

Linkers and the licensing of dependents

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1 Introduction

Work on noun phrase syntax across languages has often focused on the role of nominal *linkers*—functional elements that appear to license phrases as modifiers, arguments, or other dependents of a head noun.¹ The Japanese morpheme *-na*, for instance, obligatorily follows a certain class of adjectives when they are used as adnominal modifiers (1a), but does not occur otherwise (b).²

- (1) (a) kirei **(na)* ie
clean LNK house
‘a clean house’
(b) kono ie wa kirei **(na)* desu
PROX house TOP clean LNK be
‘This house is clean.’

The morpheme *-na* can therefore be understood to somehow be involved in licensing adjectives as attributive modifiers of a noun. Functional elements that cooccur with adjectives when used attributively but not otherwise have been documented in genetically disparate languages. A well-known case is West Germanic attributive adjective inflection (see, for example, Roehrs and Julien, 2015 and other papers in that volume). But from a cross-linguistic perspective, such licensing is not limited to adjectives or even modifiers. The Persian *ezafe* morpheme, for instance, cooccurs not only with attributive adjectives (2a), but also with adnominal DPs and PPs, including both those that are intuitively modifiers of a noun (2b), and those that appear to be its arguments (3).

- (2) (a) mard=*e* chaaq (Kahnemuyipour, 2014, p. 2)
man=LNK fat
‘fat man’

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²Unless otherwise cited, Japanese data comes from my elicitation with a native speaker. Cf. Yamakido (2005) for extensive discussion of *-na* and nominal modification in Japanese more generally.

- (b) ketaab=**e** Ali
 book=LNK PN
 “Ali’s book”
- (3) tæxrib=**e** šæhr (Larson & Samiian, 2020, p. 175)
 destruction=LNK city
 ‘destruction of the city’

Both modifiers and arguments of the head of an extended projection can be considered *dependents* of that head. The head need not be a noun, for linkers have been documented elsewhere than the noun phrase. Linkers relating adjectives with their dependents have been documented for Romanian (Rubin, 1994), Chinese (e.g., Paul, 2017), and Persian (Samiian, 1994; et seq.). Linkers have also been documented which cooccur with dependents of a verbal projection (for Chinese, see Larson, 2018; for Tagalog, see Scontras and Nicolae, 2014; for Kinande and several Khoisan languages, see Baker and Collins, 2006).

In this paper I investigate the syntax of linkers in relation to the licensing of dependents. The objectives are (i) to describe the distribution of linkers generally, (ii) and to develop an explanatory account that satisfies the twin conditions of universality and the learnability of limited variation. In service of the first aim, I establish two cross-linguistic generalizations about the syntactic distribution of linkers: one concerning the notion of dependency (4), and the other concerning word-order (6).

The diagnostic for linkerhood (4) is established based on languages with what might be considered “canonical” linker constructions, including Mandarin Chinese, Japanese, Persian, Tagalog, and Tshiluba (Bantu), drawing on published data and the author’s own elicitations where appropriate.

(4) *Optional dependent generalization*

For categories X and H, where H is the head of an extended projection, a linker L(X,H) is any category such that

- (i) each instance of L(X,H) cooccurs with a unique phrase XP, where
- (ii) XP is a syntactically optional dependent of H.

The distribution of linkers described by (4) will be argued to follow from how dependents are syntactically licensed. My primary theoretical claim is that dependents are of two kinds: *strong* and *weak*, defined as formal grammatical functions in relation to the head of an extended projection. Strong dependents of a head H are categories that H obligatorily c-selects; they are merged locally as complement or specifier of H. An example is the English complementizer *that*, which takes a TP as a strong dependent. In contrast, *weak* dependents of H are not projected as an obligatory property of H; instead, they are c-selected as the specifier of a *linker* head in the extended projection of H. For example, an adnominal PP is a weak dependent of a noun. In languages like Tshiluba with overt linkers, an adnominal PP may cooccur with a linker. The definition of “linker” is quite general: if H is N, then L is a nominal linker, if H is V, then L a verbal linker, and so on.

While the dichotomy of strong versus weak dependents resembles that of arguments versus modifiers (or “adjuncts”), I argue that the argument/modifier distinction does not adequately capture the distribution of linkers cross-linguistically. What appear to be “arguments” of a head noun, for instance, are often base-generated non-locally to the noun (e.g., Atlamaz, 2016), cooccurring with linkers, already illustrated in (3) for Persian. In the current account, these “arguments” are weak dependents of the head noun, and are therefore predicted to cooccur with a linker. An argument is

able to be a weak dependent precisely when its theta role is specified in the denotation of a head but a corresponding syntactic object is not c-selected by that head. As an example, the noun *tæxrib* in (3) has a patient argument as part of its denotation but it does not c-select for a DP; hence the identity of the patient is contextually determined unless an appropriate DP is present as a weak dependent, in which case it is syntactically determined. Instead, a DP is c-selected by a linker head, spelled out as the *ezafe* morpheme, which in turn c-selects for a nominal projection and binds a variable in the denotation of N for the patient role.

The value of the distinction between strong and weak dependents may be observed in the different syntactic behavior of functional versus lexical prepositions in Persian, traditionally known as Class 1 and Class 2 prepositions, respectively, and illustrated in (5). Functional prepositions like *æz* ‘from’ obligatorily take a DP complement, but a linker cannot intervene (a). In the current system, the preposition c-selects for a DP complement; the latter is then a strong dependent of P and, there being no weak dependents, no linker can occur.

- (5) (a) *tup oftad æz-(*e) *(miz)* (Pantcheva, 2006, p. 10)
 ball fell from-LNK table
 ‘The ball fell from the table.’
 (b) *tup oftad pain-(*e)*
 ball fell down-LNK
 ‘The ball fell down.’
 (c) *tup oftad pain-e miz*
 ball fell under-LNK table
 ‘The ball fell below the table.’

Lexical prepositions such as *pain* ‘down,’ on the other hand, may occur without a complement, in which case no linker is possible (b). When they do take a DP argument, a linker may intervene (c). In the proposed system, the arguments of a lexical preposition are weak dependents: they are not selected by the preposition itself but are instead c-selected by a linker as its specifier; the linker in turn selects for the nominal feature of the lexical preposition.

In addition to (4), I make the empirical claim that word-order in linker constructions is subject to the generalization (6).

- (6) *Conditions on word-order in linker constructions*
 If L(X,H) is a linker, then
 (a) L(X,H) and XP are adjacent, and
 (b) L(X,H) is preceded by at least one of H or XP.

Part (a) of (6) captures the fact that in languages with overt linkers, a head noun (or verb, depending on the relevant extended projection) may not linearly intervene between a linker and the linker’s associated dependent. For example, in Tagalog, each attributive adjective must be associated with a linker and the adjective may either precede or follow the head noun. When an adjective is prenominal, we must have the order AP–Lnk–N, and when postnominal, we must have the order N–Lnk–AP; there is apparently no configuration in which an AP may be linearly separated from its associated linker (Rubin, 1994, 116ff.).

Instead of the linear adjacency condition (a), however, it is often claimed in the literature that a stronger condition of linear *intervention* holds, such that a linker must linearly intervene between its associated dependent and the lexical head of the extended projection. For instance, Rubin (1994)'s Peripherality Constraint is presented as a principle of UG which specifically requires that the linker always appear on the same side of the modifier as the head of the dominating extended projection, where the linker is assumed to form a narrow constituent with its associated modifier. Similarly, Philip (2013) has proposed a universal and far more general constraint within an Optimality Theoretic implementation of linearization, the Head-Proximate Filter, which enforces that the highest head Y of an extended projection, when dominated by a superordinate extended projection of a head H, be linearized such that Y and H are as close as possible. Like Rubin, Philip assumes that a linker forms the highest head in the extended projection of its associated dependent, so that the Head-Proximate Filter always prefers linear orders in which the linker Y intervenes between its associated modifier and H.

Instead of presenting a condition of linear intervention, I present one of linear adjacency (a) and of precedence (b). I argue that this is empirically superior to a linear intervention condition, because in languages such as Daasanach (East Cushitic) and Middle Elamite (isolate), the nominal linker does not linearly intervene between the noun and dependent, but follows both. This is illustrated in (7), where the linker follows a possessor and an attributive adjective.

- (7) [DP lokod ci=a ɓasu=a] fíet ^hé kojji (Daasanach; Tosco, 2001, p. 255)
 skin 1POSS=LNK flat=LNK fire 3.SUBJ eat.PRF
 'The fire burnt my flat hide.'

The generalization (6) correctly predicts that, out of a factorial typology of the six logically possible languages generated by the free ordering of a linker (Lnk), an associated dependent (XP), and the head of the relevant extended projection (H), only three exist, namely those in (8a). If the linker head has multiple exponents, however, I assume that (6) must hold of each of its exponents. Then the additional word-order type (8b) is generated where the linker head is a circumfix, which I argue occurs in Konso (East Cushitic) and in English postnominal possessor constructions.

- (8) *Attested word-orders in linker constructions*
 (a) (i) XP–Lnk–H (Chinese, Japanese, ...)
 (ii) H–XP–Lnk (Daasanach, Middle Elamite, ...)
 (iii) H–Lnk–XP (Persian, Bantu, ...)
 (b) H–Lnk₁–XP–Lnk₂ (Konso, English, ...)

I argue that the generalization (6) is not itself an elementary principle of UG but falls out from independently motivated morphosyntactic parameters that govern (i) whether a linker has a strong agreement probe attracting an extended projection to its specifier, (ii) and that determine the possible orders of the postsyntactic operations for cliticization and the pronunciation of head chains.

The proposed theory is a generalization of accounts in which the linker forms part of the extended projection of the head (e.g., Kahnemuyipour, 2014 for Persian; Paul, 2017 for Chinese), and is compatible with accounts of the noun phrase developed within syntactic cartography (Cinque, 2005; Scott, 2002; et seq.). Evidence for the proposed structure comes from data from Tshiluba, Chinese, and other languages indicating (i) that the linker may c-select both for the category of

the extended projection HP and of its associated dependent XP and (ii) that the linker may license ellipsis of its complement, a projection of H.

In contrast, alternative accounts in which the linker forms a narrow constituent with the dependent (e.g., Larson and Yamakido, 2008; Philip, 2012; Rubin, 1994) and in which modifiers are merged as adjuncts (e.g., Abels and Neeleman, 2012; Rubin, 2003) are shown both to generate unattested word-orders and to fail to capture the facts of selection and ellipsis.

The structure of this paper is as follows. In Section 2, the diagnostic (4) for linkerhood (Section 2.1) and the cross-linguistic word-order generalization (6) (Section 2.3) are established. In particular, the previously unrecognized linker-final word-order N–XP–Lnk is shown to be attested in at least two languages. Next, in Section 3, an analysis of grammatical dependency is presented, formally defining the notions of *strong dependent*, *weak dependent*, and *linker* as grammatical functions, from which it is argued the diagnostic (4) follows. The proposed theory is shown to have explanatory depth, extending beyond canonical linker constructions to the compositional interpretation of optional arguments, to the syntactic distribution of attributive inflection in West Germanic languages, and to the dual syntactic behavior of semantically weak *of*-type prepositions cross-linguistically (Section 3.1.2). This analysis, together with a hierarchy of morphosyntactic parameters, is shown to generate precisely the orders described by (6) (Section 3.2). In Section 4, the theory is defended against alternatives. In Section 5, we conclude.

2 Linkers: Syntactic properties and variation

In this section I argue that the syntactic distribution of linkers is characterized by the descriptive generalization (9), specifying two essential properties of linkers.

(9) *Optional dependent generalization*

For categories X and H, where H is the head of an extended projection, a linker L(X,H) is any category such that

- (i) each instance of L(X,H) cooccurs with a unique phrase XP, where
- (ii) XP is a syntactically optional dependent of H.

The generalization (9) holds of linkers from several different language families, including those of Mandarin Chinese, Japanese, Tagalog, Persian, and Tshiluba. It also improves upon previous descriptions, which have captured the cooccurrence of linkers with modifiers of a head but not with its optional arguments, quantifiers, or other kinds of dependents (e.g., Karimi, 2007; Rubin, 1994; Scontras and Nicolae, 2014), or which have overgenerated the syntactic contexts in which linkers occur, by characterizing linkers as markers of any kind of subordination (e.g., Philip, 2012, 2013). Although the form of a linker may be sensitive to the syntactic category of the dependent, linkers apparently never covary with the semantic function of an associated dependent; they do not show one form for modifiers and another for arguments, for instance. Moreover, linkers appear to never occur with obligatory dependents of a head, such as the complement of a functional preposition. Hence the phrase associated with each linker is described by (ii) as any dependent, provided that it is syntactically optional.

The properties of linkers stated in (9) do not mention word-order, though it is commonly assumed that the linker must linearly intervene between a head and its dependent (e.g., Rubin, 1994,

Philip, 2013). This is not an absolute requirement. In fact, there exist at least two languages, Middle Elamite (isolate) and Daasanach (East Cushitic), where a linker satisfies (9) but *follows* both head and dependent. The word order conditions on linker constructions are therefore more accurately stated as in (10).

- (10) *Conditions on word-order in linker constructions*
 If L(X,H) is a linker, then
 (a) L(X,H) and XP are adjacent, and
 (b) L(X,H) is preceded by at least one of H or XP.

In Section 3, both (9) and (10) are argued to be consequences of the general structure underlying optional dependents.

2.1 Core properties of linkers

2.1.1 Linkers are associated with phrases

Each instance of a linker cooccurs with a phrase XP, as stated in (9i); let us call XP its *associate*. This property is illustrated in (11) for the Japanese nominal linker *na*: when two or more adjectives are conjoined, the linker must occur once, after the final conjunct, showing that the linker associates not with A⁰ but rather with AP.³ Across languages, it generally appears to be the case that if a linker may associate with a syntactic category (e.g., A), it may also associate with a phrasal projection of that category (cf. e.g., Samvelian, 2007, 621ff. for Persian *ezafe*; Zhang, 2009, 92ff. for the Chinese associative marker).

- (11) [AP *sizuka* (**na*) *de kirei*] **na** *ie*
 quiet LNK CONJ clean LNK house
 ‘a quiet and clean house’

In associating with phrases, linkers differ from noun-class affixes, which attach at the word level, even though the two are sometimes homophonous. To see the difference, consider (12), from Tshiluba.⁴

- (12) (a) *ka-ŋomba*
 XIII-cow
 ‘calf’
 (b) *ka-ŋomba k-a* *(*ka-toka ni ka-fika*)
 XIII-cow XIII-LNK XIII-white and XIII-black
 ‘white and black calf’

³In certain languages, the linker may (but never is required to) occur multiple times, after each AP conjunct. In Section 4, such cases are analyzed as right node raising.

⁴For Tshiluba glosses, we follow Burssens (1954)’s classification of noun classes. See Cocchi (2019) for a recent overview of the Tshiluba noun class system. We use Roman numerals for noun classes and Arabic numerals for persons.

As indicated in (a), a head with a noun class prefix may stand alone. In contrast, (b) shows that the linker (bolded), though itself inflected with a noun class prefix, is not itself a word-level prefix, but is instead obligatorily associated with a *phrase*, here a coordinated AP.⁵

This property holds also for linkers outside of the extended projection of the noun. This is illustrated in (13) for the Mandarin verbal linker *de*. Certain adjectives, such as *gaoxing* ‘happy,’ must be followed by *de* in order to function adverbially (b). As shown by (c), however, *de* attaches at the phrase level, unlike word-level affixes associated with adverbs, like English *-ly*. In contrast, repeating *de* for each conjunct, as in (d), yields degraded acceptability.⁶

- (13) (a) Lisi hen gaoxing (Mandarin)
 PN very happy
 ‘Lisi is (very) happy’
 (b) Lisi gaoxing-*(**de**) bangzhu le wo
 PN happy-LNK help PRF 1
 ‘Lisi happily helped me’
 (c) Lisi [gaoxing qie kuaikuai]-**de** bangzhu le wo
 PN happy and quick-LNK help PRF 1
 ‘Lisi happily and quickly helped me’
 (d) ?? Lisi gaoxing-**de** qie kuaikuai-**de** bangzhu le wo
 PN happy-LNK and quick-LNK help PRF 1
 ‘Lisi happily and quickly helped me’

An additional consequence of (9i) is that linkers never associate with higher *heads* in the same extended projection as H. This is illustrated by the Kotoko languages Zina and Afade (Central Chadic), discussed by Philip (2012, pp. 27–8). In these languages, a linker occurs between a head noun and each subsequent phrasal modifier, including demonstratives. However, linkers never occur between a head noun and the definite article, even though it is postnominal. This distribution follows from (9i), if the definite article is a head within the extended projection of the noun.

