

Solving Hartman’s puzzle: On the interaction of extraction and VP-ellipsis

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Extraction out of VP can block ellipsis of VP. This is known as a MaxElide effect. The way VP-ellipsis (henceforth VPE) interacts with extraction out of VP in embedded clauses has been taken as motivation for Rooth’s (1992) *semantic parallelism* condition ((5), Griffiths 2019, Stockwell 2020). But in matrix contexts, it has been argued that semantic parallelism is not enough and we need *syntactic parallelism* (Messick & Thoms 2016).

Contribution. This paper argues that the semantic parallelism account can be extended to MaxElide effects in matrix clauses and thereby solve a problem known as Hartman’s puzzle. Building on experimental evidence suggesting that parallel syntactic movement does not ameliorate VPE in matrix clauses, contra Messick & Thoms (2016), Stockwell (2020), I propose a unified analysis of matrix and embedded MaxElide effects. There are three ingredients to the analysis (i) contrast, (ii) reflexive focus-membership, and (iii) an independent ban on sprouting in VPE. The paper contributes to the debate about licensing conditions of VPE.

Data and previous accounts. (1a) illustrates object extraction blocking VP-ellipsis. The addition of a FOCUSED phrase makes VPE possible again, (1b). Adverbial movement in embedded clauses, (1c) doesn’t interfere with VPE since the adverbial can adjoin to a position higher than elided the VP.

- (1) a. *Mary was kissing someone, but I don’t know who she was [_{VP} kissing *t*].
b. I don’t know who John will kiss, but I know who MARY will [_{VP} kiss *t*].
c. John knows they escaped, but he doesn’t know how they did [_{VP} *t* [_{VP} escape *t*]].
(Hartman 2011:371-372)

Hartman (2011) observes that VPE behaves differently in matrix clauses: focus doesn’t help object extraction (2a,b) but is now necessary for adverbials (2c). The unexpected difference in the effect of focus has been dubbed **Hartman’s puzzle** (Messick & Thoms 2016).

- (2) a. Mary will eat something. *What will she [_{VP} eat *t*]?
b. Mary will kiss Bill. *Who will JOHN [_{VP} kiss *t*]? (Hartman 2011:379, 386)
c. Anna will retire, but when will {JOHN/ *she} retire *t*?

Messick & Thoms (2016) argue that the ungrammaticality in (2) is due to a lack of syntactic parallelism: parallel head movement makes VPE acceptable, (3). Their analysis is based on competition between VPE and sluicing, and since Griffiths (2019) and Stockwell (2020) showed that competition accounts make wrong predictions, their solution isn’t viable anymore. As a result, Hartman’s puzzle is unsolved.

- (3) A: [_{CP} What has [_{TP} he *t_{aux}* told you *t*]]? B: [_{CP} What HASN’T [_{TP} he *t_{aux}* [_{VP} told me *t*]]?
(Messick & Thoms 2016:310)

Research question. Since previous literature does not clearly separate syntactic from semantic parallelism, it is not clear if head movement is really the ameliorating factor. It is possible that parallel head movement only has an indirect influence: maybe there is a semantic/information-structural parallelism requirement such that the antecedent also has to be a question if the ellipsis site is a question. This would only coincidentally involve head movement.

Experimental evidence against parallel movement. An acceptability judgment experiment with 42 British English speaking participants tested whether parallelism has to obtain in syntactic or semantic representation. It investigates the interaction of PARALLEL HEAD MOVEMENT (present/absent) and PARALLEL WH-MOVEMENT (present/absent) in a 2x2, within-subject Latin square design. Sample test items are given in (4). The ellipsis site is identical in all condition, only the antecedent differs. All test items contain polarity contrast. A syntactic parallelism account predicts that conditions with head movement (4a,c) or with both head- and wh-movement

(4a) should be significantly better than conditions without. A semantic parallelism account predicts that antecedents that are also wh-questions (4a,b) should be significantly better than other conditions.

- (4) a. A: Who did Carl invite? B: And who didn't he? (+wh,+head)
 b. A: I wonder who Carl invited. B: I want to know this: who didn't he? (+wh,-head)
 c. A: Did Carl invite someone? B: Well, who didn't he? (-wh,+head)
 d. A: Carl invited someone. B: Well, who didn't he? (-wh,-head)

A linear mixed effects regression model found a main effect of *wh*-movement (β for +wh=0.395, std. error=0.1442, df=11.8343, t=2.735, p<0.05), in line with the prediction of the semantic account. This is a medium effect (Cohen's d=0.555), for which the number of observations in this task reaches 80% power (Sprouse & Almeida 2017). I take this to mean that head movement parallelism plays no role in licensing VPE.

