Anti-pied-piping

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Comments welcome!

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We document and investigate *anti-pied-piping*, a cross-linguistically widespread but understudied phenomenon where a language targets a proper subpart of the logical focus for focus morphosyntax, e.g. focus particle placement or focus movement. We develop a theory of focus particle placement which successfully generates both anti-pied-piping and pied-piping behavior, which in many cases results in a separation between the pronounced position of a focus particle and the logical position of its corresponding semantic contribution. Constraints on attested anti-pied-piping behavior and its interaction with movement show that particle placement takes place at particular, punctuated points in the derivation, in a cyclic model of syntactic structure-building. We also discuss the relation of particle placement to other processes such as stress assignment and discuss consequences for the status of focus in grammar.

Keywords: focus particles, focus movement, focus association, anti-pied-piping, pied-piping, particle placement, cyclic Spell-Out

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Contents

1 Introduction

In many languages, the presence of focus in a sentence triggers a characteristic morphosyntactic response, such as a marked word order via movement or the appearance of a focus particle. For example, in Hungarian (canonically SVO), exhaustive focus triggers movement to a dedicated, immediately preverbal position, as in (1):[1]

(1) **Focus-triggered movement in Hungarian:** (É Kiss 1998: p. 249)

Mari [egy kalapot]$_F$ názett ki magának ____.
Mary a hat.ACC picked VM herself.DAT
'Mary picked [a hat]$_F$ for herself.'

A language may likewise indicate the presence of focus using a dedicated particle. For example, additive focus is indicated in Japanese with the particle *mo*, as in (2). Languages may also use particle placement and movement simultaneously, or use altogether other strategies, as we will discuss.

(2) **Focus-triggered particle placement in Japanese:**

Hanako-wa [hon]$_F$-**mo** kat-ta.
Hanako-TOP book-also buy-PAST
'Hanako also bought [a book]$_F$.'

We will refer to such morphosyntactic responses to focus as "MSF" throughout. In both (1) and (2), the constituent targeted for MSF — movement in Hungarian and particle placement in Japanese — is the logically focused constituent, which we annotate with the subscript "F." But in some cases, there is a mismatch between the logical focus and the target of MSF, in which case we annotate both with separate subscripts.

Ross (1967) describes a famous type of mismatch termed *pied-piping*, where MSF targets a constituent *properly containing* the logical focus. Examples of pied-piping, again from Hungarian

[1] The preverbal focus position is associated with exhaustive, identificational focus (Szabolcsi 1981, É Kiss 1998) and is often translated with English *it*-clefts. The so-called "verb modifier" (VM, *ki* in (1)) prefixes to the verb when the preverbal focus position is unoccupied, e.g. resulting in *ki-názett* for the verb in (1); see É Kiss 2002. The postverbal position of *ki* in (1) therefore indicates that the preverbal 'a hat' occupies this focus position. Similarly, the position of the verb modifier in example (7) below indicates that a constituent has moved to the focus position there as well.

and Japanese, are given below. In (3), additional, non-focused material is moved together with the focused constituent. In (4), the focus particle attaches to a constituent which includes the logical focus, but also additional, non-focused material.[2]

(3) **Pied-piping in Hungarian focus movement:** (Horvath 2000: p. 199)

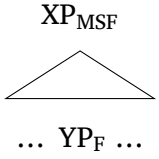
Anna [a [tegnapi]$_F$ cikkeket]$_{MSF}$ olvasta ____.
Anna the yesterday's articles-ACC read
'Anna read [yesterday]$_F$'s articles (not today's).'

(4) **Pied-piping in Japanese focus particle placement:** (based on Kuroda 1965: p. 78)

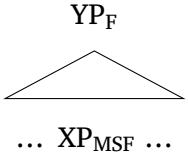
Hanako-wa [[hon]$_F$-o kai]$_{MSF}$-**mo** si, [[zassi]$_F$-o kai]$_{MSF}$-**mo** si-ta.
Hanako-TOP book-ACC buy -also do magazine-ACC buy -also do-PAST
'Hanako bought [books]$_F$ and also bought [magazines]$_F$.'

We schematize the syntactic configuration referred to as pied-piping in (5) below. In this paper, we document and investigate the phenomenon of *anti-pied-piping*, schematized in (6), where a constituent *properly contained within* the logical focus is marked with a focus particle or targeted for focus movement. Anti-pied-piping can thus be thought of as the inverse of the very well-studied pied-piping pattern.

(5) **Pied-piping**



(6) **Anti-pied-piping**



Anti-pied-piping is attested in both Hungarian and Japanese. In the Hungarian example (7), verb phrase focus results in movement of the object out of the focused verb phrase, to the pre-verbal focus position (see footnote 1 above). Similarly, in the Japanese example (8), two whole propositions contrast and license the additive focus particle *mo*, but the particle appears on the subject within each focus. In both cases, MSF targets a proper subconstituent of the logically focused constituent. It is this type of mismatch that we concern ourselves with in this paper.

[2] In example (4), as well as in (8) below, the additive particle *mo* naturally appears in each conjunct, in contrast to English additives *also* and *too* which we only give once in their translations. See e.g. Kobuchi-Phillips 2009 and Brasoveanu & Szabolcsi 2013 for discussion of this property of *mo*.

(7) **Anti-pied-piping in Hungarian focus movement:** (Kenesei 1998: p. 77)

Péter [a Hamletet]$_{MSF}$ [olvasta fel ____ a kertben]$_F$, nem pedig [úszott]$_F$.
Peter the Hamlet read VM the garden.INE not rather swim
'Peter [read out Hamlet in the garden]$_F$, rather than [swim]$_F$.'

(8) **Anti-pied-piping in Japanese focus particle placement:** (based on Kuroda 1965: p. 81)

[[Musuko]$_{MSF}$-**mo** daigaku-ni hairi]$_F$, [[musume]$_{MSF}$-**mo** yome-ni it]$_F$-ta.
son-also college-DAT enter daughter-also bride-DAT go -PAST
'[The son entered college]$_F$ and [the daughter got married]$_F$, too.'

We begin in section 2 with a brief introduction to focus semantics, which will establish a methodology for identifying the logically focused constituent and, therefore, mismatches between the target of MSF and the logical focus. Section 3 then lays the empirical groundwork for an investigation of anti-pied-piping. We will see that anti-pied-piping mismatches of the form in (7) and (8) are quite wide-spread and attested in a number of unrelated, syntactically heterogenous languages. In addition, we show that the process of anti-pied-piping in many languages must make reference to the linear order of constituents. A list of all languages discussed here as exhibiting anti-pied-piping is given at the end of the paper, organized by major subfamily and/or genus (Dryer 1989).[3]

In section 4, we introduce a new theory for the syntax/semantics of focus particles which allows for a uniform analysis of both anti-pied-piping and pied-piping behavior and accounts for their similarities. A central feature of our proposal is the dissociation of pronounced focus particles and their corresponding semantic operators. We furthermore show that interactions between anti-pied-piping and other syntactic processes such as scrambling and agreement show that anti-pied-piping cannot be the result of a process of post-syntactic lowering at the end of the derivation. Instead, we propose that particle placement takes place at certain designated, punctuated points during the derivation, in a *cyclic Spell-Out* model of grammar (Uriagereka 1999, Chomsky 2000, 2001, a.o.). Particle placement may thus make reference to some phonological information such as linear order, but then also feed further syntactic operations. Finally, we discuss the logic of

[3] We follow the classification of the WALS Genealogical Language List (Dryer 2013) but with some simplifications to genus names and by separating Bantu and Grassfields languages. Languages which we discuss in the paper as exhibiting anti-pied-piping behavior, but for which we do not reproduce examples here in the interest of space, are listed there in parentheses.

particle placement choice and its relationship to stress assignment in further detail in section 5. We conclude in section 6 with implications of the analysis and a further outlook.

2 Focus as the locus of alternatives

Before diving into the empirical landscape of anti-pied-piping, we first briefly discuss the function of focus in grammar. This section serves an important methodological purpose: anti-pied-piping represents a mismatch between the logical focus and the constituent treated as focused by the morphosyntax. An understanding of the semantics of focus is crucial for identifying the position of logical focus in any particular utterance. Here in particular we'll focus on the role of focus in the interpretation of focus particles and question-answer congruence.

The core function of focus is to highlight a portion of the sentence as standing in contrast to other values in a set of contextually salient *alternatives*.[4] Focus-sensitive expressions such as focus particles then quantify over these alternatives. For example, consider the contrast between (9a) and (9b). These examples differ only in the placement of focus — realized in English with a pitch accent — but make very different claims about the world.[5] In example (9a), the theme *sandwiches* is focused; this claim entails that Alex did not make anything else for Cara. In example (9b), *Cara* is focused instead, contrasting against other potential beneficiaries; this claim entails that Alex didn't make sandwiches for anyone else. This difference in meaning is reflected in the different felicity patterns of the continuations (i) and (ii), which elaborate on the claim made with *only* in (9a,b).

(9) a. Alex **only** made [sandwiches]$_F$ for Brie.
   i. ✓She didn't make [soup]$_F$ for her. ii. #She didn't make sandwiches for [Cara]$_F$.
   b. Alex **only** made sandwiches for [Brie]$_F$.
   i. #She didn't make [soup]$_F$ for her. ii. ✓She didn't make sandwiches for [Cara]$_F$.

[4] This notion of focus differs from the notion of focus as new information; on the relationship between these two notions of "focus," see e.g. Rochemont 2013. Focus as the locus of alternatives is the relevant notion for our purposes. See also Rooth 1992 and Krifka 2008.

[5] English *only* can also be adjoined closer to the focused constituent — for example, appearing as *only sandwiches* in (9a) or *only for Brie* in (9b). Our analysis in section 4 develops an account of the relationship between such *constituent particles* that adjoin to a sub-sentential phrase and *sentential particles* that adjoin to the clausal spine such as the *only* in (9a,b).

In common parlance, focus-sensitive expressions *associate* with the focused phrase. For example, we may say that the focus particle *only* associates with *sandwiches* in (9a) and with *Brie* in (9b).

We indicate the position of logical focus in example sentences with the subscript F, commonly referred to as *F-marking*.[6] However, the position of logical focus is not unambiguously and directly reflected in the linguistic signal. In particular, for example, the phonetic realization of example (9a) is the same as the first sentence of (10), in that both of these choices of focus result in the most prominent accent on the object *sandwiches*. But in example (10), the entire VP *made sandwiches* is focused. The first sentence with *only* therefore claims that Alex didn't do anything for Brie except make sandwiches. The second sentence elaborates on this claim, mentioning washing the car as a particular alternative activity that Alex didn't do for Brie.

(10) Alex **only** [made sandwiches]$_F$ for Brie. She didn't [wash the car]$_F$ for her.

The surface equivalence of sentences with different positions of focus — including some equivalences even when considering prosodic cues, as in the case of (9a) and (10) above — makes it a challenge to immediately identify the position of focus in a sentence in isolation. As we see from the examples above, however, the position of focus can be elucidated by explicit continuations which make the extent of contrast between alternatives clear. Explicit continuations are useful for identifying the position of focus for utterances with additive particles such as *also* as well:

(11) a. Alex made soup for Brie. She **also** made [sandwiches]$_F$ for her.
b. Alex washed the car for Brie. She **also** [made sandwiches]$_F$ for her.

Again, focus marks the position over which salient alternatives differ: the contrasting propositions differ only in their objects in (11a), but over their VPs in (11b). The semantics introduced by *also* then presupposes that another alternative is true, in contrast to *only* which claims that the other alternatives are false.

Constituent questions and their congruent answers are also useful for identifying the position of focus. Consider the object *wh* question in (12) and predicate *wh* question in (13), each presented

[6] We use F-marking in the discussion which follows in a primarily descriptive fashion, and remain ultimately uncommited to the presence or absence of F-marking as annotations in the grammar. The theory developed in §4 is ultimately compatible with either view, but we note in section 4.4 a number of conceptual and empirical reasons to prefer a theory of particle placement in which particles do not make direct reference to the position of the logical focus through such information-structural annotations in the narrow syntax.

with two possible answers. The position of contrast amongst each set of answers bears focus, roughly corresponding to the argument that has been replaced with a *wh*-word in the question.[7]

(12) What did Alex make for Brie?
   a. She made [sandwiches]$_F$ for her.
   b. She made [soup]$_F$ for her.

(13) What did Alex do for Brie?
   a. She [made sandwiches]$_F$ for her.
   b. She [washed the car]$_F$ for her.

Again, the utterances in (12a) and (13a) both result in a pitch accent on *sandwiches* and therefore cannot be distinguished in isolation, but we can identify their foci by considering the questions that they address ((12) vs (13)) and the shape of other felicitous answers to those questions.

In the following sections, we will continue to indicate the position(s) of logical focus compatible with a particular surface form using F-marking notation (subscript F). For example, following the discussion above, we could report the English surface form in (14) as compatible with two readings which differ in their F-marking, (14a,b). We address the question of the status of F-marking in the grammar in section 4.4.

(14) Alex made SÁNDWICHES for Brie.
   a. 'Alex made [sandwiches]$_F$ for Brie.'
   b. 'Alex [made sandwiches]$_F$ for Brie.'

In the interest of space, in most cases we will not include the supporting contexts or continuations which are necessary to verify the choice of F-marking, as discussed above. Most of the data we present comes from secondary sources; in all such cases, the original, cited sources include such supporting materials or otherwise have sufficiently detailed descriptions which allow us to confidently conclude that the reproduced example indeed has the focusing possibility that we report.