An analogous phenomenon may be found in the Tagalog clause. As discussed by Scontras and Nicolae (2014), the Tagalog linker obligatorily appears with adverbial phrases, but does not appear with the adverbial clitic *na* ‘already’. In fact, the linker appears to never associate with clitics (Kaufman, 2010, p. 251). This is expected by (9i) if, as Kaufman (2010) argues, these clitics are never phrasal.

The first property stated in (9) also captures the fact that each instance of a linker is associated with a *unique* phrase. This rules out elements that occur in a one-to-many relation with phrases,

⁵Note that although the inflected linker and the noun class prefix on the adjectives and noun in (12b) are homophonous, they receive different morphological analyses. The final vowel of the linker is always /a/, though this only holds for a handful of noun class prefixes (such as *ka-*, above). Hence the linker is best analyzed as a head of the form NC+L, where NC is a noun class marker and L is a linker head proper, with adjacent vowels of the complex head subject to coalescence. The linker form *ka* has an underlying form /ka+a/.

⁶Similar to Mandarin *de*, Spanish *-mente* appears to attach at the phrasal level, in contrast to French *-ment* and English *-ly*, which attach at the word level (Baker, 2004, p. 234). This contrasting behavior is explained if *de* and *-mente* are actually linkers that undergo cliticization, whereas *-ment* and *-ly* are generated at the word-level, either spelling out a derivational head or perhaps inserted on A⁰ in the context of a verbal projection. If adjectives and adverbs do not constitute distinct syntactic categories, but both belong to A, the latter hypothesis is preferable.

such as “double definite” markers, as found in Scandinavian and other languages. As argued by Taghipour (2021) for Laki (Northwest Iranian), the definite marker in such constructions is syntactically distinct from a linker, because it is not repeated for each modifier. Instead, as shown in (14), at most two definite markers occur: one after the head noun, and another after the final modifier.

- (14) (a) māl-a (Laki; Taghipour, 2021, p. 550)
house-DEF
‘the house’
(b) māl-a kalen-a
house-DEF big-DEF
‘the big house’
(c) māl-a kalen sefid-a (Taghipour, 2021, p. 558)
house-DEF big white-DEF
‘the big house’

Property (i) of (9), then, captures the characteristic property of linkers that they iterate, associating with phrases in a one-to-one relation.

2.1.2 Linkers and syntactically optional dependents

The second property of (9) requires that the phrase XP with which a linker cooccurs be a dependent of H that is syntactically optional, namely, one such that the presence of H does not imply the presence of XP in a grammatical derivation. These include phrases that may be informally considered “adjuncts,” familiar examples of which are adnominal or adverbial modifiers. But also included under this designation are non-obligatory arguments, possessors, and potentially every phrasal dependent of a head noun, given that arguments of nouns, unlike those of verbs, appear to always be optional (cf. Adger, 2013, 57ff. and references cited there). Hence a nominal linker is predicted to be able to associate with any phrasal dependent of a head noun, which appears to be true cross-linguistically, though individual languages may restrict the categories which with a linker may be associated.

Linkers associate with dependents. Let us consider first the predictions of the claim that a linker’s associate must be a dependent of a head. What exactly constitutes a “dependent” is difficult to say without making precise analytical assumptions about constituent structure (cf. Carnie, 2010, 168ff.). For now, I assume that the dependents of a categorial head include at least its arguments, modifiers, and quantifiers. Syntactically, I assume that these are base-generated within its extended projection. These assumptions suffice for our present purpose of establishing the descriptive generalization (9); we develop a more precise syntactic analysis in Section 3.

We may begin with the case of nominal linkers associated with AP modifiers of a head noun. It is predicted that a nominal linker may associate with an AP when the latter is an attributive modifier of N but not when it is a predicate, for, in the latter case, N does not take AP as its dependent but vice versa.

For Japanese, we have already seen in (1) that this is the case for nominal adjectives: they obligatorily receive a *-na* suffix when they function attributively, but cannot receive the suffix when

they function as predicate. This distribution appears to be cross-linguistically characteristic of nominal linkers and is implicit as a diagnostic in many discussions (e.g., Rubin, 1994). Persian *ezafe* trivially passes the diagnostic, because the linker is an enclitic on the head noun, and its dependents are postnominal. But as shown by (15), this property holds also when the linker cliticizes to AP, illustrated for the Tshiluba associative marker, Tagalog *ng*, and Mandarin *de*.

- (15) (a) (i) Ø-ŋomba (w-a)=mu-toka (Tshiluba)
 I-cow I-LNK=I-white
 ‘a white cow’
 (ii) Ø-ŋomba u-dʒi (*w-a)=mu-toka
 I-cow I-PRS I-LNK=I-white
 Intended: ‘The cow is white’
 (b) (i) maganda=*(ng) bahay (Tagalog; Scontras and Nicolae, 2014, p. 21)
 beautiful=LNK house
 ‘beautiful house’
 (ii) Maganda(*=ng) [ang bahay]
 beautiful=LNK SUBJ house
 Intended: ‘The house is beautiful.’
 (c) (i) gaoxing=(de) haizi
 happy=LNK child
 ‘happy child’
 (ii) Zhei-ge haizi hen gaoxing=(de)
 this-CLF child very happy=LNK
 Intended: ‘The child is (very) happy.’⁷

When the linker cliticizes to an AP modifier of N, the linker and AP form a unit of at least a prosodic nature that does not include N. But in languages where this occurs, what (15) shows is that the linker is nonetheless obligatorily absent when AP is not attributive.

In several languages, however, there exist constructions where a linker does occur with a phrase in predicate position, which have been argued by Franco et al. (2015) to suggest that the linker forms a narrow constituent with the category of the modifier. But there is evidence that such cases actually involve nominal ellipsis; that is, AP is an attributive modifier of a covert head noun. In Tshiluba, for instance, (15a_{ii}) is grammatical if the Lnk–AP expression has a referential reading, as shown in (16).⁸

- (16) Ø-ŋomba u-dʒi **w-a mu-toka**
 I-cow I-PRS I-LNK I-white

⁷In Mandarin, a diagnostic for distinguishing nouns from adjectives is that, when used as predicates, nouns obligatorily occur with the copula *shi* but adjectives cannot occur with it, typically instead with the functional element *hen* (Huang et al., 2009, pp. 24–25). *Hen* alternatively functions as an intensifier or as a marker of positive degree (Zhang, 2015). Adjectives used as predicates may occur with the copula when they are followed by *de*, however. In such cases there is likely nominal ellipsis. See discussion below.

⁸Note that either an indefinite or definite reading is possible, so that the linker cannot be analyzed as a definiteness marker.

‘The cow is a/the white one.’

* with reading ‘the cow is white.’

I assume that the locus of reference is always a noun, pronoun, or a projection thereof (Baker, 2004, 95ff.), so that there must be a silent head noun in (16). It is then correctly predicted that such Lnk–AP expressions may also occur in argument positions, as shown in (17). The basic case of a full DP direct object with no ellipsis is illustrated in (a). Given an appropriate discourse antecedent, however, the head noun ‘cow’ may be unpronounced, in which case the linker is obligatory, shown in (b).⁹

- (17) (a) ka-bwa ka-dʒi ka-ɲem-ef-a Ø-ɲomba w-a mu-toka
XIII-dog XIII-PRS XIII-run-CAUS-IND I-cow I-LNK I-white
‘The puppy chases the white cow.’
(b) ka-bwa ka-dʒi ka-ɲem-ef-a *(w-a) mu-toka
XIII-dog XIII-PRS XIII-run-CAUS-IND I-LNK I-white
‘The puppy chases the white one.’

If there is no silent head noun, then the availability of such expressions to occur as arguments is unexplained. Such facts are not limited to Tshiluba but hold also for Chinese *de* (Paul, 2017) and the Arbëresh Albanian varieties upon which Franco et al. (2015)’s arguments are based (Savoia, 2008, 99ff.).

We have seen several cases of linkers associating with AP modifiers. Linkers in many languages also associate with modifiers of other categories, typically also NPs, PPs, and relative clauses, illustrated in (18) for Mandarin (data from Paul, 2017, p. 2).

- (18) (a) [NP hei toufa] de nühair
black hair LNK girl
‘the girl with black hair’
(b) [PP caochang shang] de ren
sports_ground on LNK person
‘the people on the sports ground’
(c) [TP ni jilai] de xin
2 send LNK letter
‘the letter you sent’

But linkers cannot be said to only be markers of modification (pace Karimi, 2007; Rubin, 1994; Scontras and Nicolae, 2014), because the same morphemes that associate with modifiers typically also associate with DP and PP arguments, saturating various thematic roles of the head noun. The Japanese linker *no*, for example, occurs not only with what may be charitably considered “modifiers,” including possessors, quantifiers, and numerals, but also with agents, patients, and arguments of other thematic roles (Murasugi, 1991, 9ff.). For Tshiluba, we have already seen the linker associating with modifiers and possessors. It may also associate with DP arguments. In (19) we see the linker associating with an argument of a head noun denoting the object of emotion (italicized).¹⁰

⁹The fact that the linker is obligatory when the head noun undergoes ellipsis is explained if the linker is a head within the extended noun phrase capable of licensing ellipsis, as discussed in Section 3.

¹⁰Thanks to Gil Hamel for sharing this data.

- (19) m-wana w-a ba-kaʒi ke:na ni bowa bw-a ʒomba
 I-child I-LNK II-woman NEG with XIV.fear XIV-LNK I-cow
 ‘The girl is not afraid of the cow.’

Linkers in Tagalog, Chinese, and Persian have likewise been documented to associate with DPs and PPs bearing a wide range of semantic functions.¹¹ Briefly discussed above for Kotoko languages, certain languages also allow linkers to associate with demonstratives. In summary, there appear to be few cross-linguistic restrictions on the semantic functions of the dependent with which a linker associates. In Section 2.2 it is argued that there is little evidence that linkers are ever sensitive to a particular semantic function; they are instead sensitive to the syntactic category of the dependent.

The associated dependent must be syntactically optional. Now let us consider the second aspect of (9ii), namely that the phrasal dependent with which a linker associates be one that is not obligatorily selected by the head. To my knowledge, this is a novel claim, though it is a generalization of the familiar observation that linkers cooccur with modifiers. This property is trivially true for nominal linkers, as mentioned above. However, testable predictions exist for (i) degree phrases, (ii) prepositional phrases, (iii) and verb phrases, three domains where complements are often obligatory.

Consider first degree phrases. Intensifiers and other degree words are likely functional heads that select for an AP complement, at least in some languages (cf. McNabb, 2012, and references cited there). Among the languages investigated here, Zhang (2015) has argued that this is the case for Chinese. If this is true, then (9ii) predicts that no linker may intervene between a degree word and an AP complement.

As shown in (20a) for Mandarin, a phrasal modifier of an adnominal adjective cannot precede it, regardless of the presence of a linker. Instead, as in (b), the order of adjective and modifier must be inverted, and an intervening linker is obligatory. But when a degree word is used in place of an adverbial phrase, as in (c), it immediately precedes the adjective, and no intervening linker is possible.

- (20) (a) *yi duo [[hen qiguai] (de) hong] de hua
 1 CLF very strange LNK red LNK flower
 Intended: ‘A strangely red flower’
 (b) yi duo [hong *(de) [hen qiguai]] de hua
 1 CLF red LNK very strange LNK flower
 ‘A strangely red flower’
 (c) yi duo [hen/feichang (*de) hong] de hua (Mandarin)
 1 CLF very/extreme LNK red LNK flower
 ‘A very/extremely red flower’

¹¹For Tagalog, Cortes et al. (2012) provide examples of the linker with possessors and arguments. For Chinese, the linker associates at least with modifiers, possessors, and arguments of various kinds (Paul, 2017, pp. 2–3). The Persian linker associates with modifiers, possessors, and arguments (Larson & Samiian, 2020, p. 175). There is variation in the number of arguments that may cooccur within the same DP. For instance, Cortes et al. (2012, p. 4) show that an agent and theme argument may simultaneously occur within the same DP, but Persian allows a choice of one of these (Arsalan Kahnemuyipour, personal communication).

This pattern is expected if degree words are heads that select an obligatory complement: by (9ii), no linker may occur in such a context. The degree head harmonically precedes the latter, because Chinese is right-branching (Huang, 1982, p. 42). In contrast, a phrasal adverbial such as ‘very strange’ is a syntactically optional modifier of an adjective head—informally speaking, it is an “adjunct.” A linker may (here, must) occur. We obtain the order head–dependent, found in linker constructions whenever the lexical head is not a noun (Zhang, 2009, 93ff.).¹²

In Tagalog, linker constructions are very widespread, occurring not only in the noun phrase but also in the clause. Within the adjectival domain, a common modification construction is for an AP to precede another AP, with an intervening linker, as in (21). As in the noun phrase, the modifier may follow the head, as in (21), or precede it.

- (21) mahal na masyado (Tagalog; Schachter and Otones, 1972, p. 234)
 expensive LNK excessive
 ‘excessively expensive’

However, when a degree word is used in place of an AP modifier, it must precede the adjective, with no intervening linker, as shown in (22). This is correctly predicted by (9ii) if the degree word is a head taking an obligatory AP complement. As evidence that this is the case, notice that Tagalog degree words tightly subcategorize for their associated AP. For instance, the intensifier *napaka* requires that the associated adjective belong to a *ma-* class of adjectives, and the intensifiers *kay* and *pagka* require that the adjective be prefixed with a reduplicant (Schachter & Otones, 1972, 231ff.).

- (22) (a) iyong babae=ng **medyo**(*=ng) payat (Schachter & Otones, 1972, p. 236)
 DET woman=LNK somewhat=LNK thin
 ‘that somewhat thin woman’
 (b) iyong aso=ng **kay**(*=ng) laki-laki (Schachter & Otones, 1972, p. 233)
 DET dog=LNK very-LNK RED-big
 ‘that very big dog’

Next, consider prepositional phrases. We have already seen in Section 1 that in Persian, lexical prepositions do not take obligatory arguments, but when they do cooccur with an argument, there is a linker; in contrast, functional prepositions take obligatory complements, in which case a linker is prohibited.¹³

A similar distribution is found with Tshiluba prepositions. In Tshiluba, functional prepositions such as *ku* ‘at’ and *mu* ‘in’ are prosodically light and proclitic, forming a prosodic constituent with an obligatory syntactic complement with no linker. This is illustrated in (23a).

¹²Degree words may also follow an adjective, with an intervening linker. In such cases, I assume that they are actually APs. Perhaps they take a null “dummy *much*” AP complement, as has been suggested for Hebrew and Arabic by McNabb (2012, 67ff.).

¹³The situation is complicated for Western Iranian languages with functional *postpositions*, such as Gilaki, the obligatory arguments of which also cooccur with a linker (Kahnemuyipour et al., 2020, p. 5). I assume that functional postpositions are simply adpositions whose complement is the target of a strong agreement probe, triggering movement of the adposition’s complement to a higher specifier position. Evidence that this is the case comes from the observation of Kayne (1994, p. 49) (credited to Ken Hale) that, if an adposition agrees with its argument, it is a postposition. Then the “linker” in Gilaki functional postposition constructions may be analyzed as a distinct category from true linkers occurring elsewhere; their homophony is due to their both receiving the default exponence of shared phi-features. See Kahnemuyipour (2014) and discussion in Section 3.2 for evidence that the form of the Persian linker is similarly the exponent of an agreement probe for a nominal feature.

- (23) (a) *Context*: A balloon is tied to a stick (BowPed 20).

tʃi-pompa tʃi-dʒi **ku=** (*kw-a/*mw-a) *(mu-tʃi)
 VII-balloon VII-PRS at.XVII= XVII-LNK/III-LNK III-tree

‘A balloon is on the tree.’

- (b) (i) *Context*: A spider is on the ceiling (BowPed 07).

tʃi-ʃi tʃi-dʒi **ku:lu**
 VII-spider VII-PRS above.XVII

‘A spider is up there.’

- (ii) *Context*: A lamp is hanging from the ceiling above a table (BowPed 13).

m-we:nduf u-dʒi **ku:lu** kw-a mesa
 III-lamp III-PRS above.XVII XVII-LNK table.III

‘The lamp is above the table.’

