

RADICAL SUCCESSIVE CYCLICITY & THE FREEDOM OF PARASITIC GAPS

COLIN P. DAVIS AND PATRICK D. ELLIOTT¹

LSA 95 ◊ JANUARY 8, 2021

1 INTRODUCTION

- In this project, we use parasitic gaps (PGs; Engdahl 1983, Culicover & Postal 2001) to examine the nature and distribution of (A'-)movement.²

- A PG is a gap in a given phrase XP which takes as its antecedent a phrase that A'-moves external to, and structurally across, that XP.³

- PGs can occur in a wide variety of constituents, for instance:

(1) *PG in subject* (Chomsky 1986: ex. 132)

Who₁ would [a picture of PG₁] surprise t₁?

(2) *PG in adjunct* adapted from Kayne 1983: ex. 3c

These are the animals [∅₂ that they photographed t₂
[because they were unable to give peanuts to PG₂]].

(3) *PG in relative clause* (Citko 2014: ex. 105)

Who₁ did Mary take [pictures of t₁
[that weren't that flattering to PG₁]]?

(4) *PG in embedded CP*

Who₁ did you tell t₁ [why you dislike PG₁]?

- Since PGs are intertwined with the components of the grammar that drive syntactic movement, they are a useful tool for investigating it.

★ **Our topic of investigation:** The cyclicity of movement.

- A great deal of research has argued that movement paths are, in many cases, comprised of several **successive-cyclic** steps:⁴

(5) *A schema for a successive-cyclic movement path*

$$\begin{array}{ccccccc} [_{XP} & \alpha & X & \dots & [_{YP} & t & Y & \dots & [_{ZP} & t & Z & \dots & t] \\ & & & & \uparrow & & \uparrow & & \uparrow & & \uparrow & & \uparrow \end{array}$$

- Here we use PGs to examine the distribution of successive-cyclic movement (henceforth SCM).

- **A widely held view:** SCM is endemic to the edges of *phases* (Chomsky 2000, 2001, a.o.), vP and CP, which are cycle-demarcating constituents that bound the application of syntactic dependencies like movement.

¹ Colin Davis, University of Southern California, colind@usc.edu. Patrick Elliott, Massachusetts Institute of Technology, pdell@mit.edu. We're grateful to Tanya Bondarenko and Andrew Murphy for discussion.

² For other work in this vein, see Nissenbaum 2000, Legate 2003, Overfelt 2015, Erlewine & Kotek 2018, Bondarenko & Davis 2019, 2020, Davis 2020b, a.o.

³ It is clearest that a given gap is indeed "parasitic" when in an island.

⁴ See, for instance, Chomsky 1973, 1977, 1986, Du Plessis 1977, Henry 1995, Cole & Hermon 2000, McCloskey 2000, 2001, 2002, Nissenbaum 2000, Legate 2003, Sauerland 2003, Bruening 2001, 2006, Barbiers 2002, Torrence 2012, Abels 2003, 2012, Wiland 2010, Henry 2012, van Urk 2015, van Urk & Richards 2015, Korsah & Murphy 2019, Davis 2019, 2020a,b, and many others.

(6) *Successive-cyclic movement from vP and CP*

What did you say [_{CP} [_{Phase}] **t** that_C you_S will_T [_{vP} [_{Phase}] **t** eat_{v-V} **t**]]]?

? Why are PGs relevant for the examination of SCM?

★ Because, as we'll see, there are syntactic and semantic reasons to posit that the intermediate positions created by SCM facilitate (some) PGs.

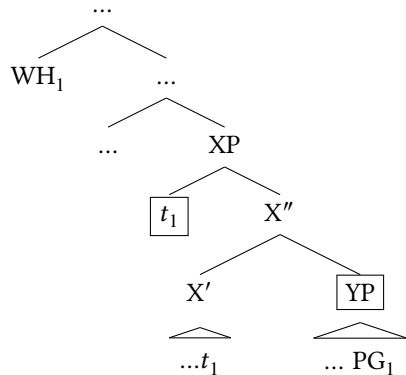
– See for instance [Nissenbaum 2000](#), [Legate 2003](#), [Nissenbaum & Schwarz 2011](#), [Fox & Nissenbaum 2018](#), [Davis 2020b](#).

• Such works argue that the semantic reflex of SCM creates positions where a PG-containing phrase can be successfully interpreted.

! Importantly, work in this vein makes a more general prediction:

• **The prediction:** If a PG-hosting phrase YP is interpretable when adjoined to a given phrase XP, the XP edge is a licit landing site for SCM.

(7) *Schema: PG-hosting phrase adjoined at intermediate landing site of SCM*



• **Our observation:** PG-hosting phrases have a very free distribution, and can occur in positions that are in all likelihood not phase edges.

• **Syntactic consequence:** SCM is not limited to the edges of the widely held-phases, vP and CP.⁵

(8) *Our conjecture: Radical successive-cyclicality*

WH ... [_{CP} *t* C [_{TP} *t* T [_{vP} *t* v [_{VP} *t* V ... *t*]]]]

• **Semantic consequence:** We argue that these facts also reveal the necessity of *flexible* composition principles in the semantic component.

⁵ Essentially all theories of phases or syntactic cycles predict the necessity of SCM in at least some contexts. For this reason, we set aside the technical details of phase theory and its varied implementations in order to focus on a more general topic—the distribution of SCM as compared to that of cycle-demarcating constituents. (See [Citko 2014](#) for a relatively recent overview of research in phase theory).

1.1 Contents of the presentation

- §2 The relationship between between PGs and SCM
- §3 The facts about PG distribution
- §4 A semantic account of the freedom of PGs
- §5 Consequences for theories of cyclic syntax
- §6 Concluding remarks

2 THE RELATIONSHIP BETWEEN PGs AND SCM

- Here we introduce the semantic connection between PGs and SCM through a discussion about PGs in sentential adjuncts, whose composition is relatively simple.

