Embedded-complement and discontinuous pseudogapping in Hybrid Type-Logical Grammar: A rejoinder to Kim and Runner (2022)

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1 Background

In their recent paper on pseudogapping in Construction Grammar (CxG)/HPSG, Kim and Runner (2022) (K&R) suggest that the analysis of pseudogapping in Hybrid Type-Logical Grammar (Hybrid TLG) presented in Kubota and Levine (2017) (K&L) does not explain certain complex patterns of pseudogapping for which their own proposal does offer an account. The supposedly problematic data are represented by the following examples (slightly modified from the original—Kim and Runner's (2022) (45), at the end of section 3.2—with the most natural stress notated in small caps).

(1) a. Mary would prefer John to eat FRUIT more than she would ~~prefer John to eat~~ COOKIES.

b. It makes sense for THEM to stay with the newborn more than it does ~~makes sense for~~ MEN ~~to stay with the newborn~~.

In these examples, the 'elided' expression in pseudogapping either crosses a clause boundary (as in (1a)), or is discontinuous (as in (1b)).[1] K&R note that 'it is unclear what kind of operator can be introduced' (p. 13) for examples like those in (1), and that '[i]t is challenging to take all these understood elliptical parts as a lexical-style operator or a reanalysis unit' (p. 14).

It should be acknowledged at the outset that these remarks by K&R are somewhat vague and ambiguous, but we take it to be reasonably safe to assume that, in characterizing the problem as 'challenging', K&R mean that it is difficult to see how data like (1) could be formally accounted for in K&L's proposal. The primary goal of our response, presented in detail in section 2, is to refute the point that K&R make in the above passage, on the assumption that this construal is correct.

After refuting K&R's claim on this interpretation, in section 3 we turn to a different interpretation of their remarks, one in which they merely question the conceptual plausibility

[1] The strikeout here is merely notational, and is not meant to reflect any particular theoretical stance.

of K&L's broader theoretical architecture. We take this alternative interpretation less likely, on the basis of the fact that the above remarks are made at the point in K&R's paper in which justifications for an alternative analysis are supposed to be given—on this weaker interpretation, their remarks (in our view) simply fail to serve the rhetorical purpose to which they are put. We nonetheless consider this alternative interpretation as well, not just for the sake of thoroughness, but because it leads to some interesting and important cross-theoretical comparison of different approaches to ellipsis.

In what follows, we reproduce some of the formal analysis from Kubota and Levine (2014, 2017) for the purpose of clarity and explicitness, but our main goal is not to dwell on the technical details, but rather to explain the key idea of the categorial grammar analysis by K&L in intuitive terms (which is actually quite simple, once one figures out a way to temporarily withhold one's familiar phrase structure-based conception of grammar). We believe that even readers with zero background knowledge on categorial grammar should be able to see clearly the relevant theoretical contention, which will be of interest to any syntactician or semanticist, especially those working in the domain of ellipsis.

2 The 'challenges'

Since the K&L paper that K&R cite omits some of the technical details and simply refers readers to a more technical paper (Kubota and Levine 2014), one of the central claims of their proposal may not have been totally transparent to readers unfamiliar with categorial grammar. We take this opportunity to rectify this potential obstacle for understanding, which may have been a major source of confusion we are addressing here. Specifically, in this section we outline the key components of the K&L analysis pertaining directly to the analysis of the more challenging types of data in (1). To state the conclusion first, contrary to what one might be led to believe based on K&R's remarks, the data in (1) fall out straightforwardly in K&L's analysis, without any extra machinery of any sort.

2.1 'Embedded complement' pseudogapping

To see how an analysis for the data in (1) goes in K&L's approach, it is important to recognize clearly one fundamental difference in the architectures of phrase structure grammar and categorial grammar. HPSG, like all phrase-structure-based frameworks (in the broader sense, encompassing both derivational and monostratal approaches), views syntactic categories as projections from lexical category assignments: NP, or DP, or AP, and even S.

