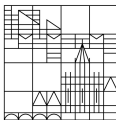


Two kinds of question-embedding strategies and veridicality alternations

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Introduction

Declarative veridicality alternations

Many languages have **declarative veridicality alternations** conditioned by clause type. We focus on Turkish and Japanese.

Surprise + nominalized declarative: Veridical

(1) Ai [yağmur yağ -dığ -ın-a] şaşırdı.

Ai [rain fall-NMZ-3S-DAT] was.surprised

Ai-wa [ame-ga hutta -no -ni] odoroitte.

Ai-TOP [rain-NOM fell-NMZ-DAT] was.surprised

'Ai was surprised that it rained'

⇒ It rained.

Declarative veridicality alternations

Many languages have **declarative veridicality alternations** conditioned by clause type. We focus on Turkish and Japanese.

Surprise + **diye/to declarative: Non-veridical**

(2) Ai [yağmur yağdı **diye**] şaşırıldı.

Ai rain fell **DIYE** was.surprised

Ai-wa [ame-ga hutta **-to**] odoroitte.

Ai-TOP rain-NOM fell **TO** was.surprised

'Ai was surprised, thinking that it rained'

≠ It rained.

Preview of the talk

Declarative veridicality alternations receive a lot of attention:

Buryat (Bondarenko 2020), Greek (Djäv 2019), Korean (Lee 2019, Jeong 2020), Japanese (Kusumoto 2017), Javanese (Bondarenko 2023), Turkish (Özyıldız 2017), Washo (Bochnak & Hanink), ...

Little attention is given to alternating predicates with *interrogatives*.

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Little attention is given to alternating predicates with *interrogatives*.

Nominalized and *diye/to* interrogatives suggest that the declarative veridicality alternation does not have an interrogative counterpart.

- ▶ Nominalized questions are veridical:
surprise + nominalized Q \Rightarrow surprised by the true answer to Q
- ▶ *Diye/to* questions give rise to linguistic production reports:
surprise + *diye/to* Q \Rightarrow
surprised by something, saying/thinking “Q”

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surprised by something, saying/thinking “Q”

Today:

- ▶ A unified account of declarative and interrogative embedding across clause types.
- ▶ A new perspective on veridicality alternations.

The (additional) puzzle:
Surprise and interrogative-embedding

Nominalized questions: Interrogative veridicality

Surprise + nominalized question:

The subject is related to an exhaustively appropriate **true answer**.

(3) Ai [parti-ye kim-in gel -diğ-in-e] şaşırdı.
Ai party-DAT who-GEN come-NMZ-3S-DAT was.surprised

Ai [dare-ga sono party-ni kuru -ka-ni] odoroitā.
Ai who-NOM the party-DAT come-Q-DAT was.surprised
'Ai was surprised by (the true answer to the question) who will come to the party.'

(All remains well if one assumes that 'surprise' merely presupposes belief.)

Diye/To questions: A relationship to the question

surprise + diye/to questions: The subject. . .

- ▶ is related to the question, not to any answer, and
- ▶ **linguistically produces the question.**

(4) Ai [partiye kim gelecek diye] şaşırdı.

Ai party who will.come DIYE was.surprised

Ai-wa [dare-ga sono party-ni kuruno -ka-to] odoroitā

Ai-TOP who-NOM the party-DAT come-Q-TO was.surprised

a. Unavailable:

Ai was surprised by {the true, a possible} answer to who'll come to the party.

b. Available:

Ai was surprised, thinking "Who'll come to the party?"

Probing for the linguistic production inference

- (3) Ai [parti-ye kim-in gel-diğ-in-e] şaşırdı.
Ai party-DAT who-GEN come-NMZ-3S-DAT was.surprised
Ai was surprised who came to the party.

Ben de öyle dedim.

I too so said

I said that too.

Probing for the linguistic production inference

- (4) Ai [parti-ye kim geldi diye] şaşırdı.
Ai party-DAT who came DIYE was.surprised
Ai was surprised, and said “Who came to the party?”