In contrast, lexical prepositions such as *ku:lu* ‘above’ are typically at least disyllabic and do not obligatorily project an argument, as illustrated in (23bi). When do they occur with an argument, a linker also occurs, typically agreeing with the preposition, as in (23bii).¹⁴ The relevant generalization is that the linker occurs with an argument of a preposition if, and only if, the argument is syntactically optional, meeting the condition (9ii).

For an example from the vP domain, consider the Bantu language Kinande, as discussed by Baker and Collins (2006). In Kinande, a linker obligatorily occurs between an applied argument (italicized) and the direct object (24a). However, when only the direct object occurs, no linker is possible (b).

- (24) (a) Kambale a-hek-er-a *omwami* *(y’-) obwabu (Baker & Collins, 2006, p. 320)
 PN I-carry-APPL-IND I.chief I.LNK XIV.drink

‘Kambale carried a drink for the chief.’

- (b) Kambale a-hek-a *(y’-) obwabu (*bo) (Baker & Collins, 2006, p. 320)
 PN I-carry-IND I.LNK XIV.drink XIV.LNK

‘Kambale carried a drink.’

This distribution is expected under property (9ii). Assume a shell structure in which the direct object is introduced as the complement of the lexical head of the verbal projection, call it V, and an applied argument is introduced as the specifier of a higher head. Then for monotransitive verbs such as ‘carry’ in (24), the direct object ‘drink’ is not a syntactically optional dependent of V, hence no linker may associate with it. In contrast, applied arguments such as ‘chief’ in (24a), being projected by higher heads rather than by V itself, are optional dependents of V, so that the linker may (here, must) occur. Other syntactically optional dependents that may cooccur with the Kinande verbal linker include manner and goal adverbials (Schneider-Zioga, 2015).

What we have seen in this section is that there are few semantic restrictions on the phrase with which a linker associates: it may be a modifier, an argument, a possessor, and so on. However, there is a syntactic restriction: the dependent must not be obligatorily projected by the lexical head of the

¹⁴The examples in (23) were elicited from a native speaker using stimuli from Bowerman and Pederson (1992) during a course on field methods at the University of Toronto in the Winter 2022 semester.

extended projection. Evidence for this property was given from the distribution of complements of degree, preposition, and verb heads.

2.2 Linkers are sensitive to their associate's syntactic category

Above, we have reviewed evidence that (9) is a significant generalization on the distribution of linkers cross-linguistically. In the next two sections we consider syntactic variation in the distribution of linkers. In this section it is argued that linkers may covary with the syntactic category of their associate. In the next section we consider restrictions on the possible orders of linker, dependent, and the lexical head of the superordinate extended projection.

In many languages for which linkers have been well-studied, the form of the linker is independent of the category of its associate, but is sensitive to the category of the lexical head of the extended projection, as in Tshiluba and Persian.¹⁵ In others, such as Tagalog and Mandarin, the form of the linker remains invariant whether it occurs within the noun phrase or elsewhere. But the generalization (9) leaves open the possibility that for distinct categories of the linker's associate we may have distinct linkers, within the same extended projection.

In fact, comparison between closely related languages suggests that apparent cases of linkers being insensitive to the category of their associates are likely due to the underspecification of morphological exponents rather than a lack of categorial selection. In contrast to the Persian linker, morphologically identical forms of which occur with APs, DPs, and PPs, the Northwest Iranian language Balochi uses one morpheme, *-en*, for adnominal APs but another, *-ay*, for adnominal DPs and PPs (Jahani and Korn, 2009; Kahnemuyipour et al., 2020), as illustrated in (25) and (26). Note that no suffix occurs on predicative APs or PPs (Jahani, 2019, pp. 63, 236).

- (25) [AP warnā]-**en** bačak (Jahani & Korn, 2009, p. 655)

young-LNK boy

‘the young boy’

- (26) [PP [DP lóg]-**ay** posht]-**ay** drachk dóshi kapt. (Jahani, 2019, p. 112)

house-LNK behind-LNK tree last_night fell

‘The tree behind the house fell down last night.’

In (26) we see one occurrence of *-ay* with the DP argument of a postposition and a second occurrence with the PP itself. The AP in (25) and the PP in (26) are both attributive modifiers of a head noun. The only syntactic distinction relevant to the form of the suffix is the syntactic category of the modifier.

Consider next Japanese, where we similarly find different morphemes occurring with different categories of modifier. We have seen that the form of the linker is *na* when the modifier belongs to the class of “nominal” adjectives.¹⁶ With adnominal NPs, DPs and PPs, however, the morpheme *no* is used, illustrated in (27) (data from Murasugi, 1991, p. 10).

¹⁵Sensitivity of a linker to the category of the head of the superordinate extended projection is discussed in Section 3.

¹⁶Nominal adjectives are simply the open class of Japanese adjectives, in contrast to the closed class of *i*-adjectives, which conjugate as verbs (Hasegawa, 2015, pp. 65–7). As Hasegawa notes, adjectival loanwords are always nominal adjectives, sharing the syntactic distribution of the nominal adjectives from the native vocabulary, i.e., obligatorily occurring with the linker *-na* in attributive position but not elsewhere.

- (27) (a) [_{NP} ame] **no** hi
rain LNK day
‘a rainy day’
(b) [_{DP} John] **no** hon
PN LNK book
‘John’s book’
(c) [_{PP} Boston de] **no** gakkai
Boston at LNK conference
‘a conference at Boston’

The linkers *na* and *no* are in complementary distribution, as are the Balochi linkers *en* and *ay*, so it is likely that they both belong to the same syntactic category.^{17,18} Japanese *na* and Balochi *en* are the exponents of a linker when their associate is adjectival; *no* and *ay* are the elsewhere forms.¹⁹

In summary, there is evidence that linkers are sensitive to the syntactic category of their associate. In contrast, there is little evidence that the modifier/argument distinction or more fine-grained semantic distinctions are ever relevant to the form of the linker.

2.3 Word-order restrictions

The attested word-orders in nominal linker constructions are sharply restricted. Such restrictions provide an additional criterion for empirically distinguishing between competing syntactic analyses in Sections 3 and 4.

Given the three elements of H, XP, and L(X,H), a factorial typology of six logically possible languages is generated, each differing by the unmarked word order of the three elements within the extended projection of H. For H = N, Philip (2012, 2013) reports the results of an investigation into which of these word-orders is attested in a sample of 85 languages from 13 language families and two creole languages. Their results are presented in Table 1, where L(X,N) is written as Lnk.

XP–Lnk–N	34
XP–N–Lnk	0
Lnk–XP–N	0
Lnk–N–XP	0
N–Lnk–XP	50
N–XP–Lnk	1

Table 1: Number of languages of each word-order type reported by Philip (2012, p. 68)

The elements classified by Philip (2012, 2013) as nominal linkers are semantically vacuous free morphemes (including clitics) that mark a relationship of any kind between N and another

¹⁷Certain Japanese nouns have homophonous adjectival forms, however, as in many languages (Takekoshi, 2002, p. 75).

¹⁸Note that neither distribution may be characterized as that of an adposition or a case marker. Neither APs nor PPs typically occur as complement of an adposition or require independent case licensing, but they nonetheless occur with the linkers discussed above.

¹⁹For Japanese, a similar conclusion is reached by Takekoshi (2002, 69ff.), with somewhat different assumptions.

dependent. The English Saxon genitive 's, for instance, is claimed not to be a true linker because it introduces definiteness in addition to the possessive relation (Philip, 2012, 30, fn.14). The phrase “semantically vacuous” is not very useful, however, because each linker is argued in Section 3.1.2 to enable the compositional interpretation of the dependent. Nonetheless, each of the canonical linkers that we have discussed above are claimed by Philip (2012, 2013) to be semantically vacuous in the relevant sense. For present purposes, then, it suffices to assume that our notion of nominal linker is coextensive with that of the above author.

The linkers we have discussed thus far are representatives of the word-order type (i) XP–Lnk–N, namely Japanese *na* and *no*, Mandarin nominal *de*, Tagalog *ng/na*, and Balochi *en* and *ay*; or of word-order type (ii) N–Lnk–XP, represented by Mandarin *de* outside of the noun phrase, Tagalog *ng/na*, the Tshiluba linker, and Persian *ezafe*. The sample discussed by Philip (2012, 2013), however, also includes Kanuri (Nilo-Saharan), the sample’s sole representative of a third word-order type, namely N–XP–Lnk.²⁰

Philip (2013, pp. 200–1) discusses example (28), where we see a head noun preceding a possessor followed by a phrasal suffix.²¹

- (28) [DP fátò [DP kām kúrà]=**be**]=ga rúskəna (Kanuri; Dryer, 2007, p. 83)
 compound man big=GEN=OBJ 1.see.PST
 “I saw the big man’s compound”

The element glossed as GEN is dismissed by Philip (2013, p. 201) as a “potential, though not proven, counterexample” to the claim that Lnk must intervene between XP and N, because the position of N may be a derived one, whereas the claim is intended to hold only of base-generated orders. This dismissal, however, depends on a theory of noun phrase structure like that of Abels and Neeleman (2012), where word-order variation is variation in the linearization of adjuncts and not in syntactic movement. But the unmarked order of elements in the Kanuri noun phrase is N–Adj–Num–Dem (Fiedler, 2010). This order is cross-linguistically very common and is derivable both in the theory of Abels and Neeleman (2012) and in an antisymmetric theory that derives word-order variation from variation in syntactic movement, such as that of Cinque (2005).

For the purpose of description, I continue to remain agnostic about the choice of a theoretical framework for noun phrase structure. However, the unmarked order of noun phrase elements in Kanuri, in which the noun is initial, makes it unlikely that the position of the noun in possessive constructions such as that in (28) involves exceptional movement of the head noun. In fact, possessors regularly follow adjectives (hence, nouns) in Kanuri (Hutchinson, 1981, 198ff.).

Besides occurring with DP possessors, as in (28), =*be* occurs with adnominal NPs (29a), lexical prepositions (b), and complement clauses (c).

- (29) (a) keska kannu=**be** (Hutchinson, 1976, p. 10)
 wood fire=GEN

²⁰Pashto is discussed as a potential representative of the linker-initial word-order Poss–XP–N, with the possessive marker being the potential linker (Philip, 2012). Citing Larson (2009), Philip (2012) dismisses Pashto possession constructions from the discussion based on evidence that their word-order is derived. As discussed below, however, this kind of reasoning is weak if movement affecting word-order is widespread in noun phrases. Nonetheless, the possessive marker does not pass the diagnostic (9), because Poss–XP expressions occur also in the clause as obligatory experiencer arguments (Babrakzai, 1999), so that Poss is likely to be an exponent of an oblique case and not a linker.

²¹In presenting Kanuri data, I follow the transcription scheme of Hutchinson (1976), so that =*ve* has been changed to =*be*.

‘firewood’

- (b) shi suro njim=**be**=n (Hutchinson, 1976, p. 11)

he inside hut=GEN=LOC

‘He is inside the hut.’

- (c) [Hawar [mai bazə-na]=**be**=də] kattuwu (Gazali & Gombe, 2020, p. 81)

news king die-PTCP=GEN=DEF false

‘The news that the king has died is false.’

Although I know of no cases where a DP–*be* expression occurs outside of an adnominal context, the availability of such a construction cannot be ruled out a priori. Moreover, I know of no cases where *be* iterates with multiple modifiers. There is some uncertainty, then, as to whether it satisfies diagnostic (9).

I argue that a much more convincing case of N–XP–Lnk order comes from Daasanach (East Cushitic). Here, dependents of a head noun are postnominal, and the morpheme =*a* (with the nonclitic allomorph *ka*) immediately follows each one, except numerals and adnominal DPs (Tosco, 2001, p. 252).²² Bare nouns do not occur with =*a*, however, and =*a* does not have any interpretation, such as definiteness, apart from that related to its licensing of attributive modifiers (Tosco, 2001, p. 225). As illustrated in (30), =*a* occurs with adjectives (a), pronominal possessors (a,b), demonstratives (b), and relative clauses (c).

- (30) (a) [_{DP} lokod ci=**a** basu=**a**] fjet ^hé koppi (Tosco, 2001, p. 255)

skin 1POSS=LNK flat=LNK fire 3.SUBJ eat.PRF

‘The fire burnt my flat hide.’

- (b) ?adda kú=**a** ti=**a** (Tosco, 2001, p. 253)

aunt 2POSS=LNK DIST=LNK

‘that aunt of yours’

- (c) [_{DP} min [gúo ká ?igill-u] **ka**] yáa ?óg (Tosco, 2001, p. 283)

woman cattle here enter.CAUS-PTCP LNK 1SG.SUBJ know

‘I know the woman who is milking the cattle.’

As illustrated by (a) and (b), =*a* iterates for each modifier, satisfying criterion (a) of our linker diagnostic (9). (For 30c, note that *ká*, with a high tone, is distinct from the linker, and is a directional preverb; the phrase ‘to cause to enter here’ idiomatically means ‘to milk.’)

When an adjective is used in predicate position, it does not cooccur with =*a* (Tosco, 2001, p. 289). In (31a), for instance, the adjective ‘clever’ is in attributive position and is immediately followed by =*a*; in (b), however, the same adjective is the predicate of the clause and =*a* does not follow.²³

- (31) (a) [_{DP} máa ^hijasic=**a**] yáa ?argi (Tosco, 2001, p. 256)

man clever=LNK 1SG.SUBJ see.PRF

‘I saw a clever man’

²²Note that although Daasanach is listed in Philip (2012, p. 201)’s sample (as “Dasanech”), the linker is incorrectly labeled as prenominal, and is not discussed in the text. In fact, =*a* is always postnominal (Tosco, 2001, p. 225).

²³There is an occurrence of =*a* in (31b), but this is associated with the demonstrative *ti*, as in (30b).

- (b) [DP máa ti=a] ^hipasic (Tosco, 2001, p. 289)
 man DIST=LNK clever
 ‘That man is clever’

Finally, =a does not occur with numerals or adnominal DPs (Tosco, 2001, p. 257), illustrated in (32a) and (b), respectively. Because adnominal DPs, such as possessors, do not occur with =a, it is unlikely to be a marker of genitive case, which is instead typically expressed by a suffix on the noun, as shown in (b).

- (32) (a) dág naama (Tosco, 2001, p. 257)
 women two
 ‘two women’
 (b) bíl car-íet (Tosco, 2001, p. 254)
 house snake-GEN
 ‘a snake’s house’

In summary, each instance of =a is associated with a unique dependent of a head noun. By (9), then, it is a linker.

One other language exhibits the word-order type N-XP-Lnk, namely, Middle Elamite, an ancient language isolate from south-west Iran.²⁴ Similar to Daasanach, a head noun precedes its dependents, each of which is immediately followed by a morpheme, known in the Assyriological literature as the “nominal classifier,” that appears to lack any semantic contribution apart from its licensing of dependents. As in Tshiluba, the nominal classifier agrees in phi-features with the head noun, which may itself be inflected by a noun class affix, often (but not always) homophonous with the nominal classifier. The nominal classifier may cooccur with pronominal possessors like *u* ‘1SG’ (a), NPs like *husa* ‘grove’ (a,b), adnominal DPs (b), adjectives like *rifa* ‘great’ (c), and relative clauses (d).²⁵

- (33) (a) hiyan [DP Infufinak napi=**ri** u=**ri**]=**me** (EKI 18, 2-3)
 hall.INAN PN god=LNK.AN 1SG=LNK.AN]=LNK.INAN
 ‘hall of my god Inšušinak’
 (b) sian Infufinak=**me** husa=**me** (EKI 48, passim)
 temple.INAN PN=LNK.INAN grove=LNK.INAN
 ‘Inšušinak’s grove temple’
 (c) e Kiririfa, rutu rifa=**ri** (Grillot-Susini, 2008, p. 41)
 oh PN, wife great=LNK.AN
 ‘Oh Kiririfa, great wife!’

²⁴Our main source for Middle Elamite is a set of literary texts known as the “royal inscriptions,” preserved in brick tablets in a variant of the cuneiform script used for the Akkadian (Semitic). The standard editions cited here are König (1965), abbreviated as EKI, and Malbran-Labat (1995), abbreviated as IRS. Multilingual texts allow comparison with Akkadian and Old Persian. For an overview of Middle Elamite grammar, see Tavernier (2018). Other standard references include the grammars of Grillot-Susini (2008), Khačikjan (1998), and Reiner (1969), and the lexicon Hinz and Koch (1987).

²⁵In (d) we also see that *me* is associated with a negation marker inside a relative clause. The usage of the Middle Elamite nominal classifier outside of the noun phrase is discussed by Grillot-Susini (2008, pp. 67–8).