Categorial grammar has a very different conception of syntactic categories (or syntactic types): syntactic types in categorial grammar reflect the combinatorial possibilities, the syntactic 'destiny' as it were, of lexical elements. Thus, an intransitive verb like *run* is not a V—there is no such type in categorial grammar—but rather NP\S (an expression that takes an NP to its left to return an S); a transitive verb is typed (NP\S)/NP (an expression that takes an NP to its right to return an 'intransitive verb'), a ditransitive verb is (NP\S)/NP/NP, and so on. But the string of words *persuaded Bill to try to subscribe to* is also (NP\S)/NP, since it would combine with, for example, an NP (such as *the new literary quarterly*) to return an NP\S. What enables us to formally derive such a string as VP/NP (where, crucially, VP is an abbreviatory notation for NP\S, and not a phrasal category 'headed by' V), and assign it a model-theoretic semantic interpretation, is a technique called ‘hypothetical reasoning’, via the Slash Introduction rule in the underlying proof system.

The formal rules for Slash Introduction are given in K&L (with a more leisurely exposition in Kubota and Levine (2020)), but the key idea is quite straightforward: if you introduce a hypothetical string (technically a variable in TLG) of type X, build up a structure C, and then withdraw that hypothesis, what you have left is an object that *would* be an instance of C if something typed X were composed together with that object. But this is exactly what the type C/X denotes. Crucially, regardless of how many steps were required to build up C, the result will still be an expression typed C/X.

We illustrate this directly with the case of (1a) that is at issue.[2]

(2)

$$
\textcircled{1}\!\rightarrow\ \dfrac{\dfrac{\dfrac{\begin{array}{l}\mathsf{prefer};\\ \lambda w\lambda R\lambda y.\mathbf{prefer}(R(w))(y);\\ \mathrm{VP}_{\mathit{bse}}/\mathrm{VP}_{\mathit{inf}}/\mathrm{NP}\end{array}\quad \begin{array}{l}\mathsf{john};\\ \mathbf{j};\\ \mathrm{NP}\end{array}}{\begin{array}{l}\mathsf{prefer}\circ\mathsf{john};\\ \lambda R\lambda y.\mathbf{prefer}(R(\mathbf{j}))(y);\mathrm{VP}_{\mathit{bse}}/\mathrm{VP}_{\mathit{inf}}\end{array}}/\mathrm{E}\quad \dfrac{\begin{array}{l}\mathsf{to};\\ \lambda Q.Q;\\ \mathrm{VP}_{\mathit{inf}}/\mathrm{VP}_{\mathit{bse}}\end{array}\quad \dfrac{\begin{array}{l}\mathsf{eat};\\ \mathbf{eat};\mathrm{VP}_{\mathit{bse}}/\mathrm{NP}\end{array}\quad \begin{bmatrix}\varphi_1;\\ u;\mathrm{NP}\end{bmatrix}^1}{\mathsf{eat}\circ\varphi_1;\ \mathbf{eat}(u);\ \mathrm{VP}_{\mathit{bse}}}/\mathrm{E}}{\mathsf{to}\circ\mathsf{eat}\circ\varphi_1;\ \mathbf{eat}(u);\ \mathrm{VP}_{\mathit{inf}}}/\mathrm{E}}{\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}\circ\varphi_1;\ \lambda y.\mathbf{prefer}(\mathbf{eat}(u)(\mathbf{j}))(y);\ \mathrm{VP}_{\mathit{bse}}}/\mathrm{E}}{\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat};\ \lambda u\lambda y.\mathbf{prefer}(\mathbf{eat}(u)(\mathbf{j}))(y);\ \mathrm{VP}_{\mathit{bse}}/\mathrm{NP}}/\mathrm{I}^1
$$

In (2), an NP (with prosody φ_1) is hypothesized in the object position of the embedded verb *eat*. A whole (matrix) VP is formed on the basis of this assumption. At that point, we withdraw the hypothesis to yield VP/NP (step ①), since the proof up to that point only shows that $\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}\circ\varphi_1$ is a complete VP (i.e., NP\S) on the assumption that φ_1 is an NP. From this tentative conclusion, we draw the real conclusion (which no longer depends on the hypothesis) that the string $\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}$ is of type VP/NP, since it is something that becomes a full-fledged VP *if* there is an NP on its right.

