Matrix verb transitivity acts as a cue for parasitic gapping in Swedish

In an eyetracking study of Swedish relative clause extractions, Tutunjian, Heinat, Klingvall, and Wiklund (2017) found evidence for incremental, filler-gap integration inside complex subjects involving a relative clause (SRC), where it was expected to be blocked (Traxler & Pickering, 1996). Tutunjian et al. (2017) hypothesized that dependency formation at the gap sites arose not because Swedish was exceptional in regard to islands, but rather on account of parasitic gapping (PG), a phenomenon in which an illicit gap is made licit by the presence of a licit gap elsewhere in the sentence (Engdahl, 1983). Tutunjian et al. proposed that because the di-transitive matrix verbs used in their study acted as a cue for an upcoming clausal object (and thus a second potential gap), they provided a form of look-ahead which facilitated the postulation of PG inside the subject island. However, this assumption was not directly tested in Tutunjian et al. (2007).

In the current study, we used a filled-gap, eyetracking while reading paradigm to investigate whether matrix verb transitivity affects the likelihood of the parser incrementally engaging in PG in Swedish SRCs. Such a finding would support Tutunjian et al.'s claim that the permeability of Swedish SRC islands for filler-gap integration is not exceptional, but can be attributed to predictive cues supporting a process that allows dependency formation to circumnavigate structural island effects. Our study avoids assessment of PG at the RC verb gap and instead uses fixation durations at a following, final verb gap region to infer prior processes at the RC verb. To do so, we manipulated matrix verb transitivity (di-transitive, DI; intransitive, INT) and the availability of a second potential gap site (gap, GAP; filled gap, FILL). We hypothesized that DI matrix verbs (Table 1: 1) would promote PG at the complex subject's optionally transitive RC verb, since DI verbs require a clausal object and thus provide an additional gap site to host PG. However, INT matrix verbs (Table 1: 2) were expected to promote a "forced integration" strategy at the RC verb, in which the parser, lacking a cue for any additional possible gap site, would attempt to fill at the RC verb without establishing/predicting PG. In the DI FILL condition the final verb's filled gap would contradict the predicted PG analysis (already begun at the RC verb) and require revision. However, in the INT FILL condition, encountering the additional gap would be comparatively easy, since the open dependency would have been resolved at the RC verb, and the filled gap would be assessed locally as an argument of the clausal verb. In the DI GAP condition, the final verb would provide an additional gap, thus supporting PG processes and precluding any revision to verb transitivity and PG postulation at the RC verb. However, in the INT GAP condition, prior forced integration at the RC verb would have saturated the open dependency without initiating PG, thus requiring revision to PG at the final verb gap site, as there would otherwise be no filler available to saturate that verb, and thus incurring a cost.

Fifty-five native Swedish speakers (4 lists) participated. We conducted a linear mixed models analysis of the final verb (V3) (*att visa*/"to show") and following two-word region (V2Spill) (filled gap or PG: *videofilmerna*/"the videos" vs. *efter skolan*/"after school"), residualized for character length. At V3 and V3Spill, total durations displayed significant gap by transitivity interactions (p<.01 and p<.001, respectively) in which FG conditions were faster for INT than DI and Gap conditions were faster for DI (V3) or the same (V3Spill) for DI and INT. Regression path durations at V3Spill also showed a significant interaction, though significance was driven by the crossing pattern, not by transitivity differences at FG and Gap. However, the trend was in the same direction as seen for total durations. These results suggest that transitivity differentially affects PG by acting as a cue to promote PG (DI) or forced integration (INT): A filled gap incurs less cost when the matrix does not support PG (INT), since PG will be less likely to occur at the RC verb, and consequently any filled gap following V3 will be more likely to attach locally without any attempt at PG revision at the RC verb. Conversely, a filled gap at V3 will incur more cost when PG is supported (DI), since PG postulated at the RC verb will fail at V3Spill, requiring widespread revision. These results support the claim that prior cues such as transitivity affect the likelihood of PG in Swedish and thus contribute to apparent exceptions to island constraints.

References

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Traxler, M. J., & Pickering, M. J. (1996). Plausibility and the processing of unbounded dependencies: An eye-tracking study. *Journal of Memory and Language,35*(3), 454-475.

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Table 1. Example stimuli by condition, with critical word regions

(1) DI+GAP/(FILL)	*Matrix-V*					*RC-V*					*Final-V*
Dessa	*volter*	*övertalade*	*hon*	*som*	*varje*	*tisdag*	*tränade*	*på*	*gymmet*	*sina*	*lärare*	*att visa*
such	somersaults	persuaded	she	who	every	Tuesday	practiced	at	gym-the	her	teacher	to show

"Such somersaults she who every Tuesday practiced at the gym persuaded her teacher to show

Wrap Up		
(videofilmerna)	*efter*	*skolan.*
(videos-the)	after	school-the

(the videos) after school."

(2) INT+GAP/(FILL)	*Matrix-V*					*RC-V*					*Final-V*
Dessa	*volter*	*knallade*	*hon*	*som*	*varje*	*tisdag*	*tränade*	*på*	*gymmet*	*hem*	*igen*	*för*	*att visa*
such	somersaults	walked	she	who	every	Tuesday	practiced	at	gym-the	home	again	for	to show

"Such somersaults she who every Tuesday practiced at the gym walked home again to show

Wrap-Up		*.*
(videofilmerna)	*efter*	*skolan*
(videos-the)	after	school-the

(the videos) after school."

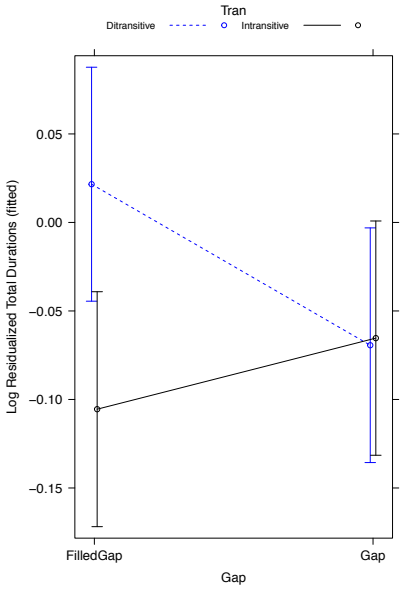

Figure 1. V3 total durations

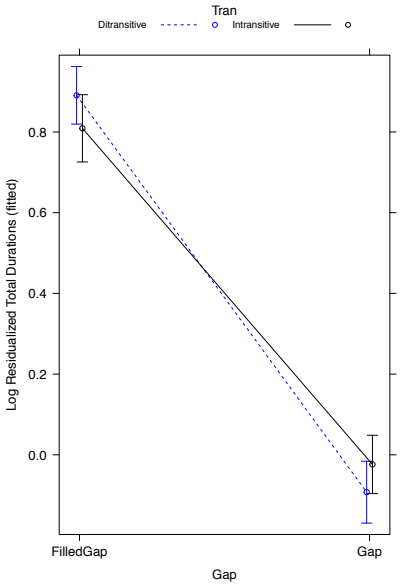

Figure 2. V3Spill total durations