✓ Ben de öyle dedim.
I too so said
I said that too.

Probing for the linguistic production inference

- (5) Context: Hanako tells Ai that Carly Rae Jespen came to a party. Surprised, Ai says “Who came to the party!?”

Ai [parti-ye kim geldi diye] şaşırdı.

Ai party-DAT who came DIYE was.surprised

Ai was surprised, and said “Who came to the party?”

In particular:

- ▶ Simultaneity between the surprisal and the linguistic production event is not enough.
- ▶ There needs to be some (context-dependent) causal link between the two.

An expectation: Q-to-P and P-to-Q entailments

Spector & Egré 2015

The meaning difference between nominalized and *diye/to* questions is surprising because the schema in (6) is partially violated.

(6) $x \text{ Vs } Q \Leftrightarrow \exists p \in Q[x \text{ Vs that } p]$

(7) a. Al and Bo {know, agree on} which celebrity was there.

\Leftrightarrow

b. Al and Bo {know, agree} that Carly Rae was there.

S&E do not consider veridicality alternations conditioned by clause type. We transpose (6) into (8) & (9):

(8) $x \text{ Vs } \underline{\text{nominal-Q}} \Leftrightarrow \exists p \in Q[x \text{ Vs } \underline{\text{nominal-p}}]$

(9) $x \text{ Vs } \underline{\text{diye/to-Q}} \Leftrightarrow \exists p \in Q[x \text{ Vs } \underline{\text{diye/to-p}}]$

An expectation (continued)

The expectation is satisfied for nominalized questions:

$x \text{ Vs } \underline{\text{nominal-Q}} \Leftrightarrow \exists p \in Q[x \text{ Vs } \underline{\text{nominal-p}}]$

- (10) a. A_i [parti-ye kim-in gel diğ ine] şaşırdı.
Ai party-DAT who-GEN come.NMZ was.surprised
Ai was surprised who came to the party.
 \Leftrightarrow
- b. A_i [parti-ye Carly-nin gel diğ ine] şaşırdı.
Ai party-DAT Carly-GEN come.NMZ was.surprised
Ai was surprised that Carly came to the party.

An expectation (continued)

The expectation is not satisfied for *diye/to* questions.

$x \text{ Vs } \underline{\text{diye/to-Q}} \not\Rightarrow \exists p \in Q[x \text{ Vs } \underline{\text{diye/to-p}}]$

- (11) a. Ai [parti-ye kim geldi diye] şaşırıldı.
Ai party-DAT who came DIYE surprised
Ai was surprised, thinking “Who came to the party?”
⋈ ⋇
- b. Ai [parti-ye Carly geldi diye] şaşırıldı.
Ai party-DAT Carly came DIYE surprised
Ai was surprised, thinking “Carly came to the party.”

The implication fails in both directions:

- ▶ (11-a) requires that the subject entertain a question
- ▶ (11-b) requires that they entertain a declarative.

Argumenthood and adjuncthood of the two types of clauses

The intuition behind our proposal

Now, we provide empirical evidence suggesting that

- ▶ Nominalized clauses are arguments of attitude verbs.
- ▶ *Diye/to* clauses are modifiers.

We will make use of this empirical difference to argue that

Veridicality and similar restrictions may only be imposed by predicates to their arguments.

- ⇒ V+NMZ combinations are veridical; V+*diye/to* combinations are non-veridical.

Precedents in the literature:

- ▶ An adjunction strategy is available for clausal composition.

[Elliott 2020, a.m.o.]

- ▶ In some languages, both a complementation and an adjunction strategy is available for clausal composition.

[Bochnak and Hanink 2021, a.o.]

Nominalized clauses are arguments/D-T clauses adjuncts

Composition with intransitives (Parallel Turkish data in Appendix)

Nominalizations cannot combine with intransitives or verbs with saturated internal arguments:

- (12) Taro-wa yuki-ni [*hutta--ka-ni] odoroitā.
Taro-TOP snow-DAT fell-Q-DAT surprised

To clauses can:

- (13) Taro-wa yuki-ni [itsu huttano--ka-to] odoroitā.
Taro-TOP snow-DAT when fell-Q-TO surprised
Int. Taro was surprised by the snow, saying/thinking
“When did it snow?”