[7] The English predicate question in (13) may in fact be described as a case of anti-pied-piping: the alternatives range over contrasting VP denotations, but the morphosyntax of question formation narrowly targets the object *what* of the VP *do what* for *wh*-movement. As we discuss in section 4, the approach to anti-pied-piping mismatches that we develop here also extends to *wh*-constructions, as well as to pied-piping mismatches which are well attested with both *wh* and focused phrases. However, here we will concentrate on anti-pied-piping in focus constructions.

3 Properties of anti-pied-piping

In this section, we sketch the empirical landscape of anti-pied-piping and highlight some of its important properties and points of cross-linguistic variation. We show that anti-pied-piping is widely attested in a range of genetically unrelated and typologically varied languages, with both particle placement (§3.2) as well as phrasal movement (§3.3). We then discuss the choice of constituent that is targeted for MSF and the obligatoriness of anti-pied-piping in section 3.4 and highlight some parallels between pied-piping and anti-pied-piping in section 3.5.

3.1 Yaeyaman

We begin by presenting a detailed and instructive case of anti-pied-piping in Yaeyaman, a Southern Ryukyuan (Japonic) language, from Christopher Davis's work on the Miyara variety. We consider the focus particle *du*, which in the basic case appears as an enclitic on *wh*-phrases and the focused constituent in corresponding answers. This is illustrated by the question-answer pairs in (15–16).[8] Note that the answers in (15b) and (16b) convey the same proposition, that Chris ate soba. In (15b), as an answer to a subject *wh* question, *du* appears on the subject. In (16b), as an answer to an object *wh* question, *du* appears on the object.

(15) **Subject focus:** (Davis 2014: p. 124)

a. *Taa*-**du** suba-ba fai.
who-PRT soba-BA ate
'Who ate soba?'

b. [Kurisu-n]$_F$-**du** suba-ba fai.
Chris-NOM-PRT soba-BA ate
'[Chris]$_F$ ate soba.'

(16) **Object focus:** (*ibid.*)

a. Kurisu-ja *noo*-ba-**du** fai.
Chris-TOP what-BA-PRT ate
'What did Chris eat?'

b. Kurisu-ja [suba-ba]$_F$-**du** fai.
Chris-TOP soba-BA-PRT ate
'Chris ate [soba]$_F$.'

What is of particular interest is the behavior of *du* in utterances with *sentence focus* and *predicate focus* (Lambrecht 1994), such as in the answer to the question 'What happened?' in (17) and to the question 'What did that woman do?' in (18). In (17), where the entire sentence constitutes

[8] Where possible, we have made glosses more uniform across languages and sources below and in some cases simplified glosses where the morphological composition is orthogonal to the phenomena at hand. We refer readers to the original sources for further details on the morphology of these languages and on glosses reproduced here. We use the gloss PRT throughout for focus particles which do not have immediate parallels in English.

the focus in the answer to the question, the particle *du* appears on the subject. In (18), where the predicate 'eat fish' is focused, *du* appears on the object. The placement of *du* in (17–18) constitutes cases of anti-pied-piping.[9]

(17) **Sentence focus:** (Davis 2013: p. 33)

a. *Noo*-n-**du** ari?
what-NOM-PRT existed
'What happened?'

b. [Hajasi-san]$_{MSF}$-**du** ziroo-ba bari.
Hayashi-san-PRT Jiro-BA hit
'[Hayashi-san hit Jiro]$_F$.'

(18) **Predicate focus:** (*ibid.*)

a. Unu midunpïto-o *noo*-ba-**du** hii?
that woman-TOP what-BA-PRT did
'What did that woman do?'

b. Kunu midunpïto-o [izï-ba]$_{MSF}$-**du** fai.
this woman-TOP fish-BA-PRT ate
'This woman [ate fish]$_F$.'

Davis (2013) furthermore notes that this anti-pied-piping in (17–18) is obligatory — that is, *du* cannot instead appear after or inside the verbal complex — despite the fact that *du* can encliticize to the verb in cases of narrow focus on the verb. Instead, "*du* seems only to be able to occur attached to the leftmost element within its associated focus" (p. 36). In section 3.4 below, we will address these questions of which subpart of the focus is targeted for MSF in anti-pied-piping (in Yaeyaman, strictly leftmost) and when anti-pied-piping occurs (in Yaeyaman, obligatorily for sentence focus and predicate focus).

3.2 Anti-pied-piping in particle placement

Anti-pied-piping in focus particle placement, which we have just observed in Yaeyaman, is readily attested in many other languages. Examples (19–25) all illustrate anti-pied-piping in predicate focus in eight other verb-final languages from distinct language families. In each of these transitive clauses, a focus particle targets the direct object for attachment (MSF) while semantically associating with the entire predicate VP.[10]

[9] The placement of *du* on the *wh*-phrases in (17–18) may also constitute cases of anti-pied-piping, just as we noted with the English *do what* question in footnote 9 above.

[10] For brief discussions related to the data here, we thank Dorothy Ahn (Korean) and Rahul Balusu (Telugu).

(19) **Imbabura Quechua** (Kwon 2013: p. 76)

[Pirkuti-ta]$_{MSF}$ **-mi** wanyuchirka Pepe.

rat-ACC -PRT killed Pepe

a. 'Pepe killed [the rat]$_F$.'

b. 'Pepe [killed the rat]$_F$.'

(20) **Ishkashimi** (Karvovskaya 2013: p. 81)

Salima [kulča]$_{MSF}$ **-məs** pacu.

Salima kulcha -also bake

a. 'Salima also bakes [kulcha]$_F$.'

b. 'Salima also [bakes kulcha]$_F$.'

(21) **Korean** (Choe 1996: p. 677)

[sakwa]$_{MSF}$**-man** mekesseyo.

apple-only ate

a. '[I] only ate [the/an apple]$_F$.'

b. '[I] only [ate the/an apple]$_F$.'

(22) **Masalit** (Leffel 2011: pp. 30–31)

Hawa [mada]$_{MSF}$ **de** taŋge.

Hawa mada only drink

a. 'Hawa only drinks [mada]$_F$.'

b. 'Hawa only [drinks mada]$_F$.'

(23) **Telugu** (Kotani 2008: p. 191)

Karthik [Sean-ni]$_{MSF}$ **kuuDaa** kottææDu.

Karthik Sean-ACC even hit

a. 'Karthik even hit [Sean]$_F$.'

b. 'Karthik even [hit Sean]$_F$.'

(24) **Tibetan** (Erlewine notes[11])

Tshe.ring [deb]$_{MSF}$ **-yang** 'bri.'dug.

Tsering book -also wrote

a. 'Tsering also wrote [a book]$_F$.'

b. 'Tsering also [wrote a book]$_F$.'

(25) **Turkish** (Kamali 2011: p. 182)

Biz [iskambil]$_{MSF}$ **de/bile** oynadık.

we cards also/even played

a. 'We also/even played [cards]$_F$.'

b. 'We also/even [played cards]$_F$.'

(26) **Qunqi Dargwa** (Dmitry Ganenkov, p.c. to Forker & Belyaev 2016: p. 249)

[it:i]$_{MSF}$**-ra** durt'ibce cadi.

them-also give COP

'(they) also [gave them away]$_F$.'

As noted above, we do not reproduce supporting contexts or continuations which motivate each attested choice of F-marking, but such information is available in the original sources that we cite.

Note that the focus particles in (19–26) follow their MSF constituent, which is the logical focus in object focus readings. In these languages, we might wonder whether anti-pied-piping is a response to the fact that particle placement directly on the logically focused VP may disrupt the morphology of the verbal complex. The Japanese examples in (27) show that this cannot be the motivation for anti-pied-piping in the general case. When associating with a transitive VP, the scalar additive *-sae* may adjoin to the VP itself as in (27a) or may adjoin to the object as in (27b),

[11] The Tibetan judgments here and in (62) below reflect the judgments of three native speakers in Dharamsala, India, consulted in 2018–2019.

the latter a case of anti-pied-piping parallel to those above. In the former case in (27a), the verbal morphology is indeed disrupted, triggering a process akin to *do*-support.

(27) **Japanese**[12] (Aoyagi 1998: p. 143)

a. [sushi-o tabe]$_{MSF}$ **-sae** si-ta.
sushi-ACC eat -even do-PST
'(He) even [ate sushi]$_F$.'

b. [sushi]$_{MSF}$ **-sae** tabe-ta.
sushi -even eat-PST
'(He) even [ate sushi]$_F$.'

The optionality in anti-pied-piping in Japanese — despite its obligatoriness in the related Yaeyaman language in the preceding section — shows that anti-pied-piping cannot be generally described as a kind of repair to satisfy morphological processes, and that its application is subject to cross-linguistic variation that must be learned.

Focus may also trigger other morphosyntactic reflexes in a clause. In Tundra Yukaghir, when an object is focused with a particle such as *leŋ*, as in example (28a), the subject agreement affix on the verb changes to a dedicated object focus (OF) form. In cases of predicate focus, a particle similarly appears on the object, again triggering the object focus agreement form, as in (28b). See Comrie 1992 for an overview of this verbal morphology.

(28) **Tundra Yukaghir** (Matić & Odé 2015: p. 630)

a. Object focus:
Q: What do you fear?
[Labunme]$_F$-**leŋ** iŋeː-**meŋ**.
ptarmigan-PRT fear-OF.1/2SG
'I fear [ptarmigans]$_F$.'

b. Predicate focus:
Q: What do you do for a living?
Met [qajser]$_{MSF}$-**leŋ** wie-nun-**meŋ**.
I ski-PRT make-HAB-OF.1/2SG
'I [make skis]$_F$.'

Anti-pied-piping in particle placement is not limited to verb-final languages. As seen in examples (29–31) below, anti-pied-piping in predicate focus is also attested in verb-medial languages.

[12] In addition to the intended predicate focus reading, example (27a) may associate narrowly with the object or the verb and example (27b) also allows narrow focus with the object.

(29) **Awing** (Fominyam & Šimík 2017: p. 1039)

a. A-pe'-náŋnə **tsɔ́'ə** [ŋgəsáŋə́]$_{MSF}$.
AGR-PAST-cook only maize
'He only cooked [maize]$_F$.'

b. A-tə́-ndzí'ə **tsɔ́'ə** [alí'ə]$_{MSF}$.
AGR-PROG-till only farm
'She is only [tilling the farm]$_F$.'

(30) **Dagbani**[13] (Fiedler & Schwarz 2005: p. 9)

ɔ̀ bɔ̀l **lá** [George]$_{MSF}$.
3sg call PRT George
a. 'She called [George]$_F$.'
b. 'She [called George]$_F$.'

(31) **Tangale** (Hartmann & Zimmermann 2007a: p. 119)

N fad-go **núm** [littáfi-i]$_{MSF}$.
I buy-PERF only book-the
a. 'I only bought [the book]$_F$.'
b. 'I only [bought the book]$_F$.'
c. 'I only [bought]$_F$ the book.'

We note in passing that example (31) is also compatible with a narrow verb focus reading, in (31c). We return to this data point in section 4.4.

Anti-pied-piping in focus particle placement is also attested in verb-initial languages. We discuss the behavior of the 'only' particle in Tagalog later in this section.

Readers may note that the anti-pied-piping data just presented fall largely into two categories: OV (head-final) languages with focus particles that are enclitics or otherwise postfocal (19–28) and VO (head-initial) languages with focus particles that are proclitics or otherwise prefocal (29–31). Readers may rightly wonder whether other combinations are possible, i.e. anti-pied-piping in head-final languages with proclitic particles or in head-initial languages with enclitic particles. We imagine that such languages do exist, but have not identified any here, due to a systematic methodological challenge.

To illustrate the issue, consider example (32) below from Konkomba, another Oti–Volta Gur language related to Dagbani. Much like the Dagbani case in example (30) above, example (32) is reported as able to express object focus or predicate focus.

[13] A. Schwarz (2009, 2010) shows that the pattern in the Dagbani example (30) also holds of the related Oti–Volta Gur languages Buli, Gurene, and Kɔnni.

(32) **Konkomba** (A. Schwarz 2007: pp. 123, 126)

Ù ŋmán !ŋítùùn **lá**.

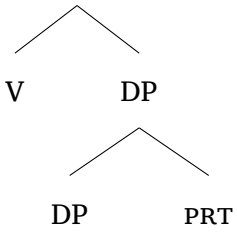
CL chew beans PRT

a. 'She ate [beans]$_F$.'

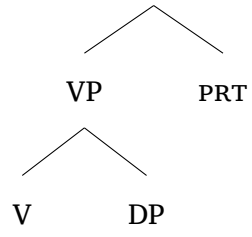
b. 'She [ate beans]$_F$.'

Before we can determine whether there is a mismatch between the logical focus and focus particle placement, we must identify the syntactic position of the particle. Unlike in Dagbani, the focus particle *lá* that appears in cases of object focus and predicate focus *follows* the entire head-initial verb phrase. Therefore, the surface structure in (32) is amenable to either of the parses in (33):

(33) a.



b.



If object focus in (32a) and predicate focus in (32b) correspond respectively to the structures in (33a) and (33b), then there is no mismatch of anti-pied-piping nor pied-piping. However, if the particle is adjoined to the object as in (33a) for both readings in (32), we would describe (32b) as a case of anti-pied-piping. Without further work to establish the exact position of the particle in such sentences, such examples are not sufficiently informative as to whether the particle exhibits anti-pied-piping or not.[14] In contrast, with postfocal particles in head-final structures and prefocal particles in head-initial structures, anti-pied-piping is more immediately identifiable.