- (d) [DP *sian* Upurkubak=**me** [CP *sunki-pi* *uripu=pi* *ʃufun*
 temple.INAN PN=LNK.INAN king-AN.PL previous=LNK.AN.PL PN
im=me *kuʃi-hʃi*=**me**]=a *u* *alumelu* *kuʃi-h* (IRS 23, 2-3)
 not=LNK build-3PL]=LNK.INAN]=a 1SG acropolis build-1SG
 ‘A temple of Upurkubak that previous kings in Susa did not build, I built on the
 acropolis.’

In (a) we see that the nominal classifier *me* attaches at the phrase level, where it follows an adnominal DP possessor but agrees with the inanimate head noun *hiyan* ‘temple.’ The nominal classifier iterates with each dependent of a head noun, as can be seen in (a), (b), and (d). Notice also in (b) that *=me* attaches to the proper DP *Inšušinak*, which functions as an adnominal modifier. When a proper DP is not a dependent, however, it does not cooccur with any form of the nominal classifier. This is the case in (34), for example, where the same proper DP is the subject.²⁶

- (34) *Infuʃinak* *sunki-me* *u-n* *duni-ʃ* (EKI 4C.4)
 PN kingdom-INAN 1SG-DAT give-3SG
 ‘Inšušinak gave me the kingdom’

Due to the limited nature of the data, the correct morphosyntactic description is uncertain in many cases. But it is clear that a form of the nominal classifier occurs with each dependent of a head noun, but does not occur when the same element, e.g., a DP, is not a dependent of a noun. Hence the Middle Elamite nominal classifier satisfies our diagnostic (9) for linkerhood.

To sum up this discussion, the word-order type N–XP–Lnk is clearly attested in at least two genetically-unrelated languages, Daasanach and Middle Elamite, and is possibly also found in Kanuri. The attested word orders are then the three listed in (35).²⁷

- (35) *Attested word-orders in linker constructions*
 (a) XP–Lnk–H (Chinese, Japanese, ...)
 (b) H–XP–Lnk (Daasanach, Middle Elamite, ...)
 (c) H–Lnk–XP (Persian, Bantu, ...)

In each of the three attested word-orders, the linker is adjacent to its associate, and is not in initial position—that is, it is preceded by either its associate or the head of the extended projection. These two conditions are stated in (36).

- (36) *Conditions on word-order in linker constructions*
 If L(X,H) is a linker, then

²⁶In (34) we find the noun class suffix *-me* on the root *sunki-* ‘king.’ This noun class suffix is homophonous with a form of the nominal classifier but receives a different morphological analysis. The choice of noun class suffix on the root of a head noun yields different interpretations, behaving as a derivational head, call this *n*. For example, we have *sunki-me* $\sqrt{\text{king}}$ -INAN ‘kingdom’ but *sunki-r* $\sqrt{\text{king}}$ -AN ‘king.’ A noun class suffix attached to a root may undergo suppletion as zero, as is the case for the head noun *sian* in (33b). In contrast, the nominal classifier is (i) not arbitrary, but is always chosen to match the phi-features of the head noun of the extended projection, (ii) attaches at the phrasal level, (iii) and never undergoes suppletion as zero. The noun class suffix and the nominal classifier are underlyingly distinct syntactic terminals, but are homophonous due to the underspecification of vocabulary items.

²⁷A further word-order type, H–Lnk₁–XP–Lnk₂, in which the linker is realized as a circumfix around XP, is discussed in Section 3.2. This does not violate the generalization (36), if both components of the circumfix are analyzed as a single L(X,H).

- (a) $L(X,H)$ and XP are adjacent, and
- (b) $L(X,H)$ is preceded by at least one of H or XP .

In this section we have established two cross-linguistic generalizations on the distribution of linkers. In the next section it is argued that they may receive a uniform explanation.

3 Deriving the linker generalizations

We have established two cross-linguistic generalizations about the syntactic distribution of linkers, to be derived presently. First, in Section 3.1, it is argued that generalization (9) follows from a theory of structure-building in which each syntactically optional—or *weak*—dependent of a head H is the specifier of a higher head within the same extended projection, spelled out as a linker. Syntactic evidence for this universal structure for “weak” dependency comes from the fact that a linker (i) is sensitive to the syntactic category of both its associate and of H , (ii) and that it may license ellipsis of its complement, which includes H but not XP .

Semantically, each linker head is argued to first compose with a projection of H , potentially binding an otherwise free or contextually-bound variable within the denotation of H , subsequently saturated upon composition with the linker’s associate. This enables structures involving modifiers or optional arguments to be interpreted compositionally, without construction-specific rules of interpretation.

Next, in Section 3.2, all and only the word-orders that satisfy the conditions (36) are shown to be derivable from the proposed structure, given parameters governing (i) whether a linker undergoes head reprojection to check a strong probe feature, (ii) and whether the higher or the lower copy of the linker is pronounced.

Alternative analyses are considered in Section 4. In particular, the present analysis is compared with those in which the linker forms a narrow constituent with the dependent or in which the dependent is an adjunct. Coordination and ellipsis facts show these alternative analyses to be problematic on language-internal grounds. In addition, these alternative analyses are shown to generate unattested word-orders.

3.1 Strong versus weak dependency

We have seen that a linker $L(X,H)$ always cooccurs with a dependent XP that is “syntactically optional,” in the sense that the presence of the categorial head H of the extended projection does not imply the presence of XP . This condition was illustrated via contrasts between lexical versus functional prepositions, between adverbial modifiers of an adjective versus degree heads, and between applied versus direct objects of a verb. We may semi-formally capture the relevant distinction via the definitions in (37).

(37) *Strong versus weak dependents*

Let H be the head of an extended projection. A *dependent* XP of H is any phrase within the extended projection of H that underlyingly c-commands it.²⁸ XP is *strong* if it is obligatorily selected by H ; otherwise it is *weak*.

²⁸The relevant notion of c-command here is that of Chomsky (2000, p. 116), where “ α c-commands β if α is the sister of K that contains β ,” and containment is assumed to be reflexive. Note that this version of c-command is not

The structural definition of “dependent” adopted here is sufficiently broad enough to capture the familiar cases of modifiers, obligatory and optional arguments, quantifiers, and, so on, while ruling out constituents embedded among those as well as those base-generated outside of the relevant extended projection, such as certain kinds of left-dislocated topics. Heads within the extended projection of H are also not formally its dependents, capturing the generalization, mentioned in Section 2, that a linker never associates with higher heads in the same extended projection.

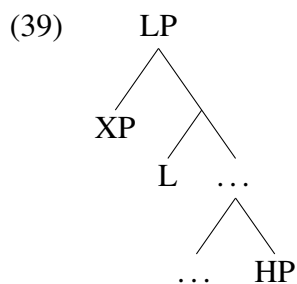
The distinction between “strong” and “weak” dependents is closely related to the concepts of structural locality and syntactic optionality. I assume that feature-checking is local, so that a strong dependent of H is always merged locally to H, namely, as its complement or specifier (Chomsky, 1965; et seq.; cf. especially Sportiche, 2005). A weak dependent may or may not be, depending on further assumptions about phrase structure, to be elaborated below.

Though the above definitions are not without controversy, they do not stake a strong position on how weak dependents are integrated into syntactic structure. It is now widely accepted that weak *arguments* of the head of an extended projection are merged as specifiers of higher heads in the extended projection, best studied in Larsonian vP shells. There has been considerably more debate over whether *modifiers* are structurally parallel (for a recent overview of this debate, cf. Ernst, 2020.) I make the strong claim here that *every* weak dependent XP is merged as a specifier of a “linker” head L in the extended projection of H, as stated in (38) and illustrated in (39).^{29,30}

(38) *Linker thesis*

Given syntactic categories X and H, where H is the head of an extended projection,

- (a) a head L is a *linker*, and *links* XP to H (in symbols, $L(X,H)$) if, and only if, L c-selects for a projection of H as its complement and for XP as its specifier, and, conversely,
- (b) if XP is a weak dependent of H, the relation $L(X,H)$ holds for some linker L.



Analyses of particular languages resembling the structure (39) for linker constructions include Paul (2017) and Zhang (2009) for Chinese, and Kahnemuyipour (2014) for Persian. Alternative structural analyses, to be discussed in Section 4, include those in which L first merges with XP

asymmetric, so that sisters c-command each other. Then a complement XP of a head H is a dependent of H, according to (37). Adnominal DPs, which co-occur with *of*, raise interesting complications, to be discussed in Section 3.1.2.

²⁹In Section 2.3 it is shown that a linker head L may be syntactically split into two structurally-adjacent heads. In such cases, an overt linker may spell out either the higher one, the lower one, or both.

³⁰It has sometimes been argued that c-selection is always for a complement, and never for a specifier. Svenonius (1994), argues, for instance, that certain verbs require that their complement be a DP, but not a CP, whereas no verbs place a corresponding categorial restriction on the external argument. Even if this is the case, nothing is learned about the ability of a head to c-select for a specifier, if one assumes that the external argument is not an argument of the verbal root but instead of a higher Voice head, as argued in Kratzer (1996) and subsequent work.

(Rubin, 1994 et seq.) or in which L first merges outside of a small clause that includes XP and HP (den Dikken, 2006; den Dikken & Singhapreecha, 2004).

Definition (38) identifies the concept “linker” as any syntactic head that satisfies the “link” relation between a head H and a phrase XP. This successfully accounts for generalization (9) that each linker is associated with a single weak phrasal dependent. To see this, suppose we have the configuration (38a)/(39). Then, according to our structural definition of dependency (37), XP c-commanding H is its dependent, and, because XP is merged non-locally to H, it must also be weak and syntactically optional.

Next, the categorial feature of H percolates through the heads in its extended projection (by definition of the latter, cf. Grimshaw, 2000); there is, in principle, no limit to the number of such heads. The fact that there exists a landing site for verb movement between any two adverbials suggests that heads at least sometimes associate with their specifiers in a one-to-one relation (Cinque, 1999). Similarly, it is argued by Giusti (2019) that variation in the position of the Latin noun with respect to its modifiers is best accounted for if each modifier occupies the unique specifier of a head in a functional sequence, any head of which may be the landing site for head-movement of the noun.³¹ If this can be assumed to be the case for weak dependents generally, then any L satisfying (38a)/(39) also satisfies the empirical generalization (9).

Now suppose XP is not base-generated in the configuration (38a)/(39). Then XP may not cooccur with a linker L without a projection of H also being present, given that a linker c-selects for a projection of H, by hypothesis. This is also what we find empirically, as stated in (9). For instance, we saw in Section 2 for several languages that a nominal linker may cooccur with AP when the latter is an attributive modifier of N, but that a linker may *not* cooccur with the same AP when the latter is the predicate of a clause. Configurations in which a linker associates with a head in the same extended projection are also ruled out, as desired. Hence (9) is a consequence of (38a)/(39).

3.1.1 Syntactic evidence for the analysis of linker constructions

Selectional asymmetries and ellipsis offer further syntactic evidence that (38a)/(39) is the correct base-generated configuration for linker constructions. Issues of word-order are discussed in Section 3.2.

In the structure (39), L c-selects for a categorial feature, taking a phrase bearing this feature as its complement, namely HP or an extended projection of it. To show that this is actually the case, it suffices to show that L may covary with H, keeping XP fixed. Concretely, we wish to find categories X, $H_1 \neq H_2$, such that, given an associate XP, within the extended projection of H_1 L must have the exponent Λ_1 , and within the extended projection H_2 L must have the exponent Λ_2 , where $\Lambda_1 \neq \Lambda_2$. The validity of this test should not depend strongly on the choice of morphological theory. For the sake of explicitness, however, I work within a realizational theory in which exponents are inserted for each syntactic terminal after structure-building has completed (e.g., Distributed Morphology; cf. Bobaljik, 2017 and references cited there). Each exponent belongs to a list of Vocabulary Items, each a pair consisting of a set of morphosyntactic features and a phonological representation, the most specified item always being chosen (according to the so-called “subset principle”).

³¹More precisely, working within the framework of Giusti (2015), Giusti (2019) argues that the head noun can only host a single modifier in its specifier and must undergo internal merge and reprojection in order to host additional modifiers. Latin is claimed to be free with respect to which head in the chain is pronounced.

We can find instances of such covariation in the cases of PP modifiers in Tshiluba and AP modifiers in Cantonese. In Tshiluba, as in many other languages, PPs may serve as attributive modifiers of either N or V. When PP modifies N, an overt linker is obligatory; but when PP modifies V, no linker may appear. This illustrated in (40).

- (40) (a) [_{DP} mpusu *(w-a) mu nzubu] u-dʒi w-a ji
 I.cat I-LNK in house I-PRS I-LNK 1SG.POSS
 ‘The cat in the house is mine.’
 (b) [_{DP} mpusu [_{CP} u-dʒi mu-somb-a (*w-a) mu nzubu]] u-dʒi w-a ji
 I.cat I-PRS PRF-sit-IND I-LNK in house I-PRS I-LNK 1SG.POSS
 ‘The cat sitting in the house is mine.’

This distribution is explained if the inflectional base *-a* of the linker spells out a feature bundle that includes the feature *c*-selecting for a nominal category. If the linker occurs in a different extended projection, it is spelled out as zero, the morphological default.³² The relevant fragment of the Tshiluba vocabulary is given in (41).

- (41) (i) [L, uN] \longleftrightarrow -a
 (ii) [L] \longleftrightarrow -Ø

In other languages, the default form of the linker may be overt. In Mandarin, for instance, the form *de* occurs within the nominal domain, the adjectival/adverbial domain, and the clausal domain, despite its different syntactic behavior in these different domains.³³ This homophony is unlikely to be completely accidental, given that we find essentially the same distribution in other varieties of Chinese. In Shanghainese (Shanghai Wu), for instance, the linker has the form [əʔ] (in apparently free variation with [gəʔ]) both within the extended projection of the noun and of the verb, as shown by comparing (42a) and (b), respectively.³⁴

- (42) (a) ŋu əʔ [_{AP} lɔ k^hɛʃiŋ] əʔ ky (Shanghainese)
 I LNK very happy LNK dog
 ‘my very happy dog’
 (b) ŋu əʔ ky [_{AP} lɔ k^hɛʃiŋ] əʔ tʃi-lə jave
 I LNK dog very happy LNK eat-PRF dinner
 ‘My dog very happily ate dinner.’

Given the generally great morphological and phonological differences between Mandarin and Shanghainese, it would be surprising if the aforementioned pattern of homophony within each of the two languages were accidental. Instead, it is likely that the homophony reflects a shared morphosyntactic feature, namely the feature of a shared category for the linker, call it *L*.

In Cantonese, however, the form of the linker is spelled out differently when used within the nominal versus the verbal domain. It was shown by Zhu (1980) that the nominal linker has the form [ge] whereas the verbal linker has the form [gam], as can be seen by comparing (43ai) and (aii), below.

³²Note that in certain other Bantu languages, such as Kinande, the linker associated with an adverbial PP may be overt (Baker & Collins, 2006).

³³For instance, *de* follows its associate in the noun phrase but precedes it in the clause and in the adjective phrase.

³⁴Zoe Wu (2004, 128ff.) discusses additional examples, including also Taiwanese.

- (43) (a) (i) hou houhaak **ge** yahn (Cantonese; Matthews and Yip, 2011, p. 180)
 very hospitable LNK person
 ‘a very hospitable person’
 (ii) Keoi sengjat mting **gam** gong (Tang & Cheng, 2014, p. 602)
 he all_day non_stop LNK speak
 ‘He speaks non-stop all day’
 (b) Ta zhengtian buting **de** shuo (Mandarin; Tang and Cheng, 2014, p. 602)
 3 all_day non_stop LNK speak
 ‘He speaks non-stop all day.’
 (c) i tsant^{hi}i vədiŋ əʔ gaŋ (Shanghainese)
 3 all_day non_stop LNK speak
 ‘He speaks non-stop all day.’

This contrasts with Mandarin and Shanghainese, shown in (b) and (c), respectively, where the default form is used in both domains. In Cantonese and Shanghainese, a third form of the linker, [dak] and [lə], respectively, appears with postverbal adverbials, which are focused (Tang, 2002; Zoe Wu, 2004).³⁵

The relevant morphological differences between these three varieties are captured by the vocabulary fragments in (44). Mandarin only has a single vocabulary item for linkers, used regardless of the selectional features of a given linker head. Shanghainese has a default form (bii), but also has a special form for focused adverbials (bi). In Cantonese, there are at least three vocabulary items, as shown in (c). In contrast to postverbal adverbials, I assume that preverbal ones do not bear the focus feature [Foc]; hence, a linker cooccurring with preverbal adverbials is spelled out as the elsewhere form [gam].