(9) PGs in sentential adjuncts

- a. **Who**₁ did you forget about t_1 [] after talking to **PG**₁ []?
- b. This is a dish [\emptyset]₂ that I know a lot about t_2 [] because I make **PG**₂ every week []].

- That a given gap is indeed “parasitic” is clearest when in an island, since this shows that the PG was not formed by typical extraction.

- Sentential adjuncts like those used above are indeed generally islands:

(10) Sentential adjunct island

- a*?? Tell me [**which paper**]₁ you ate fried chicken for lunch [] after giving the students comments on t_1 []].
- b*?? [**What assignment**]₂ did you go home [] because you need to finish t_2 tonight []?]

- **Question:** Why can a PG and its antecedent be separated by an island?
- **An answer:** A PG is not formed by movement from an island, but rather, by movement of a separate silent operator within the island:⁶

(11) PG as trace of null operator

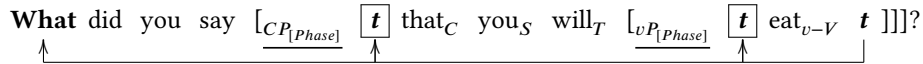
- Who**₁ did you forget about t_1 [] **OP** after talking to $t_{OP}(=PG)$ []?

- Importantly, [Nissenbaum 2000](#) shows that PG interpretation requires the operator-hosting phrase to adjoin to a landing site of A'-movement.

⁶ This approach to PGs is argued for by [Contreras 1984](#), [Stowell 1985](#), [Chomsky 1986](#), [Browning 1987](#), [Nissenbaum 2000](#), [Nissenbaum & Schwarz 2011](#), a.o. See Chomsky, Nissenbaum, as well as [Munn 2001](#) for supporting evidence from phenomena such as weak crossover and reconstruction asymmetries.

- Specifically, he argues that the intermediate landing site formed by SCM from vP facilitates PGs in sentential adjuncts.

(12) *SCM from vP and CP*

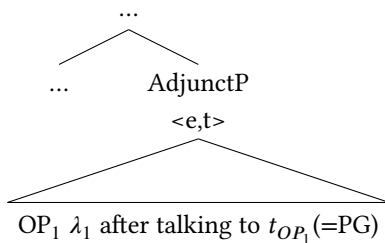


- Such PG-licensing involves three general components.

#1 Movement of the PG-forming operator to the edge of the adjunct, which triggers the semantic rule of Predicate Abstraction (Heim & Kratzer 1998), changing it from type t to a derived predicate of type $\langle e,t \rangle$:⁷

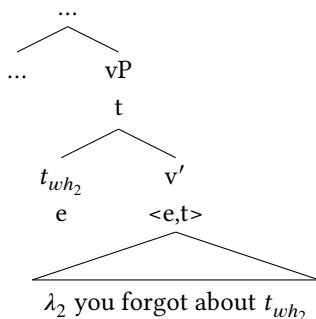
⁷ The null operator itself is semantically vacuous, i.e., the identity function.

(13) *Null operator movement inside adjunct forms a clausal predicate*



#2 SCM from vP, triggering an application of Predicate Abstraction in vP as well, creating a second $\langle e,t \rangle$ position there:⁸

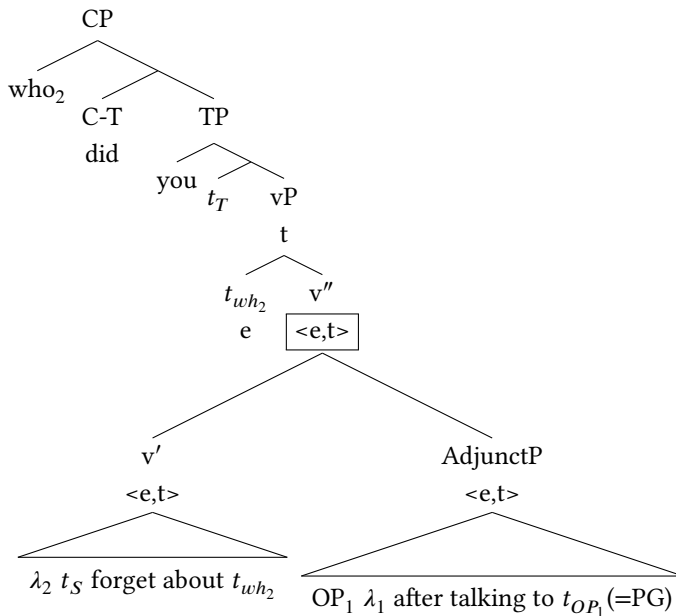
(14) *Successive-cyclic A'-movement creates an $\langle e,t \rangle$ node in vP*



⁸ For the purposes of this section, we adopt from Nissenbaum the simplifying assumption that vPs and vP modifiers (such as sentential adjuncts) are type t , modulo A'-movement within them triggering Predicate Abstraction. We return to this point later, since a more precise account of the meaning of these constituents (including, for instance, information about events) is straightforwardly compatible with the theory of PGs shown here, given the semantic proposals of section 4.

#3 Merge of the operator-hosting adjunct to the $\langle e,t \rangle$ position in vP. Since both of these constituents are of type $\langle e,t \rangle$, the PG host may compose via Predicate Modification (Heim & Kratzer 1998).

(15) *Predicate Modification of vP with PG-containing island*



- Here the (boxed) $\langle e,t \rangle$ function created by merge of the adjunct to v' is saturated by the intermediate type e trace formed by SCM from vP .⁹
- ✓ As a result, the A' -moved phrase will come to bind both the trace in VP corresponding to the true gap, and the trace of the moved operator in the adjunct, which is the PG.
- **Important point:** SCM creates derived predicates, to which PG-containing phrases can be merged and interpreted.¹⁰
- ★ **General prediction:** If a PG-hosting phrase can be interpreted in a given position, that position must be a possible landing site for SCM.
- With this prediction in mind, in the next section we show data indicating that SCM is not exclusive to the edges of the phases vP and CP.