While examples involving predicate focus are most readily available, this is not the only type of anti-pied-piping mismatch. Another common pattern involves the subject being marked by a focus particle, with the sentence as a whole being interpreted as the logical focus, as seen in (34–38) below. This is also the pattern we observed for the particle *du* in Yaeyaman sentence focus in section 3.1. We discuss the more general question of which constituent is targeted for MSF in anti-pied-piping in section 3.4.

[14] Similar challenges hold for prefocal focus particles in head-final languages. To wit, there has been an active debate concerning the proper analysis of prefocal focus particles in Germanic as either consistently adjoined to the head-final clausal spine (see especially Jacobs 1986, Büring & Hartmann 2001) or indeed potentially adjoined to sub-clausal constituents (see e.g. Smeets & Wagner 2018).

(34) **Even** (Matić & Wedgwood 2013: p. 153)

[Ama]$_{MSF}$-**dmar** ọmọlgọ-j negirin.

father-PRT son-REFL.POSS scolded

'[A father was scolding his son]$_F$.'

(35) **Ishkashimi** (Karvovskaya 2013: p. 82)

[Wai mol]$_{MSF}$-**məs** xi dusto-i zənayu isu.

DEM husband-also REFL hands-ACC wash come

a. '[Her husband]$_F$ goes to wash his hands, too.'

b. '[Her husband goes to wash his hands]$_F$, too.'

(36) **Korean** (Choe 1996: p. 680)

[[Moduni]$_{MSF}$-**man** tonguiha-myen], na-to ttaru-kess-so.

everybody-only agree-COND I-also follow-TAM

'Only if [everybody agrees]$_F$, I too would follow.'

(37) **Lak** (Victor Friedman p.c. to Forker & Belyaev 2016: p. 251)

K'ič:a [ca č'iwis:a q:urši]$_{MSF}$-**gu** bahnu bur.

up.there one small box-also fall COP

'[from up there a small box fell]$_F$, too.'

(38) **Navajo** (Perkins 1978: p. 26)

[[Jáan]$_{MSF}$ **hanii** chidí yiyíiłchọ'-go] t'áani' naashá.

John NEG.PRT car wreck-C afoot 1.walk

a. 'It's not because [John]$_F$ wrecked the car that I'm on foot.'

b. 'It's not [because John wrecked the car]$_F$ that I'm on foot.'

Tundra Yukaghir also exhibits this same form of sentence-focus anti-pied-piping. Recall that verbal subject agreement morphology is affected by the presence of focus particles, as we saw in (28) above. Similarly, when an intransitive subject is focused with a particle as in (39a), the agreement morphology on the verb is replaced with an invariant subject focus (SF) suffix. When an entire intransitive clause is in focus, as in (39), its subject bears a focus particle, with the verb again appearing in the subject focus form.

(39) **Tundra Yukaghir** (Matić & Odé 2015: p. 630)

a. Subject focus:

They say that [you]$_F$ are strong.

Ele:ń, [köde]$_F$-**leŋ** werwe-**l**.

no man-PRT be.strong-SF

'No, [the man]$_F$ is strong.'

b. Sentence focus:

Q: What is going on?

[Ilije]-**leŋ** werwe-mu-**l**!

wind-PRT be.strong-INCH-SF

'[The wind has gotten strong]$_F$!'

Anti-pied-piping in sentence focus is also not limited to verb-final languages, as shown in (40) and (41) below. Example (40) shows the enclitic focus particle *é* on the subject in a sentence-focus utterance in Ewe. Example (41) shows that the preverbal focus marker *lé* in Konkomba is compatible with subject focus or sentence focus.[15]

(40) **Ewe** (Ameka 2010: p. 151)

[ɖeví-á-wó]$_{MSF}$-**é** gba ze-a.

child-DEF-PL-PRT break pot-DEF

'[The children broke the pot]$_F$.'

(41) **Konkomba** (A. Schwarz 2007: pp. 23, 24)

[Àjúá]$_{MSF}$ **lé** !ŋmán ŋítùùn.

Ajua FM chew beans

a. '[Ajua]$_F$ ate beans.'

b. '[Ajua ate beans]$_F$.'

The English example in (42) below also descriptively constitutes a case of anti-pied-piping, although perhaps for a different reason. *Only* is in the preverbal position, where it conventionally associates with the VP or a subpart thereof (see example (9) above),[16] but here it associates with the entire proposition.

(42) **English** (McCawley 1970: p. 296)

The judge **only** sent you to prison; your wife didn't leave you too.

'It's only that [the judge sent you to prison]$_F$...'

Assuming that the subject *the judge* originated within the extended VP, in the complement of *only*, and moved out (the *VP-internal subject hypothesis*; see e.g. Kitagawa 1986, Kuroda 1988, McCloskey 1997), we may straightforwardly think of this as a case of *only* associating with the content of its

[15] A. Schwarz (2007) argues against analyzing *lé* as an enclitic that forms a constituent with the subject. The pattern in (41) also holds of four other Oti–Volta Gur languages, Buli, Dagbani, Gurene, and Kɔnni (A. Schwarz 2009, 2010).

[16] English *only* in preverbal position cannot narrowly associate with the preceding subject (Jackendoff 1972, Erlewine 2014).

sister, with the subject reconstructed (Erlewine 2014: p. 82). Note that this analytic strategy — to claim that a particle associates naturally with its syntactic sister, but that portions of the focus then move out, leading to the surface appearance of anti-pied-piping — clearly is not applicable for many of the examples of anti-pied-piping above, and thus cannot be entertained as a general approach to anti-pied-piping effects.[17]

Finally, we discuss anti-pied-piping in Tagalog and Latin, which will foreshadow our own proposal for the nature of anti-pied-piping. The Tagalog 'only' particle *lang* also exhibits anti-pied-piping, but this anti-pied-piping behavior can be directly attributed to a more general mechanism in the language. In example (43a), the 'only' particle *lang* immediately follows the focus, which is an adjunct fronted to initial position. This gives the appearance of *lang* being an enclitic focus particle. In contrast, *lang* in (43b) associates with the verb phrase 'give money' in (43b), with *lang* appearing properly within the predicate, between 'give' and 'money.'

(43) **Tagalog** (Kaufman 2005: p. 181)

a. [Sa simbahan]$_F$ **lang** ako nag-bi-bigay ng pera.
OBL church only 1SG AV-ASP-give GEN money
'I only give money [in church]$_F$.'

b. Sa simbahan ay nag-bi-bigay **lang** ako ng pera.
OBL church TOP AV-ASP-give only 1SG GEN money
'I only [give money]$_F$ in church.'

The behavior of *lang* in (43) is explained in part by recognizing its more general status as a second-position clitic. Second-position clitics in Tagalog follow one phrase or head within the clause, not counting topic phrases (Kroeger 1998, Kaufman 2010). Note that the pronoun *ako* here is also such a second-position clitic and thus exhibits this same pattern of placement in (43a) vs (43b). Thus we can conclude that the anti-pied-piping manifested by *lang* in examples such as (43b) is due to a more general property of second-position clitic placement in Tagalog.[18]

Latin too exhibits anti-pied-piping behavior involving the well-known second-position clitic *que* (see e.g. Zwicky 1977). Here we follow Mitrović & Sauerland (2014) and Szabolcsi (2015) in

[17] For example, Kotani (2009) describes cases of Japanese predicate focus with object particle placement, as in (27), as due to verb-movement out of VP. However, this explanation does not immediately extend to cases of sentence focus with subject particle placement, as in example (8) above and (63a) below.

[18] Tagalog further allows for focused VPs to be discontinuous via postverbal scrambling. See Richards 2019.

describing *que* as an additive focus particle rather than a conjunction. The placement of *que* in second-position within its logical focus leads to examples such as (44):

(44) **Latin** (Julius Caesar, glossed in Carlson 1983: p. 80)

A cultū prōvinciae longissime absunt, [minime]$_{MSF}$-**que** ad eōs mercatores
from culture province furthest be.absent least-also to them merchants
saepe commeant, [proximī]$_{MSF}$-**que** sunt Germānīs.
often visit near-also are Germany

'[They] are furthest from the civilization of Roman Italy, are [rarely visited by merchants]$_F$, and are also [closest to Germany]$_F$.'

We consider these final cases from Tagalog and Latin to be instructive, as anti-pied-piping in these cases can be described rather clearly as due to a process of second-position clitic placement which leads to a mismatch between the position of the particle and the position of its logical interpretation. In particular, of the mismatch exhibited by Latin *que*, Carlson (1983) writes, "A much simpler interpretation of *-que* could be given, though, if we were to somehow 'postpone' its semantic effect until a larger unit is encountered in the tree" (p. 73). The analysis that we develop in section 4 builds on this intuition and generalizes to other cases of anti-pied-piping.

3.3 Anti-pied-piping in phrasal movement

Many languages conventionally target focused constituents for movement. Such movement may also exhibit anti-pied-piping, where focus movement targets a constituent that is a proper subpart of the logical focus. We first saw this possibility in Hungarian in the introduction (example (7)), but it is also attested in various other unrelated languages as well. Considering examples from German and Czech, Fanselow & Lenertová (2011) refer to such cases as *subpart of focus fronting* or SFF, but we argue that such patterns are most fruitfully studied in conjunction with anti-pied-piping in focus particle placement, in a manner inspired by the theory of pied-piping (Horvath 2007, Cable 2010) that we present in section 4.

The examples in (45–49) all illustrate predicate focus with transitive VPs where only the object is moved to a left-peripheral focus position. All five languages here have VO base orders: Garrwa in (45) is a verb-initial language (Mushin 2005), while the others here are conventionally SVO.

(45) **Garrwa**[19] (Mushin 2006: p. 311)

[Nganbi-nyi]$_{MSF}$ ngayu yadajba.
lilyseed-DAT 1sg.NOM wait
'I'm [waiting for lilyseed]$_F$.'

(46) **Haitian Creole** (Franz Cozier ms. in Fanselow & Lenertová 2011: p. 194)

Se [poul]$_{MSF}$ m ap kuit ____.
FM chicken I PRES.PROG cook
'I am [cooking chicken]$_F$.'

(47) **Russian**[20] (Fanselow & Lenertová 2011: p. 203)

[Cvety]$_{MSF}$ oni sobrali ____.
flowers.ACC they plucked.PL
'They [plucked flowers]$_F$.'

(48) **Somali**[21] (Svolacchia, Mereu & Puglielli 1995: pp. 73–74)

Cali [Maryan]$_{MSF}$ **buu** ____ dilay.
Cali Maryam FM + 3sgm beat
a. 'Cali beat [Maryam]$_F$.'
b. 'Cali [beat Maryam]$_F$.'

(49) **Yoruba** (Manfredi 2004: ex 39a)

[Ẹmụ]$_{MSF}$ **ni** Àràbá rà ____.
palmwine FM Araba buy
a. 'Araba bought [palmwine]$_F$.'
b. 'Araba [bought palmwine]$_F$.'

Again, just as with focus particle placement above (see (27)), in certain cases anti-pied-piping is optional rather than required. For example, for predicate focus in German, the object alone may be fronted to the V2 prefield, constituting a case of anti-pied-piping (50a), or the entire focused VP can be fronted (50b), both with the same intended reading.

(50) **German** (Fanselow 2004: p. 10)

a. [Ein Büch]$_{MSF}$ hab ich __ gelesen.
one book have I read
'I have [read a book]$_F$.'

b. [Ein Büch gelesen]$_F$ hab ich __.
one book read have I
'I have [read a book]$_F$.'

German additionally allows the fronted constituent to host a focus particle, as in (51). Note that the stranded verb itself has been independently fronted here to verb-second position.

[19] The pronoun *ngayu* is a second-position clitic, which follows the verb in verb-initial clauses (Mushin 2006).

[20] Fanselow (2004: pp. 17–18) notes that similar facts hold of Czech, Croatian, and Polish as well. We will discuss some Czech examples in section 5.

[21] The focus marker *baa* here has fused with the subject pronoun to become *buu*. Given material is often preposed or postposed. In this case, the subject Cali is left-dislocated, with a coreferential subject pronoun. Svolacchia, Mereu & Puglielli (1995) show that Cali may also be right-dislocated, following the verb instead.

(51) **German**[22] (Fanselow 2004: p. 17)

On his wedding anniversary...

[**Nur** einen Blumenstrauß]$_{MSF}$ überreicht jeder dritte Ehemann ____.

only a bunch.of.flowers hands.over every third husband

'Every third husband only [hands over a bunch of flowers]$_{F}$.'

Fronted foci also appear with a dedicated focus marker in many Bantu languages. See for instance the Kîîtharaka example in (52), where object fronting is compatible with predicate focus. The marker on the fronted constituent (here, *i-*) may be analyzed as forming a constituent with the fronted phrase, like German *nur* in (51). However, because this marker only appears on fronted constituents, it is also amenable to an alternative analysis where *i-* is not a particle in our sense, but instead the realization of a higher functional head involved with focus movement, as in Yuan 2017.

(52) **Kîîtharaka** (Abels & Muriungi 2006: p. 9)

I-[nyomba]$_{MSF}$ Maria araakire __.

PRT-house Maria built

a. 'Maria built [the house]$_{F}$.'

b. 'Maria [built the house]$_{F}$.'

Focus movement with anti-pied-piping is also attested in cases of sentence focus. Examples (53–58) below are all reported as answers to questions such as 'What happened?' or 'What's the matter?', but where only the subject moves to a dedicated focus position. The relevant position is a cleft pivot position in (53), (56), and (57), V2 prefield position in (54), and a left-peripheral position marked by a focus marker in (55) and (58).

