Knowledge reports with(out) true belief

Deniz Özyıldız

dozyildiz@umass.edu · deniz.fr

The factive inference

'Factive' verbs trigger the inference that the proposition that they embed is true.

(1) Tunc   knows that Trump won.
     Tunc doesn't know that Trump won.
⤳ Trump won.   (factive)

(2) Tunc {says, thinks} that Trump won.
↛ Trump won.   (non-factive)

The FI can be encoded as a presupposition

(3) $[\![\mathbf{know}]\!](w)(p_{st})(x_e)$ is <u>defined</u> iff
                        p is true at w

    $[\![\mathbf{know}]\!](w)(p_{st})(x_e)$ is <u>true</u> iff
                        x thinks p at w

Hypothesis (to be refined):
The FI is a property of the matrix verb.

The view from Turkish:
The FI arises in the composition.

The factive inference alternates in Turkish

The availability of the factive inference is conditioned by clause type.

Under predicates like *bil-*, 'know,' *anla-*, 'understand,' *hatırla-*, 'remember,' . . .

Nominalizations: Factive inference	Tensed clauses: No factive inference

(4) Tunç [Trump'ın kazandığını] biliyor.
     T.   Tr.   win.NMZ   know
≈ Tunc knows that Trump won.
⤳ Trump won
	(5) Tunç [Trump kazandı diye] biliyor.
	     T. Tr. win.PST diye know
	≈ Tunc believes that Trump won.
	↛ Trump won

This is unexpected if the matrix verb is factive and clauses compose uniformly.
Question: What gives rise to the factive inference in Turkish?
Answer: The inference arises in the composition.

| Tests	Sentences	
	(4) NMZ	(5) tensed
Ok with denial of of embedded clause?	No (modulo focus)	Yes
Ok with prior assertion of embedded clause?	Yes	No
Hey wait a minute!	Yes	No
Does the inference project?	Yes	NA

Proposal

The factive inference is 'built up' in the syntactic/semantic composition.

The definition of *bil-*

(6) $[\![\mathbf{bil}]\!](w_s)(p_{st})(q_{st})(x_e) = 1$ iff
    There is a proper acquaintance R s.t.

    the situation s that x is acquainted with through R at w satisfies p, and

    x believes that the situation that she is acquainted with satisfies q.
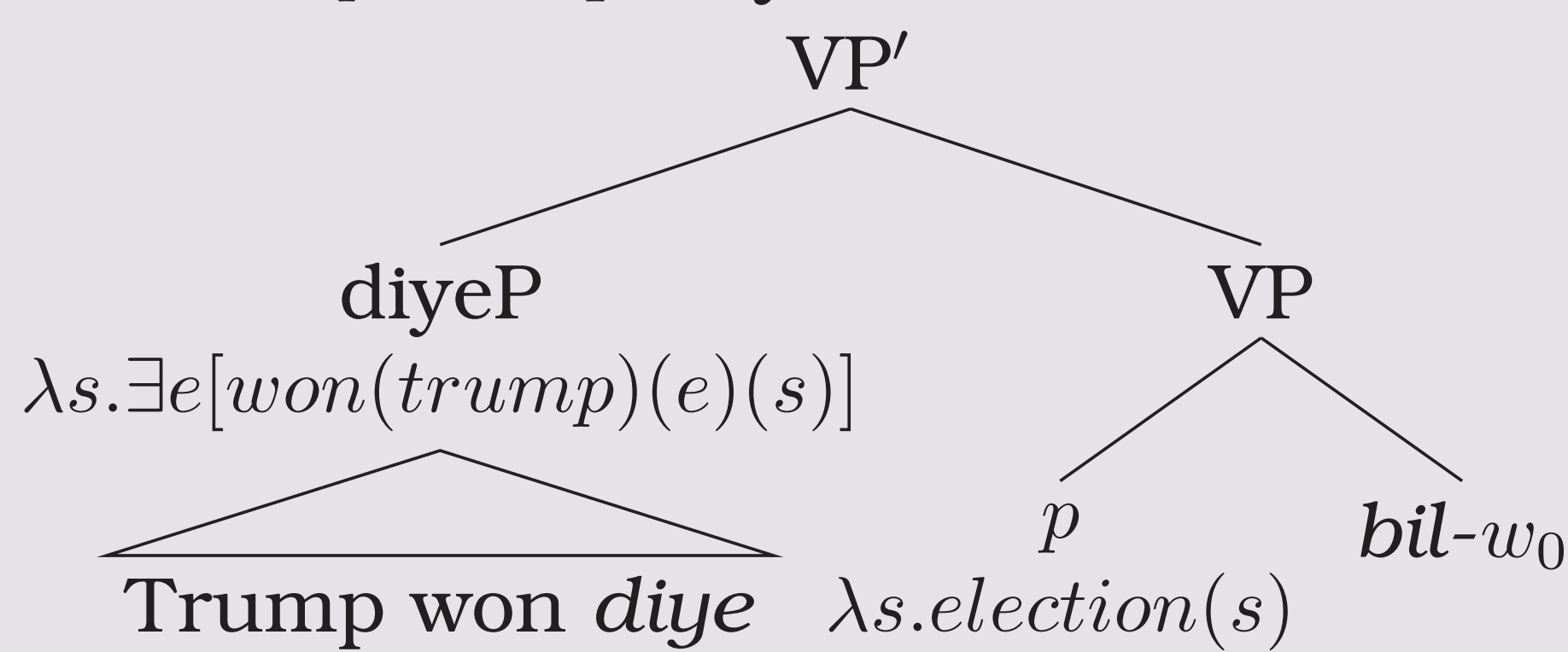
p and q are independent predicates.

