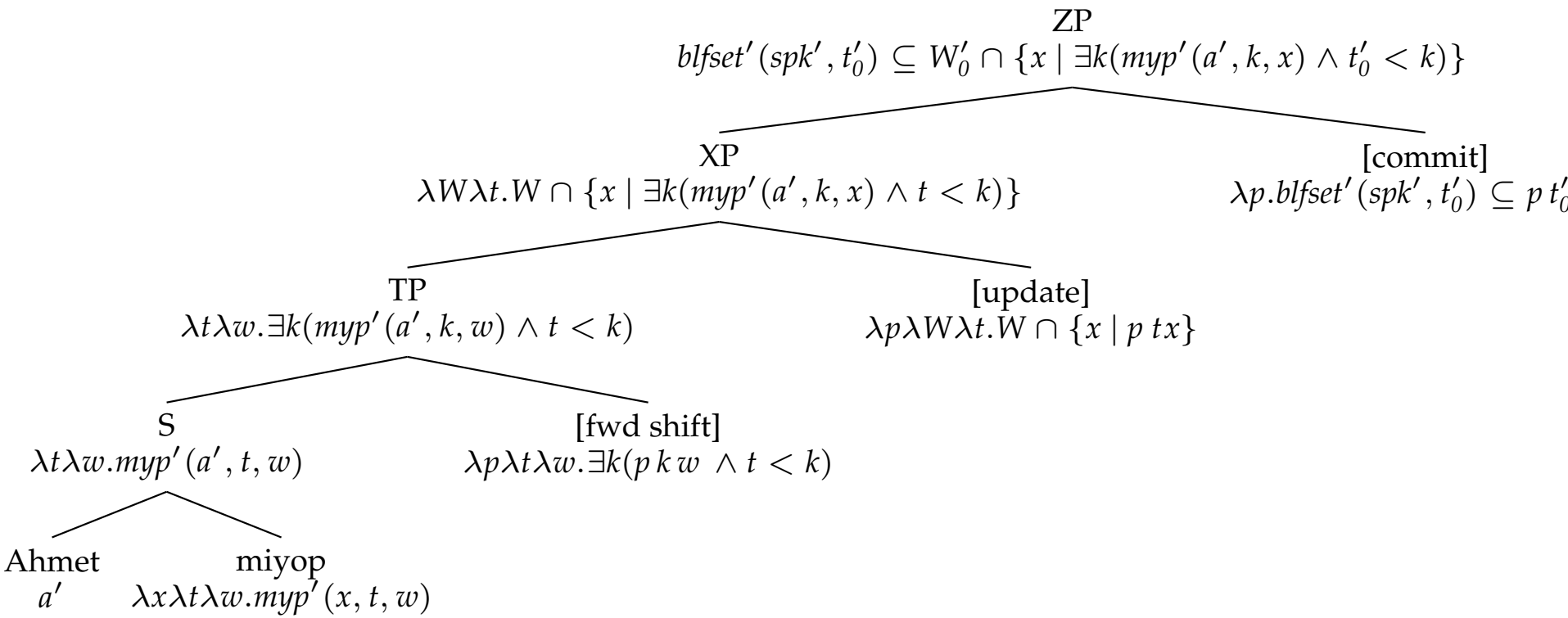