(53) **French** (Sasse 1987: p. 538)

C' est [maman]$_{MSF}$ qui ____ me bat.

This is mother who me hit

'[Mum's hitting me]$_{F}$.'

[22] The attested, natural reading here involves reconstruction of 'only' *nur* to a position below the universal subject quantifier, associating with the entire VP. The reconstruction of *nur* adjoined to a prefield constituent is independently known to be possible; see Smeets & Wagner 2018 and citations there.

(54) **German** (Fanselow & Lenertová 2011: p. 181)

[Eine Krankenschwester]$_{MSF}$ hat ____ einen Patienten getötet.

a nurse has a.ACC patient killed

'[A nurse killed a patient]$_F$.'

(55) **Somali** (Svolacchia, Mereu & Puglielli 1995: p. 74)

[Cali]$_{MSF}$ **baa** ____ Maryan dilay.

Cali FM Maryam beat

'[Cali beat Maryam]$_F$.'

(56) **Tilapa Otomi** (Palancar 2018: p. 261)

ñü [a rú ngopho]$_{MSF}$ kẹha ____ bi... bi-kokhi-'a.

PRT DEF.SG POSS.3SG brain COP TAM TAM-bleed-3SG

'[Her brains bled]$_F$.' (literally: "it was her brains that... that bled.")

(57) **Welsh** (Mac Cana 1973: p. 93, as glossed in Sasse 1987: p. 539)

[Y ffermwr]$_{MSF}$ (a) adawodd y glwyd ar agor.

DEF farmer REL let.3sg DEF gate open

a. 'It was [the farmer]$_F$ that left the gate open.'

b. '[The farmer left the gate open]$_F$.'

(58) **Wolof** (Robert 2010: p. 254)

[Musaa]$_{MSF}$, **moo** ____ dóor Ndey!

Musaa FM.3SG beat Ndey

'[Musa beat Ndey]$_F$!'

While such patterns are common, there are also cases of anti-pied-piping with sentence focus leading to focus movement of the object rather than the subject. One such example is (59) in Breton; in this case, there is no independent subject which can be fronted. We will discuss the general question of what subconstituent of the logical focus is targeted for MSF in section 3.4, and again in section 5.

(59) **Breton** (Jouitteau 2007: p. 178)

Q: What will happen?

[Va lein]$_{MSF}$ e tebrin ____.

my breakfast E eat.FUT.1SG

'[I will eat my breakfast]$_F$.'

Finally, we note that the common patterns of anti-pied-piping, above, are not exhaustive. Consider example (64) in Hinuq, where foci commonly occupy a preverbal position (Forker & Belyaev 2016). In this example, the entire phrase 'into an iron box' (i.e. a coffin) is focused, but only 'into a box' is put in the preverbal focus position, stranding the modifier 'iron,' underlined below.

(60) **Hinuq** (Forker & Belyaev 2016: p. 245)

haze oƛ̣ran essu-y haw [ɬadi teɬ]$_F$, [raƛ'-moɬ]$_F$, [yašik'-ma]$_{MSF}$ gor-no keruzo.

those seven brother-ERG she rock inside earth-OBL box-OBL put-TAM iron.GEN

'The seven brothers put her [into a rock]$_F$, [into the earth]$_F$, [into an iron box]$_F$.'

3.4 Position

The data presented in the preceding sections establish that anti-pied-piping is well attested cross-linguistically, as observed in both the position of focus particle placement and in the choice of constituent targeted for focus movement, which are two dominant MSF strategies. Given the existence of anti-pied-piping, a natural question is which sub-constituent of the logical focus is targeted for MSF. We will see that, in many languages, the element targeted for MSF is required or preferred to appear either at or near the left edge of the logical focus, but there is also substantial cross-linguistic variation in the presence or strength of this effect.

First, recall that in Yaeyaman and Ishkashimi, sentence focus is marked by particle placement on the subject and transitive predicate focus is marked by particle placement on the object. For these two languages, Davis (2013) and Karvovskaya (2013) also explicitly show that other possibilities are ungrammatical. These options are schematized below.

(61) **Miyara Yaeyaman *du* (Davis 2013, 2014) and Ishkashimi *məs* (Karvovskaya 2013):**

a.	Sentence focus:	[S O V]$_F$	⇒	✓S-PRT O V	*S O-PRT V
b.	Predicate focus:	S [O V]$_F$	⇒	*S-PRT O V	✓S O-PRT V

Similar leftmost effects are observed in other languages as well, although with the status of a preference rather than a hard constraint. Example (62) is a case of predicate focus with a ditransitive predicate in Tibetan. For the intended reading, consulted speakers prefer to place the additive particle *yang* after the leftmost (goal) argument within the predicate:

(62) **Tibetan** (Erlewine notes)

Kunga's a very good person. She prays at the temple every day.

Kun.dga' khyi-la-{✓**yang**} kha.lag-{?**yang**} sprad-gi-'dug.

Kunga dog-DAT -also food -also give-IMPF-AUX

'Kunga also [gives food to dogs]$_F$.'

In Japanese, however, there appears to be no such leftmost effect, or else it is even weaker.[23] For example, Aoyagi (1998, 2006) reports that the additive particle *mo* can be placed on the subject or object in (63) and support a sentence focus interpretation.

(63) **Japanese** (Aoyagi 2006: p. 123, based on Aoyagi 1998: p. 151)

At yesterday's party, not only did Hanako dance a dance, but...

a. [Taro]$_{MSF}$-**mo** piano-o hiita.
Taro-also piano-ACC played
'[Taro played piano]$_F$, too.'

b. Taro-ga [piano]$_{MSF}$-**mo** hiita.
Taro-NOM piano-also played
'[Taro played piano]$_F$, too.'

Dash & Datta (2020) describe a similar optionality in Hindi-Urdu and Bangla. For instance, both variants of the ditransitive example (64) below are described as grammatical for predicate focus, with the particle on a ditransitive goal or theme, although they also describe anti-pied-piping as subject to a "weak leftmost preference."

[23] Numata (2009: p. 70) claims that focus particles in Japanese anti-pied-piping always target the leftmost constituent of the focus, but she does not discuss cases such as Aoyagi's in (63). There does appear to be some speaker variation here; one speaker that we have consulted systematically rejected the sentence focus reading for examples with object *mo* as in (63bii).

(64) **Hindi-Urdu** (Dash & Datta 2020)

During Diwali, Pulkit plans to feed the poor and also distribute gifts to children. However, due to some emergency, he fails to be able to feed the poor.

(Vo) (sirf) bachcho-ko {✓**hii**} tohfe {✓**hii**} de payaa hai.
he only child.PL-DAT PRT gift.PL PRT give able.PERF.3PL AUX

'He could only [give gifts to children]$_F$.'

Next we turn to anti-pied-piping involving phrasal movement. Here too, a similar leftmost effect has been described in some languages. In the German example in (65), fronting of the ditransitive's theme allows for the predicate focus reading in (65aii), but fronting of the goal argument in (65bii) does not. The theme is naturally leftmost in the VP's base order.

(65) **German** (Fanselow 2004: p. 11)

a. [Die Bücher]$_{MSF}$ hab ich ____ ins Regal gestellt.
the books have I into.the shelf placed

i. 'I put [the books]$_F$ on the shelves.'

ii. 'I [put the books on the shelves]$_F$.'

b. [Ins Regal]$_{MSF}$ hab ich die Bücher ____ gestellt.
into.the shelf have I the books placed

i. 'I put the books [on the shelves]$_F$.'

ii. * 'I [put the books on the shelves]$_F$.'

The contrast in (65) also serves to motivate our description of these restrictions and preferences on MSF position as "leftmost" rather than "highest." Recall that German predicate focus can also be expressed by VP fronting, as in (50) above. Interpreting the contrast in (65) as illustrating a requirement for attracting the highest possible target for MSF should lead to uniform VP fronting in predicate focus; in contrast, both options are possible, as explained by a description of German as exhibiting a leftmost requirement on MSF position. In addition, the description of these requirements as "leftmost" allows for a productive unification between anti-pied-piping and pied-piping effects, in section 3.5 below, and also accords with additional evidence in section 5 that MSF position correlates with positions of stress assignment in some languages.

Kikuyu, like its sister language Kîîtharaka in (52) above, has a process of focus-fronting with concomitant particle placement. In cases of focus on a ditransitive VP with goal–theme base

order, F. Schwarz (2003) notes that "the answer in [(66a) with goal fronting] seems to be slightly preferred over the answer in [(66b) with theme fronting], although both seem to be acceptable." We indicate this with ? on (66b).

(66) **Kikuyu** (F. Schwarz 2003: p. 95)

Q: What does Abdul do?

a. **Ne-** [mwana] Abdul aðomaɣera ____ iβuku.
PRT 1.child Abdul read book

b. ? **Ne-** [iβuku] Abdul aðomaɣera mwana ____.
PRT book Abdul read child
'Abdul [read the child a book]$_F$.'

These examples from German and Kikuyu illustrate a leftmost requirement or preference on the choice of constituent chosen for movement from within the logical focus, parallel to the leftmost requirement or preference observed in focus particle placement within the logical focus. Like the observed leftmost effects on particle placement, the strength of the effect appears to be subject to cross-linguistic variation.

Finally, we note that the privileged status of subjects and objects here — as frequent targets of MSF for sentence focus and predicate focus, respectively — has also been recognized in Lambrecht & Polinsky 1997 and Lambrecht 2000. In particular, Lambrecht & Polinsky put forward the generalization in (67):

(67) Lambrecht & Polinsky 1997: p. 145, Lambrecht 2000: p. 626:
In a sentence-focus sentence, the subject is grammatically coded with some or all of the prosodic and/or morphosyntactic properties associated with the object in a corresponding predicate-focus sentence.

While such a generalization indeed holds in many languages, we have seen that it is not universal. We argue that this parallelism in (67) is best explained by our approach, by recognizing the widespread possibility of anti-pied-piping, which is commonly subject to leftmost requirements.[24]

[24] Lambrecht & Polinsky attempt to explain the status of subjects in sentence focus as a paradigmatic effect: in brief, paradigmatic differentiation between sentence focus and predicate focus necessitates the detopicalization of subjects in sentence focus. However, this explanation by itself does not explain the connection to predicate-focus objects in (67).

We conclude that anti-pied-piping in many languages observes a leftmost requirement, whereby MSF must or prefers to target the leftmost sub-phrase of the logical focus, although there is substantial cross-linguistic variation. We discuss further details of this process and its relation to stress placement and the theory of focus projection in section 5, after we present our core proposal. For now, it suffices to note that the process of MSF target selection that results in anti-pied-piping must be able to make reference to linearized structures, and ultimately to stress or determinants of stress as well. In addition, we note that anti-pied-piping behavior in particle placement and phrasal movement are notably parallel. Both of these properties of anti-pied-piping will be important features of the proposal we develop here.

3.5 Pied-piping and anti-pied-piping

The facts we have presented so far involve a mismatch between the logical focus and target of MSF, which we have termed *anti-pied-piping*, in reference to the more well-known phenomenon of *pied-piping*, a mismatch where the target of MSF properly contains the logical focus. As we conclude this section, we briefly highlight some parallels between the two phenomena, above and beyond this connection on a conceptual level. These parallels will further motivate our theory of particle placement to be developed in §4.

One parallel between pied-piping and anti-pied-piping is that there is cross-linguistic variation in whether these mismatches are optional or obligatory. Consider the contrast below between English and French in the obligatoriness of pied-piping when *wh*-movement targets a propositional object. In the former, a mismatch in the form of pied-piping is optional, while in the latter pied-piping is obligatory. This is reminiscent of the fact, presented above, that anti-pied-piping is obligatory in some languages and cases but optional in others.

(68) **Optional pied-piping of PP in English:**

a. [$_{PP}$ To *whom*] did you talk ____?

b. *Who* did you talk [$_{PP}$ to ____]?

(69) **Obligatory pied-piping of PP in French:** (Isobe & Sugisaki 2002)

a. [$_{PP}$ De *quel* sujet] as-tu parlé ____?
of which subject have-you talked
'About which subject have you talked?'

b. * [*Quel* sujet] as-tu parlé [$_{PP}$ de ____]?
which subject have-you talked of
'Which subject have you talked about?'

A second similarity comes from the presence of a leftmost requirement on pied-piping in some languages, for some forms of Ā-movement. For instance, as shown in (70), pied-piping in English *wh*-movement requires the *wh*-word — the locus of variation across semantic alternatives — to be at the left edge of the pied-piped constituent. The pair in (71) furthermore shows that the restriction is sensitive to linear position, rather than depth of embedding.

(70) **Leftmost requirement in English pied-piping:**
a. [*Whose* picture] did you frame ____?
b. * [A picture of *whom*] did you frame ____?

(71) a. [[[*Whose* brother]'s friend]'s father] did you see ____?
b. * [The father of [[*whose* brother]'s friend]] did you see ____?
(Kotek & Erlewine 2016: p. 687 based on Cable 2012: p. 823)

This leftmost requirement is not a necessary component of pied-piping, however. For example, *wh* pied-piping in Russian does not require the *wh*-phrase in pied-piping constructions to appear at the left edge, as demonstrated by (72):

(72) **No leftmost requirement in Russian pied-piping:** (Heck 2008: p. 79)
Interesno [$_{CP}$ [na sestre druga *č'ej* materi] on ženilsja ____].
interesting on sister friend whose mother he married
'I wonder whose mother's friend's sister he married.'

In sum, pied-piping also appears to make reference to the linear alignment of the logical locus of alternatives (*wh* or focus) and the target of MSF (here, *wh*-movement), subject to significant cross-linguistic variation; see especially Heck 2008. This aspect of pied-piping clearly echoes the observed variation in the leftmost requirements on anti-pied-piping, surveyed in section 3.4 above.