Nominalized clauses are arguments/D-T clauses adjuncts

Adverbial vs. argument pro-forms (Parallel Turkish data in Appendix)

To-clause... ✓ adverbial pro-form / #argument pro-form

- (14) a. Taro-wa [dare-ga kuru -ka-to] odoroitā.
Taro-TOP who-NOM come-Q-TO surprised
- b. Jiro-mo {soo/#sore-ni} odoroitā.
Jiro-too so/it-DAT surprised
Taro was surprised, thinking “Who will come?” Jiro
was surprised in that way too.

Nominalized clauses are arguments/D-T clauses adjuncts

Adverbial vs. argument pro-forms (Parallel Turkish data in Appendix)

Nominalized clause... #adverbial pro-form / argument pro-form

- (14) a. Taro-wa [dare-ga kuru -ka -ni] odoroitā.
Taro-TOP who-NOM come-Q-DAT surprised
- b. Jiro-mo {#soo/sore-ni} odoroitā.
Jiro-too so/it-DAT surprised
Taro was surprised by who will come. Jiro was surprised by it too.

Nominalized clauses are arguments/D-T clauses adjuncts

Subjecthood (Parallel Turkish data in Appendix)

Hartman (2012)

Nominalizations can be subjects (arguments in positions other than internal argument).

- (15) [Dare-ga kita -ka-ga] akirakada.
who-NOM came-Q-NOM obvious
It is obvious who came.

To-clauses cannot be subjects (or occur in other argument positions).

- (16) *[Dare-ga kita -ka-to] akirakada.
who-NOM came-Q-TO obvious
- a. Intended: “It is obvious who came.”
 - b. Intended: *It is obvious, thinking “Who came?”

(While it is in principle possible to adjoin to adjectival predicates, that parse will be ruled out here for semantic reasons.)

Proposal

Desiderata

Proposal

A successful account of nominalized and diye/to clauses should. . .

- ▶ reflect their complement vs. adjunct-like behavior,
- ▶ involve a relation to a true answer with nominalizations,
- ▶ involve a *linguistic production* inference with diye/to clauses.

Predicates alternating in declarative veridicality

Proposal

Predicates like *surprise* are defined as in (17):

$$(17) \quad \llbracket \text{odoroku / şaşır- 'be surprised'} \rrbracket^w = \\ \lambda Q_{\langle st, t \rangle} \lambda e_v : \underline{\exists p \in Q[p(w)]}. \\ \exists p \in Q[p(w) \wedge \mathbf{surprise}(e) \wedge \mathbf{Theme}(e, p)]$$

- ▶ Declarative and interrogative nominalizations saturate the internal argument slot Q .
 - ↪ Imposes veridicality on Q .
 - ↪ Supports S&E's generalization wrt Q .
- ▶ Diye/to clauses introduce an additional eventuality of *linguistic production* associated with the surprise event.
 - ↪ No veridicality requirement.
 - ↪ Non-conformity to S&E's generalization.

Surprise + nominalized clauses

Proposal

Q saturated by nominal complements \Rightarrow Veridical readings with declaratives and questions.

$$(17) \quad \llbracket \text{odoroku} / \text{şaşıır- 'be surprised'} \rrbracket^w = \\ \lambda Q_{\langle st, t \rangle} \lambda e_v : \exists p \in Q[p(w)]. \\ \exists p \in Q[p(w) \wedge \mathbf{surprise}(e) \wedge \mathbf{Theme}(e, p)]]$$

Declaratives:

$$\exists p \in \{\lambda w'. \text{come}(\text{hanako}, w')\}[p(w)]$$

- ▶ Entails and presupposes that Hanako came.
- ▶ Entails that it is surprising that Hanako came.