- Many of the following PG facts require a composition principle that is more general than Predicate Modification.
- In section 4, we propose a flexible composition principle which subsumes Predicate Modification while maintaining its argument-unifying property.¹¹

⁹ N.b. that, in order for composition to proceed, the PG host must adjoin below the intermediate trace t_{wh_2} , but above its accompanying abstraction index λ_2 . In order to construct the desired LF, we can assume that adjuncts may be merged counter-cyclically, modulo interpretability (see Davis 2020b: ch. 5 for relevant discussion).

¹⁰ For further exploration of this point, see Legate 2003, Davis 2020b.

¹¹ The considerations that our semantic proposal addresses have been observed and discussed by Nissenbaum 2000 and Nissenbaum & Schwarz 2011. We argue for a proposal that is simpler and more general, which in our view, the free distribution of PGs necessitates.

3 THE DISTRIBUTION OF PG-CONTAINING PHRASES

3.1 PGs in high adjuncts

- Above we've seen PGs in sentential adjuncts:

(16) PGs in sentential adjuncts

Who₁ did you forget about t_1 [] after talking to PG₁ []?

- Nissenbaum 2000 argues that such adjuncts attach to vP, and that PGs within them are licensed by SCM through the vP edge, as we've seen.

- Importantly, PGs are possible in structurally higher adjuncts as well.
- For instance, in the following we see a PG in a high conditional adjunct:

(17) PG licensing in conditional adjuncts

This is the professor \emptyset_1 that Kim says that [if you run into PG₁], t_1 won't say hello to you.

(van Urk 2015 p. 192, modified from Engdahl 1983)

- The PG-containing adjunct here sits between C and tense, and is thus plausibly adjoined to TP, where its PG must therefore be licensed.
- **Alternative hypothesis:** Perhaps this adjunct was initially merged in vP and then fronted, but reconstructed into vP for PG-licensing.
- **Counterpoint:** An R-expression in the adjunct co-referent with the subject would be unacceptable if that adjunct reconstructed into vP, due to a principle C violation. Such configurations are acceptable, however:

(18) PG-containing conditional need not be interpreted in vP

Who₁ did you say (that) [if Mary₂ talks to PG₁] she₂'ll definitely throw a tomato at t_1 ? (Davis 2020b, ch. 4, ex. 48)

(19) More PG-bearing high adjuncts

- [Which beans]₁ do you think that, [despite us giving Mary₂ a lot of PG₁], she₂'ll have completely eaten t_1 by Wednesday?
- Remind me [what kind of beans]₁ you think that, [because Mary₂ likes PG₁], she₂ ought to just buy a bunch of t_1 at once.
- These are the beans which₁ I think that, [in order for Mary₂ to have enough of PG₁], she₂ ought to order several crates of t_1 from the internet.

- ★ These facts indicate that adjuncts can be successfully interpreted in the TP region when containing a PG.

3.2 PGs in subjects

- PGs are possible in subjects (Engdahl 1983), as shown once more below:

(20) PG in subject

Who₁ would [a picture of PG₁] surprise *t*₁?

- Nissenbaum 2000 argues that PG-containing subjects must always reconstruct into vP, in order to appropriately combine with the predicate created by SCM through vP.¹²

! **Our proposal:** PG-containing subjects do not always reconstruct.

Case 1: scopal interaction with negation

- Examples like (21), for instance, have a salient $\forall > \neg$ interpretation, which precludes obligatory subject reconstruction.^{13,14}

(21) Subject QPs containing PGs with $\forall > \neg$ scope

- John's the kind of guy \emptyset_1 that [absolutely everyone who talks to PG₁] doesn't want to be around *t*₁ for very long.
(That is, there's absolutely nobody that wants to be around him!)
- [Which picky customer]₁ did you say that [every single picture of PG₁] for one reason or another didn't manage to satisfy *t*₁.
(In other words, for this customer all the pictures were no good.)
- Guess who₁ [all of my mean jokes about PG₁] surprisingly don't offend *t*₁ at all!
(You'd think that at least one would offend them, but none do!)

Case 2: team NPs

- A similar argument comes from British English agreement facts.
- Sauerland & Elbourne 2002 show that in British English, where team NPs may trigger either singular or plural agreement, plural agreement bleeds subject reconstruction.¹⁵

(22) No reconstruction for plural-agreeing team-NP

Some Northern team { is | %are } likely to win.

is/are: $\exists > \text{likely}$ **is/*are:** likely $> \exists$

- Importantly, we observe that in British English, a team NP triggering plural agreement can contain a PG:

¹² The acceptability of (20) raises an important component for the semantic component of the theory, given that subjects are interpreted as arguments, rather than intersective modifiers. Data such as (20) already motivate a generalization of Nissenbaum's account, which he entertains in, e.g., Nissenbaum 1998. We return to the question of how PG-containing subjects compose in a later section.

¹³ Nothing we say here entails that reconstruction of PG-containing subjects is banned. For us, all that matters is that they are not always forced to reconstruct. Nissenbaum 2000 reports subject PG examples with obligatory reconstruction in a variety of environments. In our assessment, many of these judgements are contestable, but we will not attempt to address all of them in this context.

¹⁴ An anonymous reviewer speculates that scope-fixing mechanisms may operate independently from reconstruction, thereby providing Nissenbaum with a way out. We acknowledge this as a theoretical possibility, although we believe that similar loopholes do not exist for the other arguments in this section.

¹⁵ The cause of this effect is not important for us. See for instance Thoms 2019 for further discussion of it.