The derivation for the antecedent clause then proceeds by feeding the (real) embedded object NP to obtain a complete matrix VP, which can then be combined with the auxiliary and the matrix subject in the ordinary manner:

(3)

$$
\dfrac{\begin{array}{l}\mathsf{mary};\\ \mathbf{m};\\ \mathrm{NP}\end{array}\quad \dfrac{\begin{array}{l}\mathsf{would};\\ \lambda Q\lambda v.\mathbf{would}(Q(v));\\ \mathrm{VP}_{\mathit{fin}}/\mathrm{VP}_{\mathit{bse}}\end{array}\quad \dfrac{\begin{array}{c}\vdots\\ \boxed{\begin{array}{l}\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat};\\ \lambda u\lambda y.\mathbf{prefer}(\mathbf{eat}(u)(\mathbf{j}))(y);\mathrm{VP}_{\mathit{bse}}/\mathrm{NP}\end{array}}\end{array}\quad \begin{array}{l}\mathsf{fruit};\\ \mathbf{frt};\\ \mathrm{NP}\end{array}}{\begin{array}{l}\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}\circ\mathsf{fruit};\\ \lambda y.\mathbf{prefer}(\mathbf{eat}(\mathbf{frt})(\mathbf{j}))(y);\mathrm{VP}_{\mathit{bse}}\end{array}}/\mathrm{E}}{\mathsf{would}\circ\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}\circ\mathsf{fruit};\ \lambda v.\mathbf{would}(\mathbf{prefer}(\mathbf{eat}(\mathbf{frt})(\mathbf{j}))(v));\ \mathrm{VP}_{\mathit{fin}}}/\mathrm{E}}{\mathsf{mary}\circ\mathsf{would}\circ\mathsf{prefer}\circ\mathsf{john}\circ\mathsf{to}\circ\mathsf{eat}\circ\mathsf{fruit};\ \mathbf{would}(\mathbf{prefer}(\mathbf{eat}(\mathbf{frt})(\mathbf{j}))(\mathbf{m}));\ \mathrm{S}_{\mathit{fin}}}\backslash\mathrm{E}
$$

The point of this analysis is that the antecedent expression for pseudogapping (the grayed-in part in (3) derived in (2)) is a full-fledged syntactic constituent, essentially a derived transitive verb of type VP/NP.[3]

[2] Following the standard practice in G/HPSG, we distinguish infinitival, base form and finite VPs via syntactic features *inf*, *bse* and *fin*. Formally, the notations $\mathrm{VP}_{\mathit{inf}}$, $\mathrm{VP}_{\mathit{bse}}$ and $\mathrm{VP}_{\mathit{fin}}$ are abbreviations for $\mathrm{NP}\backslash\mathrm{S}_{\mathit{inf}}$, $\mathrm{NP}\backslash\mathrm{S}_{\mathit{bse}}$ and $\mathrm{NP}\backslash\mathrm{S}_{\mathit{fin}}$, respectively.

[3] Note that such derived transitive verbs are found in coordination as well, as in the following example:

(i) I would [prefer John to cook]$_{\mathrm{VP/NP}}$, and [allow Bill to serve]$_{\mathrm{VP/NP}}$, a very expensive and elaborate main course (but not the reverse).