Surprise + nominalized clauses

Proposal

Q saturated by nominal complements \Rightarrow Veridical readings with declaratives and questions.

$$(17) \quad \llbracket \text{odoroku} / \text{şaşıır- 'be surprised'} \rrbracket^w = \\ \lambda Q_{\langle st, t \rangle} \lambda e_v : \exists p \in Q[p(w)]. \\ \exists p \in Q[p(w) \wedge \mathbf{surprise}(e) \wedge \mathbf{Theme}(e, p)]]$$

Questions:

$$\exists p \in \{\lambda w'. \text{come}(\text{hanako}, w'), \lambda w'. \text{come}(\text{taro}, w'), \dots\} [p(w)]$$

- ▶ Presupposes that there is a true answer to who came.
- ▶ Entails that that true answer is surprising.

Surprise + nominalized clauses

Proposal

Q saturated by nominal complements \Rightarrow Veridical readings with declaratives and questions.

$$(17) \quad \llbracket \text{odoroku} / \text{şaşıır- 'be surprised'} \rrbracket^w = \\ \lambda Q_{\langle st, t \rangle} \lambda e_v : \underline{\exists p \in Q[p(w)]}. \\ \exists p \in Q[p(w) \wedge \text{surprise}(e) \wedge \text{Theme}(e, p)]]$$

We also predict that the predicate satisfies S&E's generalization wrt nominal complements.

$$(18) \quad x \text{ Vs } \underline{\text{nominal-}Q} \Leftrightarrow \exists p \in Q[x \text{ Vs } \underline{\text{nominal-}p}]$$

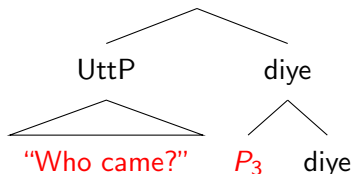
The semantics of *diye/to* clauses

Proposal

Diye/to has two semantic contributions:

- ▶ It specifies the linguistic form of events that satisfy a contextually supplied description P_3 [Maier 2018, Potts 2004]

$$\lambda R_{vt} \lambda e_v \left\{ \begin{array}{l} P_3(e) \models_c \exists e^+ [\tau(e) \sqsubseteq \tau(e^+) \wedge R(e^+)] \\ P_3(e) \wedge \text{form}(e) = \text{"Who came?"} \end{array} \right. \quad (\text{psp})$$



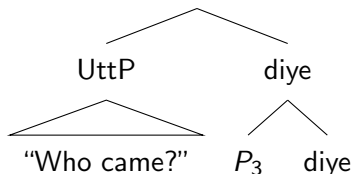
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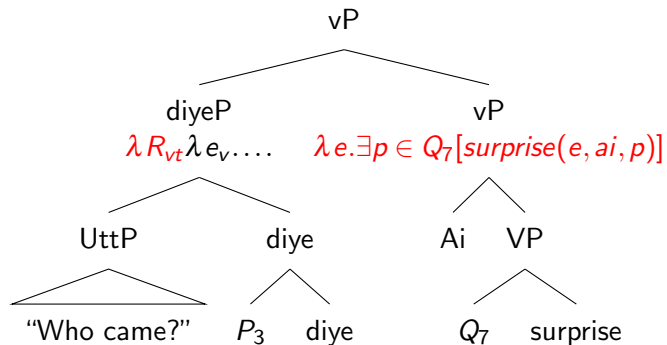
- ▶ It specifies the linguistic form of events that satisfy a contextually supplied description P_3 [Maier 2018, Potts 2004]
- ▶ It relates P_3 to a matrix event description R ('Ai be surprised')
inspired by Homer's (2021) analysis of actuality entailments cf. Alxatib 2019
 - ▶ The runtime of P_3 is included in the runtime of R
 - ▶ In context, P_3 is a sufficient condition for R .

$$\lambda R_{vt} \lambda e_v \left\{ \begin{array}{l} P_3(e) \models_c \exists e^+ [\tau(e) \sqsubseteq \tau(e^+) \wedge R(e^+)] \\ P_3(e) \wedge \text{form}(e) = \text{"Who came?"} \end{array} \right. \quad (\text{psp})$$