(23) *PGs in plural-agreeing team-NPs*

- a. %This is a guy who₁ [any team involved with PG₁] **are** always pleased to talk to *t*₁.
- b. %Guess who₁ [the very same committee that hired PG₁] now **want** to get rid of *t*₁.
- c. %Rob is the kind of musician who₁ [every band that play with PG₁] **are** immediately impressed by *t*₁.

★ Overall, these facts reveal that PG-hosting subjects can be interpreted in their surface position in TP—a non-phasal constituent.

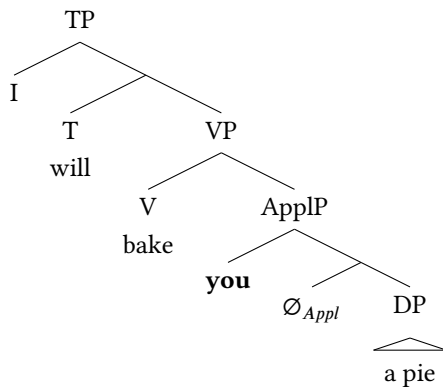
3.3 *PGs in ditransitives*

- Above, we've seen that subjects can host PGs. We can also add PGs to indirect objects:

(24) *PG in indirect object*¹⁶

- a. [Which dog]₁ did you give [the owner of PG₁] a treat for *t*₁
- b. John's the guy who₁ I showed [the best friend of PG₁] an embarrassing picture of *t*₁.
- c. Guess who₁ we told [every relative of PG₁] that we plan to play a prank on *t*₁?

- Since indirect objects in English follow V in the surface string, there is no obvious sense in which they can be assumed to be adjoined to vP.¹⁷
- Following [Pylkkänen 2008](#), such arguments are introduced in the specifier of an appl(icative) head.
- In English, this is what Pylkkänen classifies as a *low applicative*, which is selected by V, inducing a Larsonian shell structure:

(25) *Low applicative structure in English (vP excluded for convenience)*

¹⁶ Here we license the PG in the indirect object by extraction from the direct object, because movement of the full direct object creates a configuration where the PG is adjacent to its licensing trace, which seems to be more difficult to process.

¹⁷ We argue that these facts cannot be explained by posting covert movement of the PG-containing indirect object to the vP edge. If generally available, this method of licensing should be able to create violations of the robust constraint that a PG cannot be c-commanded by the trace of the licenser (the *anti-c-command condition*, evidence for which [Nissenbaum 2000](#) and [Culicover & Postal 2001](#) summarize.)

Additionally, notice that the PG-hosting indirect objects in (24a-b) are definites. Since these are not scope bearing phrases, covert movement of them into the vP edge would likely violate the Scope Economy condition ([Fox 1995, 2000](#)), unless PG-licensing is a semantic effect that in of itself is a sufficient condition to license covert movement.

- This contrasts with what she classifies as a *high applicative*, which is merged above VP, and which English happens to lack.
- **Importantly**, it has been argued that while high applicative heads demarcate phases, low applicatives do not (McGinnis 2001, Citko 2014).
- ★ This means that English indirect objects are not adjoined to a phase edge. Despite this, PGs within them are allowed.

3.4 Interim summary

- **Observation:** PG-containing phrases can be interpreted in positions other than the edges of the widely-assumed phases vP and CP.
- **Consequence:** If PG interpretation depends on predicates formed by (intermediate) landing sites of SCM, we thus must conclude that SCM can occur outside of vP and CP.¹⁸
 - Before considering these issues further, in the next section, we resolve a puzzle about how some of these PGs are interpreted.

¹⁸ It's perhaps worth mentioning that there is not a total consensus in the literature that vP is indeed a phase — see, e.g., Keine 2016 for a dissenting view. If it turns out that evidence for the phasehood of vPs is indeed lacking, this only serves to strengthen our argument.

4 PGs AND FLEXIBLE SEMANTIC COMPOSITION

- Let's begin by considering the mechanics of Nissenbaum's theory of Parasitic Gaps (pgs) in a little more detail.
- In order to simplify the presentation, Nissenbaum assumes that sentential adjuncts are of type t .
- As he acknowledges, this isn't realistic — a standard semantics for, e.g., *after*-adverbials would treat them as predicates of eventualities (Davidson 1967), of type $\langle v, t \rangle$:

(26) $\llbracket \text{after Mary left} \rrbracket$
 $= \lambda e . \exists e' [e' \text{ was a leaving of Mary's and } e \text{ happened after } e'] \quad \langle v, t \rangle$

- An *after*-adverbial composes with vP, which also denotes a predicate of eventualities, via Predicate Modification, the definition of which is given in (27b), with the types appropriately adjusted.

(27) *Predicate Modification* (PM)

- a. $\mathbf{PM}(P)(Q) := \lambda x . P(x) \wedge Q(x) \quad \langle et, \langle et, et \rangle \rangle$
- b. If α is a branching node and $\{ \beta, \gamma \}$ the set of α 's daughters, and $\llbracket \beta \rrbracket, \llbracket \gamma \rrbracket$ both of type $\langle v, t \rangle$, then:

$$\llbracket \alpha \rrbracket = \text{PM}(\llbracket \beta \rrbracket)(\llbracket \gamma \rrbracket) \quad (\text{Heim \& Kratzer 1998: p. 65})$$

$$(28) \quad \text{PM}(\llbracket \text{Sally spoke} \rrbracket)(\llbracket \text{after Mary left} \rrbracket) \\ = \lambda e . e \text{ is a speaking of Sally's and } \exists e' [e' \text{ was a leaving of Mary's and } e \text{ happened after } e']$$