The ellipsis clause is then licensed as in (4), via the VP ellipsis/pseudogapping operator in (5) and the anaphora resolution condition in (6).[4] In this derivation, since there is a matching VP/NP in the antecedent clause, the value of the free variable P in (4) is instantiated to the meaning of this antecedent constituent (as shown in the step marked by the dotted line), and the right meaning is recovered for the pseudogapping clause. Examples such as (1a) thus emerge almost trivially in K&L's account.[5]

(4)

$$
\dfrac{\dfrac{\dfrac{\begin{array}{l}\vdots\\ \dfrac{\begin{array}{l}\lambda\varphi.\varphi;\\ \lambda\mathscr{F}.\mathscr{F}(P);\\ (\mathrm{VP}/\$)\upharpoonright((\mathrm{VP}/\$)/(\mathrm{VP}/\$))\end{array}\quad \begin{array}{l}\mathsf{would};\\ \lambda Q\lambda v\lambda z.\mathbf{would}(Q(v)(z));\\ \mathrm{TV}/\mathrm{TV}\end{array}}{\mathsf{would};\ \lambda v\lambda z.\mathbf{would}(P(v)(z));\ \mathrm{TV}}\,/\mathrm{E}\end{array}}{\mathsf{would};\ \lambda v\lambda z.\mathbf{would}(\mathbf{prefer}(\mathbf{eat}(v)(\mathbf{j}))(z));\ \mathrm{TV}}\cdots \quad \begin{array}{l}\mathsf{cookies};\\ \mathbf{cookies};\\ \mathrm{NP}\end{array}}{\mathsf{would}\circ\mathsf{cookies};\ \lambda z.\mathbf{would}(\mathbf{prefer}(\mathbf{eat}(\mathbf{cookies})(\mathbf{j}))(z));\ \mathrm{VP}}\,/\mathrm{E}\quad \begin{array}{l}\mathsf{she};\\ x_{fem,sg};\\ \mathrm{NP}\end{array}}{\mathsf{she}\circ\mathsf{would}\circ\mathsf{cookies};\ \mathbf{would}(\mathbf{prefer}(\mathbf{eat}(\mathbf{cookies})(\mathbf{j}))(x_{fem,sg}));\ \mathrm{S}}\,\backslash\mathrm{E}
$$

(5) **VP ellipsis/pseudogapping operator**
$\lambda\varphi.\varphi$; $\lambda\mathscr{F}.\mathscr{F}(P)$; $(\mathrm{VP}/\$)\upharpoonright((\mathrm{VP}/\$)/(\mathrm{VP}/\$))$
——where P is a free variable whose value is resolved anaphorically

(6) Anaphora resolution condition on the VP ellipsis/pseudogapping operator:

a. If there is a syntactic constituent with category VP/\$ in the antecedent clause matching the syntactic category of the missing verb in the target clause, then the value of P is identified with the denotation of that constituent.

b. If there is no such syntactic constituent, then the value of P is anaphorically identified with some salient property in the discourse that is not inconsistent with the syntactic category VP/\$.

2.2 Discontinuous pseudogapping

Discontinuous pseudogapping is slightly more complicated. In cases such as (1b), the antecedent that corresponds to the missing expression(s) in the ellipsis clause cannot simply be analyzed as a VP/NP, since *make sense for __ to stay with the newborn* is not a VP that is missing an NP on its right edge, but rather a VP that is missing an NP *in the middle*.

This type of expression that is missing some other expression in the middle is analyzed in Hybrid TLG by the use of a special type of slash called the 'vertical slash' ↾. Intuitively, VP↾NP is a VP that has an NP-type 'gap' inside. Such 'gapped' expressions of any arbitrary type can be derived in the proof theory of Hybrid TLG via the Slash Introduction rule for ↾, which is analogous to the Slash Introduction rule for / but crucially differs from the latter in its prosodic specification. Signs derived by this rule such as (7) have function-type prosodies

[4]The notation /\$ in (5) is a metavariable over a sequence of /X, where X is some syntactic type. This analysis covers cases of pseudogapping with multiple remnants, for which K&R do not propose an explicit analysis.