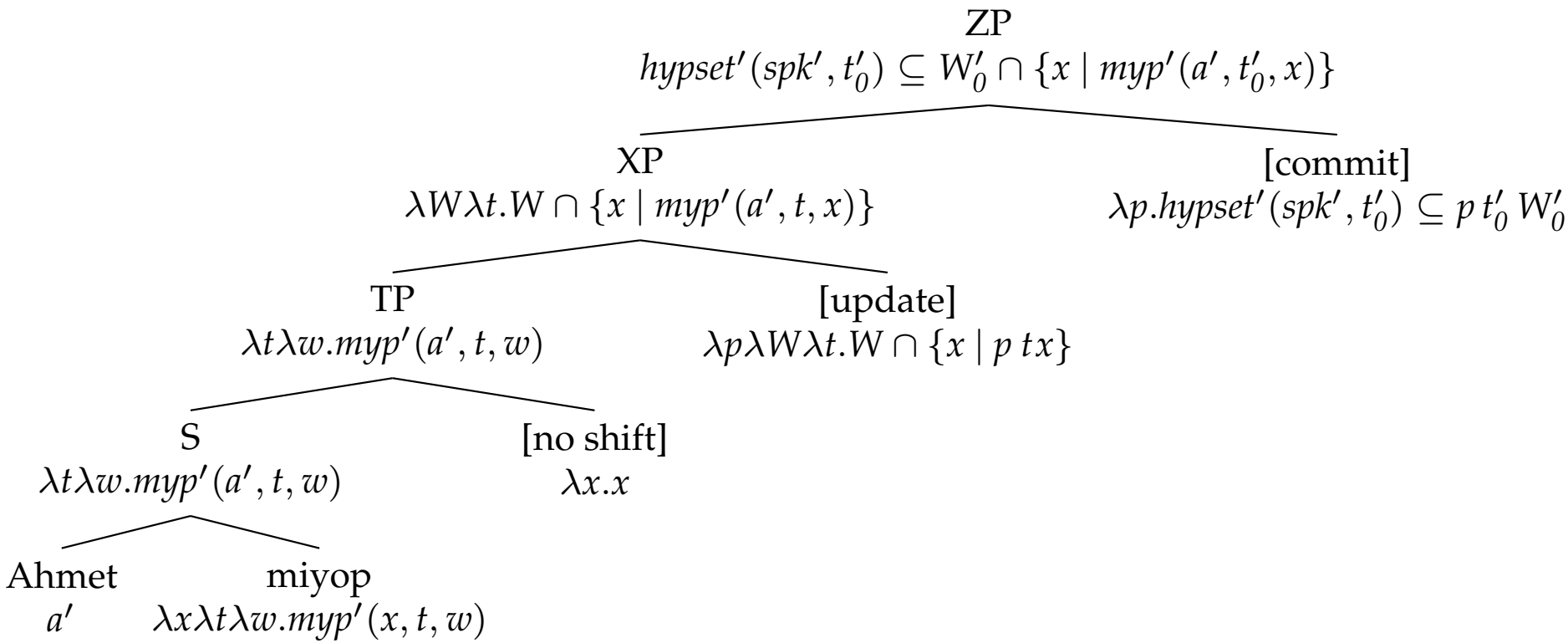
A tip of time-travel