Analysis. The experimental results motivate a treatment of matrix MaxElide effects in terms of semantic parallelism, parallel to embedded MaxElide effects. I argue that root object questions can be accounted for straightforwardly in Griffiths' (2019) account. He argues that VPE is licensed under the condition in (5).

- (5) For a phrase X to be elided, X must be contained in a parallelism domain E that has an antecedent parallelism domain A such that (adapted from Griffiths 2019:575,590)
- a. $\llbracket A \rrbracket^o \neq \llbracket E \rrbracket^o$, *contrast*
 b. $\llbracket A \rrbracket^o \in \llbracket E \rrbracket^f$ and $\llbracket E \rrbracket^o \in \llbracket A \rrbracket^f$ *reflexive focus membership*

VPE can fail to be licensed for two reasons: (i) violation of the contrast requirement and (ii) violation of parallelism in terms of reflexive focus membership. (2a) violates (5a): the antecedent $\exists y. \text{Mary}_i \text{ eat } y$ doesn't contrast with the ellipsis site $\exists x. \text{she}_i \text{ eat } x$. (2b) violates (5b,c): information-structurally, it is parallel to (6). Griffiths argues that the antecedent in (6) constitutes a contrastive topic-focus-structure, which makes its focus alternatives sets of sets of propositions (Büring 2003). The ellipsis site's focus alternatives is only a set of propositions. Therefore, they are not contained in each other's alternatives, and VPE cannot be licensed.

- (6) * $[_A \text{ Mary}_{CT} \text{ kissed a hipster}_F]$, but I don't know who John_F did *kiss*- t . (Griffiths 2019:594)

Thus, objects actually behave completely parallel in embedded and matrix environments. I argue that, for object questions, Griffiths' (2019) account of semantic parallelism can be extended to matrix contexts, without carrying over his assumption that subjects don't move. In matrix and embedded contexts, VPE can only be licensed by the addition of a focused phrase, which provides contrast, *and* an information-structurally parallel antecedent. As for adverbial questions, I propose that they require a contrastive element in matrix but not root clauses to obey (5a). (2c) shows sprouting: the wh-remnant has an implicit correlate in the antecedent. Stockwell (2020), Overfelt (2024) show that sprouting is independently bad in VPE. I argue that this is because of a contrast failure: *Anna will retire* is not sufficiently different from *Anna will retire at time x*. In matrix clauses, contrast must come from another element to license ellipsis, like *John* in (2c). In embedded clauses however, it seems that sprouting is allowed (1c). This is because embedded clauses have more structure that can contrast: contrast can come from VERUM (Hardt & Romero 2004) and intensionality. In (1c), contrast is between [VERUM [they escape]] and [KNOW [they escape (in manner x)]]. Thus, the different behavior of adverbial questions is due to independent restrictions, that also stem from (5).

Conclusion. This paper presents novel experimental evidence that shows that semantic, but not syntactic parallelism makes right predictions for MaxElide effects in matrix clauses. This motivates a uniform treatment of embedded and matrix contexts. I show how the semantic

parallelism account can be extended to matrix clauses and how adverbial questions face the additional ban on sprouting, explaining their deviant behavior.

References

- Büring, D. 2003. On D-trees, beans, and B-accent. *Linguistics and Philosophy*, 26, 511–545.
- Griffiths, J. 2019. Beyond MaxElide: An investigation of A'-movement from elided phrases. *Linguistic Inquiry*, 50(3), 571–607.
- Hardt, D., & Romero, M. 2004. Ellipsis and the structure of discourse. *Journal of Semantics*, 21(4), 375–414.
- Hartman, J. 2011. The semantic uniformity of traces: Evidence from ellipsis parallelism. *Linguistic Inquiry*, 42(3), 367–388.
- Messick, T., & Thoms, G. (2016). Ellipsis, economy, and the (non)uniformity of traces. *Linguistic Inquiry*, 47, 306–332.
- Overfelt, J. 2024. Having space to sprout: Failed sprouting in sub-clausal ellipses. In R. Autry et al. (Eds.), *Proceedings of the 39th West Coast Conference on Formal Linguistics*. 206–215. Cascadilla Proceedings Project.
- Rooth, M. 1992a. Ellipsis redundancy and reduction redundancy. In S. Berman & A. Hestvik (Eds.), *Proceedings of the Stuttgarter Ellipsis Workshop. Arbeitspapiere des Sonderforschungsbereichs 340* (Vol. 29).
- Sprouse, J., & Almeida, D. 2017. Design sensitivity and statistical power in acceptability judgment experiments. *Glossa: A Journal of General Linguistics*, 2(1), 1–32. <https://doi.org/10.5334/gjgl.236>
- Stockwell, R. 2020. Contrast and verb phrase ellipsis: Triviality, symmetry, and competition Doctoral dissertation, University of California, Los Angeles.