Composing diye/to clauses with *surprise*

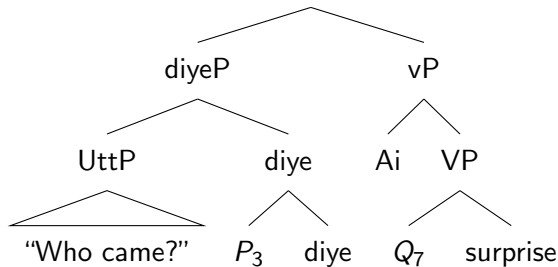
Proposal



Composing diye/to clauses with *surprise*

Proposal

$$\lambda e_v \left\{ \begin{array}{l} P_3(e) \models_c \exists e^+ [\tau(e) \sqsubseteq \tau(e^+) \wedge \exists p \in Q_7 [\text{surprise}(e^+, ai, p)]] \quad (psp) \\ P_3(e) \wedge \text{form}(e) = \text{"Who came?"} \end{array} \right.$$



- ▶ True of eventualities P_3 whose form is "Who came?"
- ▶ Defined only if P_3 is a sufficient condition for Ai 's surprisal.

Valuing the eventuality predicate introduced by diye/to

Proposal

- (19) Ai-wa [dare-ga kuruno-ka-to] odoraita.
Ai-TOP who-NOM came-Q-TO was.surprised
Ai was surprised, saying “Who came?”
 $\exists e : P_3(e) \wedge form(e) = \text{“Who came?”}$
 $\exists e : P_3(e) \models_C \exists e^+ [\tau(e) \sqsubseteq \tau(e^+) \wedge \exists p \in Q_7 [surprise(e^+, ai, p)]]$

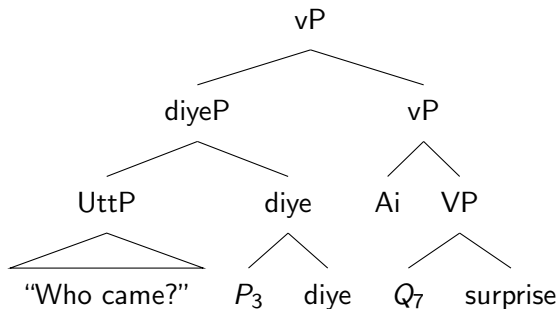
We want to accommodate an eventuality description...

- ▶ whose linguistic form is “Who came?”
- ▶ that contextually entails that Ai is surprised by something.

If Ai expresses the question “Who came?” in a certain way, we can infer that they are surprised.

\Rightarrow We accommodate $P_3 = \lambda e. say(e) \wedge form(e) = \text{“Who came?”}$

Spot checks



- ▶ P_3 is always silent.
- ▶ Q_7 may be silent or pronounced. Evidence for the latter:

(20) Ai [kimin geldiğine] [Carly mi geldi diye] şaşırdı.
Ai who came.NMZ Carly Q came DIYE was.surprised
Ai was surprised who came, thinking “Is it Carly who came?”

Predictions

1. Semantic restriction other than veridicality

- ▶ **Prediction:** there can be semantic restrictions imposed by predicates other than veridicality that uniformly apply to nominal declaratives/interrogatives but not to D/T-clauses.
- ▶ Prediction borne out with predicates like Jp *hantai-suru* 'to oppose' / Tu *sorgula* 'to question' (response-stance verbs; Cattell '78).

(21) Ai-wa [Taro-o yobu koto/ka-ni] hantai-shita.
Ai-TOP T.-ACC invite NMZ/Q-DAT opposed
'A opposed inviting T/the decision on whether to invite T'
↪ *p/Q* had been introduced in the discourse

(22) A-wa [{ T-ga kuru / dare-ga kuru-ka } to]
A-TOP T-NOM come / who-NOM come-Q TO
hantai-shita.
opposed
'A opposed sth, saying 'T will come / who will come.'
↪ *p/Q* had been introduced in the reported discourse

2. S-selection

- ▶ **Prediction:** S-selection—which can be thought of as lexical semantic restrictions—is observed for nominal clauses but not for D/T-clauses.