- PM, which Nissenbaum invokes to account of PG licensing, is the standard mode of composition for adverbial modifiers!
 - If both adverbial modifiers and vPs are basically of type $\langle v, t \rangle$, then PM won't do as an account of PG composition — null operator movement induces an additional outer argument.

$$(29) \quad \llbracket \text{after Mary hugged PG} \rrbracket \\ = \lambda x . \lambda e . \exists e' [e' \text{ was a hugging of } x \text{ by Mary and } e \text{ happened after } e'] \\ \langle e, \langle v, t \rangle \rangle$$

- Intuitively, in order to compose a PG-hosting adverbial, we must generalize PM in order to allow for the presence of an additional outer argument.
- Moreover, we can think of Predicate Modification itself as a generalization of plain logical conjunction, which allows for the presence of an additional outer argument.¹⁹
- In order to cash out this intuition, we'll conjecture simply that *logical conjunction* is a basic composition principle, alongside, e.g., function argument application.²⁰

$$(30) \quad \text{Conjunction (CONJ)} \\ \text{CONJ}(t)(u) := t \wedge u \quad \langle t, \langle t, t \rangle \rangle$$

- In order to account for composition of predicates, we assume that the basic composition rules may be recursively lifted via an abstract operator, lift_2 , which we define below.²¹

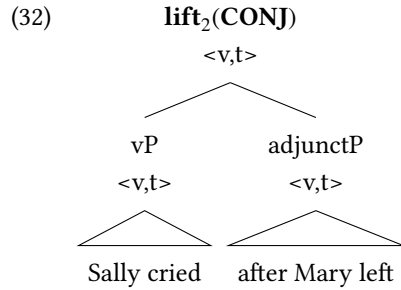
$$(31) \quad \text{lift}_2(R) := \lambda m . \lambda n . \lambda x . R(m(x))(n(x)) \quad \langle \langle ab, c \rangle, \langle \langle ea, eb \rangle, ec \rangle \rangle$$

- Importantly, the definition of lift_2 is *type flexible*.
 - If R is a function from an a and a b , to a c , $\text{lift}_2(R)$ takes an a with an outer individual argument, and a b with an outer individual argument, and returns a c with an outer individual argument.
- $\text{lift}_2(\text{CONJ})$ is equivalent to Predicate Modification, which we can use to compose adverbial adjuncts.

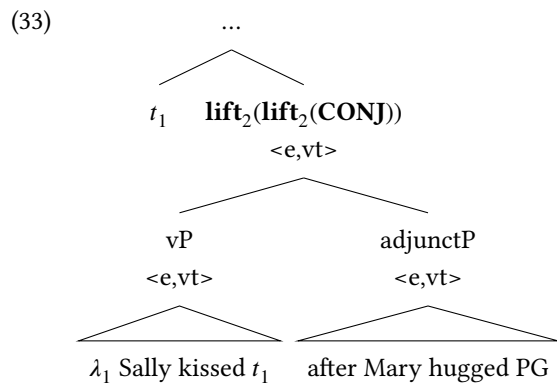
¹⁹ See Partee & Rooth's (1983) notion of *generalized conjunction*.

²⁰ It's natural to suppose that an overt conjunction marker such as *and* is the reflex of CONJ at PF, as opposed to a *bona fide* lexical item. For want of time, we don't pursue this speculation here.

²¹ lift_2 is related to a number of existing concepts in the technical literature: it takes advantage of the fact that $\langle e, \cdot \rangle$ (the type of functions from individuals) is an *applicative functor* (McBride & Paterson 2008) — its definition is identical to that of liftA2 from the functional programming literature.



- A PG induces an additional outer argument in the denotation of the adjunct, and SCM induces an additional outer argument in the denotation of the vP – composition proceeds by applying lift_2 to CONJ twice.²²



- There is at least one other, independently motivated semantic composition rule: function application (FA).
 - For presentational purposes, we define both forwards function application $\text{FA}_>$ and backwards function application $\text{FA}_<$.

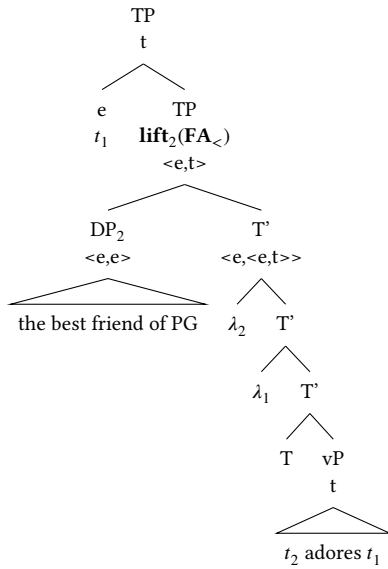


- Our theory automatically predicts the possibility of PGs in A positions, since FA can be recursively lifted via lift_2 , to accommodate the possibility of outer arguments induced by null operator movement and SCM.²³
- Consider, e.g., the derivation of a subject PG:

²² Something like this machinery is also necessary in order to account for the composition a host containing multiple PGs (Nissenbaum 2000), in which case composition proceeds via an additional application of lift_2 .

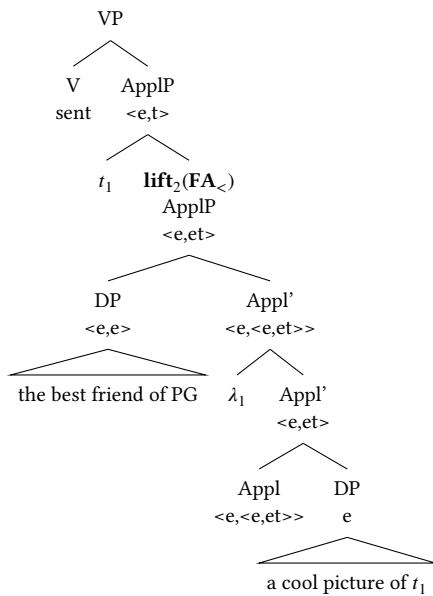
²³ We're grateful to an anonymous reviewer for pointing out that $\text{lift}_2(\text{FA}_>)$ is identical to the S combinator of combinatory logic (Curry, Feys & Craig 1958), which Steedman (1987) makes use of in his influential CCG account of PGs. This reveals a deep connection between the account we develop here, and the account of PGs developed in the CCG literature. In future work, we plan to explore this connection further.