[5]The auxiliary verb, which is lexically of type VP/VP, is derived in the category TV/TV (where TV is an abbreviation for (NP\S)/NP) in (4) via a theorem called the 'Geach rule'. See Kubota and Levine (2017) for details.

in which the position of the gap is represented by a variable (φ in (7)) that is bound by the lambda operator.[6]

(7) $\lambda\varphi.\mathsf{makes} \circ \mathsf{sense} \circ \mathsf{for} \circ \varphi \circ \mathsf{to} \circ \mathsf{stay} \circ \mathsf{with} \circ \mathsf{the} \circ \mathsf{newborn};$
$\lambda w \lambda y.\mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(w)); \mathrm{VP}{\upharpoonright}\mathrm{NP}$

Formally, (7) is a function that takes a sign of type NP as an argument and embeds the prosody of the latter in the position right after the word *for*.

Since the antecedent expression is of type VP↾NP and not VP/NP, this requires a slight extension of the ellipsis operator in (5), along the following lines (where the ↾\$ notation is a metavariable over sequences of argument specifications of the form ↾X, rather than /X):[7]

(8) **VP ellipsis/pseudogapping operator, generalized version**
$\lambda\rho.\rho(\lambda\varphi_0.\varphi_0); \lambda\mathscr{F}.\mathscr{F}(P); (\mathrm{VP}{\upharpoonright}\$){\upharpoonright}((\mathrm{VP}{\upharpoonright}\$){\upharpoonright}(\mathrm{VP}{\upharpoonright}\$))$

While Kubota and Levine (2017) omits this detail, an earlier and slightly more technical version of the paper Kubota and Levine (2014) cited in Kubota and Levine (2017) explicitly spells out an analysis of discontinuous pseudogapping using (8). We reproduce the key points of that analysis in what follows.

When ↾\$ is instantiated as ↾NP (for cases involving just the direct object as the remnant as in (1a) and (1b)), the syntactic category of the pseudogapping operator is (VP↾NP)↾((VP↾NP)↾(VP↾NP)). A lexical auxiliary, of type VP/VP, can be derived in (VP↾NP)↾(VP↾NP) as in (9), just like it can be derived in (VP/NP)/(VP/NP) in (4)—both are instances of the Geach theorem (see Kubota and Levine (2014) for a proof).

(9) $\lambda\sigma_1\lambda\varphi_2.\mathsf{does} \circ \sigma_1(\varphi_2); \lambda f \lambda x \lambda y.f(x)(y); (\mathrm{VP}{\upharpoonright}\mathrm{NP}){\upharpoonright}(\mathrm{VP}{\upharpoonright}\mathrm{NP})$

Once this derived form of the auxiliary verb is obtained, the rest of the derivation is essentially parallel to the case of (1a) shown above, except that VP↾NP replaces VP/VP. The whole derivation is given below. Note in particular the way in which the meaning of the missing expression, though discontinuous, is recovered by the same anaphora resolution condition in (6) as in the simpler case in the previous section, by making reference to the discontinuous constituent of type VP↾NP in the antecedent clause.

(10)

$$
\dfrac{\begin{array}{c}\mathsf{it};\\ \Delta;\\ \mathrm{NP}\end{array} \quad \dfrac{\begin{array}{c}\vdots\\ \lambda\varphi_3.\mathsf{makes} \circ \mathsf{sense} \circ \mathsf{for} \circ \varphi_3 \circ \mathsf{to} \circ \mathsf{stay} \circ \mathsf{with} \circ \mathsf{the} \circ \mathsf{newborn};\\ \lambda w \lambda y.\mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(w)); \mathrm{VP}{\upharpoonright}\mathrm{NP}\end{array} \quad \begin{array}{c}\mathsf{them};\\ x_{pl};\\ \mathrm{NP}\end{array}}{\begin{array}{c}\mathsf{makes} \circ \mathsf{sense} \circ \mathsf{for} \circ \mathsf{them} \circ \mathsf{to} \circ \mathsf{stay} \circ \mathsf{with} \circ \mathsf{the} \circ \mathsf{newborn};\\ \lambda y.\mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(x_{pl})); \mathrm{VP}\end{array}}}{\begin{array}{c}\mathsf{it} \circ \mathsf{makes} \circ \mathsf{sense} \circ \mathsf{for} \circ \mathsf{them} \circ \mathsf{to} \circ \mathsf{stay} \circ \mathsf{with} \circ \mathsf{the} \circ \mathsf{newborn};\\ \mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(x_{pl})); \mathrm{S}\end{array}}
$$