- (44) (a) [L] \iff de (Mandarin)
 (b) (i) [L, uV, uFoc] \iff lə (Shanghainese)
 (ii) [L] \iff əʔ
 (c) (i) [L, uV, uFoc] \iff dak (Cantonese)
 (ii) [L, uN] \iff ge
 (iii) [L] \iff gam

The c-selectional features of distinct linkers are responsible for their different forms. An alternative analysis that views these forms as the result of contextual allomorphy faces the problem that the linker is not necessarily local to the head of the extended projection. In the noun phrase, for instance, the linker iterates for each phrasal dependent of the head noun; likewise, in the clause, the linker may be separated from the verb by a manner adverbial (cf. Matthews and Yip, 2011, p. 223 for a Cantonese example). But then if one assumes that linear adjacency is required for contextual allomorphy (cf. Embick, 2010, 49ff. and references cited there), contextual allomorphy cannot be responsible for conditioning the form of the linker.

Additional evidence that the linker c-selects for H comes from its ability to license ellipsis. Zhang (2009, 102ff.) shows that in Chinese, verbs, auxiliaries, and heads in general appear to be

³⁵Postverbal adverbial constructions are discussed more in Section 4.1.3.

able to license ellipsis of their complements; in contrast, adverbials cannot. As illustrated in (45), the linker *de* patterns as a head, being freely able to license ellipsis of the NP material to its right; without *de*, ellipsis cannot occur.

- (45) [[Dai yanjing] *(de) na ge ren] lai-le (Mandarin; Zhang, 2009, p. 102)
 wear glasses LNK DIST CLF person come-PRF
 ‘The person who wears glasses came.’

Zhang (2009) suggests, accordingly, that when used as a nominal linker, *de* is a head within the spine of a right-branching extended nominal projection (for additional commentary, see Paul, 2017, 7ff.). Japanese appears to pattern with Chinese in this respect (cf. Watanabe, 2010), and as discussed in Section 2, linkers appear to be able to license nominal ellipsis also in Tshiluba. I argue that this is the result of an [E]llipsis feature on a linker head L, interpreted at the syntax-phonology interface as an instruction to delete its complement (Merchant, 2001; et seq.). In this respect, L patterns with other heads in the extended nominal projection, namely, D, Num/Cl, and *n*, an E feature on each of which has been argued to be responsible for different kinds of nominal ellipsis (Saab, 2018).

3.1.2 Linkers beyond canonical cases

We have seen evidence that canonical cases of linker constructions likely have the base-generated structure (39). Item (b) of the proposed thesis (38) makes the stronger claim that *all* weak dependent constructions have such a structure, including both those involving “adjuncts” and those involving syntactically optional arguments. I continue to put aside issues of word-order, to be considered in Section 3.2, as well as the consideration of alternative analyses, with which we will be in a better position to make empirical comparisons after further arguments for the present theory are presented below.

I discuss below three otherwise mysterious phenomena that this theory is able to explain, concerning (i) the compositional interpretation of constructions involving modifiers and optional arguments, (ii) the distribution of West Germanic attributive inflection, (iii) and the dual behavior of semantically weak *of*-type prepositions crosslinguistically.

Modification, optional arguments, and compositionality Within the “Fregean program” of deriving the interpretation of a sentence from the semantic composition of its constituents via function application, syntactically optional grammatical functions like modifiers and optional arguments have proven problematic, as follows. Suppose that a phrase XP is a syntactically optional dependent in an extended projection HP. Then it is reasonable to assume that XP is also semantically optional, in the sense that XP does not saturate an argument of H. For instance, an AP modifier of a head noun N is syntactically optional; it also does not saturate the *e*-type argument of $\llbracket N \rrbracket$, assuming that a noun denotes a one-place predicate. If XP is semantically-optional in this sense and XP composes directly with a projection of H, then XP must denote an endotypical functor, essentially an identity function. It is then unexpected that XP can be interpreted otherwise in other syntactic contexts. For example, AP is endotypical when an “adjunct” to N, but is interpreted as a one-place predicate elsewhere—this is simply the attributive/predicative alternation of adjectives.

We may term the situation just described as the “optionality” problem, which goes back at least as far as Higginbotham (1985). As discussed by Bücking (2018), the two most common analytical

solutions to this problem are either to propose a special rule of interpretation for nodes whose children are of the same type (e.g., Heim and Kratzer, 1998’s rule of Predicate Modification), or to require that certain categories, such as A, are inherently endotypical (e.g., Montague, 1974). The first family of analysis is not explanatory, essentially proposing a construction-specific interpretive rule. In the absence of compelling evidence for such a rule, it is theoretically preferable to pursue the stronger hypothesis that all semantic composition is function application. The second family of analysis is also inadequate, because it does not extend to all problematic cases. As mentioned in Section 2, adnominal DPs, whether possessors or arguments, appear never to be strong dependents of the head noun. Adnominal DPs are then essentially parallel to adnominal APs, PPs, and other “adjuncts” to N in not saturating the *e*-type argument of $\llbracket N \rrbracket$. But DPs cannot be assumed to generally be of the endotypical type $\langle et, et \rangle$.

An alternative approach to the compositional interpretation of modification assumes that the category of the modifier, e.g., AP, forms a narrow-constituent ModP with a modifier-forming Mod head, spelled out as a linker in various languages (Rebuschi, 2005; Rubin, 1994, 1996, 2003; Scontras & Nicolae, 2014).³⁶ This approach has the advantage of enabling the compositional interpretation of constructions involving modifiers, without special interpretive rules. However, the “narrow-constituent” family of analysis for linker constructions makes incorrect predictions regarding constituency, to be discussed in Section 4. Moreover, the ModP analysis has not been extended to account for syntactically optional phrases besides canonical modifiers, for example, weak dependent DPs and PPs that may instantiate thematic relations.

Let us adapt the central insight of the ModP analysis to the present syntactic account, namely, that the linker is a functional head that enables AP and other predicates to be compositionally interpreted as modifiers of the head of an extended projection. The composition of modifiers is straightforward and proceeds essentially as in works cited above that assume the ModP analysis, except that, in the present analysis, the linker L composes with the head of the extended projection before it composes with the modifier.³⁷

Now consider how we may derive the optional syntactic instantiation of a thematic relation that is present in the denotation of a head noun. Consider, for instance, the case of the patient role of an action-denoting noun, as in the Persian example (46). The present theory proposes that $=e$ spells out a linker head L, which takes an NP headed by ‘destruction’ as its complement and the DP ‘city’ as its specifier.

- (46) $tæxrib=e$ $šæhr$ (Larson & Samiian, 2020, p. 175)
 destruction=LNK city
 ‘destruction of the city’

³⁶Related, but not identical to ModP analyses are analyses in which a modifier forms a narrow-constituent with a head that functions as a “join” operator (Baker, 2004; Belk, 2017; Truswell, 2004). It has been suggested by Kahnemuyipour et al. (2020) that the linker spells out such an operator. These analyses are not discussed here. I merely note that join-based analyses face the same empirical issues as any analysis in which the linker first merges with the modifier. See Section 4 for further discussion.

³⁷The structure (39) for modifiers has in fact been predicted to exist by independent considerations regarding the semantics of “expressive” modification, as in “that damn dog!” Morzycki (2008, pp. 120–1), crediting Chris Kennedy, argues that “rather than a separate rule of Expressive Predicate Modification ..., one might instead suppose there is a functional head E, that takes APs as specifiers and NPs as complements, ... *if an overt expression of E could be discovered ... this would be an appealing approach* (emphasis added—ZF).” The head E suspected in the preceding quote corresponds to our linker head L.

I assume that every noun has a fixed set of thematic relations that may be optionally instantiated within the syntactic derivation, and otherwise either determined by the context or simply left undetermined.³⁸ For the sake of concreteness, suppose that the argument structure of a noun N is a conjunction of thematic relations $R(x, y^R)$, where $y^R : e$ is a free variable indexed to R , and $x : e$ is the unique lambda-bound argument. For example, if N is a prototypical “transitive” noun like ‘destruction,’ then its semantics include a unique entity, y^{Patient} , standing in the relation of patient to N . A diacritic, indicated by a superscript, ensures that this entity is uniquely identifiable. Then “destruction” can be said to have the denotation (47).

$$(47) \quad \llbracket \text{tæxrib} \rrbracket = \lambda x_e. \text{ACT_OF_DESTRUCTION}(x) \wedge \text{PATIENT}(x, y^{\text{Pat}}) : \langle e, t \rangle$$

If a thematic relation R is not syntactically instantiated, then y^R may be contextually valued. In (48), for instance, the patient argument of “destruction” is not instantiated in the syntax. It then receives a contextual interpretation, corresponding to “the city of Carthage.”

- (48) *Context: Shortly after the battle near Zama, the Roman army arrived at Carthage.*
The destruction was immense.

In order to be syntactically instantiated, however, each thematic relation y^R of N must be bound. Given that the linker obligatorily occurs whenever a thematic relation is instantiated, it is reasonable that the syntactic head L of which the linker is an exponent is responsible for the binding. The linker first binds a thematic relation that is present in the denotation of the head noun, followed by saturation of the lambda-bound argument upon composition with the linker’s DP associate. There are definitions of the form (49) for each thematic relation.³⁹

$$(49) \quad \llbracket =e_{\text{Pat}} \rrbracket = \lambda P_{et} \lambda y^{\text{Pat}}_e \lambda x_e. P(x) : \langle et, \langle e, et \rangle \rangle$$

Then the derivation and composition of (46) proceeds as illustrated in (50), where C is a variable for the context. We continue to abstract away from word-order.

$$(50) \quad \begin{array}{c} \text{LP} \quad \rightsquigarrow \lambda x_e. \text{ACT_OF_DESTRUCTION}(x) \\ \quad \wedge \text{PATIENT}(x, \iota y_e. y \in C \wedge \text{CITY}(y)) : \langle e, t \rangle \\ \swarrow \quad \searrow \\ \text{DP} \quad \text{L}' \quad \rightsquigarrow \lambda y^{\text{Pat}}_e \lambda x_e. \text{ACT_OF_DESTRUCTION}(x) \\ \text{\textit{sæhr}} \quad \quad \wedge \text{PATIENT}(x, y^{\text{Pat}}) : \langle e, et \rangle \\ \swarrow \quad \searrow \\ \lambda P_{et} \lambda y^{\text{Pat}}_e \lambda x_e. P(x) \quad \text{L} \quad \text{NP} \quad \rightsquigarrow \lambda x_e. \text{ACT_OF_DESTRUCTION}(x) \\ : \langle et, \langle e, et \rangle \rangle \quad =e \quad \triangle \quad \wedge \text{PATIENT}(x, y^{\text{Pat}}) : \langle e, t \rangle \\ \quad \quad \quad \text{tæxrib} \end{array}$$

To summarize, a theory of phrase structure that allows modifiers and optional arguments to merge directly with the head of the extended projection as adjuncts conflicts with the desire for the

³⁸Note that the syntactic instantiation of a thematic relation is optional even if a functional head in the derivation of the noun is responsible for its introduction into the semantics.

³⁹This analysis predicts that there are languages in which distinct linker forms occur with arguments of different thematic relations. It is unclear if any such languages are attested, though it is possible that argument-introducing “prepositions” in some languages are actually linkers (i.e., they are “pseudo-prepositions,” see below). Such apparent prepositions do seem to select for arguments of different thematic relations.

compositional interpretation of such constructions. The ModP hypothesis succeeds at interpreting modifiers, but faces empirical syntactic issues. The advantages of the ModP hypothesis, however, are adapted to the present LP account. The linker first composes with the head of the extended projection, potentially binding one of its arguments, which is subsequently saturated upon composition of the linker's associate. Thus, LP in (50) has the same type as NP, as desired. Then both modifiers and the optional syntactic instantiation of thematic relations may be compositionally interpreted.

West Germanic attributive inflection Further evidence for the structure (39) comes from differences in the morphosyntactic distribution of inflection associated with adjective phrases in West versus North Germanic languages. I argue that in West Germanic languages, the syntactic locus of so-called “adjective inflection” is not A^0 but rather L^0 . In North Germanic languages, however, there is “true” adjective inflection, i.e., inflection on A^0 , as in Romance.⁴⁰

There are two main pieces of evidence in support of this view. First, in West Germanic languages with overt concord, attributive inflection may be “suspended,” detectably occurring as a phrasal suffix in comparative constructions (Roehrs, 2006) and also in coordinated APs. First, consider adjective coordination. In German, when coordinated adjectives modify a noun, they may both be inflected, as in (51).

- (51) eine zweite Phase [_{DP} demokratisch-**er** und sozial-**er**
a second phase democratic-FPL.GEN and social-FPL.GEN
Reformen] (German; DWDS 1998/adg19980428_119579)
reform.FPL
‘a second phase of democratic and social reforms’

Alternatively, the inflection may occur once, after the final adjective, as in (52a), suggesting that inflection occurs outside of the AP, as in (b).

- (52) (a) in einem demokratisch und sozial-**en**
in a.MSG.DAT democratic and social-MSG.DAT
Bundesstaat (DWDS 1990/DE_g_dok374_1990_07_30)
federal_republic.MSG
‘in a democratic and social federal republic’
(b) in einem [_{AP} demokratisch und sozial]=**en** Bundesstaat

Attributive inflection appears as a phrasal suffix also in comparative constructions, as in (53). Crucially, here the inflection appears at a distance from the A^0 head, underlined (Roehrs, 2006, 221ff.).

- (53) (a) das [_{AP} so schnell wie möglich]=**e**
the.NSG.NOM as quick as possible=NSG.NOM
Aufräumen (Roehrs, 2006, 222, ex. 57a)
cleaning_up.NSG
‘The as quick as possible cleaning up’

⁴⁰Cited in this section are corpus data from the Digital Dictionary of the German Language (DWDS), freely available at <https://www.dwds.de/d/about.en>.

- (b) ein [AP braun-er als braun]=es
 a.NSG.NOM brown-CMPR than brown=NSG.NOM
 Auto (Roehrs, 2006, 222, ex. 57b)
 car.NSG
 ‘A browner than brown car’

Similar constructions are available for Dutch (van Riemsdijk, 1998, pp. 671–4; Grosu, 2003, pp. 173–5).

In contrast, in Swedish, a North Germanic language, inflection must occur on the A⁰ head of each coordinated AP (a), and cannot occur as a phrasal suffix (b).

- (54) (a) den grön-**a** och blå-**a** skjortan (Swedish; Akil Ismael, p.c.)
 the green-a and blue-a shirt
 ‘the green and blue shirt’
 (b) *den [AP grön och blå]=**a** skjortan
 the green and blue=a shirt

Next, notice that in West Germanic languages, attributive inflection is limited to APs in prenominal, attributive position. As shown in (55) for German, attributive inflection does not occur when AP is used as a predicate (Durrell, 2017, 142ff.). The same holds for Dutch (Donaldson, 2008, 106ff.) and Frisian (Tiersma, 1999, 44ff.).

- (55) (a) ein gut-*(**er**) Mensch (Durrell, 2017, p. 142)
 a.MSG.NOM good-MSG.NOM person.MSG
 ‘a good man’
 (b) Der Mensch war gut-*(**er**) (Durrell, 2017, p. 142)
 the.MSG.NOM person.MSG be.PST.3SG good-MSG
 ‘The man was good.’

In contrast, adjectives in North Germanic languages inflect regardless of their attributive or predicative usage. This holds for Swedish (Holmes & Hinchliffe, 2013, 77ff.), Danish (Lundskær-Nielsen & Holmes, 2010, 81ff.), Icelandic (Neijmann, 2022, 243ff.) and Norwegian (Holmes & Enger, 2018, 69ff.).

To capture the above data, I propose that the locus of inflection in West Germanic is L⁰, the linker head hosting attributive modifiers in its specifier. In fact, this conclusion is forced by the fact that attributive inflection passes the linker diagnostics (9).⁴¹ This account successfully predicts that inflection may appear as a phrasal suffix non-local to A⁰ and that when an AP is used outside of an attributive context, no inflection may appear. In North Germanic languages, on the other hand, the locus of inflection is on A⁰, so that inflection must never appear nonlocal to the adjective and inflection must occur both in attributive and in predicative contexts.

It is unclear how the West/North Germanic alternation could be derived via an alternative analysis in which a syntactic parameter determines variation in the availability of feature-sharing for AP predicates. Under such an analysis, the A⁰ locus of phi-feature concord would be present in

⁴¹The case of both coordinated APs each occurring with their own inflection may be derived via right-node raising, discussed in Section 4.