(10) Ahmet miyop olacak. = 'Ahmet's gonna get myopic.'



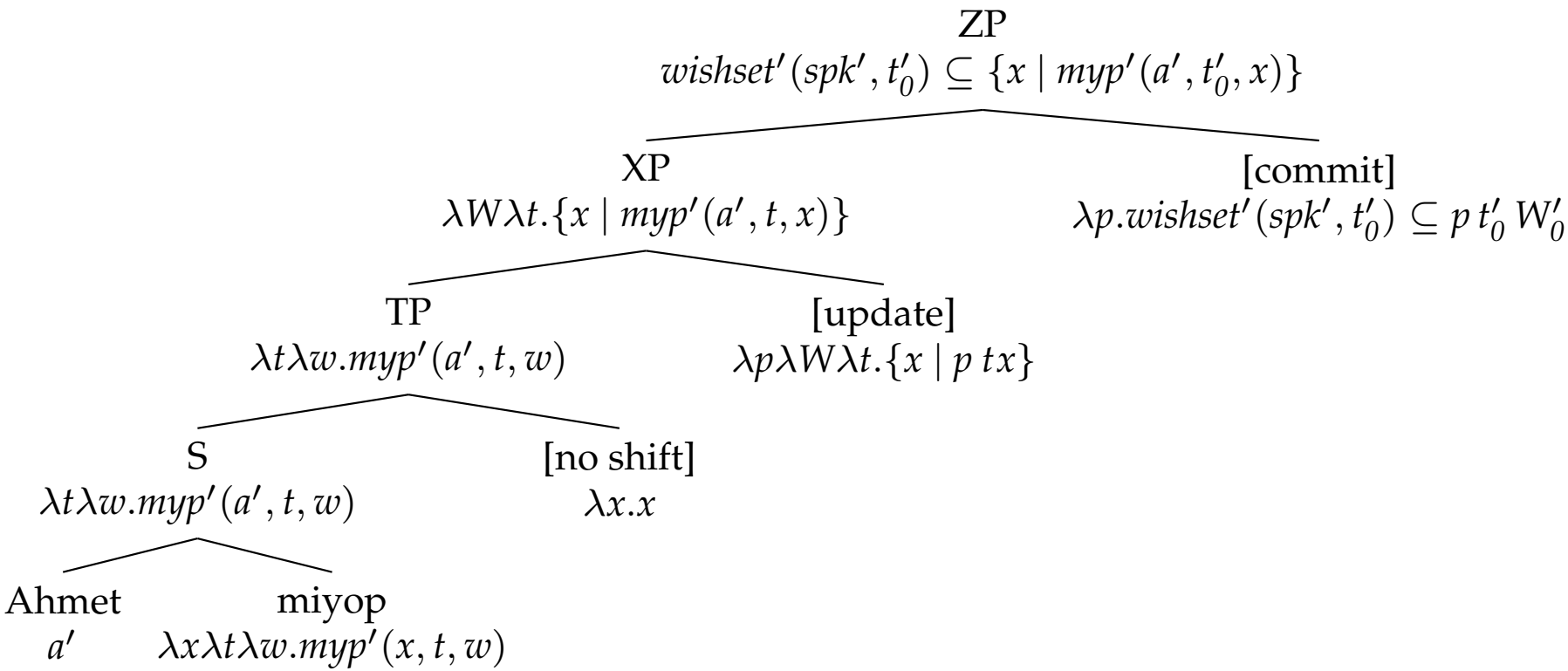
A tip of world-making

(11) Ahmet miyop olsa…



Another tip of world-making

(12) (Keşke) Ahmet miyop olsa.



An example with a -K nominal?

(13) Canan Bahar-ın miyop ol-duğun-a inanıyor.
C. B.-Gen myopic be-K-Dat believes
'Canan believes that Bahar is myopic.'

Assume the sentence means,

$$blfset'(spk', t_0') \subseteq W_0' \cap \{x \mid blfset'(c', t_0') \subseteq \{x \mid myp'(b', t_0', x)\}\}$$

assume the contribution of *believe*;
abstract it from the above to get the semantics of *-K*;
analyze other data using these "semantices";
revise and reapply;
revise and reapply;
revise and reapply
⋮