[6] To keep things simple, we assume here the 'anomalous semantic type' analysis of expletive pronouns in Carpenter (1997), in which the expletive *it* has a meaningless meaning which just gets thrown away by the verb that takes it as a syntactic argument. This is why the variable y is vacuously bound in the semantics in (7). Nothing hinges on this assumption.

[7] We omit the proof, but since any arbitrary expression of type VP/NP can be converted to an expression of type VP↾NP By the general rules of the proof theory alone, once we posit (8), (5) no longer needs to be posited as a separate operator.

(11)

$$\dfrac{\begin{array}{l}\mathsf{it};\\ \Delta;\\ \mathrm{NP}\end{array} \qquad \dfrac{\begin{array}{c}\dfrac{\begin{array}{l}\lambda\rho.\rho(\lambda\varphi_0.\varphi_0);\\ \lambda\mathscr{F}.\mathscr{F}(P);\\ (\mathrm{VP}{\upharpoonright}\mathrm{NP}){\upharpoonright}((\mathrm{VP}{\upharpoonright}\mathrm{NP}){\upharpoonright}(\mathrm{VP}{\upharpoonright}\mathrm{NP}))\end{array} \qquad \begin{array}{l}\qquad\qquad\vdots\\ \lambda\sigma_1\lambda\varphi_2.\mathsf{does}\circ\sigma_1(\varphi_2);\\ \lambda f\lambda x.f(x);\\ (\mathrm{VP}{\upharpoonright}\mathrm{NP}){\upharpoonright}(\mathrm{VP}{\upharpoonright}\mathrm{NP})\end{array}}{\lambda\varphi_2.\mathsf{does}\circ\varphi_2;\ \lambda x\lambda y.P(x)(y);\ \mathrm{VP}{\upharpoonright}\mathrm{NP}}{\upharpoonright}\mathrm{E}\\ \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\\ \lambda\varphi_2.\mathsf{does}\circ\varphi_2;\ \lambda x\lambda y.\mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(x));\ \mathrm{VP}{\upharpoonright}\mathrm{NP}\end{array} \qquad \begin{array}{l}\mathsf{men};\\ \mathbf{men};\\ \mathrm{NP}\end{array}}{\mathsf{does}\circ\mathsf{men};\ \lambda y.\mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(\mathbf{men}));\ \mathrm{VP}}}{\mathsf{it}\circ\mathsf{does}\circ\mathsf{men};\ \mathbf{make\text{-}sense}(\mathbf{stay\text{-}w\text{-}nb}(\mathbf{men}));\ \mathrm{S}}$$

The beta conversion of the prosodic term on the first ${\upharpoonright}\mathrm{E}$ step in (11) is perhaps a bit complex. It is unpacked in (12).

(12)
$$\begin{aligned}&\lambda\rho[\rho(\lambda\varphi_0.\varphi_0)](\lambda\sigma_1\lambda\varphi_2.\mathsf{does}\circ\sigma_1(\varphi_2))\\ &= \lambda\sigma_1\lambda\varphi_2[\mathsf{does}\circ\sigma_1(\varphi_2)](\lambda\varphi_0.\mathsf{P0})\\ &= \lambda\varphi_2[\mathsf{does}\circ\lambda\varphi_0[\varphi_0](\varphi_2)]\\ &= \lambda\varphi_2[\mathsf{does}\circ\varphi_2]\end{aligned}$$

To summarize, the discontinuous pseudogapping case is also straightforward, given the generalized version of the ellipsis operator in (8) that was already proposed in Kubota and Levine (2014).