West Germanic, but merely unvalued for phi-features. We would then expect the morphological default to be able to have an overt neuter form, as occurs in North Germanic when the subject of a predicate adjective is a clause, which presumably lacks phi-feature values to transfer to the adjective. This is illustrated for Swedish in (56) where the predicate adjective receives a default overt neuter suffix.

- (56) [Att han aldrig kommer att vinna Nobelpriset] är
 that he never come to win Nobel_Prize is
otänkbar-t (Swedish; Holmes and Hinchliffe, 2013, p. 94)
 unthinkable-N
 ‘That he will never win the Nobel Prize is unthinkable.’

We have seen, however, that the form of inflection on West Germanic adjectives in predicate position is always zero (see references cited above), despite the fact that neuter inflection may be overt in attributive contexts, as in (53). This is precisely what is predicted by the proposed theory, for the locus L^0 of attributive inflection in West Germanic is syntactically absent in predicative contexts.

Semantically weak prepositions

Further evidence for the structure (39) comes from variation in the syntactic distribution of semantically-weak *of*-type prepositions. I argue that such prepositions come in two varieties: (i) “true” prepositions (i.e., of the syntactic category P), (ii) and “pseudo-prepositions,” which are morphologically identical to true prepositions but are syntactically linkers.

Consider, first, English *of*. As illustrated in (57a), a postnominal possessor DP (italicized) must be directly preceded by *of*, and no preposition may be substituted. This stands in contrast with other adnominal DPs. For example, the *of* preceding the represented object ‘Lake Ontario’ in (a) may be replaced by various prepositions (with predictable interpretive differences).

- (57) (a) This picture **(of)/(*about)/(*with)/(*for) both of ours* *of/about/with/for* Lake Ontario
 has recently sold for \$500.
 (b) The picture is **(of) both of ours*.
 (c) The picture is **(of)/*(about)/*(with)/*(for) Lake Ontario*.

As shown in (b), however, when the possessor DP is used predicatively, *of* cannot occur. This stands in contrast with the other instance of *of*, which is obligatory when the represented object is used as a predicate, patterning again with other prepositions (c).

If *of* is uniformly a preposition, the above duality is mysterious. But it is explained if the *of* with postnominal possessors is actually a linker L, forming a head within the extended projection of the noun phrase, and the other *of* is a true preposition. We can consider *of* that occurs with postnominal possessors a *pseudo-preposition*, namely, one that is morphologically identical to a preposition but is syntactically a linker in the configuration (39).

As evidence that the *of* associated with the represented object is in fact a true preposition and not inserted postsyntactically, notice that when it occurs in predicates like the underlined one in (57c), it is not underlyingly in a local configuration to the root of *picture*, so it is unclear how the context

for a rule of *of*-insertion could be met.⁴² But the fact that this *of* patterns with other prepositions suggests that such a rule is not necessary.

The *of* associated with postnominal possessors is not the only pseudo-preposition *of* in English. Another occurs, for example, in complex prepositions like *(the) back of*. As shown by (58), constituency tests clearly show that the *of* in such constructions does not form a narrow constituent with the DP location.

- (58) (a) John is standing in the back of the room.
 (b) *Cleft construction*
 (i) It is the room that John is standing in the back of.
 (ii) **It is of the room that John is standing in the back.
 (c) *Pseudocleft construction*
 (i) What John is standing in the back of is the room.
 (ii) **What/**where John is standing in the back is of the room.
 (d) *Topicalization*
 (i) The room, John is standing in the back of.
 (ii) *Of the room, John is standing in the back.
 (e) *Wh-fronting*
 (i) Which room/what is John standing in the back of?
 (ii) *Of which room/what is John standing in the back?

The distinction between true and pseudo-prepositions is useful beyond English, and it seems that the true kind has a tendency to undergo diachronic reanalysis as the pseudo-kind. French *de*, for instance, though historically a true preposition, has a wider synchronic distribution than other prepositions, and likely spells out syntactically distinct heads, one a true preposition and the other a pseudo-preposition (cf. Rowlett, 2007, 55ff.).⁴³

Similarly, the Persian form *æz* spells out both a preposition with ablative semantics as well as a semantically bleached form that largely overlaps with the *ezafe* linker *-(y)e* (Larson & Samiian, 2020, 196ff.). The ablative kind is clearly a true preposition, as shown by the fact that adnominal PPs headed by *æz* may cooccur with the *ezafe* linker, just as with other Ps, as in (59).

- (59) porsesh=**e æz** ra'is-jomhur (Persian; Kahnemuyipour, 2014, 11, fn.37)
 question=LNK from president
 'a question from the president'

In its form without ablative semantics, however, *æz* may well be a pseudo-preposition. In (60), for instance, we see that *æz* may be substituted for the *ezafe* linker with no detectable difference in meaning.

- (60) ye bæste =**ye/æz** ketab-ha=ye zæbanšenasi resid (Larson & Samiian, 2020, p. 196)
 a package =LNK/of book-PL=LNK linguistics arrive.PST
 'A package of books about linguistics arrived.'

⁴²There is not a silent head noun here, because expressions like “of Lake Ontario” are unacceptable in argument position.

⁴³French *de* is analyzed as a linker by den Dikken and Singhapreecha (2004); noteworthy is its cooccurrence with adnominal adjectives. Additional data and critical commentary may be found in Paul (2012).

Interim summary In this section it was argued that the generalization (9) on the syntactic distribution of linkers follows from the nature of weak dependents, which are not adjuncts, but are phrasal specifiers of functional heads. Syntactic evidence for this analysis of canonical linker constructions of the form discussed in Section 2 came from facts showing that a linker may license nominal ellipsis and that it may select for the category of the extended projection in which it occurs. The analysis was argued to hold of weak dependent constructions generally, and its explanatory power was illustrated in its ability to explain the compositional interpretation of optional arguments, syntactic differences between attributive inflection in West versus North Germanic, and variation in the syntactic behavior of different kinds of semantically-weak prepositions.

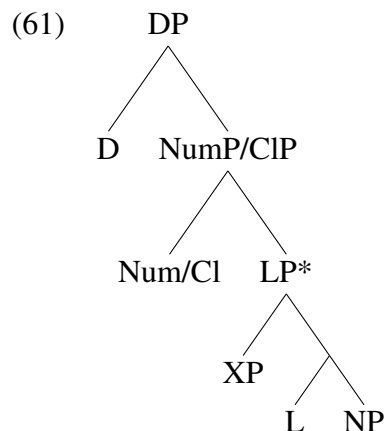
3.2 Word-order parameters and spellout

In the previous section we have seen syntactic evidence that linker constructions and, more generally, constructions involving weak dependents, have the underlying structure (38a)/(39), which accounts for generalization (9). Next, I argue that the word-order conditions (36) can be derived from (38) assuming parameters governing head-complement order and the linearization of head chains. As a case study, let us assume that $H=N$, so that we are dealing with the nominal linkers.

Suppose that weak-dependent constructions involve the base-generated configuration (39), as we have argued. If no movement occurs, then we obtain the cross-linguistically common order $XP-Lnk-N$, found in Chinese languages, Japanese, West Germanic, and so on. Each head L hosting a weak dependent of N may be identified as one of the functional heads whose hierarchy has been mapped in syntactic cartography, typically assumed to be unpronounced (Scott, 2002; et seq.). It is assumed in such work that each head is immediately c-commanded by an Agr head, postulated to drive movement of a projection of N to its specifier in languages with unmarked postnominal modifiers (Cinque, 2005; et seq.). But Agr is presumably uninterpretable, and does not have any syntactic effects in languages with prenominal modifiers, such as Chinese. In contrast to cartographic work, then, let us assume that such Agr heads do not exist in these languages (or in any language, see below).

For weak dependents “low” in the extended noun phrase, we have a structure like (61) in languages with unmarked $XP-Lnk-N$ order. I represent the linker phrase as a recursive projection LP^* , iterating as needed for each modifier or optional argument.⁴⁴

⁴⁴I remain agnostic about whether there is fixed hierarchy of L heads or whether their hierarchical organization is determined by scope. In the context of the present paper, I also do not take a strong stand on the issue of the constituency of numeral classifier constructions and whether classifiers should be considered linkers. It is interesting to note, however, that the attested orders of classifier, numeral, and noun are precisely those that would be expected under such an analysis (Hall, 2019).

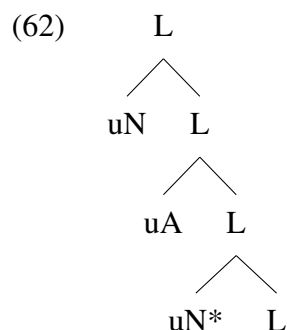


In Chinese, Japanese, and other languages, linkers may also occur higher within the extended nominal projection, hosting quantifiers and other “high” dependents in their specifiers. These are not explicitly represented in (61), but may be considered to be the exponents of higher heads within the extended noun phrase of which D is a conventional abbreviation.

Let us now turn to the derivation of the alternative word-order NP–Lnk–XP, one of two that are attested, as discussed in Section 2.3. To begin, I assume that the locus of syntactic variation is in the featural makeup of individual syntactic feature bundles—the so-called Borer-Chomsky conjecture (cf. Roberts, 2019 for a discussion of this and related issues). It follows that syntactic variation cannot depend on parametric conditions on the numerations that constitute the input to syntactic derivations. But such conditions are precisely what the AgrP hypothesis of syntactic cartography requires, for it supposes that in languages with postnominal modifiers, there is an Agr head for each L head in the numeration. Instead, I assume that word-order variation comes from a choice of whether a linker head L must be bundled with a strong probe feature for N, which we may notate as uN^* .

Next, I follow Georgi and Müller (2010) in assuming that a head’s features are hierarchically arranged such that (i) higher features must be checked before lower features, (ii) and features involved in subcategorization dominate those involved in probe-goal relations, which potentially involve movement. In order to facilitate syntactic manipulation of feature bundles, I analyze them as binary-branching syntactic treelets (Martinović, 2015).

To illustrate, a nominal linker L selecting for an AP associate in a structure with postnominal modifiers has the structure (62).



Because uN is higher than uA , it must be checked first, yielding the correct categories of the head and complement of L. The feature that must be checked last is uN^* , because it is lowest. I

assume that the c-command condition on Agree holds of the highest, “maximal” head L^0 , which dominates all subcategorization and probe features (Martinović, 2015).

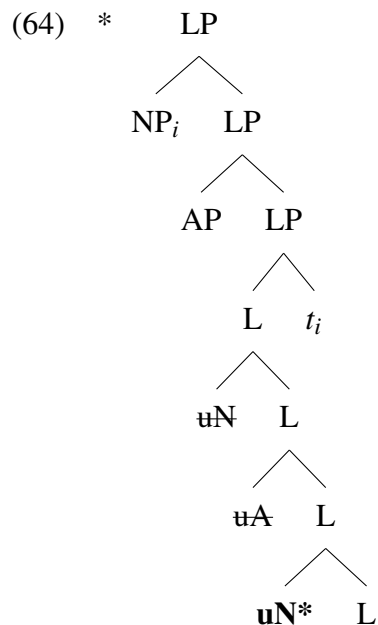
To check uN^* , its goal NP must undergo internal merge to a position c-commanding L in a configuration that is sufficiently local. What “sufficiently local” means is possibly subject to cross-linguistic variation, but I assume that, at least for certain languages, it means immediate c-command. Martinović (2015, 2017, 2022) shows for Wolof (Niger-Congo), for instance, that, in declarative clauses, C and I are bundled together in a single CI head, but that C and I form separate heads in clauses involving raising of object wh- phrases. The author argues that, in the latter case, CI undergoes “head splitting,” where the subtree of CI^0 immediately dominating the [Wh*] feature must undergo internal merge to a position above the subject and reproject as C.

I argue that a similar process occurs within the noun phrase to derive the word-order N–Lnk–XP. First, notice that this is the order that we find in the Wolof noun phrase. I follow Guérin (2011, p. 150) (who credits Denis Creissels for the analysis) in analyzing the Wolof “relative marker,” which is obligatory with adnominal adjectives, as a linker (“*un joncteur*”) rather than as a relative pronoun or complementizer, because it agrees with the head noun in noun class and definiteness. If it were a relative marker embedded in some kind of reduced clausal structure, there would be no mechanism for it to receive a definiteness feature, whose origin is not in the noun but high in the matrix DP. An example is given in (63).⁴⁵

- (63) fas w-u ñuul (Guérin, 2011, p. 149)
 horse.AN LNK.AN-INDF black
 ‘a black horse’

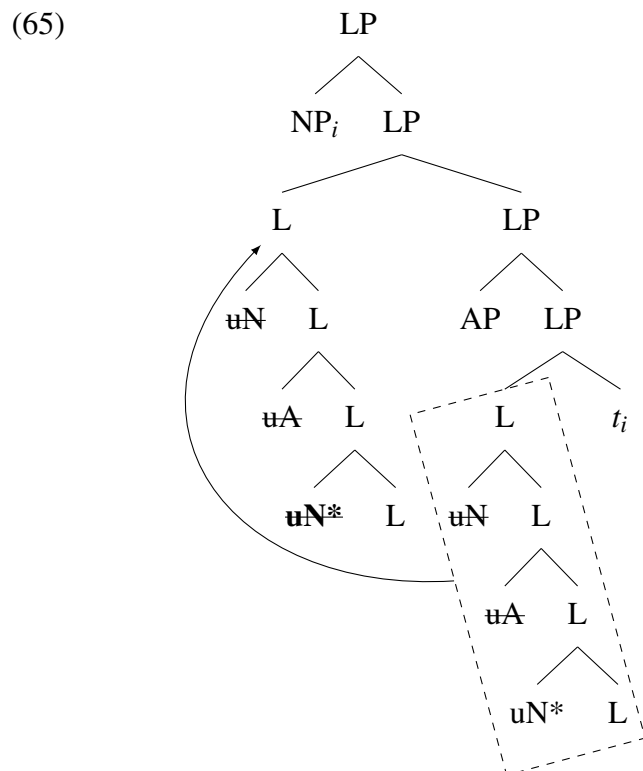
Following Martinović (2022)’s analysis of head reprojection in the clause, we likewise obtain head reprojection in nominal linker constructions. In Wolof, suppose that a head can check a probe feature only in a single specifier configuration. This rules out a derivation such as that in (64): here, AP occupies the specifier of L, subsequent movement of NP leaves it in too distant a position from L to check the uN^* feature of L.

⁴⁵I label the noun class of ‘horse’ here as “animate,” though more precisely it is the w- noun class, associated with animals Guérin (2011, p. 77).



Instead, I propose that a projection of L dominating uN^* undergoes internal merge above LP and reprojects as LP. Subsequently, NP merges in its specifier position, now sufficiently local to check uN^* . Precisely what projection of L remerges is a matter of variation. In the vast majority of N–Lnk–XP configurations cross-linguistically the lower copy of L is unpronounced. It is reasonable that in such cases, as in Wolof, the maximal L^0 is remerged and Chain Reduction deletes the lower copy (because it has the most unchecked features, thereby requiring fewer applications of Formal Feature Elimination; cf. Nunes, 2004, 33ff.). Call this *total* reprojection, which differs from the *partial* reprojection or “head-splitting” in the Wolof clause in moving the entire head, rather than a proper subtree of it.

The syntactic derivation of N–Lnk–XP in Wolof and in other languages, then, is given in (65), where the higher copy of L spells out the linker.



In many languages of word-order type N–Lnk–XP where we have total reprojection, the form of the linker does not depend on the category of its associate. In Persian, for instance, the linker has the form =*e* (with allomorph =*ye*), realized as an enclitic on the preceding element. There is evidence that the linker in such languages is the exponent of the L^0 head immediately dominating the probe feature uN^* . Kahnemuyipour (2014) observes that the Persian linker is obligatory with postnominal dependents (except relative clauses) but is prohibited from associating with prenominal dependents. To capture this, Kahnemuyipour (2014) argues that the linker is the exponent of an Agr head whose specifier is the landing site for roll-up movement of N. In our analysis, the same facts are captured by a vocabulary fragment such as (66).

- (66) (i) $[L, uN^*] \iff =e$
(ii) $[L] \iff \emptyset$

The existence of partial reprojection in the Wolof clause, however, suggests that it should be possible within the noun phrase as well. Evidence comes from “circumfixing” linker constructions, where a phrasal weak dependent is both preceded and followed by a linker. I argue that this is what we find in English postnominal possessor constructions, as in (67a).

