Processing covert dependencies: a study on Turkish wh-in-situ

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Main Question

WHAT IS THE SEARCH PROCESS UNDERLYING THE RESOLUTION OF COVERT LONG-DISTANCE DEPENDENCIES?

Background

OVERT DEPENDENCIES: A wh-phrase is linked to a gap site elsewhere in the clause. The search process for the gap is active and grammatically guided [2].

(1) *Who* did John see __?

COVERT DEPENDENCIES: The wh-element remains in its thematic position, and scope is not always marked overtly (2).

(2) Gizem *nere-ye* gid-iyor $\overleftarrow{C_q}$?

- In this case, a covert dependency is formed with the scope position of the wh-element, the *SPEC CP of a relevant clause* [1].
- Previous research provides evidence for a preference for shorter dependency length in covert dependencies [4, 6].
- Overt dependencies show *active dependency resolution* where the position of the gap is predicted before there is definitive evidence, resulting in the *filled gap effect* [2, 5].

  (3) My brother wanted to know *who*$_i$ Ruth will bring **us** home to __$_i$ at Christmas.

- Working memory models posit that predictive processing helps alleviate memory load caused by feature maintenance [3].

Filled gap effect in Japanese wh-in-situ

- One previous study in Japanese [4] finds that the parser anticipates the first grammatically available position as the dependency resolution site in wh-in-situ dependencies.
- Significant slowdown in reading times in an SPR study when the embedded verb bears an affirmative particle instead of a q-particle (4).

(4) [C$_m$ Senmu-ga [C$_{emb.}$ { atarasii-pasokon-o / donna-pasokon-o } director-NOM what-kind-of/new-computer-ACC { tukatteiru-to / tukatteiru-ka } kakarichoo-ga using-is-that/QP supervisor-NOM itta-no? said-QP

Current study

- In Japanese, the dependency may be resolved using the same mechanisms as an argument-verb dependency (i.e., a feature on the lexical verb).
- Unlike Japanese, Turkish does not morphologically mark the scope position in wh-in-situ constructions.
- This allows us to test the most abstract configuration for covert dependency formation, where structural features must be maintained during dependency formation.
- **Can a filled-gap effect be observed in the lack of overt surface cues for wh-in-situ dependencies?**

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Experiment I

Design

- Non-cumulative SPR experiment conducted online.
- 36 items and 54 fillers.
- 2x2: **sentence type** (decl. x wh.) x **local scope** (allowed x disallowed)

(5) [$_{C_m}$ Ece [$_{C_{emb.}}$ Özge-nin sunum-a ekle-mek için Ece Özge-GEN presentation-DAT add-CVB to { *hangi* / ∅ } makale-yi bir gecede (which) article-ACC a night CR { oku-**ma**-sı-na / oku-**duğ**-u-na } { disallowed / allowed } şaşır-dı]? read-**NMLZ**-DATIVE-3SG surprised-PST
'Which article was Ece surprised that Özge read in a night to add to the presentation?'

- Local scope is *disallowed* in the -MA condition.
- All sentences resolve grammatically to matrix scope.
- **TASK:** argument-verb matching (2AFC with one verb and two non-case-marked arguments)

Predictions

Slowdown in reading times is expected in the wh-ungrammatical condition if local scope is predicted immediately upon encountering an in-situ wh-element.

Results (N=36)