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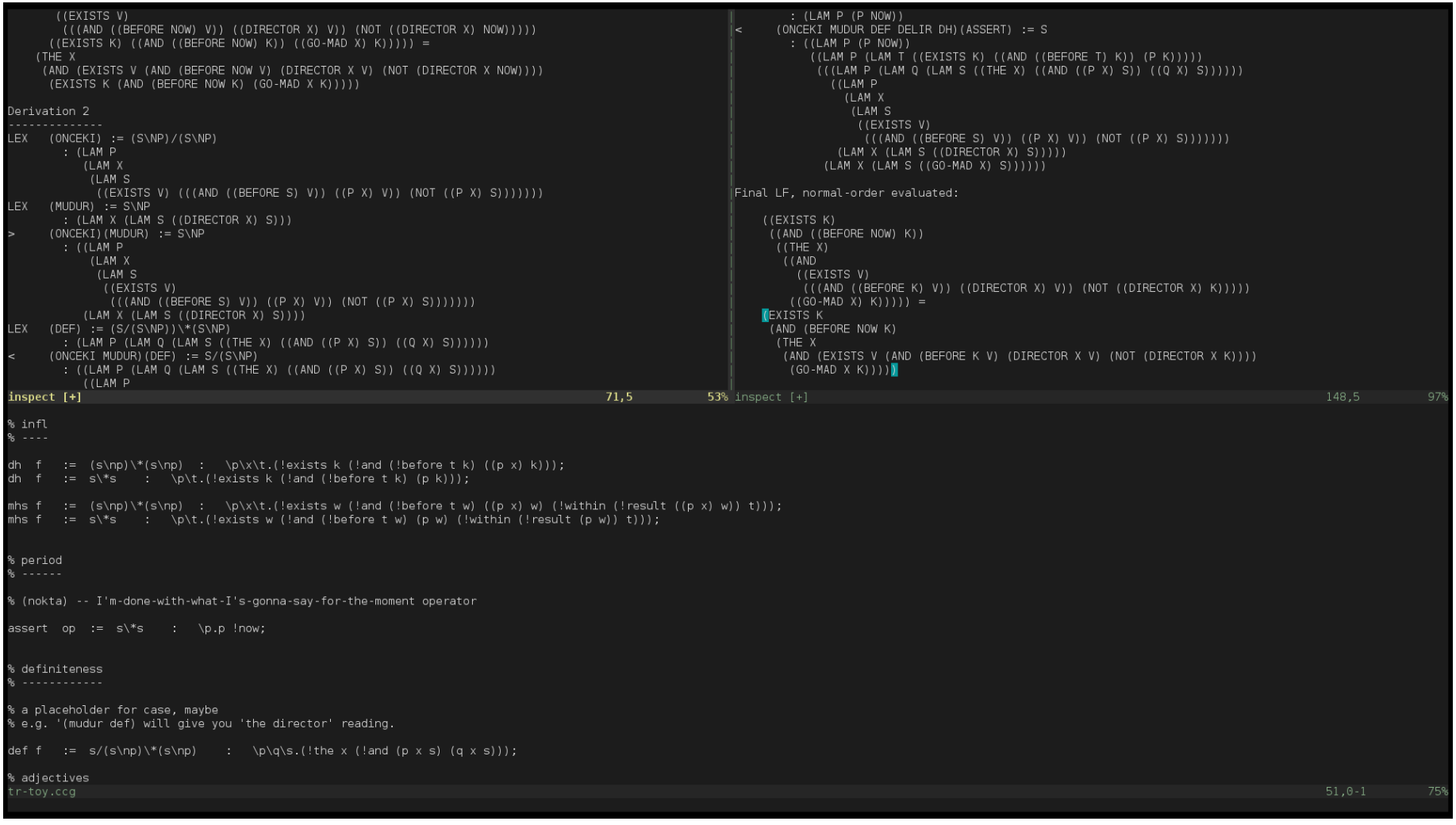
CCGLab!