- (67) (a) A friend of all of our=s is waiting inside.
(b) A friend of us all/*our=s all is waiting inside.

In Section 3.1.2 it was argued that the *of* in such constructions is a linker. Example (67a) shows that the underlined possessor in such constructions may be a full DP. A pronoun may receive a special possessive form only when it is the final word of the possessor DP, as is evident by comparing (a) and (b).

I propose that such a possessive form is the exponent of a complex head made up of a pronoun and a linker, call the latter head Poss(essive), which ends up as an enclitic on the pronoun. The mechanism of such cliticization is a species of postsyntactic morphological merger; suppose that this is the rebracketing operation of Local Dislocation (Embick & Noyer, 2001).⁴⁶ When immediately dominated by Poss⁰ as a result of this operation, as in (67a), the pronoun is spelled out in an idiosyncratic possessive form, as captured by the vocabulary item (68i). Otherwise the default form (ii) is used.

- (68) (i) [1, PL] \longleftrightarrow our / __] POSS]
(ii) [1, PL] \longleftrightarrow us

The fact that both *of* and *s* may be pronounced in such constructions suggests that we are not here dealing with internal merge and reprojection of the entire Poss⁰ head, unlike the Wolof case discussed above. Instead, the subtree of Poss⁰ immediately dominating uN* undergoes internal merge, a partial reprojection configuration. The form *s* is the elsewhere form of a Poss head; the form *of* spells out a projection of Poss dominating a probe feature, as in (69a).^{47,48}

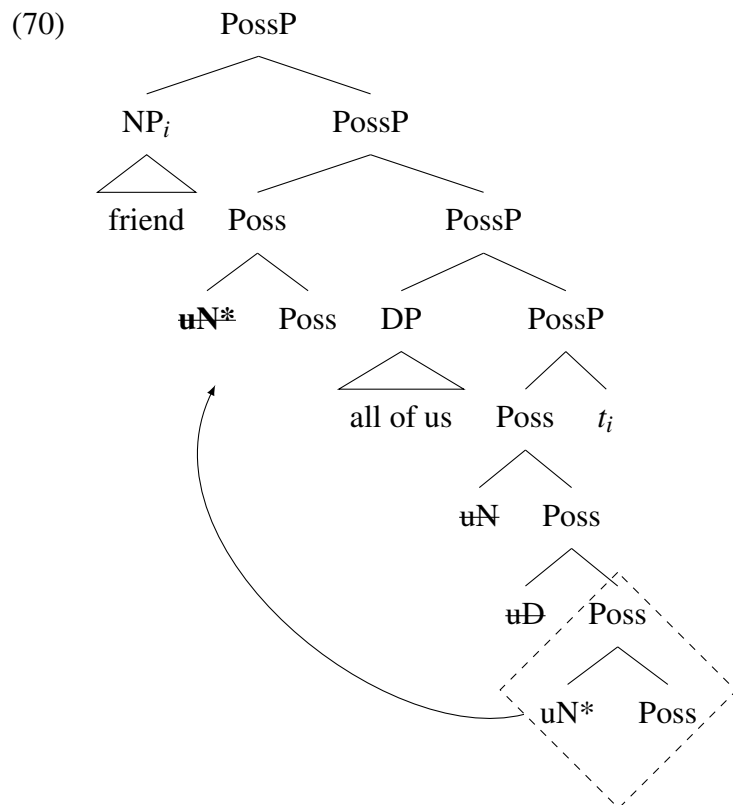
- (69) (i) [POSS uN* POSS⁰] \longleftrightarrow of
(ii) [POSS] \longleftrightarrow s

The syntactic derivation, preceding both Local Dislocation and Vocabulary Insertion, is shown in (70).

⁴⁶This assumption requires some qualification. It is argued by Embick and Noyer (2001) that Local Dislocation follows Vocabulary Insertion because Local Dislocation is responsible for second-position clitic phenomena where the clitic is sensitive to phonological material in its host. However, we are here arguing that cliticization precedes Vocabulary Insertion, because cliticization of Poss feeds the realization of a pronoun with a special possessive form, e.g., *mine*. So it is more correct to specify that there are at least two operations of morphological merger which are sensitive to linear order. One operation, which we are dealing with here, yields enclitic “leaners” like *not* that precede Vocabulary Insertion, potentially feeding suppletion of their host, as in *won’t* from *will+not*. A second operation, which does not occur in examples discussed in this paper, follows Vocabulary Insertion, and does not feed suppletion.

⁴⁷This is not the complete vocabulary of the English postnominal possession system. For instance, a vocabulary item is needed to capture the fact that Poss⁰ undergoes suppletion as zero in the context of a first-person singular pronoun.

⁴⁸Note that Poss is distinct from the possessive marker in D, which we do not treat here.



Another circumfixing linker may be found in Konso (East Cushitic).⁴⁹ In the Konso noun phrase, a head noun precedes its dependents, each of which is immediately preceded by an occurrence of the proclitic [a=], except numerals and certain quantifiers (Orkaydo, 2013, 194ff.).⁵⁰ As illustrated in (71a-b), each adnominal adjective root (underlined) is obligatorily followed by a suffix inflecting for the number of the head noun; in (a) we see a separate reduplicative plural prefix (Orkaydo, 2013, 173ff.). As shown in (c), however, when an adjective is used predicatively, the reduplicative plural prefix appears, but neither the prepositive [a=] nor the number suffix does (Orkaydo, 2013, p. 170).⁵¹

- (71) (a) dillaa a=ku-kutt=aa? (Konso; Orkaydo, 2013, p. 175)
 field.PL LNK=PL-big=LNK.PL
 ‘big fields’
 (b) nama a=der=a (Orkaydo, 2013, p. 194)
 person.SG LNK=tall=LNK.SG
 ‘a tall person’
 (c) ifoonna-? ?i=ded-der-i (Orkaydo, 2013, pp. 63, 170)
 3PL-NOM 3=PL-tall-PRF

⁴⁹Konso and Daasanach are closely related. In Tosco (2020, p. 197)’s revised classification of East Cushitic languages, Daasanach and Konso both belong to the Nuclear Southern Lowland subgroup.

⁵⁰Attributive adjectives are only preceded by [a=] when the noun phrase is indefinite, in which case they are obligatory (Orkaydo, 2013, pp. 173–4).

⁵¹In glosses, I represent prepositive [a=] as a proclitic, following Amare (1999), who represents it as a prefix. It is clear from its occurrence with adnominal complex DPs and PPs, however, that it attaches at the phrasal level.

‘They are tall.’

When an adnominal modifier is instead a non-human DP, the enclitic [=ʔ] appears instead of the number suffix (Orkaydo, 2013, 115f.), as in (72a). (Note that “Garootē” is a woman who has died, which is why she is here considered grammatically non-human). The same formative appears with an adnominal PP in (b).⁵² In (a-b), we see that both [a=] and [=ʔ] attach at the phrasal level. And in (c) we see that [a=] iterates for each dependent of the head noun.

- (72) (a) *nessa a=[gʻarooti χannú]=ʔ* (Orkaydo, 2013, p. 302)
voice LNK=PN 1PLPOSS=LNK
‘the voice of our Garootē’
- (b) *hotaarta a=[kirra kapa]=ʔ* (Orkaydo, 2013, p. 284)
acacia LNK=river near=LNK
‘an acacia tree near the river’
- (c) *xorma a=sowaa a=xala a=xonso* (Amare, 1999, p. 70)
ox LNK=meat LNK=yesterday LNK=PN
‘Konso’s meat ox from yesterday.’

To capture the above distribution, I propose that Konso has a single circumfixing linker, made up of a prepositive and a postpositive component. The prepositive component is morphologically invariant, spelled out as [a=] regardless of the phi-features of the head noun or its associate. Following the analysis sketched above for Persian and English, I suggest that it always spells out the probe feature [uN*], which drives movement of NP to its specifier. The form of the postpositive component of the linker, however, depends both on the number of the head noun and the category of its associate. I therefore propose that it spells out the maximal linker head L^0 that remains after partial reprojection, and which dominates the linker’s selectional features.

Briefly considering potential alternatives, notice first that the number suffix that follows adjectives cannot simply be analyzed as the exponent of number concord on A^0 , for number on A^0 is properly exponed as the reduplicative prefix. As evidence, we have seen in (71c) that only this prefix occurs with adjectives in nonattributive contexts, which suggests that the number “suffix” does not form a narrow constituent with the adjective. Hence, I argue that there is not really multiple exponence of number on adjectives in Konso. Instead, I analyze the reduplicative prefix as inflection on A^0 and the postpositive number suffix as inflection on a linker head.⁵³

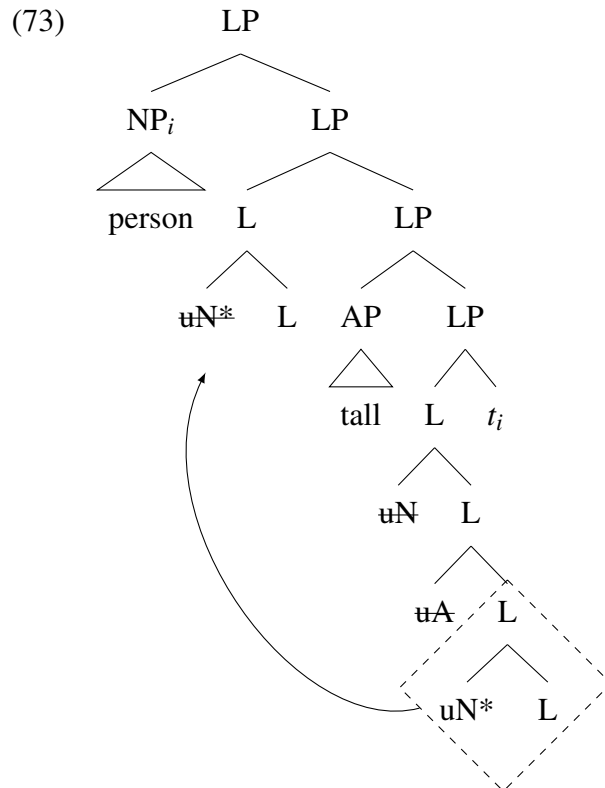
Next, I consider the claim by Orkaydo (2013) that postpositive =ʔ, which I analyze as the exponent of L^0 , is a genitive case marker. These two proposals are not mutually exclusive inasmuch as “genitive case” is a kind of formative involved in licensing certain adnominal phrases. However, if genitive case is instead understood as the exponent of a certain value of a case feature high in DP, this is unlikely to be what is occurring in Konso, for =ʔ occurs with categories other than DP.

⁵²Note that for this example, Orkaydo (2013) glosses =ʔ as a locative marker. However, the “locative” marker =ʔ is described elsewhere as a morpheme that always has goal semantics, occurring as the goal argument of verbs such as *χaay* ‘put;’ it is ungrammatical with DPs denoting locations (Orkaydo, 2013, p. 121). For this reason, I analyze =ʔ in (72b) as a postpositive linker.

⁵³Note that the Cushitic literature typically analyzes the postpositive suffix as plural *gender* concord, with the reduplicative prefix the exponent of plural number proper (Mous, 2021). From a cross-linguistic perspective, however, it makes more sense to analyze cases of so-called “plural gender” as plural number concord with a *pluralia tantum* head noun, which is the strategy I adopt here (Corbett, 2012, pp. 223–233).

It may occur with adnominal PPs (which presumably do not require case-licensing), as in (72b). The marker in question occurs also with adnominal ordinal numerals, as in *ahta a=lammatta=?* ‘wife LNK=second=LNK’ ‘second wife’ (Orkaydo, 2013, p. 299). Lastly, this marker also occurs with wh- quantifiers like ‘how many,’ as in *fagāa a=meegāa=?* local_beer ‘LNK=how_many=LNK’ ‘how many local beers?’ Assuming that ordinal numerals and wh- quantifiers are not full DPs, they lack the functional head that is the locus of case.⁵⁴

The proposed analysis is essentially the same as proposed above for the English postnominal possessor. The derivation of the phrase (71b) is shown in (73).



As with Wolof CI-splitting in the clause and English postnominal possessors, we are here dealing with partial reprojection. Hence the higher and lower copies of L do not form a head chain eligible for Chain Reduction and both copies are pronounced. We obtain the word-order NP–Lnk–XP–Lnk, which, though not described in Section 2.3, is consistent with the descriptive generalization (36), provided that the two components of the linker are understood as a single circumfixing element: (a) both components are adjacent to their associate XP, (b) and both are preceded by N.

Let us now turn to the derivation of word-order type NP–XP–Lnk, as in Daasanach. Suppose that we have total reprojction, yielding a chain of two L heads. Given this configuration, the lower copy of L is expected to be pronounced only when it would result in a better-formed phonological representation (Nunes, 2004, 33ff.). I propose that this occurs in Daasanach. In this language, the linker is an enclitic on its associate, as in (74).

⁵⁴Nor are PPs DPs in Konso, for otherwise we would expect the word-order P-Lnk-DP, corresponding to the order found in the noun phrase. In fact, Ps are postpositional and no linker occurs. Postpositions are best analyzed, then, as functional heads of a separate category, namely P, from that of nouns.

- (74) (gáal)_ω (léð=a)_ω (Tosco, 2001, p. 252)
 people white=LNK
 ‘white people’

Let us assume that cliticization is a process of at least two steps, involving first Local Dislocation of the clitic onto a structurally-adjacent head X^0 , as just discussed, and the subsequent formation of a complex prosodic word in the phonology. Suppose Chain Reduction precedes Local Dislocation. Then the lower copy of L^0 is deleted and the higher copy must cliticize onto either the preceding (as in Persian) or the following element (as in Bantu).

Alternatively, suppose Local Dislocation may precede Chain Reduction (Schoorlemmer, 2012). Then there is nothing ruling out the lower copy of L^0 from cliticizing onto XP .⁵⁵ Then we have a configuration in which the lower copy of L^0 forms a complex head with X^0 . Then it is more economical for the higher link of the chain [L^0 , [L^0 X^0 L^0]] to be deleted under Chain Reduction than for the the lower, complex link to be deleted, because more features of the complex L^0 head would need to be eliminated by Formal Feature Elimination (cf. Nunes, 2004, 33ff.).⁵⁶ Then only the lower copy is pronounced, and we obtain the word-order N–XP–Lnk.⁵⁷

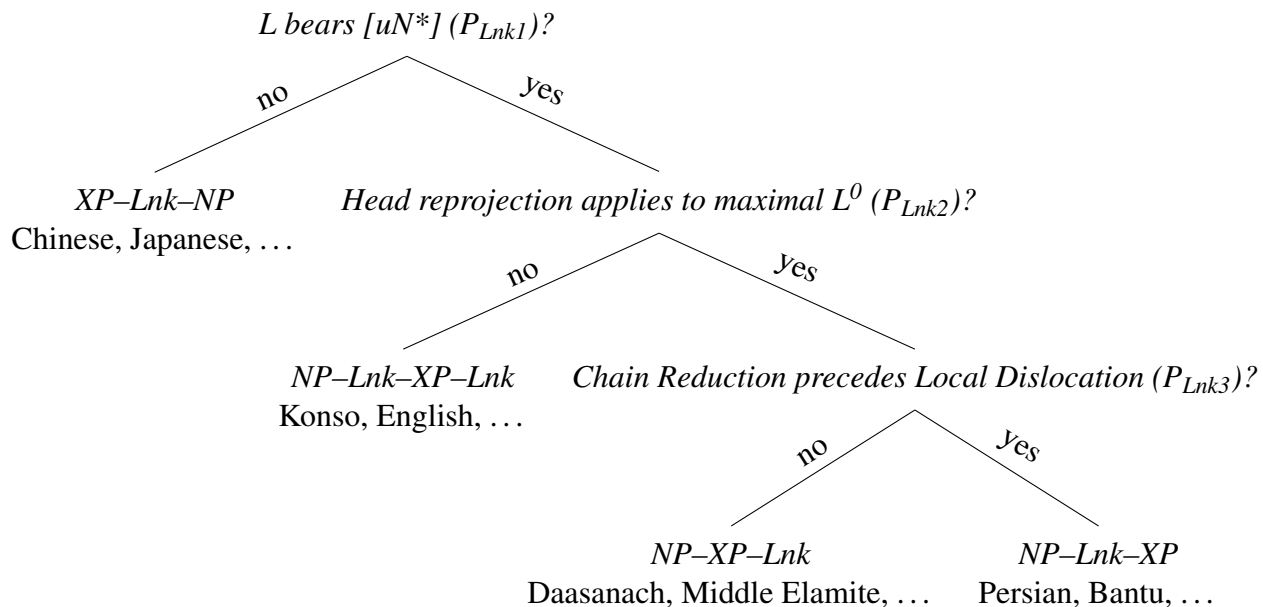
This discussion may be summarized by the parameter hierarchy (75), where each branching node represents a binary parameter that is applicable only when the edge to its parent is labeled “yes” (cf. Roberts, 2019.) Given our emphasis on the noun phrase, the parameter hierarchy presented is that for nominal linkers, though I assume that a corresponding one exists for linkers occurring in other extended projections. Acquisition of nominal linker constructions abstractly consists of starting with the root P_{Lnk1} and traversing downward until a terminal node is found, where each decision attempts to maximize consistency with the primary linguistic data.