Finally, this leftmost requirement for pied-piping — in languages which display it — tolerates certain exceptions, which parallel the shape of attested exceptions to the leftmost requirement on anti-pied-piping. For example, in English, a light preposition like *to* may intervene between the

left edge of the pied-piped constituent and the *wh*-phrase as in (73a), but anything heavier such as a lexical noun in (73b) may not.

(73) **Not quite leftmost in English *wh* pied-piping:**

a. [To *which* student's friend] did you speak ____?

b. * [A friend of *which* student] did you see?

Exceptions of this form are also tolerated in anti-pied-piping with Latin *que*, discussed in section 3.2 above. *Que* generally follows one word at the left edge of its logical focus, but similarly skips monosyllabic prepositions:

(74) **Not quite leftmost in Latin *que* anti-pied-piping:** (Carlson 1983: p. 73)

... [ob [eās]$_{MSF}$-**que** rēs]$_{F}$

because these-also things

'... and [because of these things]$_{F}$, too'

We have shown here that there are a number of salient similarities between the two types of mismatch between the semantic locus of alternatives (focus or *wh*) and the corresponding constituent targeted by the syntax: pied-piping and anti-pied-piping. Whether or not these mismatches are optional or obligatory appears to be subject to variation. And perhaps more strikingly, both display a similar sensitivity to the linear order of elements in the sentence in some languages — requiring or preferring alignment of the left edge of the logical focus or *wh* with the left edge of the constituent targeted for MSF — suggesting a deeper connection between the two phenomenon.

3.6 Summary

We have now established a number of facts about anti-pied-piping. Anti-pied-piping is attested in a wide range of languages: in total, we have identified anti-pied-piping in over fifty languages from over thirty different genera, which we list in an index at the end; see also footnote 3. Both particle placement as well as focus fronting allow anti-pied-piping, where it may be invoked optionally, and with the choice of constituent targeted often exhibiting a leftmost requirement. These properties of optionality and preferences for left edge alignment, subject to cross-linguistic variation, are also well-studied properties of pied-piping.

The existence of anti-pied-piping complicates the syntax/semantics of focus particle placement. It forces us to divorce the pronounced position of particles and their position of interpretation,

just as Carlson (1983) suggests in his discussion of Latin *que* as noted above.[25] The existence of anti-pied-piping in focus movement also challenges the idea that syntactic operations make direct reference to information-structural features such as F-marking (Fanselow 2006, Hartmann & Zimmermann 2007b: p. 388), in much the same way that pied-piping does (Horvath 2007, Cable 2010). The analysis that we develop is very much inspired by contemporary theories of pied-piping, allowing us to unify anti-pied-piping in particle placement and in movement and explain their similarities, as well as to account for parallels between anti-pied-piping and pied-piping.

4 A theory of particle placement

We now present our analysis for the anti-pied-piping patterns presented in the previous sections. Anti-pied-piping constitutes a serious a serious challenge for the compositional semantics of focus particles, as a central expectation of focus semantics since Jackendoff 1972 and Rooth 1985 is that a focused constituent be in the scope of an associated focus-sensitive operator. We therefore begin by putting forward a new and general theory for the syntax/semantics of focus particles and their placement, which will allow for anti-pied-piping in focus particle placement. We then address cases of anti-pied-piping in focus movement, building on the influential proposal for pied-piping put forward by Horvath (2007) and Cable (2010), which takes all Ā-movement to be movement of particle-adjoined phrases.

4.1 Severing the particle from its semantics

We begin with a consideration of the syntax/semantics of focus particles. There are broadly two analytic approaches to the semantics of focus particles which adjoin to a sub-clausal phrase such as the *only* in example (75) below.

(75) Alex made **only** [sandwiches]$_F$ for Brie.

One approach is for *only* here to be a semantically contentful, two-place operator: roughly, *only* builds a quantifier based on the denotation of its sister. We refer to this approach as the *quantificational particle* theory. Another approach would be for the pronounced *only* in (75) to not itself

[25] Alternatively, such data may lead us to abandon the assumption that individual focus particles have a uniform semantics, which is the conclusion that Matić & Wedgwood (2013) suggest after considering data with anti-pied-piping.

be a semantically contentful operator, but instead simply a flag that signals the presence of a corresponding ONLY operator in the clause (Lee 2004, Hirsch 2017, a.o.). The covert ONLY operator is a one-place operator that takes a sister of propositional type.[26] We refer to this second theory as the OPERATOR–PARTICLE theory.

We propose that anti-pied-piping reflects the fact that languages make use of the operator–particle theory, with particles being inserted via *Late Adjunction* (Lebeaux 1988, 1991) at particular, cyclic breaks in the derivation. We discuss the timing of this process in detail in section 4.2. In the remainder of this section, we discuss and motivate the operator–particle theory in greater detail.

Let's return again to example (75). Under the operator–particle approach, example (75) above reflects the syntactic structure in (76) below: an operator OP with the semantics of one-place *only* is adjoined to the clausal spine, here taking *v*P as its sister,[27] and a corresponding particle PRT is adjoined to the focused phrase *sandwiches*. Particles are adjoined clitics, as explicitly claimed by Aoyagi (1998), targeting maximal projections.[28] English then allows either the operator or particle to be pronounced as *only*, but not simultaneously.[29] If the particle position is pronounced, we yield (75) above. If the operator is pronounced instead, we yield the form in (77) with sentential *only*, which has the equivalent interpretation.

(76) Alex$_{\text{i}}$ **OP$_{\textbf{only}}$** [$_{v\text{P}}$ t_{i} made [**PRT$_{\textbf{only}}$** [sandwiches]$_{\text{F}}$] for Brie]

---

[26] See Rooth 1985 for a general type-shifting procedure which systematically relates these two-place and one-place variants of focus particle meanings.

[27] We adopt the VP-internal subject hypothesis and refer to the agent-introducing head as *v*. Operators must take a constituent of propositional type as their sister. *v*P is proposition-denoting, with extensional type *t* (Heim & Kratzer 1998).

[28] More specifically, Bayer (1996: p. 14) interestingly claims, "the only requirement seems to be that [focus particles] attach to a [+max] category which is able to bear stress." This reference to stress foreshadows our discussion in section 5.

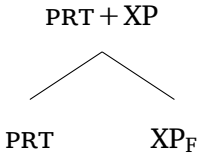
[29] Some languages allow both the particle and corresponding operator to be pronounced simultaneously, descriptively in a concord-like relationship. In German Sign Language, known as Deutsche Gebärdensprache or DGS, the 'only' particle NUR$_1$ may realize a particle adjoined to the focus or an operator in sentence-final position, or NUR$_1$ may appear in both positions simultaneously (Herrmann 2013: pp. 299–300). In Vietnamese, the operator *chỉ*, particle *mỗi*, or both can be pronounced at a time (Hole 2013, Erlewine 2017: pp. 331–332). We also discuss dual pronunciation of the particle and operator in Lavukaleve below. See also Barbiers 2010.

(77) Alex **only** made [sandwiches]$_F$ for Brie. =(9a)

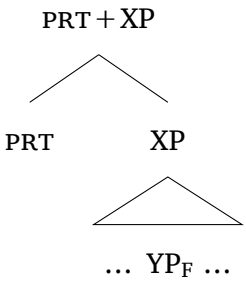
See Hirsch 2017 chapter 7 for extensive motivation for the operator–particle theory, primarily from the scope-taking behavior of English *only*. Hirsch proposes that the operator and particle are linked by an Agree operation, which we will present overt evidence for below.[30]

In (76), the particle has adjoined directly to the logical focus. This possibility is schematized in (78). But faithful adjunction to the focused constituent is not the only possibility. The particle could be adjoined to a constituent that properly contains the logical focus, as schematized in (79); this is pied-piping. The particle could also be adjoined to a constituent properly contained within the focus, as in (80), which is the configuration we recognize as anti-pied-piping.

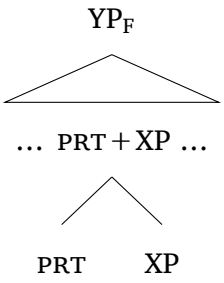
(78) **No mismatch (MSF = F)**



(79) **Pied-piping (MSF > F)**



(80) **Anti-pied-piping (MSF < F)**



Crucially, because OP bears the semantics associated with the OP–PRT pair but PRT is semantically inert, the structure in (80) will be interpreted correctly as long as the focused constituent (YP in (80)) is within the scope of the corresponding operator, regardless of the position of the particle.

We should emphasize again that we use F-marking (subscript F) here, as in (78–80), solely as a presentational device to indicate the interpreted position of logical focus. We do not intend to commit to the existence of F-marking as a syntactically visible annotation (as in Jackendoff 1972 and Rooth 1985), although the theory for particles that we describe here is in principle compatible with either choice. We will return to this architectural question in section 4.4.

Motivation for the operator–particle theory comes from the existence of cases of anti-pied-piping involving multiple particles within a single focus. Eaton (2010b) observes that focus particles in Sandawe exhibit anti-pied-piping, as they "mark the constituent in question as contained

[30] In addition, the particle phrase may be thought to covertly move to the corresponding operator at LF, as in Erlewine & Kotek 2018. This would account for the behavior of particles which are not allowed to be separated from their corresponding operator position by syntactic islands, as in Premodern Japanese, Okinawan, and Sinhala (see e.g. Hagstrom 1998), Imbabura Quechua (Hermon 1984), Tlingit (Cable 2010), and Tundra Yukaghir (Matić 2014).

within the focus of the sentence" (p. 10). For instance, example (81a) is described as a felicitous sentence-focus answer to 'What happened?', with focus particles appearing on both the subject and object. Example (81b) from Jonah 1:5 is an instance of predicate focus, where the theme, goal, and source arguments of the verb all bear particles. The verb can also host focus particles, but only in cases of narrow focus on the verb.

(81) **Sandawe**[31]

a. [Nâm]$_{MSF}$-**aː** [sómbá]$_{MSF}$-**sà** t^{h}ìmè.
Nam-PRT.NOM fish-PRT.3SGF cook
'[Nam cooked the fish]$_{F}$.' (Eaton 2002: p. 276)

b. … [mêlì-tà-tʃè-é]$_{MSF}$-**àʔ** [mìzígò-ɨ̃-ts'ì]$_{MSF}$-**àʔ** [ts'â-tà-nà]$_{MSF}$-**àʔ** kùʔùm̀sè.
boat-in-from-3SGM-PRT.3PL load-sp.-at-PRT.3PL water-in-to-PRT.3PL throw
'…they [threw the loads out of the boat into the water]$_{F}$.' (Eaton 2010a: p. 112)

Similar multiple particle placement within a single focus is also attested in Kokama-Kokamilla; see Vallejos Yopán 2009: pp. 422–423, exx 25a–c.

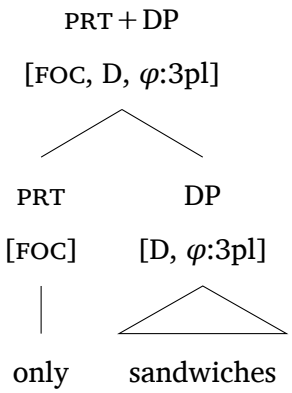
Such patterns can be modeled straightforwardly under the operator–particle theory. These languages simply allow for multiple particles to be adjoined within a single focused constituent. A single logical operator then Agrees with all of these particles and takes the entire focus in its scope. Under the operator–particle theory, particles and operators need not be one-to-one, although in most cases this does seem to be required. See also Lee 2004: p. 276 for a separate argument from multiple focus constructions that particles need not be one-to-one with their corresponding operator.

We now discuss the formal consequences of particle adjunction and extend the analysis to (anti-)pied-piping in phrasal movement, before discussing the timing of particle adjunction in section 4.2. Although particles are semantically inert, they may introduce formal features. Formal

[31] Note that the forms of these particles differ. The focus particle on subjects as in (81a) is limited specifically to focus-marked subjects and thus is described as "nominative" in this literature, and is therefore glossed PRT.NOM here. The form of the focus particle on non-subjects reflects the *φ*-features of the subject, i.e. third singular feminine in (81a) and third plural in (81b). We thank Helen Eaton (p.c.) for discussion of these examples and related aspects of Sandawe. See Branan 2019 for discussion of the syntax of such agreement morphology which can appear on multiple other nominals, and see also Forker 2016 (especially pp. 20–21) for discussion of subject agreement markers with focus particle-like distribution in other, unrelated languages.

features of both the particle (PRT) and its sister XP will project to their mother (Kotek 2014b; see also Citko 2008), which we refer to as a *particle phrase* and label PRT + XP in the general case. Suppose for example that the particle in (76) bears the feature [FOC]. The resulting phrase *only sandwiches* will project the [FOC] feature, as well as features projected from *sandwiches* such as the category [D] and its φ-features:

(82)



Focus constructions in Lavukaleve offer explicit evidence for many aspects of the operator–particle theory as just described.[32] In Lavukaleve, a focused argument hosts a particle, which is the subject in (83a) and object in (83b). Notice that the form of the particle inflects to reflect the φ-features of the constituent it has adjoined to. In addition, in such cases, Lavukaleve allows for the pronunciation of another marker in a fixed, post-verbal position, which we analyze as the corresponding operator. The operator also inflects to reflect the φ-features of the focused constituent. (See footnote 29 for other languages which allow for the simultaneous realization of particles and their operators.)