3 The larger picture

We have shown above that the two cases that K&R identify as being problematic for the Hybrid TLG analysis of pseudogapping in Kubota and Levine (2017) actually fall out straightforwardly in the latter analysis, as already discussed by Kubota and Levine (2014, 2017, 2020) themselves. The point may have escaped K&R since K&L's proposal crucially exploits a radical reconceptualization of the notion of constituency. As explained above, this is part of the built-in architecture of Type-Logical Grammar, but it is arguably quite alien to researchers of phrase structure grammar.

At this point, the reader may wonder how the two proposals on pseudogapping by K&L and K&R actually compare with each other. After all, K&R's take on K&L's analysis is in principle orthogonal to how the two proposals compare with one another in terms of their respective scientific content. In what follows, we offer some brief remarks on this latter question from our own perspective, since we believe that the aspects of K&L's analysis we have reviewed above (which may initially strike one as being unfamiliar or puzzling) bear directly on the pros and cons of competing approaches in this particular empirical domain. While we fully recognize that different scholars approach this issue from very different (and often mutually inconsistent) angles, we believe that, for any syntactician/semanticist working on ellipsis (regardless of their theoretical persuasion), the question we address in the ensuing discussion has important ramifications to the division of labor between syntax and semantics and the architecture of the syntax-semantics interface more generally, well beyond the specific comparison of the CxG/PSG vs. CG/TLG approaches we focus on below.

The demonstration in the previous section should have made it clear that in K&L's analysis, the flexible syntax-semantics interface of Type-Logical Grammar plays a crucial role in 'reanalyzing' substrings of a sentence that don't correspond to ordinary constituents as derived constituents (such as derived 'transitive verbs'), with explicit model-theoretic interpretations in the semantic component. This makes the anaphora retrieval process extremely simple: the missing meaning in the ellipsis clause can be directly recovered from the antecedent clause by making reference to the meaning of this antecedent constituent. But one may rightfully be skeptical about whether such a radical reconceptualization of the notion of constituency is really justified.[8] That is, if one can account for all the relevant data by maintaining a more conservative view on the syntax of English (in a suitably extended version of phrase-structure grammar without complex and powerful mechanisms like syntactic transformations or hypothetical reasoning), then one might find such an alternative more preferable. We take it that considerations of this sort is one of the key underlying motivations for K&R's proposal (and, as noted in section 1, it may even be that this is what K&R really meant when they characterized the data in (1) 'challenging' for the K&L analysis). Their analysis essentially assumes a maximally simple phrase structure for the syntax of pseudogapping, with the consequence that a large portion of heavy-lifting is shifted to the purely semantic component of anaphora retrieval.

Although K&R do not spell out the relevant anaphora retrieval process explicitly, it is instructive to examine in some detail how their proposal may deal with the more complex types of data that they claim pose challenges to K&L's proposal, just so we have a clearer idea of the exact nature of the heavy-lifting that needs to be done in the semantic component in their approach. We illustrate the point with the case of embedded complement from the last section, but essentially the same point holds for the discontinuous pseudogapping case as well.

For the embedded complement example in (1a), based on what K&R say about simpler cases, we can safely assume that their analysis will assign something like the following meaning to the antecedent VP:

(13) $[[\text{antecedent-VP}]] = \lambda y.\mathbf{prefer}(y, \mathbf{j}, \mathbf{eat}(\underline{\mathbf{f}}))$

The meaning of the VP in the pseudogapping clause, shown in (14), is then supposed to be obtained from (13) somehow.