(35) The guy who [the best friend PG] of adores t .



- Here the subject tucks in below the PG-licenser’s trace and above its associated lambda operator. Crucially, here SCM of the licenser must stop-off at the edge of TP – a *non-phase*.
- An analogous though simpler (since the PG host is not in a derived position) derivation models PG-licensing at ApplP, as shown below.²⁴

(36) Who did you send [the best friend of PG] a cool picture of t ?



²⁴ We ignore eventualities here, for presentational purposes.

- The general picture that emerges is that **semantic composition is flexible**:
 - Given a branching node α with daughters $\{\beta, \gamma\}$, composition proceeds if the following is well typed: $R(\llbracket\beta\rrbracket)(\llbracket\gamma\rrbracket)$, where R is in the set of basic composition rules, closed under recursive application of **lift**₂.
- On the syntactic side, we've suggested that SCM may in principle pass through the edge of *any* constituent (radical SCM).
- Radical SCM in tandem with flexible semantic composition predicts permissive PG licensing – PGs are in principle possible in *any* phrase adjoined within the movement path of a potential PG-licenser.

5 CONSEQUENCES FOR THEORIES OF CYCLIC SYNTAX

- **Observation:** PG-containing phrases can be interpreted in positions other than the edges of the widely-assumed phases vP and CP.
- **Consequence:** If PG interpretation depends on predicates formed by (intermediate) landing sites of SCM, we thus must conclude that SCM can occur outside of vP and CP.
- This result leads us to a theory in which SCM is potentially rampant:

(37) *Our conjecture: Radical successive-cyclicity*

WH ... [_{CP} t C [_{TP} t T [_{vP} t v [_{VP} t V [_{ApplP} t Appl ... t]]]]]

↑ ↑ ↑ ↑ ↑ ↑

- This theory easily accommodates the fact that a single A'-movement can license numerous PGS:

(38) *Licensing of many PGs by one movement*

That's the person who₁ I told [the best friend of PG₁] that, [if you praise PG₁], [an enemy of PG₁] will send [every relative of PG₁] [an angry email about t₁].

- If PGs can only be licensed in the edge of vP (or CP), this sentence would have to involve a great deal covert movement, which clusters the PG-containing phrases at phase edges.
- ★ But if movement can form intermediate landing sites in every phrase it crosses, each these PGs can be licensed by a separate intermediate landing site without further assumptions.²⁵
- Such rampant SCM is consistent with a theory in which every phrase is a phase (Müller 2010, Muller 2011).

²⁵ The possibility of rampant SCM likely entails the availability of various fairly short movement steps, and thus comes into conflict with works arguing for versions of *anti-locality*—a constraint banning movements that are too short (Ishii 1999, Grohmann 2003, Abels 2003, 2012, Erlewine 2016, a.o.). We leave this topic open for future investigation.

- This view is tempting, since as Ko 2014 points out, most phrases beyond vP and CP have been argued to be phases at some point.²⁶
- However, the hallmarks of phasehood investigated in recent years do not seem to be found at all phrases, only some of them, such as vP and CP. (See Citko 2014 for a recent overview.)
- Thus we take a more conservative view:
- ★ **Our hypothesis:** SCM may be forced by cyclic constituents (phases), but barring this, SCM is free to apply optionally.²⁷
- This is the view taken in Chomsky 2013, who argues that movement is freely available, just as external merge is often assumed to be.

²⁶ For instance, phasehood has been attributed to VP (Fox & Pesetsky 2005, Wiland 2010, Ko 2011), AspectP (Bobaljik & Wurmbrand 2013, Harwood 2015) and TP (Deal 2016, Wurmbrand 2013, 2017, Davis 2019). Further, some works argue that phasehood can change during a derivation, thickening the plot even further (Den Dikken 2007, Gallego 2010, Alexiadou, Anagnostopoulou & Wurmbrand 2014). See Davis 2020a,b for further discussion.

²⁷ If movement is feature-driven as argued in much recent work, this would be reducible to the proposal that movement-triggering features can be allocated freely.

6 CONCLUDING REMARKS

- In brief, we've shown empirically that PG licensing is more permissive than is typically assumed.
- Assuming a tight connection between PG licensing, and SCM, this suggests that SCM is not necessarily endemic to phase edges.
- Permissive PG licensing in both adjuncts *and* arguments necessitates flexible semantic composition.