(83) **Lavukaleve**[33] (Terrill 2003: p. 277)

a. [Aira la]$_F$ **feo** fo'sal na aua **heo**.
woman(f) ART.SGF PRT.3SGF fish(m) ART.SGM ate.AGR OP.3SGF
'[The woman]$_F$ ate a fish.'

b. Aira la [fo'sal na]$_F$ **fin** oum **hin**.
woman(f) ART.SGF fish(m) ART.SGM PRT.3SGM ate.AGR OP.3SGM
'The woman ate [a fish]$_F$.'

[32] We thank Isaac Gould (p.c.) for drawing our attention to the patterns of focus markers in Lavukaleve.

The possibility of this inflection on both the particle and operator directly supports our analysis for the syntax of particle phrases and their relationship to operators. As illustrated in (82) above, the particle phrase will bear both the formal features of the particle (e.g. [FOC]) and of its host, such as its φ-features. Following Hirsch 2017, a particle phrase and its corresponding operator will establish an Agree relationship (see e.g. Chomsky 2000) based on their shared feature (e.g. [FOC]), which then allows for the particle phrase's φ-features to be copied onto the operator.

This approach to particle syntax may also serve to explain interactions between focus and the realization of case-marking on nominals. Consider the behavior of Kakataibo (Panoan) as described in Valle 2014. (We do not reproduce this data here, in the interest of space.) Focused arguments in Kakataibo occupy a dedicated sentence-initial position, identifiable by the position of second-position clitics which encliticize to the focused constituent, if any. Valle shows that sentence focus in Kakataibo is also expressed by movement of the subject to the focus position, exemplifying anti-pied-piping. Valle furthermore notes that this focus position triggers differential subject marking: the ergative case marker on transitive subjects is generally optional, but it becomes obligatory in the focus position, including in cases of sentence focus with anti-pied-piping. Thus in Kakataibo, targeting a subject for MSF — by adjoining an unpronounced particle or by its subsequent movement to the sentence-initial focus position — then has the result of affecting the realization of case-marking on the subject.

The adjunction of a focus particle may have other consequences for its host, by affecting the structural relationship between the host and its surrounding structure. The syntactic presence of adjoined particles may serve to explain the inability of focused phrases to undergo incorporation or to be visible for external morphological operations (Haiman 1988), or for focus particles to shield nominals from what would otherwise be binding-theoretic violations (Heim 1998: see especially p. 242).

The syntactic visibility of features such as [FOC] on the particle phrase is also key to our account for anti-pied-piping in phrasal movement. For concreteness, let us return to our basic English example with the particle phrase *only sandwiches*. Suppose we introduce a higher head that probes for the [FOC] feature and moves a matching goal. This probe will skip the subject *Alex* and the verb *made* and Agree with the particle phrase PRT + DP and move it. This movement of

[33] The form of the verb 'ate' varies in these examples due to an interaction between the choice of argument agreed with by the clause-final focus marker and the agreement expressed on the verb. See Terrill 2003 for discussion.

PRT + DP could, for example, result in a cleft:[34]

(84) It's $[_{\text{PRT+DP}}\ \text{PRT}_{\text{only}}\ [\text{sandwiches}]_{\text{F}}\ ]$ that Alex made ____ for Brie.
⇒ It's only SANDWICHES that Alex made for Brie.

Suppose furthermore that there is also a PRT which introduces the [FOC] formal feature but is unpronounced. Adjunction of this particle to *sandwiches* will lead to the appearance of *sandwiches* moving alone to become the cleft pivot, without an overt particle:

(85) It's $[_{\text{PRT+DP}}\ \text{PRT}_{\emptyset}\ [\text{sandwiches}]_{\text{F}}\ ]$ that Alex made ____ for Brie.
⇒ It's SANDWICHES that Alex made for Brie.

We follow Horvath 2007, Cable 2010, Safir to appear, among others, in proposing that all Ā-movement is, by definition, movement of particle phrases.[35] If the particle adjoins to a focus-containing phrase, this results in Ā-movement with pied-piping. Similarly, if the particle adjoins to a phrase contained within the focus, this yields Ā-movement with anti-pied-piping. Notice that, under this proposal, the parallels observed between anti-pied-piping in particle placement and in phrasal movement — for example, in both being subject to leftmost requirements in many languages — fall out immediately: Ā-movement such as focus movement is always movement of a particle phrase, although in many cases the relevant particle may be unpronounced.[36]

4.2 The timing of particle placement

We now turn to the question of when and how particles are introduced into the derivation. Recall that anti-pied-piping behavior makes reference to the linear order of constituents (§3.4) and furthermore also correlates with stress assignment in some languages, as we elaborate in section 5

[34] The corresponding operator in this case must be higher than where it is represented in (76), in the cleft's higher clause.

[35] Cable calls these particles which form targets for Ā-movement *Q-particles*. However, Cable's motivating discussion centered around *wh*-questions, where the term "Q-particle" may refer to semantically contentful morphemes associated with *wh*-questions; see especially Hagstrom 1998 and Kotek 2014a. Here we refer to the broader class of such morphemes simply as *particles*, comprising both constituent focus particles and Cable's Q-particles.

[36] This approach also accords with Van Urk 2015's featural criterion for the A/Ā-distinction: A-movement is that which targets obligatory features of lexical items, such as category features, whereas Ā-movement is that which targets optional features. These optional features are introduced by particle adjunction. In contrast, A-movement does not pied-pipe, nor anti-pied-pipe, because A-movement does not target a feature introduced by a particle, and thus there is no apparent optionality or mismatch in the size of the moved constituent due to variability in adjunction position. We briefly discuss further consequences of our theory of particle placement for the A/Ā-distinction in the conclusion.

below. It follows that particle placement must make reference to structures that are linearized and possibly prosodified. But at the same time, particle placement cannot be entirely post-syntactic. As we just proposed, particle placement also feeds further syntactic processes, by forming targets for movement and agreement.

Our solution will be to adopt a theory of cyclic structure-building, where structures are built and undergo *Spell-Out* at certain punctuated points in the derivation (Uriagereka 1999, Chomsky 2000, 2001, a.o.). Whereas the syntax proper operates on hierarchical structures without reference to the phonology, when a structure undergoes Spell-Out, the pronunciation of its terminal nodes, their word order, and prosodic phrasing are calculated (see e.g. Dobashi 2003, 2010, Ishihara 2004, 2007, Fox & Pesetsky 2005, Kratzer & Selkirk 2007, Kahnemuyipour 2009, Sato 2012a). Spell-Out can be followed by further derivational steps, building on the output of Spell-Out. Following this body of work, especially Fox & Pesetsky 2005, we take Spell-Out to target complete *phases*, which for our purposes correspond to *v*P and CP of the clausal spine.

We propose that particles are adjoined during cyclic Spell-Out. When a phase undergoes Spell-Out, first its linear and prosodic representation is calculated. Particle adjunction then takes place via Late Adjunction (Lebeaux 1988, 1991) into this structure.[37] As noted above, particles may adjoin directly to a focused phrase, or to a containing phrase (pied-piping) or to a contained phrase (anti-pied-piping), as the language allows. To determine the target for adjunction, the grammar may make reference to the phase's linear and prosodic representation, therefore allowing for languages to specify particular rules for particle placement such as targeting the leftmost phrase within the focus. As a final step during Spell-Out, we propose that the newly derived particle phrase may optionally move to the edge of the phase. This is necessary for allowing the particle phrase to be moved out of the current phase, if we assume the Phase Impenetrability Condition of Chomsky 2000, 2001 or similar.[38]

One advantage of this Late Adjunction approach to particle placement is that it allows us to account for the fact that particles do not disrupt selection between their host and its selector, despite the fact that particle phrases themselves are later syntactically visible for syntactic operations. See Aoyagi 1998 ch. 2 for discussion of this tension. This can be seen as a case of derivational opacity:

[37] The appeal to Late Adjunction here can be thought of as similar to theories of second-position clitic placement that involve counter-cyclic placement or displacement in the post-syntax (see e.g. Halpern 1995, Embick & Noyer 2001, Legate 2008), but not applying entirely post-syntactically, which will be important below.

[38] We thank Stefan Keine (p.c.) for bringing this question to our attention.

the strictly local structural relationship necessary for selection between, for instance, a transitive verb and its object is satisfied prior to introduction of a particle, during the construction of the phase, prior to the introduction of particles during phasal Spell-Out.

After one phase undergoes Spell-Out, the syntactic derivation can continue, building on the result of the lower phase. Therefore a particle phrase built during a lower phase's Spell-Out will be visible for syntactic operations from above, including for movement and agreement, as we have seen. Ultimately, for the derivation to converge, the corresponding operator must be present and Agree with the particle,[39] as we discussed above, and the logical focus must be in the scope of the operator.

Further motivation for the timing of particle placement comes from opaque interactions between particle placement and subsequent, independent movement operations. For example, consider the Ishkashimi example in (86), where the object has scrambled over the subject and the subject bears the focus particle *məs*. Karvovskaya (2013) reports this sentence as "marked but somewhat acceptable" with sentence-focus interpretation, which we report with ?. The (relative) acceptability of (86) is puzzling given the strict leftmost requirement of anti-pied-piping particle placement in Ishkashimi (see schema in (61)): the particle targets the subject in (86), which is not leftmost within the sentence.

(86) **Ishkashimi** (cf 35) (Karvovskaya 2013: p. 88)

?Xi dusto-i [wai mol]$_{MSF}$-**məs** ____ zənayu isu.
REFL hands-ACC DEM husband-also wash come
'[Her husband goes to wash his hands]$_F$, too.'

The possibility of (86) with its sentence-focus interpretation supports our proposal for the timing of particle placement. Suppose that the sentence-focus construal here involves the *v*P event description being the logical focus, which includes the base position of the subject as well as the object, which contains a reflexive which must be bound by the subject. When the *v*P phase undergoes Spell-Out in (87a), the phase is first linearized in its basic SOV order, and then particle placement applies, targeting the leftmost constituent within the focus: the subject. Scrambling of the object then applies for independent reasons, in (87b), fronting the object across the subject to the phase edge, and potentially later to a higher position.

[39] Or *particles*, plural, as in the cases of multiple particle placement discussed above; see (81).

(87) a. At phasal Spell-Out, Late Adjoin particle to the leftmost sub-phrase in the focused *v*P:

$[_{vP}$ S-**PRT** O V $]_F$

b. Independently scramble object across subject:

O S-PRT ____ V

A similar interaction is also reported for Japanese. Consider example (88), where the object is marked with the focus particle *dake*, and has been fronted across the subject. Kotani (2009) shows that examples of this form allow for a predicate-focus interpretation, as given in (88).

(88) **Japanese** (based on Kotani 2009: p. 30)

[Huro]$_{MSF}$-**dake** Takuya-wa ____ wakasi-ta.

bath-only Takuya-TOP heat-PAST

'Takuya only [heated up a bath]$_F$.'

Recall that Japanese allows optional anti-pied-piping at the VP level (see (27)), with particle placement targeting a proper subpart of the logical focus. On the surface, however, the constituent targeted by particle adjunction in (88) is not a subpart of the focus.[40]

Such examples are also accounted for straightforwardly under our proposal. We begin by linearizing the *v*P phase, including the base position of the subject, when it undergoes cyclic Spell-Out in (89a). Particle adjunction here optionally targets a subpart of the focus, resulting in anti-pied-piping particle placement on the object. Subsequent movement operations, as in (89b), may target the resulting particle phrase PRT + DP.

(89) a. At phasal Spell-Out, Late Adjoin particle within the focused VP:

$[_{vP}$ S $[_{VP}$ O-**PRT** V $]_F$ $]$

b. Scramble object particle phrase across subject:

O-PRT S ____ V

Notice that, in these cases, an approach to anti-pied-piping via post-syntactic lowering will fail. Such an approach may posit that particles are first built adjoined directly to their logical focus but then lower after the end of the syntactic derivation onto its surface host. The cases under consideration argue against such an approach, as lowering should always take place after any

[40] Dash & Datta (2020) show this same interaction to hold in Hindi-Urdu and Bangla as well: an object particle phrase may scramble out of VP over the subject and retain its predicate-focus interpretation.

and all instances of syntactic movement. Contrary to fact, on such an approach we would expect movement of an object to a position higher in the clause to bleed particle placement in cases such as (88), or to feed particle placement if the object then becomes the leftmost constituent within the focus as in the Ishkashimi (86). In contrast, the theory developed here, which interleaves particle placement and movement operations, derives the attested counterbleeding and counterfeeding patterns discussed here.

4.3 Argument/adjunct asymmetries

The empirical landscape laid out in §2 was restricted, in that the patterns of anti-pied-piping consistently involved core arguments, without adjuncts. While this is in part a function of sources from which our survey was built, there is evidence from at least some languages in the survey which suggests that there is a systemtic asymmetry between arguments and adjuncts for anti-pied-piping.

Consider the Japanese examples in (90) below. Aoyagi (1998) observes that when the focus particle appears on an object, as in (90a), both the narrow focus and anti-pied-piping predicate focus readings are available, while in (90b), when the focus particle appears on a frequency adverbial, only the narrow focus reading is available.

(90) **Japanese** (Aoyagi 1998: p. 175)

John not only took a shot every morning, but...

a. iti-niti san-kai [kusuri]$_{MSF}$-**mo** nom-ta
one-day three-times medicine-also drink-PAST
   i. '(he) also took [medicine]$_F$ three times a day.'
   ii. '(he) also [took medicine three times a day]$_F$.'

b. [iti-niti san-kai]$_{MSF}$-**mo** kusuri-o nom-ta.
one-day three-times-also medicine-ACC drink-PAST
   i. '(he) even took medicine [three times a day]$_F$'.
   ii. * '(he) also [took medicine three times a day]$_F$.'