2. S-selection

- ▶ **Prediction:** S-selection—which can be thought of as lexical semantic restrictions—is observed for nominal clauses but not for D/T-clauses.
- ▶ E.g., Jp *tazuneru* ‘ask’ is incompatible with nominalized declaratives but compatible with D/T-declaratives. Turkish *um-* ‘hope’ is incompatible with nominal questions but compatible with D/T-questions.

Conclusions

Conclusions

- ▶ **Known puzzle:** veridicality alternation conditioned by clause types (nominal vs. D/T-clause)
- ▶ **New wrinkle:** the interpretations of nominal clauses satisfy S&E's generalisation but those of D/T-clauses don't.
- ▶ **A unified analysis:**
 - ▶ Nominal comps saturate the internal arg of the predicate, which is (i) specified to be veridical and (ii) follow S&E.
 - ▶ D/T-clauses are adjuncts that introduce an additional linguistic production eventuality.
- ▶ **Implications**
 - ▶ Veridicality alternation is not only about flipping veridicality. D/T-clauses add the linguistic production inference.
 - ▶ Behavior wrt interrogative clauses provide evidence that Japanese and Turkish have two types of clause-embedding strategies: complementation and adjunction (cf. Bochnak & Hanink 2021, Major 2021, Goodhue & Shimoyama 2022, Bondarenko 2023)

Appendix

Further implications for cross-linguistic variation

- ▶ Bondarenko ('22): a clause under Russian *objasnit'* 'explain' can exhibit two types of embedding strategy, parallel to the internal-argument/adjunct distinction in Turkish/Japanese.
- ▶ However, crucially, the two types of clauses cannot co-occur under *objasnit'* in Russian unlike in Turkish/Japanese.
- ▶ Possibility: this variation boils down to whether a language involves a head like *diye/to* which introduces an additional representation event.
 - ▶ In Russian, since such an item is absent, the adjunction strategy is possible only if the predicate itself introduces a contentful eventuality (analyzed in terms of silent SAY composing w/ *objasnit'* in Bondarenko).
 - ▶ In Turkish/Japanese, by virtue of *diye/to*, adjunction is available in general without the predicate itself introducing a contentful eventuality.

Additional data

Nominalizations cannot combine with intransitives or verbs with saturated internal arguments:

- (25) Ai kar-a [*yağ-dığ-ın-a] **şaşırdı**.
Taro snow-DAT fall-NMZ-3S-DAT surprised

Diye clauses can:

- (26) Ai kar-a [ne zaman yağdı diye] **şaşırdı**.
Taro snow-DAT when fall-PST DIYE surprised
Ai was surprised by the snow, thinking “When did it fall?”

Additional data

Diye-clause... ✓ adverbial pro-form / #argument pro-form

- (27) a. Taro [kim gel-ecek diye] şaşırđı.
Taro who come-FUT **DIYE** was.surprised
- b. Jiro da {**öyle/#on-a**} şaşırđı.
Jiro too {so/that-DAT} was.surprised
Taro was surprised, thinking “Who will come?” Jiro
was surprised in that way too.

Nominalized clause... # adverbial pro-form / ✓ argument
pro-form

- (28) a. Taro [kim-in gel--diğ-in-e] şaşırđı.
Taro who-GEN come-NMZ-3S-DAT surprised
- b. Jiro da {**#öyle/on-a**} şaşırđı.
Jiro too {so/that-DAT} surprised
Taro was surprised who came. Jiro was surprised by
that way too.

Additional data

Nominalizations can be subjects (arguments in positions other than internal argument).

- (29) [Kim-in gel-diğ-i] belli.
who-GEN come-NMZ-3S obvious
It is obvious who came.

Diye-clauses cannot be subjects (or occur in other argument positions).

- (30) *[Kim geldi diye] belli.
who came DIYE obvious
- a. Intended: It is obvious who came.
 - b. Intended: *It is obvious, thinking “Who came?”