A minimal structure
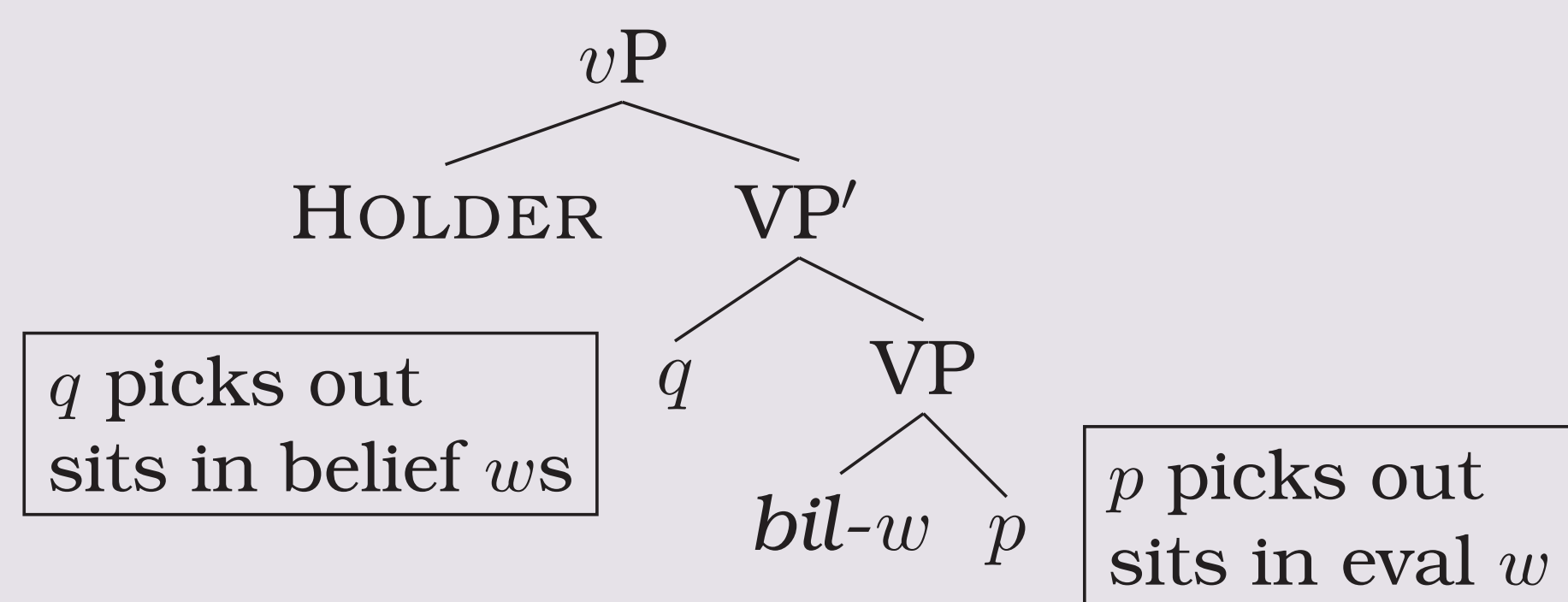
Situations: [3, 5]; De re belief based on acquaintance: [2];
Knowledge as de re belief about situations: [4].