Kenesei (1998) observes a similar asymmetry between arguments and adjuncts in Hungarian, where the relevant MSF strategy is focus movement rather than overt particle placement. Although the object can be fronted to the preverbal focus position to express predicate focus — as in example

(7), repeated here as (91a) — an adverb such as *hangosan* 'aloud' in the focus position as in (91b) is only compatible with narrow focus on the adjunct.[41]

(91) **Hungarian** (Kenesei 1998: p. 77)

a. Péter [a Hamletet]$_{MSF}$ olvasta fel a kertben.
Peter the Hamlet read VM the garden.INE
'Peter [read out Hamlet in the garden]$_F$.' =(7)

b. Péter [hangosan]$_{MSF}$ olvasta fel a Hamletet.
Peter aloud read VM the Hamlet
i. 'Peter read out Hamlet [aloud]$_F$.'
ii. * 'Peter [read out Hamlet aloud]$_F$.'

The theory developed here — in which particle placement takes place at punctuated points in the derivation — allows us to account for this asymmetry, based on an approach to the argument/adjunct asymmetry proposed by Lebeaux (1988, 1991) and in much subsequent work. On this approach, one crucial distinction between arguments and adjuncts is that adjuncts, in contrast with arguments, are introduced into the clause via Late Adjunction, perhaps later during cyclic Spell-Out. This may offer a way of understanding the impossibility of adjunct anti-pied-piping: the adjunct is not present in the structure at the point of *v*P Spell-Out, when particles for predicate focus are adjoined. Since these elements are not present in the phase, they cannot be targeted for particle adjunction.

Note that it is also not simply the case that adjuncts cannot be targeted for particle placement at all: to wit, in (90b) and (91b), MSF does target the adjunct — with overt particle placement in Japanese and covert particle placement followed by movement in Hungarian — but in these cases, the particle must adjoin directly to the logical focus. One possibility is that the particles in these cases are quantificational particles of the type briefly described in section 4.1; quantificational particles do not allow for anti-pied-piping mismatches. These contrasts in (90–91) then suggest that the placement of particles of operator–particle pairs must take place early at cyclic Spell-Out, prior to the Late Adjunction of adjuncts, which in turn feeds the introduction of quantificational particles. We leave a fuller investigation of such argument/adjunct contrasts and their consequences for derivational timing for future work.

[41] Recall from footnote 1 that the postverbal position of the verb modifier *fel* ensures that the preverbal constituent is in the focus position.

4.4 Reference to the logical focus and misplacement effects

Up to this point, we have described patterns of anti-pied-piping and their derivation by descriptively making reference to the position of logical focus, indicated by subscript F. We now turn to the status of these annotations in the grammar. An important question for the architecture of grammar is whether or not the syntax is actually able to make reference to these F-mark annotations, as originally proposed by Jackendoff 1972 and adopted in much subsequent work on the syntax/semantics of focus, including Kratzer & Selkirk to appear.[42] The theory for particle placement that we have developed here is in principle compatible with either possibility. However, we believe that there are both empirical and conceptual arguments against syntax making reference to these F-mark annotations, which we briefly discuss here.[43]

Our first argument concerns the lack of evidence for syntactic reference directly to F-marking. For example, we are not aware of any syntactic process (e.g. movement or agreement) that specifically targets the precise constituent that is interpreted as the logical focus, without any tolerance for pied-piping or anti-pied-piping mismatches. Following Horvath (2000, 2007) and Cable's (2010) discussions of pied-piping, then, we believe that any morphosyntactic process at first glance described as a reflex of focus is in fact better stated as a morphosyntactic response to a particle phrase, potentially involving an unpronounced particle.[44, 45]

The second argument against F-marking in the syntax comes from the existence of what we call examples of *misplacement* mismatches. In addition to the well-known pied-piping mismatch (79), we have now extensively documented the possibility of anti-pied-piping, where a proper subpart of the logical focus is targeted for MSF (80). There is however yet another type of mismatch: where MSF targets a constituent which is completely *disjoint* from the logical focus, as schematized in (92):

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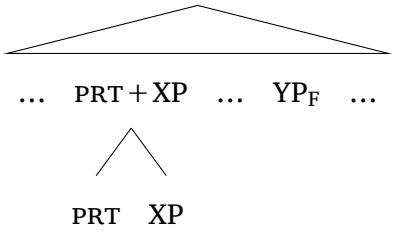
[42] This question can be thought of as the morphosyntactic analogue of the question raised in Rooth 1992 of how severely the compositional semantics can be restricted in its access to focus alternatives.

[43] See also Kadmon & Sevi 2011 for other, independent arguments against F-mark annotations in the syntax.

[44] And although we concentrate on focus constructions here, we believe similar arguments may be made for other information-structural notions which have been argued to be syntactically visible, such as topichood.

[45] As proposed in Kratzer & Selkirk to appear and citations therein, particles may manifest not only as segments, but also as tones or tunes; apparently unpronounced particles might instead be realized supersegmentally. See Ahn & Sailor (2018) for discussion of a number of cases of misplacement (below) involving such prosodic reflexes of focus, which could be accounted for straightforwardly on such an extended account.

(92) **Misplacement (MSF and F do not overlap):**



We have already seen one example of misplacement above. As noted in section 3.2 above, the Tangale example (31), repeated here as (93), is compatible with object focus, predicate focus, or verb focus. Hartmann & Zimmermann (2007a) show that three readings are realized equivalently, also without any prosodic differentiation. The option of verb focus here, with particle placement on the object, is an instance of misplacement. Hartmann & Zimmermann (2009) also document the same focus ambiguity behavior in the sister language Gùrùntùm.

(93) **Misplacement in Tangale** =(31)

N fad-go **núm** [littáfi-i]$_{MSF}$.

I buy-PERF only book-the

a. 'I only bought [the book]$_F$.' (no mismatch)

b. 'I only [bought the book]$_F$.' (anti-pied-piping)

c. 'I only [bought] the book$_F$.' (misplacement)

Another striking example of particle misplacement comes from Ngamo, which is also Chadic. Example (94) shows that the 'only' particle *yak('i)* may be placed in various positions in the clause while associating with the object, with no change in meaning. In each of these positions, the position of the particle is underinformative as to its intended focus associate, with the only clue being that, descriptively, the particle appears as *yak* when preceding the intended focus and *yak'i* when following.

(94) **Misplacement in Ngamo** (Grubic 2015: p. 188)

(**Yak**) Kule (**yak**) salko (**yak**) [bano]$_F$ (**yak'i**) mano (**yak'i**).

only Kule only build.PRF only house only last.year only

'Kule only built [a house]$_F$ last year.'

Grubic (2015: ch. 6) also documents similar patterns with the additive particle *ke('e)* and scalar particle *har('i)*.

Focus movement may also manifest misplacement effects, as exemplified in the Chadic language Kanakuru, as described in Tuller 1992 based on Newman 1974.[46] In brief, Kanakuru has default SVOX word order and can front focused non-subject arguments to a clause-initial focus position. However, subject focus results in a VOSX word order. As especially argued by Tuller, this VOSX order is best analyzed as the result of VP fronting to the focus position. Taking this account to be correct, this focus movement targeting the VP in the case of subject focus is an instance of misplacement. We refer the interested reader to Newman 1974, Tuller 1992, as well as Samek-Lodovici 1998 for the details of these facts in Kanakuru.

The possibility of misplacement effects in any language is surprising if grammars universally may make reference to the intended logical focus in the form of F-marking. Both pied-piping and anti-pied-piping mismatches are naturally described in relation to the position of logical focus: when a particular structure undergoes Spell-Out, the grammar finds the position of F-marking and may optionally move up or down the tree, respectively, to choose an ideal host for particle adjunction. Given the potential costs incurred by misplacement on the efficient communication of intended meanings, it is unclear why any grammar that can make direct reference to the position of focus would allow for misplacement mismatches.

In contrast, if the syntax is unable to make reference to the position of focus, the existence of misplacement effects is less surprising. The operator–particle theory for focus particles presented here allows for misplacement as well: recall that the particle of an operator–particle pair is not semantically contentful, so all that is ultimately required is for the logical focus to be in the scope of the interpreted operator at LF and for the particle to be in a position to syntactically Agree with the operator. The operator–particle theory does not enforce any direct relationship between the position of the logical focus and the position of particle adjunction. For concreteness, consider the Ngamo example (94) once again. For (94) to be grammatical, the 'only' operator must be in a position that takes the focused object in its scope, and with the particle *yak('i)* in a position to Agree with it, which is straightforwardly possible if the operator may be adjoined relatively high in the clause. The particle *yak('i)* then simply serves as a flag to signal the presence of an abstract 'only' operator higher in the clause.

Instead, the challenge for an F-less theory of grammar would be to account for the many

[46] We have no reason to believe that misplacement effects are somehow a distinctive feature of Chadic languages. The fact that the most compelling examples of misplacement that we have identified are all in Chadic languages, we believe, simply reflects the relative richness of detailed prior work on the syntax/semantics of focus in these languages.

languages which apparently do not tolerate misplacement mismatches, which overwhelmingly successfully place particles directly onto the logically focused constituent. Can the grammar consistently place a particle on or near the logical focus, without misplacement, if it cannot directly make reference to the position of the logical focus? We believe that this may be possible, although we leave a full investigation and demonstration for future work. As a first step towards such an account, we must develop a richer understanding of how grammars generally choose a target for particle placement, for example in cases of anti-pied-piping. This is the question we turn to next, in section 5.

We reiterate that, for the purposes of the current paper, we will stay agnostic as to whether or not particle placement may make reference to the position of logical focus (F-marking). The operator–particle theory introduced in this section, which allows for the anti-pied-piping mismatches documented above, is compatible with either theoretical position. Below, we will continue to make reference to the position of logical focus using F-marking for expository convenience. However, on the basis of considerations of theoretical parsimony, in the absence of evidence that any other syntactic process makes direct reference to F-marking, and with the existence of misplacement effects, we believe an F-less theory of grammar is worthy of serious further pursuit.

5 Anti-pied-piping and stress placement

With our proposal for particle placement in place, we now return to the question of how languages determine which sub-constituent of the focus to target for particle placement in anti-pied-piping. In section 3.4 above, we saw that many languages exhibit a strong or weak leftmost requirement: particle placement must — or in some languages, prefers to — target the leftmost sub-phrase of the logical focus, with some cross-linguistic variation attested. A crucial consequence of this is that particle placement is sensitive to information commonly associated with *Phonological Form* (PF), not necessarily present in the narrow syntax. In this section, we discuss apparent parallels between this particle placement process and stress assignment in stress languages and possible theoretical approaches to this connection.

Our starting point is the observation that there appears to be a common class of exceptions to leftmost requirements of the type described in section 3.4 above: certain nominals — roughly corresponding to those which are indefinite, given, or less informative — do not count for this evaluation of "leftmost." This is illustrated here first with Czech focus fronting: for sentence focus,

object fronting across the subject 'mother' is blocked in (95a), but is allowed across an indefinite subject in (95b). While (95a) is grammatical, it can only be interpreted with narrow focus on the object.

(95) **Czech** (Lenertová & Junghanns 2007: p. 356)

Q: What's new?

a. # [Guláš]$_{MSF}$ **matka** uvařila ____.
goulash.ACC mother.NOM cooked.SGF
Intended: '[Mother made goulash]$_F$.'

b. [Janu]$_{MSF}$ **někdo** hledal ____.
Jana.ACC somebody.NOM looked.for.SGM
'[Somebody was looking for Jane]$_F$.'

Similar facts are reported for German, where the effect has been studied experimentally by Féry & Drenhaus (2008) and Wierzba & Fanselow (2020). Here we present the results of an acceptability rating study in Féry & Drenhaus 2008. In this experiment, participants were asked to rate audio recordings of question-answer pairs on a 1–6 scale, where 6 is most natural. Example (96) is one representative set of stimuli to test the acceptability of object fronting in a sentence-focus context, with accented words in smallcaps. Notice that the subject is a pronoun in (96a), an unaccented DP in (96b), and an accented DP in (96c). In all cases, the fronted object was also accented. The numbers on the right correspond to average ratings for each condition exemplified by the item at left.

(96) **German** (Féry & Drenhaus 2008: pp. 24–25)

Q: Why are your neighbors complaining?

a. [Die MIETE]$_{MSF}$ haben **sie** wieder mal ____ erhöht. 5.5
the rent have they again once raised

b. [Die MIETE]$_{MSF}$ hat **der Hauswirt** wieder mal ____ erhöht. 4.8
the rent has the landlord again once raised

c. [Die MIETE]$_{MSF}$ hat **der HAUSWIRT** wieder mal ____ erhöht. 2.2
the rent has the landlord again once raised

'[They/the landlord raised the rent once again]$_F$.'

The results reflect a clear and statistically significant difference between these conditions (see Féry & Drenhaus 2008: fn 10): object fronting across an accented subject (96c) may be described as highly degraded, whereas object fronting is acceptable across a pronominal subject (96a) or otherwise destressed subject (96b), which may be interpreted as being given under accommodation.

We observe a similar effect in Japanese, where anti-pied-piping is manifested by overt particle placement rather than focus movement. Recall that for sentence focus in Japanese, the particle *mo* may be placed on the subject or object, as we saw in example (63) above. In example (97), we have modified example (63) so that the subject is indefinite. Speakers then disprefer the placement of the particle on the indefinite subject.[47]

(97) **Japanese** (based on (63) from Aoyagi 1998, 2006)

At yesterday's party, not only did Hanako dance a dance, but...

a. # [dareka]$_{MSF}$-**mo** piano-o hiita.
someone-also piano-ACC played
'[someone played piano]$_F$, too.'

b. dareka-ga [piano]$_{MSF}$-**mo** hiita.
someone-NOM piano-also played
'[someone played piano]$_F$, too.'