((EXISTS V)
(((AND ((BEFORE NOW) V)) ((DIRECTOR X) V)) (NOT ((DIRECTOR X) NOW)))))
((EXISTS K) ((AND ((BEFORE NOW) K)) ((GO-MAD X) K)))) =
(THE X
(AND (EXISTS V (AND (BEFORE NOW V) (DIRECTOR X V) (NOT (DIRECTOR X NOW))))
(EXISTS K (AND (BEFORE NOW K) (GO-MAD X K)))))
Derivation 2
LEX (ONCEKI) := (S\NP)/(S\NP)
: (LAM P
(LAM X
(LAM S
((EXISTS V) (((AND ((BEFORE S) V)) ((P X) V)) (NOT ((P X) S)))))))
LEX (MUDUR) := S\NP
: (LAM X (LAM S ((DIRECTOR X) S)))
> (ONCEKI)(MUDUR) := S\NP
: ((LAM P
(LAM X
(LAM S
((EXISTS V)
(((AND ((BEFORE S) V)) ((P X) V)) (NOT ((P X) S)))))))
(LAM X (LAM S ((DIRECTOR X) S))))
LEX (DEF) := (S/(S\NP))*(S\NP)
: (LAM P (LAM Q (LAM S ((THE X) ((AND ((P X) S)) ((Q X) S))))))
< (ONCEKI MUDUR)(DEF) := S/(S\NP)
: ((LAM P (LAM Q (LAM S ((THE X) ((AND ((P X) S)) ((Q X) S))))))
((LAM P
: (LAM P (P NOW))
< (ONCEKI MUDUR DEF DELIR DH)(ASSERT) := S
: ((LAM P (P NOW))
((LAM P (LAM T ((EXISTS K) ((AND ((BEFORE T) K)) (P K)))))
(((LAM P (LAM Q (LAM S ((THE X) ((AND ((P X) S)) ((Q X) S))))))
((LAM P
(LAM X
(LAM S
((EXISTS V)
(((AND ((BEFORE S) V)) ((P X) V)) (NOT ((P X) S)))))))
(LAM X (LAM S ((DIRECTOR X) S)))))
(LAM X (LAM S ((GO-MAD X) S)))))
Final LF, normal-order evaluated:
((EXISTS K)
((AND ((BEFORE NOW) K))
((THE X)
((AND
((EXISTS V)
(((AND ((BEFORE K) V)) ((DIRECTOR X) V)) (NOT ((DIRECTOR X) K)))))
((GO-MAD X) K))))) =
(EXISTS K
(AND (BEFORE NOW K)
(THE X
(AND (EXISTS V (AND (BEFORE K V) (DIRECTOR X V) (NOT (DIRECTOR X K))))
(GO-MAD X K)))))
inspect [+] 71,5 53%
inspect [+] 148,5 97%
% infl
% ----
dh f := (s\np)*(s\np) : \p\x\t.(!exists k (!and (!before t k) ((p x) k)));
dh f := s*s : \p\t.(!exists k (!and (!before t k) (p k)));
mhs f := (s\np)*(s\np) : \p\x\t.(!exists w (!and (!before t w) ((p x) w) (!within (!result ((p x) w)) t)));
mhs f := s*s : \p\t.(!exists w (!and (!before t w) (p w) (!within (!result (p w)) t)));
% period
% ------
% (nokta) -- I'm-done-with-what-I's-gonna-say-for-the-moment operator
assert op := s*s : \p.p !now;
% definiteness
% ------------
% a placeholder for case, maybe
% e.g. '(mudur def) will give you 'the director' reading.
def f := s/(s\np)*(s\np) : \p\q\s.(!the x (!and (p x s) (q x s)));
% adjectives
tr-toy.ccg 51,0-1 75%

Natural language semantics

A semantics that is,

- inference supporting;
- and compositionally paired with morphosyntax.

is needed to,

- complement data-driven text understanding systems;
- naturalize/explain learning, processing and evolution of language.

LFCS

Laboratory for Formal and Computational Semantics

- `lfcs.ii.metu.edu.tr`
- Projects:
  - Discourse transparency of bare objects in Turkish (TÜBİTAK, ongoing).
    - Samet Albayrak, Arzu Burcu Güven
  - Semantics of nominalizing word derivations (BAP, coming soon).
  - Semantics of sentential nominals (ongoing).

Thank you!

Bibliography

Asher, N. (1993). *Reference to Abstract Objects in Discourse*. Springer, Dordrecht.

Lewis, D. K. (1979). Scorkeeping in a language game. *Journal of Philosophical Logic*, 8:339–359.

Temürcü, C. (2007). *A Semantic Framework for Analyzing Tense, Aspect and Mood*. PhD thesis, University of Antwerp.