Reading Times

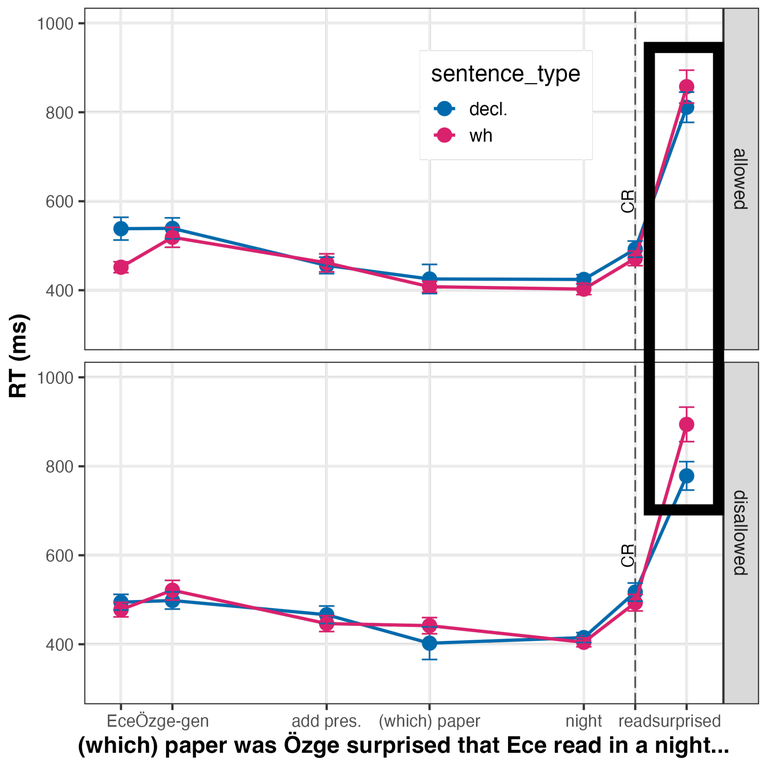

Figure 1. Experiment I RT plot.

- Interaction in spillover: **slower reading times in the wh x LS: disallowed**
- Local scope is predicted **prior** to the embedded verb.
- **ACCURACY:** no significant effects

Conclusions

- Covert dependencies are resolved actively even when no direct cues for scope exist.
- Structural features are maintained/retrieved in the same way as semantic features.

References

[1] Joseph Aoun et al. In: *Linguistic Inquiry* (1993). [2] Lyn Frazier et al. In: *Journal of memory and language* (1989). [3] Brian McElree. In: *Psychology of learning and motivation* (2006). [4] Edson T Miyamoto et al. In: *Scientific approaches to language* (2002). [5] Laurie A Stowe. In: *Language and cognitive processes* (1986). [6] Ming Xiang et al. In: *Journal of East Asian Linguistics* (2014). [7] Ming Xiang et al. In: *Language* (2023).

Experiment II

IS THE LOCALITY PREFERENCE IN PROCESSING PARALLELED IN PRODUCTION?

Design

- Fragment completion task using the same items from Experiment I.
- 10 itemsets, 30 fillers.

condition	short	short adverbial	wh x declarative	MA x DIK
	Ece Özge-nin			
	Ece Özge-GEN	sunum-a ekle-mek için		
			presentation-DAT add-CVB to { *hangi* / ∅ } makaleyi	
			(which) article-ACC	
				{ oku-**ma**-sı-na / oku-**duğ**-u-na } ...
				read-**NMLZ**-DATIVE-3SG

Table 1. Experiment II itemset

Predictions

We expect to see the same locality preference observed in processing if the planning of wh-in-situ dependencies is subject to the same memory constraints.

Results (N=26)

condition	scope preference	percentage
DIK	LOCAL	100
MA	LOCAL	4.76
MA	MATRIX	52.38
MA	NON-LOCAL	42.85

Table 2. Experiment II continuations

- Overwhelming preference for local scope.
- If local scope is disallowed, matrix or non-local scope configurations are preferred (7) (8).

Scope preferences

LOCAL SCOPE

(6) Ece Özge-nin hangi makale-yi oku-duğ-u-na şaşır-dı.
Ece Özge-GEN which article-ACC read-NOM-3SG-DAT surprise-PST
"Ece was surprised which article Özge read."

MATRIX SCOPE

(7) Ece Özge-nin hangi makale-yi oku-ma-sı-na şaşır-dı?
Ece Özge-GEN which article-ACC read-NOM-3SG-DAT surprise-PST
"Which article was Ece surprised that Özge read?"

NON-LOCAL SCOPE

(8) Ece Özge-nin hangi makale-yi oku-ma-sı-na şaşır-dığ-ı-nı anlat-tı.
Ece Özge-GEN which article-ACC read-NOM-3SG-DAT surprise-NOM-3SG-DAT tell-PST
"Ece told which article she was surprised that Özge read."

Discussion

- Non-matrix scope in production may reflect an **interpretive preference**.
- However, this conflicts with previous research showing asymmetry between the parsing and interpretation of wh-in-situ [7].
- **FUTURE DIRECTIONS:** Can different context scenarios bias participants to produce questions vs. statements?