These contrasts show that a certain class of elements appear to be ineligible for particle placement and thus may be skipped for the evaluation of leftmost requirements on particle placement. We now consider the mechanisms behind such effects and their architectural consequences. Here, we discuss three imaginable options for describing possible targets for MSF in cases of anti-pied-piping:[48]

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[47] We report the contrast in (97) based on the judgments of eight native speakers of Japanese. As noted in footnote 23 above, there appears to be some variation between Japanese speakers in sentence focus anti-pied-piping behavior. In particular, the contrast between the patterns in (97) and (63) seems to be clearest for speakers of Japanese from the greater Tokyo (Kanto) region.

[48] Fanselow & Lenertová (2011) propose what may be thought of as a particular version of hypothesis (98b). Specifically, to capture patterns of anti-pied-piping in focus movement of the form in Czech and German above, they propose a ban on the movement of an accent-bearing phrase across another accent-bearing phrase. The leftmost condition and its exceptions as in Czech (95) and German (96) arise naturally from this constraint: in most cases, the leftmost subpart of the focus is accented, thereby blocking movement of another subpart across it, but when the leftmost subpart is deaccented (either because it is pronominal, or because it is given or uninformative), movement across that element is allowed. This description however does not explain leftmost restrictions on the placement of particles with anti-pied-piping as in Yaeyaman and Ishkashimi (see §3.4), and in particular cannot explain the parallels between restrictions on particle placement as in the Japanese in (97) and focus movement in Czech and German here above.

(98) **Three descriptions for the target of MSF in anti-pied-piping:**

The constituent chosen for MSF is...

a. {the leftmost / preferably the leftmost / any} sub-phrase of the focus which is not indefinite, given, or less informative; *or*

b. {the leftmost / preferably the leftmost / any} accented sub-phrase of the focus; *or*

c. the phrase that bears main stress within the focus.[49]

In the discussion which follows, we will see that none of these formulations in (98) can be entirely correct. We will then instead sketch a theory most similar to (98b), but without reference to accents or stress.

We note that the third formulation, in (98c), is conceptually attractive, as it relates anti-pied-piping to the phenomenon of *focus projection*, which relates the positions of main prosodic prominence and logical focus. (See Arregi 2016 for an overview.) Indeed, a number of previous authors have drawn an explicit comparison or explanatory link between the process of focus projection and anti-pied-piping; we are aware of such discussions in Choe 2002, Szendrői 2003, Fanselow 2004, Yoshimura 2007, F. Schwarz 2007: pp. 147–149, Kotani 2009, and Karvovskaya 2013.

However, one immediate challenge for (98c) comes from cases where the target of MSF is clearly not the most prominent. Consider the case of predicate focus in German ditransitive clauses, as in (65) above. As noted by Fanselow (2004: p. 23) and Fanselow & Lenertová (2011), both objects in such cases receive pitch accents, but it is the second object (the goal) which bears a more prominent pitch accent. Nonetheless, it is the first (leftmost) object which is targeted for anti-pied-piping as in (65). Another concrete challenge comes from patterns of anti-pied-piping in Japanese transitive clauses with sentence focus. As discussed by Ishihara (2000, 2001) and Sato (2012b), nuclear stress in Japanese generally targets the immediately preverbal phrase. Nonetheless, as described by Aoyagi (1998, 2006) and shown in (63) above, MSF may target either the subject or the object. See also Kahnemuyipour & Megerdoomian 2017 for explicit arguments against tying focus particle position to main stress in Eastern Armenian, although without discussion of anti-pied-piping.

A second challenge, affecting both hypotheses (98b) and (98c), comes from the possibility of anti-pied-piping in languages which do not utilize accents or stress as many of the languages de-

[49] Under this third formulation, cases of apparent optionality would have to be described as fed by independent manipulations in the choice of main stress placement.

scribed thus far do. One such example is Hausa, a tone language that lacks accents of the relevant sort, and where focus is not generally prosodically marked.[50] Nevertheless, Hausa demonstrates anti-pied-piping similar to the aforementioned Czech and German cases. Sentence focus may be expressed by fronting the subject before the focus marker *nèe*, as in (99a). However, in certain circumstances, as in (99b), the object is fronted instead; it is further noted that fronting the subject in (99b) is not an available option.

(99) **Hausa** (Hartmann & Zimmermann 2007b: p. 385)

a. [B'àràayii]$_{MSF}$ **nèe** ____ su-kà yi mîn saatàa!
robbers FM 3PL-REL.PERF do to.me theft
'[Robbers have stolen from me]$_F$!'

b. [Dabboobi-n jeejìi]$_{MSF}$ **nee** mutàanee su-kà kaamàa ____.
animals-of wild FM men 3PL-REL.PERF catch
'[(The) men caught wild animals]$_F$!'

Hartmann & Zimmermann (2007b) note, "When asked as why only the object could be fronted, both our informants indicated that the object provided the *interesting* or *surprising* part of the utterance." (p. 385; emphasis theirs). The argument skipped for the evaluation of leftmost in (99b) again seems to be of the sort that is skipped in German, Czech, and Japanese above: one which is indefinite, given, or less informative. That such similar effects hold of a language which does not prosodically realize focus in the same way may support hypothesis (98a) over (98b,c).

Among other languages which demonstrate anti-pied-piping discussed here, A. Schwarz (2009) shows that, in the Oti-Volta Gur languages described above (see (30) and (41)), there are no prosodic effects of focusing independent of the effects of particle placement. Focus is also not reflected prosodically in Wolof (see (58)) (Rialland & Robert 2001). Recall too that Tangale exhibits anti-pied-piping and misplacement effects, with no prosodic differentiation according to Hartmann & Zimmermann 2007a, as discussed in section 4.4.

There is, however, also evidence that (98a) in and of itself cannot be entirely correct, as

[50] Leben, Inkelas & Cobler (1989) note a tonal phenomenon involving raising of H tones involving preverbal constituents, which naturally include focus fronted objects. While Hartmann & Zimmermann (2007b) suggest that this tonal phenomenon is a reflex of focus marking, it is equally conceivable that this is a result of the phonological phrasing generally enforced on preverbal arguments in the language, independent of considerations of focus. Postverbally, focused and non-focused constituents are not prosodically distinguished.

suggested by the following facts from Yaeyeman. As noted in section 3.1 above, anti-pied-piping is obligatory for expressing predicate focus. Of particular interest are cases where nothing in the VP may host a focus particle — for instance, when the object is given and *pro*-dropped. In one such case, Davis (2013) reports that the first translation given by his consulting speaker included a 'spurious' instrumental adverb to host the focus particle, as in (100). Here, the instrumental is clearly not informative, given the lexical semantics of the verb *kir* 'kick.'

(100) **Miyara Yaeyaman** (Davis 2013: p. 38)

Q: What did Chris' older brother do to his younger brother?

[Pan-sari]$_{MSF}$-**du** kir-i.

leg-INST-PRT kick-TAM

'He [kicked him with (a/his) leg]$_F$.'

It appears then that none of the characterizations in (98) can be entirely right, although the hypothesis in (98c) tying particle placement to main stress position faces more challenges than the others. In the remainder of this section, we sketch a hybrid theory which draws on aspects of both (98a) and (98b).

The core intuition behind this new theory is that the generalization in (98b) is on the right track — that languages may choose to target the leftmost accented sub-phrase of the focus for particle placement — but that we cannot make reference to stress or accents in the general case. We have already argued above that particle placement must make reference to linear order information, associated with PF and commonly assumed to be unavailable in the narrow syntax. We suggest that particle placement is furthermore sensitive to the same information which languages with phrasal stress use to determine which elements receive phrasal stress, and which do not. For expository purposes, we refer to this information as •-*marking*, a rule for which is given below in (101).

(101) **• assignment:**

At the phase level, assign a • to each phrase which is not a part of the extended projection which contains the highest phase head.

Our rule for •-marking in (101) draws on a long line of work arguing that information relevant for nuclear stress determination is assigned cyclically throughout the derivation (see e.g. Bresnan

1971, 1972, Legate 2003, Adger 2007, Kahnemuyipour 2009, Sato 2012b, Richards 2018). Although these prior works differ in the details of this process, •-marking and the rule in (101) are meant to be theory-neutral abstractions standing in for what its proper characterization turns out to be.

Importantly for our current purpose, •-marking is abstract in a way that stress in and of itself is not. • assignment may subsequently feed the application of a realization rule like that in (102) — giving rise to what we would call a language with phrasal stress — but, crucially, • assignment takes place independent of the existence of such a rule in a language. In languages like Hausa, for instance, • assignment takes place, but there is no such rule like that in (102).

(102) **• realization:**
Each element marked with • is realized with phonological prominence (e.g. with phrasal stress).

We propose that particle placement may also make reference to •, and offer the more general statement on particle placement in anti-pied-piping in (103):

(103) **The leftmost requirement in anti-pied-piping:**
Particle placement targets {the leftmost / preferably the leftmost / any} •-marked subphrase of the focus.

In stress languages, particle placement seems to be sensitive to phrasal stress, as in the formulation in (98b), since phrasal stress is fed by •-marking.[51] We will leave as an open question whether or not a language's choice between the strong, weak, or free variant of (103) can be predicted by independent properties of the language.

As we have seen earlier in this section, certain types of phrases are cross-linguistically commonly ineligible for particle placement and therefore may be skipped for the evaluation of a leftmost requirement in anti-pied-piping. In many of the languages which have phrasal stress, these elements tend to be destressed; languages such as Hausa, however, show that stress distinctions are not necessary for such effects. We propose that these elements resist •-marking:[52]

[51] Büring 2015 *et seq* describes a procedure for relating metrical annotations on trees to possible positions of logical focus. An important feature of this approach — whose intuition we share here — is that the relevant annotation may reflect stress in stress languages, but need not be prosodically realized in all languages.

[52] Particle placement on the uninformative instrumental adjunct in (100) is still a challenge and deserves further con-

(104) • **avoidance:**

Indefinite, given, or less informative elements are not assigned a •.

In some languages, this bleeds stress assignment (102), but, again, the calculation of • placement is independent of the presence of a realization rule such as (102) in the language. • avoidance (104) allows particle placement (103) to also appear to reference discourse-level notions such as givenness, as in the formulation in (98a) above, even in languages without stress distinctions.

Finally, we note again that the statement in (103) is still at the level of a descriptive generalization. In particular, recall from section 4.4 that there are a number of conceptual and empirical reasons to disprefer a grammatical theory which makes reference to positions of logical focus (F-marking). Ultimately, we should hope to describe a grammatical procedure for particle placement which derives the observed leftmost effects on anti-pied-piping as in (103) as well as on pied-piping (see section 3.5), while avoiding reference to the 'sub-phrase of the focus' in (103).

6 Discussion and conclusion

The study of focus has featured prominently in linguistic theory, in part because choices of focus placement have consequences for interpretation, morphosyntax, and prosody, naturally leading to questions of grammatical architecture and modularity. In this paper, we have described cases of *anti-pied-piping*, a form of mismatch between the morphosyntax and semantics of focus where focus morphosyntax targets a proper subpart of the interpreted position of focus. Anti-pied-piping is quite widely attested cross-linguistically — with examples identified here in over fifty languages across over thirty distinct genera — with some notable parallels to well-studied pied-piping behavior. In particular, both mismatches require alignment at the left edge between the logical focus and morphosyntactically focus-marked element in many languages.

We have argued that the details of anti-pied-piping behavior motivate a theory of particle placement in which particles are introduced into the syntactic structure independent of their corresponding semantic operator (the operator–particle theory), at certain punctuated points in the derivation (Spell-Out) where PF-branch information such as statements of linear order are accessible to the syntax. The cyclic Spell-Out model of grammar (Uriagereka 1999, Chomsky 2000, 2001, a.o.) adopted here allows us to account for certain opaque interactions between particle

sideration. We tentatively suggest that such adjuncts must receive •-marking in the language, despite (104), or that particle placement targets the adjunct as a last-resort.

placement and scrambling, as well as to unify the anti-pied-piping behavior of overt focus particle placement with anti-pied-piping in focus movement, following previous work on the syntax of pied-piping.

These facts and the resulting theory developed here have important further consequences for the theory of grammar, especially surrounding the nature and behavior of Ā-movement. Following Horvath 2000, 2007, Cable 2010, we take Ā-movement to be movement of particle phrases built from a process of particle placement. The theory thus explains aspects of the classic A/Ā-distinction in terms of the timing of particle placement (see also Safir to appear): for instance, as particle placement takes place at cyclic Spell-Out, we predict that a constituent cannot undergo Ā-move until a containing phase is complete and undergoes Spell-Out. Furthermore, if movement operations take place as soon as possible, all things being equal, we predict A-movement (movement not contingent on particle placement) to precede Ā-movement.

In addition, in the final section we discussed parallels between particle placement position and positions of prosodic prominence, and sketched an approach to both sets of facts which indirectly derives their parallels. Again, as Ā-movement is always movement of a particle phrase, we predict that Ā-movement can only target phrases which can bear pitch accents in languages with phrasal accents, as has been independently motivated in work such as Cheung 2009 and Branan 2018. We explore these and other consequences of the proposal here in future work.

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Languages with anti-pied-piping by genus