(14) $[[\text{PG-VP}]] = \lambda x.\mathbf{prefer}(x, \mathbf{j}, \mathbf{eat}(\underline{\mathbf{c}}))$

(14) can be obtained from (13) by replacing the subterm **f** (the underlined part) with the constant **c**. This essentially amounts to a non-compositional rewriting of a subterm in semantic translation, and it commits one to the view that formulas (or whatever semantic notations one adopts) such as those in (13) and (14) are real representational objects (equivalent to LF representations in derivational approaches) with internal syntactic structure that rules of the grammar can directly manipulate. While this may be consistent with the overall theoretical assumptions of HPSG/Sign-based Construction Grammar, and while such noncompositional operations have sometimes been proposed in the tradition of direct interpretation analysis (cf., e.g., the Higher-Order Unification analysis of VP ellipsis by Dalrymple et al. (1991)), it should be noted that it represents a marked violation of the stronger notion of compositionality (see Dowty (2007) for a lucid discussion of this issue).

[8] But note that Kubota and Levine (2020) offer a series of systematic arguments involving a range of complex data with (various types of) non-canonical coordination and their interactions with phenomena pertaining to semantic interpretation (including generalized quantifiers and more complex types of scope-taking expressions).

One might argue that the relevant meaning, specifically the relation denotation in (15) (which can be applied to the denotation **c** for *cookies* to yield (14)), can be recovered from the focus semantic value of the antecedent VP.

(15) $\lambda z \lambda y.\mathbf{prefer}(y, \mathbf{j}, \mathbf{eat}(z))$

However, since K&R do not work out the details, it is unclear just exactly how this may be implemented in their setup—the important question that is left unaddressed here is whether an explicit compositional mechanism can be worked out. Whatever form it takes, an explicit formulation of such an antecedent retrieval process is likely to resemble the process of hypothetical reasoning-driven meaning composition that is independently available in the underlying architecture of the proof theory of Hybrid TLG in K&L's approach.[9]

The above illustration should have made it clear that even a simplicity-based argument is difficult to maintain (or, at the very least, is not straightforward at all) for K&R's proposal that sticks to simple phrase structure grammar for the syntax and attempts to handle all cases of pseudogapping via a semantic anaphora retrieval process. Their proposal essentially shifts the locus of heavy-lifting from the syntax-semantics interface to the purely semantic component, but that doesn't change the nature of the heavy-lifting that needs to be done. If the apparent simplicity of their approach is attained only because the necessary details are left unworked out, then we are (cautiously) inclined to conclude that overall simplicity considerations actually speak in favor of K&L's approach, since it accounts for all the relevant examples with the general and independently needed mechanisms of the syntax-semantics interface alone, without the need to complicate the anaphora retrieval process in ways that mimic the syntactic composition of linguistic signs.

4 Conclusion

We have shown that all of the examples that K&R adduce as problematic for K&L's Hybrid TLG analysis fall out immediately, with no extra machinery or special stipulation, from the more general form for the ellipsis operator given in Kubota and Levine (2014). Their objections can alternatively be construed as comments at a conceptual level. We considered this possibility as well in our discussion above, which led to some interesting comparison of the pros and cons of competing approaches to ellipsis. We take K&R's proposal to represent the simplest version of the direct interpretation approach, updating an earlier proposal by Miller (1990). Given the complexities of the pseudogapping phenomenon well documented in the literature, if tenable, this is indeed a laudable achievement. We have suggested some reasons, however, which make us not as optimistic about the success of such a project as K&R themselves seem to be.

[9] It is true that K&L do not make explicit how their setup can be extended to incorporate the effect of semantic focus explicitly. This requires incorporating some version of Roothian focus semantics (Rooth 1985, 1992) to the compositional system of Type-Logical Grammar. Working out this component is by no means a trivial task, but in principle we do not see any obstacle to such an extension, especially given that the proof theory of Hybrid TLG already comes with a mechanism to make open propositions (or open constituents of any semantic type), with the architecture-native hypothetical reasoning process that allows one to posit hypotheses at arbitrary positions in the sentence which can later be abstracted over to yield open constituents to be given as arguments to focus-sensitive operators.

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