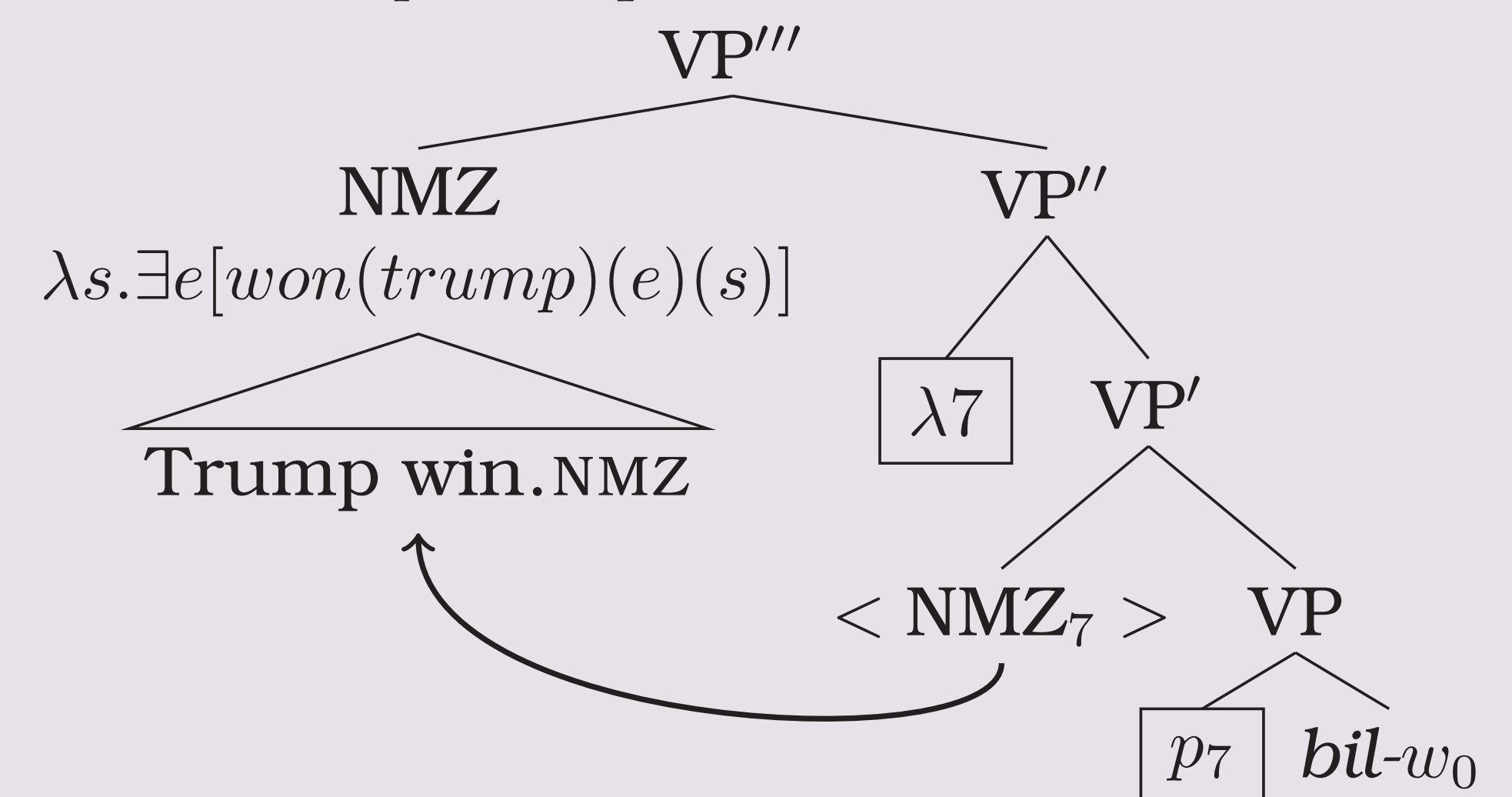### Deriving the non-factive alternant (5)
p and q may **mismatch**.

p valued contextually/∃-closed.
q expressed by *diye* clause.

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(7) $[\![(5)]\!](w_0) = 1$ iff ∃R s.t.

    the situation s that Tunç is acquainted with through R at w_0 is the US presidential election, and

    Tunç believes that the s he is acquainted with includes a Tr. victory.

Deriving the factive alternant (4)
p and q **must match**.

p is bound by the nominalization.

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(8) $[\![(4)]\!](w_0) = 1$ iff ∃R s.t.

    the situation s that Tunç is acquainted with through R at w_0 includes a Trump victory, and

    Tunç believes that the s he is acquainted with includes a Tr. victory.

Thanks & References

References

[1] Abrusán. Predicting the presuppositions of soft triggers. *L&P*, 2011.
[2] Charlow and Sharvit. Bound 'de re' pronouns and the LFs of attitude reports. *S&P*, 2014.
[3] Kratzer. An Investigation of the Lumps of Thought. *L&P*, 1989.
[4] Kratzer. Facts: Particulars or information units? *L&P*, 2002.
[5] Kratzer. Situations in natural language semantics. *SEP*, 2016.
[6] Moulton. Natural selection and the syntax of clausal complementation, 2009.

More on embedded clauses

Nominalizations are not always facts.
$[\![p + \text{NMZ}]\!] \not\approx$ the fact that p

(9) [Trump'ın kazandığını] düşünüyor.
     Tr.   win.NMZ   think
     Tunc thinks that Trump won.
↛ Trump won

⇒ Source of FI is not the nominalization.

Tensed clauses are direct content.
$[\![diye + \text{CP}]\!] \not\approx [\![\textsc{Modal}]\!]([\![\text{CP}]\!])$

In a context where (5) is true the attitude holder would assent to:
✓Trump won.
According to me (≈? *diye*), Trump won.

⇒ Lack of FI not due to 'plugging.'

Concluding remarks

Regular factors condition the FI in Turkish.
⇒ The FI is derived, rather than being a property of attitude verbs, or of clauses.
Proposal: **Matching/mismatching *de re* beliefs about situations**.

Other Turkic langs (ongoing, Travis Major), Korean [6], Hungarian [1], etc., have it too!

Speculation

Further work: Unpacking the complexity of 'factive' verbs into the interpretation of tensed clauses and nominalizations.

Attitudes denote **non-veridical states**.
diye introduces (non-veridical) **content**.
Nominalizations → **scope ambiguities**.
Eval w: Factive; Belief ws: Non-factive.