References

- Abels, Klaus. 2003. *Successive-Cyclicity, Anti-locality, and Adposition Stranding*. Doctoral dissertation, University of Connecticut.
- Abels, Klaus. 2012. *Phases: an Essay on Cyclicity in Syntax*. Berlin: De Gruyter.
- Alexiadou, Artemis, Elena Anagnostopoulou & Susi Wurmbrand. 2014. Movement vs. long distance Agree in raising: Disappearing phases and feature valuation. In Hsin-Lun Huang, Ethan Poole & Amanda Rysling (eds.), *Proceedings of the 43rd meeting of the North Eastern Linguistics Society*, 1–12. University of Massachusetts, GLSA.
- Barbiers, Sjef. 2002. Remnant stranding and the theory of Movement. In Artemis Alexiadou et al. (eds.), *Dimensions of movement: from features to remnants*. <https://doi.org/10.1075/la.48.04bar>. John Benjamins.
- Bobaljik, Jonathan & Susi Wurmbrand. 2013. Suspension across Domains. In Ora Matushansky & Alec Marantz (eds.), *Distributed Morphology Today: Morphemes for Morris Halle*, 289–315. <https://doi.org/10.7551/mitpress/9780262019675.001.0001>. Cambridge, MA: MIT Press.
- Bondarenko, Tatiana & Colin Davis. 2019. Parasitic gaps diagnose concealed pied-piping in Russian. In *Proceedings of North East Linguistic Society 49*. UMass Amherst: GLSA Publications.
- Bondarenko, Tatiana & Colin Davis. 2020. *Concealed pied-piping in Russian*. Manuscript under review.
- Browning, M. 1987. *Null Operator Constructions*. Doctoral dissertation, MIT.
- Bruening, Benjamin. 2001. *Syntax at the edge: cross-clausal phenomena and the syntax of Passamaquoddy*. Doctoral dissertation, Massachusetts Institute of Technology.
- Bruening, Benjamin. 2006. Differences between wh-scope marking and wh-copy constructions in Passamaquoddy. *Linguistic Inquiry* 37. 25–49.
- Chomsky, Noam. 1973. Conditions on Transformations. In Stephen Anderson & Paul Kiparsky (eds.), *A Festschrift for Morris Halle*, 232–288. New York: Holt.
- Chomsky, Noam. 1977. On wh-movement. In Adriam Akmajian, Peter Culicover & Thomas Wasow (eds.), *Formal syntax*, 71–132. New York: Academic Press.
- Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press. Linguistic Inquiry Monographs.
- Chomsky, Noam. 2000. Minimalist Inquiries. In Roger Martin et al. (eds.), *Step by step: essays on Minimalist Syntax in Honor of Howard Lasnik*, 89–155. MIT Press.
- Chomsky, Noam. 2001. Derivation by Phase. In Michael Kenstowicz (ed.), *Ken hale: a life in language*. MIT Press.
- Chomsky, Noam. 2013. Problems of projection. *Lingua* 130. <https://doi.org/10.1016/j.lingua.2012.12.003>.

- Citko, Barbara. 2014. *Phase Theory: An Introduction*. Cambridge University Press, Cambridge: UK.
- Cole, Peter & Gabriella Hermon. 2000. Partial wh-movement: Evidence from Malay. In Gereon Müller & Armin von Stechow (eds.), *Wh-Scope Marking*, 101–130. Amsterdam: Benjamins.
- Contreras, Heles. 1984. A note on parasitic gaps. *Linguistic Inquiry* 15. 698–701.
- Culicover, Peter & Paul Postal (eds.). 2001. *Parasitic Gaps*. Cambridge, MA: MIT Press.
- Curry, Haskell Brooks, Robert Feys & William Craig. 1958. *Combinatory logic*. Amsterdam: North-Holland Publishing Company.
- Davidson, Donald. 1967. The logical form of action sentences. In Nicholas Rescher (ed.), *The logic of decision and action*. University of Pittsburgh Press.
- Davis, Colin. 2019. Possessor Extraction in Colloquial English: Evidence for Successive-Cyclicity and Cyclic Linearization. *Linguistic Inquiry*. LI Early access. https://doi.org/10.1162/ling_a_00369.
- Davis, Colin. 2020a. Crossing and stranding at edges: On intermediate stranding and phase theory. *Glossa* 5. <http://doi.org/10.5334/gjgl.854>, 1–32.
- Davis, Colin. 2020b. *The Linear Limitations of Syntactic Derivations*. Doctoral Dissertation, MIT.
- Deal, Amy Rose. 2016. Cyclicity and Connectivity in Nez Perce Relative Clauses. *Linguistic Inquiry* 47. https://doi.org/10.1162/LING_a_00218, 427–470.
- Den Dikken, Marcel. 2007. Phase Extension: Contours of a theory of the role of head movement in phrasal extraction. *Theoretical Linguistics* 33. <https://doi.org/10.1515/TL.2007.001>, 1–41.
- Du Plessis, Hans. 1977. WH Movement in Afrikaans. *Linguistic Inquiry* 8.
- Engdahl, E. 1983. Parasitic Gaps. *Linguistics and Philosophy* 6.
- Erlewine, Michael Y. & Hadas Kotek. 2018. Focus association by movement: Evidence from binding and parasitic gaps. In *Proceedings of Sinn und Bedeutung*, 1–9.
- Erlewine, Michael Yoshitaka. 2016. Anti-locality and optimality in Kaqchikel Agent Focus. *Natural Language & Linguistic Theory* 34. <https://doi.org/10.1007/s11049-015-9310-z>.
- Fox, Danny. 1995. Economy and scope. *Natural Language Semantics* 3. 283–341.
- Fox, Danny. 2000. *Economy and semantic interpretation*. The MIT Press Linguistic Inquiry Monographs.
- Fox, Danny & John Nissenbaum. 2018. *Pied-piping and covert movement: Evidence from parasitic gap licensing*. Talk given at Workshop on Altaic Formal Linguistics 14: Workshop in honor of Shigeru Miyagawa.

- Fox, Danny & David Pesetsky. 2005. Cyclic Linearization of Syntactic Structure. *Theoretical Linguistics* 31. <https://doi.org/10.1515/thli.2005.31.1-2.1>.
- Gallego, Ángel J. 2010. *Phase theory*. <https://doi.org/10.1075/la.152>. John Benjamins.
- Grohmann, Kleanthes. 2003. *Prolific domains: On the anti-locality of movement dependencies*. Amsterdam: John Benjamins.
- Harwood, William. 2015. Being progressive is just a phase: Celebrating the uniqueness of progressive aspect under a phase-based analysis. *Natural Language & Linguistic Theory* 33. <https://doi.org/10.1007/s11049-014-9267-3>, 523–573.
- Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.
- Henry, Alison. 1995. *Belfast English and Standard English: Dialect Variation and Parameter Setting*. Oxford, UK: Oxford University Press.
- Henry, Alison. 2012. Phase Edges, Quantifier Float, and the Nature of (Micro-) Variation. *Iberia: An International Journal of Theoretical Linguistics* 4. 23–39.
- Ishii, Toru. 1999. Cyclic spell-out and the *that*-trace effect. In A. Carnie, J. D. Haugen & P. Norquest (eds.), *Proceedings of WCCFL 18*, 220–231. Somerville, MA: Cascadilla Press.
- Kayne, Richard. 1983. Connectedness. *Linguistic Inquiry* 14. 223–249.
- Keine, Stefan. 2016. *Probes and their Horizons*. Doctoral Dissertation, University of Massachusetts Amherst.
- Ko, Heejeong. 2011. Predication and edge effects. *Natural Language & Linguistic Theory* 29. <https://doi.org/10.1007/s11049-011-9143-3>.
- Ko, Heejeong. 2014. *Edges in Syntax: Scrambling and Cyclic Linearization*. Oxford University Press.
- Korsah, Sampson & Andrew Murphy. 2019. Tonal reflexes of movement in Asante Twi. *Natural Language & Linguistic Theory*.
- Legate, Julie Anne. 2003. Some Interface Properties of the Phase. *Linguistic Inquiry* 34. <https://doi.org/10.1162/ling.2003.34.3.506>.
- Mcbride, Conor & Ross Paterson. 2008. Applicative programming with effects. *Journal of Functional Programming* 18(1).
- McCloskey, James. 2000. Quantifier Float and Wh-movement in an Irish English. *Linguistic Inquiry* 51. <https://doi.org/10.1162/002438900554299>.
- McCloskey, James. 2001. The morphosyntax of wh-extraction in Irish. *Journal of Linguistics* 37. 67–100.
- McCloskey, James. 2002. Resumption, successive cyclicity, and the locality of operations. In SD Epstein & TD Seeley (eds.), *Derivation and explanation in the minimalist program*, 184–226. Oxford, UK: Blackwell.
- McGinnis, Martha. 2001. Variation in the Phase Structure of Applicatives. *Linguistic Variation Yearbook* 1. 105–46.
- Muller, Gereon. 2011. *Constraints on Displacement*. John Benjamins Publishing Company.

- Müller, Gereon. 2010. On deriving CED effects from the PIC. *Linguistic Inquiry* 41. 35–82.
- Munn, Alan. 2001. Explaining Parasitic Gap Restrictions. In Peter Culicover & Paul Postal (eds.), *Parasitic Gaps*, 369–402. Cambridge, MA: MIT Press.
- Nissenbaum, John. 1998. Movement and Derived Predicates: Evidence from Parasitic Gaps. In *The Interpretive Tract*, 247–295. Cambridge, MA: MIT Working Papers in Linguistics.
- Nissenbaum, John. 2000. *Investigations of covert phrase movement*. Doctoral dissertation, MIT.
- Nissenbaum, John & Bernhard Schwarz. 2011. Parasitic degree phrases. *Natural Language Semantics* 19. <https://doi.org/10.1007/s11050-010-9061-7>, 1–38.
- Overfelt, Jason. 2015. Unbounded successive-cyclic rightward DP-movement. *Lingua* 162. <https://doi.org/10.1016/j.lingua.2015.04.002>, 1–31.
- Partee, Barbara & Mats Rooth. 1983. Generalized conjunction and type ambiguity. In Rainer Bäuerle, Christoph Schwarze & Arnim von Stechow (eds.), *Meaning, use, and interpretation of language*, 361–383. Berlin: de Gruyter.
- Pylkkänen, Liina. 2008. *Introducing arguments* (Linguistic Inquiry Monographs). Cambridge Massachusetts: The MIT Press. 156 pp.
- Sauerland, Uli. 2003. Intermediate adjunction with A-movement. *Linguistic Inquiry* 34.
- Sauerland, Uli & Paul Elbourne. 2002. Total reconstruction, PF movement, and derivational order. *Linguistic Inquiry* 33(2). 283–319.
- Steedman, Mark. 1987. Combinatory Grammars and Parasitic Gaps. *Natural Language & Linguistic Theory* 5(3). 403–439.
- Stowell, Tim. 1985. Licensing conditions on null operators. In *Proceedings of the 4th West Coast Conference on Formal Linguistics (WCCFL)*. Center for the Study of Language & Information (CSLI), Stanford University.
- Thoms, Gary. 2019. Antireconstruction as layering. In Maggie Baird & Jonathan Pesetsky (eds.), *Proceedings of North East Linguistic Society 49*. University of Massachusetts Amherst.
- Torrence, Harold. 2012. The morpho-syntax of silent wh-expressions in Wolof. *Natural Language & Linguistic Theory* 30. 1147–1184.
- van Urk, Coppe. 2015. *A uniform syntax for phrasal movement: A case study of Dinka Bor*. Doctoral dissertation, MIT.
- van Urk, Coppe & Norvin Richards. 2015. Two Components of Long-Distance Extraction: Successive Cyclicity in Dinka. *Linguistic Inquiry* 46. 113–155.
- Wiland, Bartosz. 2010. Overt Evidence from Left-Branch Extraction in Polish for Punctuated Paths. *Linguistic Inquiry* 41. <https://doi.org/10.1162/ling.2010.41.2.335>.
- Wurmbrand, Susi. 2013. QR and Selection: Covert Evidence for Phasehood. In Stefan Keine & Shayne Sloggett (eds.), *Proceedings of North East Linguistic Society 42*. GLSA Publications: UMass Amherst.

Wurmbrand, Susi. 2017. Stripping and topless complements. *Linguistic Inquiry* 48. 341–366.