(75) *Parameter hierarchy for $L(N,X)$*

⁵⁵Note that because Local Dislocation occurs after internal merge, we cannot derive the unattested word-order Lnk–N–XP order by L first cliticizing onto N before NP moves.

⁵⁶I assume that the cliticizing head projects after Local Dislocation.

⁵⁷Given the potential existence of multiple specifier configurations in other languages, however (e.g., in Japanese multiple subject constructions), it may be possible that head reprojection in linker constructions is not universal. That is, configurations such as (64) may be grammatical in certain languages, deriving N–XP–Lnk order, as in Daasanach. I remain agnostic as to this issue.



At the top of the hierarchy, P_{Lnk1} determines whether we get postnominal modifiers (*yes*) or prenominal ones (*no*). If postnominal, P_{Lnk2} determines whether we get total reprojection (*yes*) or partial reprojection (*no*). If total, a final parameter P_{Lnk3} determines the relative order of Chain Reduction or Local Dislocation. I assume that morphological operations form a strict partial order, so that each may occur only once and they are not simultaneous. Then a setting of *no* to P_{Lnk3} means that Local Dislocation precedes Chain Reduction.

Head reprojection, either partial or total, is driven by the need to check a probe feature on the linker. This is formally captured in (75) by P_{Lnk1} dominating P_{Lnk2} . If a language does not have such a feature, as in Chinese, reprojection cannot occur. This captures the intuition that head reprojection without feature checking has no syntactic purpose and is uneconomical. In the proposed theory, then, there is no way to derive the unattested word-order type $Lnk-XP-N$. Similarly, because L selects for XP as its specifier, they are in a local configuration; then there is no way to derive the remaining unattested word-orders, where Lnk and XP are nonadjacent. We generate all and only the word-orders described by conditions (36).

3.2.1 Interim summary

I have argued that the basic distribution of linkers described in Section 2 follows from a uniform syntax for weak dependents in which each weak dependent XP is merged as the specifier of a linker head L within the extended projection of the head H of which XP is a dependent. This structure was argued to hold for canonical linkers based on the ability for L to c-select both for XP and H and for L to license nominal ellipsis. This account was argued to extend beyond canonical linker constructions by being able to form the basis of a theory of the composition of modifiers and optional arguments, by explaining syntactic differences between attributive inflection in West versus North Germanic, and by explaining the dual behavior of semantically weak prepositions.

We then saw that the proposed analysis derives precisely the cross-linguistically attested word-orders of linker constructions discussed in Section 2.3. Languages vary on whether a linker head L bears a strong agreement probe, checked by internal merge of its complement. An immediate c-command condition on the checking of probe features, however, motivates head reprojection of

L. At spell-out, languages vary on whether L is realized as a proclitic, attaching to the linearly following head, or an enclitic, attaching to the linearly preceding head. If L has undergone head reprojection, then we may obtain XP–Lnk order or Lnk–XP order, but no others.

Next, the present theory is tested against alternatives.

4 Alternative analyses

In the preceding pages we have developed a unified theory of linker constructions, which, by virtue of being able to extend beyond canonical cases, has been argued to be of some explanatory depth. The position adopted throughout has been that a theory can be adopted for a single language only if it is valid for a wide range of other languages, modulo discrete parameters of variation. Below, alternative analyses are considered based on their intra- and cross-linguistic predictions with respect to constituent structure, word-order, and other syntactic factors. Many analyses of the syntax of linker constructions exist in the literature. Below, we consider several of them, in particular those in which the linker is asserted to first merge with its associate and those in which weak dependents are analyzed as adjuncts.

4.1 Narrow constituent analyses

4.1.1 Arguments from coordination

Let us begin with the basic question of the phrase structure of linker constructions. In Section 2 it was argued that a linker Lnk spells out a head within the spine of the extended projection of a category H of which the linker’s associate XP is a dependent. Many analyses in the literature, however, have claimed that Lnk first merges with XP to form a narrow constituent that excludes H. For convenience, we can call this family of analysis the “narrow constituent” analysis.

Proponents of a narrow constituent analysis include work arguing for a Modifier Phrase (ModP) (e.g., Rubin, 1994, 1996, 2003; Scontras and Nicolae, 2014), according to which linker spells out a Mod head that enables the compositional interpretation of modification. Let us adopt this notation for the following discussion of narrow constituent analyses, keeping in mind, however, that the distribution of linkers is not limited to modification and that authors disagree on the interpretation (if any) of Mod. The symbol Lnk is used to refer to the surface form of the linker, and L is reserved for a syntactic linker head in the theory proposed in the preceding sections.

Outside of work within the ModP program, a narrow constituent analysis is defended by Philip (2012, 2013), according to whom the linker is a semantically empty subordinator, and by Franco et al. (2015) for whom it is a determiner. It is also assumed by work that analyzes Mod as a case marker (e.g., Larson and Samiian, 2020), or by authors for whom it is a relative clause marker, as in much descriptive literature.

An initial attraction of narrow constituent analyses is the ease of accounting for linker constructions of the form (76), where each of the underlined expressions appears to be a constituent that is coordinated by some conjunction Conj (Philip, 2012, pp. 34–43).

- (76) (a) XP Lnk Conj XP Lnk H
 (b) H Lnk XP Conj Lnk XP

Constructions of the form (a) are available for some languages of the word-order type XP–Lnk–H, including Chinese; and those of the form (b) may be found in some languages of type H–Lnk–XP, including Tshiluba.

The example (77) has been considered strong evidence in favor of the narrow constituent hypothesis by its proponents (Aoun & Audrey Li, 2003; Philip, 2012) and has proven problematic for other analyses (Zhang, 2009, pp. 100–101).

- (77) [AP zhuyao] (**de**) *erqie* [TP women yijing taolun-guo] **de**
 main LNK CONJ we already discuss-EXP LNK
 shiqing (Aoun & Audrey Li, 2003, p. 150)
 matter
 ‘the main matters that we have discussed’

Intuitively, the single head noun ‘matter’ is “shared” by both linkers *de*. Such expressions may therefore be analyzed along the lines of right-node raising, where a single head noun appears to be the complement of two coordinated expressions. As a comparison, notice that the naïve interpretation of coordination as evidence for constituency might lead one to believe that the two underlined expressions of (78) are constituents that exclude the head noun ‘musician.’ In fact, we know on independent grounds that a possessor and adjective phrase do not form a constituent. Instead, we are here dealing with a kind of DP coordination where the head noun *musician* is somehow “shared” by the two conjuncts, perhaps by multidominance, as has been argued for right-node raising in the clause (cf. Citko, 2011).

- (78) Bob Dylan, John’s favorite and Mary’s least favorite musician walked on stage.

Under this analysis, (77) is actually LP coordination, where the head noun ‘matter’ is shared by both LPs. Such a structure has been ruled out by Aoun and Audrey Li (2003), because *erqie* does not generally appear to coordinate nominal projections. In fact, the distribution of *erqie* is typically described negatively, as a non-nominal coordinator, typically coordinating clauses, adjective phrases, and verb phrases (Huang et al., 2009, p. 231).

Assuming, however, that heads cannot select for set-theoretic complements of feature sets, we should assume that *erqie* is actually not categorially selective within the narrow syntax. Plausibly, the restricted distribution of this coordinator is instead related to its nature as a nonscalar additive that places sharp presuppositional restrictions on its conjuncts (unlike *and*, cf. H. C. Tsai, 2006). Note that the ban on N coordination cannot easily be explained in terms of type incompatibility, given that *erqie* may coordinate AP, which is presumably of the same type as N. For reasons of scope, I do not develop an analysis of the syntactic restrictions on *erqie* here, but I merely point out that ModP coordination is not the only possible analysis of constructions of the form (76).

A second problem with using coordination constructions of the form (76) as evidence for the narrow-constituent analysis is that they are not available in all languages with linkers.⁵⁸ Philip (2012, pp. 37–43) discusses the ungrammaticality of (76b) in Persian and Lagwan (Central Chadic), where the narrow-constituent hypothesis instead predicts it to be grammatical. It is claimed by Philip (2012) and Toosarvandani and van Urk (2014) that such constructions would involve a ill-formed

⁵⁸In fact, even in Mandarin, sentences of the form (76a) are reported to be more acceptable if the first occurrence of the linker is not pronounced. For further discussion, see Cheung (2012, 50, fn. 10).

prosodic representation where the linker encliticizes to the coordinator, and there is some evidence that coordinators are not suitable hosts for clitics (cf. e.g., Ćavar and Wilder, 1999).

However, linker coordination constructions may be prohibited even when such a rule is not applicable, namely, when we have the form (76a). In such a configuration we could have the linker acting as host for an enclitic coordinator, which is not a prosodically ill-formed configuration. In Japanese, for instance, the conjunction *de* may coordinate APs or nominal projections below DP, as in (79a). But we see in (b) that *de* cannot appear between expressions of the form AP=LNK. Here, the coordinator is an enclitic on the linker, itself an enclitic on A—distinct from the configuration that is claimed to be banned by Philip (2012).

- (79) (a) [_{AP} sizuka=de kirei]=na ie (Japanese)
 quiet=CONJ clean=LNK house
 ‘a quiet and clean house’
 (b) *sizuka=na=de kirei=na ie
 quiet=LNK=CONJ clean=LNK house

There is, then, rather mysterious variation in the grammaticality of right-node raising in the noun phrase. But it is clear that cross-linguistic coordination data does not offer convincing evidence for the narrow-constituent hypothesis.

4.1.2 Arguments from movement

In addition to coordination, proponents of the narrow-constituent analysis have argued that expressions of the form XP–Lnk or Lnk–XP appear to behave as a unit with respect to syntactic movement, suggesting that they form a constituent ModP. Philip (2012, pp. 29–31) discusses two cases of subextraction of a phrase whose initial element is claimed to be a linker.

First are discussed French constructions of the form (80), where a preposition is pied-piped in A-bar movement of a wh-phrase.

- (80) (a) Elle est [la femme de François] (French; Philip, 2012, 30, ex. 32a)
 she is the woman of PN
 ‘She is François’ wife.’
 (b) [De quel mari] est elle [la femme t] (ex. 32b)
 of which man is she the woman
 ‘Of which husband is she the wife?’

Such examples are not strong evidence for the narrow-constituent hypothesis, since the *de* in such constructions may simply be a true preposition, rather than a linker.⁵⁹ In fact, (81) shows that the corresponding construction is unacceptable in Tshiluba, a language in which the linker is not homophonous with a preposition; instead a circumlocution such as (c) must be used.

- (81) (a) kapiŋa u-dʒi mu-kaʒi w-a mu-tombo
 I.PN I-PRS I-woman I-LNK I-PN
 ‘Kapinga is Mutombo’s wife.’

⁵⁹Recall the discussion from Section 3.1.2 where true prepositions were argued to be syntactically distinct from pseudo-prepositions, which are linkers.

- (b) *w-a [bajenda kaji] u-dži kapiŋa mu-kaži
 I-LNK husband which I-PRS I.PN I-woman
 Intended: ‘Of which husband is Kapinga the wife?’
- (c) mu-luma kaji u-dži bajenda w-a kapiŋa
 I-man which I-PRS husband I-LNK I.PN
 ‘Which man is the husband of Kapinga?’

Next, Philip (2012, pp. 30–31) discusses data from Morimoto and Mchombo (2004) that is claimed to show that the linker in Chichewa (Bantu) forms a narrow constituent with its associate. In (82b), we appear to see subextraction of a linker and possessor from the direct object.

- (82) (a) [anyaní [á mísala]] a-ku-chí-pwány-a [chipanda [ch-á
 II.baboon II.LNK IV.madness II-PRS-VII-smash-IND VII.calabash VII-LNK
 kazitápé]]. (Morimoto & Mchombo, 2004, 355, ex. 16)
 I.spy
 ‘The mad baboons are smashing the spy’s calabash.’
- (b) [**ch-á kazitápé**] [anyaní [á mísala]] a-ku-chí-pwány-a
 VII-LNK I.spy II.baboon II.LNK IV.madness II-PRS-VII-smash-IND
 [chipanda]. (Morimoto & Mchombo, 2004, 355, ex. 16)
 VII.calabash
 ‘Of the spy, the mad baboons are smashing the calabash.’

There is evidence, however, that what is fronted is actually an LP remnant containing an NP trace (i.e., a lower copy). In Chichewa, the unmarked order of elements in the noun phrase is N–Dem–A (Morimoto & Mchombo, 2004, p. 349). This suggests that a low projection of N, call it NP, obligatorily undergoes movement to a specifier position above the demonstrative. But then subextraction of LP from the extended noun phrase strands N and yields a word-order like that in (82b). This is sketched in the schematic derivation (83), where XP may be AP, or XP may be NP, like ‘madness’ in (82a), or XP may be DP, like ‘the spy’ in (82b).

- (83) [_{LP} NP L XP] ... [_{DP} NP [_{DP} DemP D [_{LP} NP L XP]]]
-

Now suppose we have a language where NP does not move above the demonstrative in (83), instead remaining in Spec,LP. Tshiluba is such a language, where the unmarked order of elements is Dem–N–A. Here, as in Chichewa, the narrow-constituent hypothesis predicts that expressions of the form Lnk–XP may be subextracted in A-bar movement. But as shown by (84), this is not the case.

- (84) (a) kapiŋa u-dži u-tajil-a ŋomba w-a mu-tombo
 I.PN I-PRS I-see-IND I.cow I-LNK I-PN
 ‘Kapinga is looking at Mutombo’s cow.’
- (b) *w-a **mu-tombo** kapiŋa u-dži u-tajil-a ŋomba
 I-LNK I-PN I.PN I-PRS I-see-IND I.cow
 ‘Of Mutombo, Kapinga is looking at the cow.’

The ungrammaticality of (84b) is correctly predicted, however, if the linker and possessor do not form a narrow constituent.

4.1.3 Evidence against narrow-constituent analyses

We have seen that coordination and movement data do not stand as convincing evidence in favor of the narrow-constituent analysis of linker constructions, for in each case there is an alternative analysis that makes use of the structure (39). There are, moreover, many indications that the narrow-constituent analysis is not correct.

An initial problem with the narrow-constituent analysis is that, in a structure such as [_{MODP} Mod XP], the Mod head is predicted to project a specifier position, but it is unclear if this position is ever filled by overt material.⁶⁰ If there were such a specifier position, plausibly it could be filled by focusing particles. But for Tshiluba, this prediction is not borne out, as indicated by (85). With narrow focus on an attributive adjective, the particle *anu* ‘only’ may occur at the left edge of DP, but not between the head noun and a linker, where it would be expected to be able to occur if the linker projected a specifier position.

(85) *Context*: Mutombo’s cow is white. Kapinga’s cow is both black and white.

Anu ŋomba (***anu**) w-a mu-toka ki u-dʒi w-a mu-tombo.
only I.cow only I-LNK I-white FOC I-PRS I-LNK I-PN

‘Only the white cow is Mutombo’s.’

* with reading ‘It is the cow that is only white that is Mutombo’s.’

Next, let us compare the predictions of our analysis (39) with those of the narrow constituent hypothesis with respect to ellipsis. We have seen in Section 3.1 that a linker may license ellipsis of material to its right, which was analyzed as complement ellipsis; in Mandarin, when the overt linker is absent, no ellipsis may occur. Under the narrow-constituent hypothesis, where the linker is not sister to the material that has undergone ellipsis, it is unclear how to explain this alternation.

Additional evidence against the narrow-constituent hypothesis comes from a gapping-like construction in Mandarin that we can call *descriptive complement gapping*. In coordinated clauses whose verb phrase is a so-called “descriptive complement” construction, i.e., of the form V Lnk AP, the verb and linker of the second clause either delete together or neither do.⁶¹ This is illustrated in (86).⁶²

- (86) (a) Baoyu xie de hen zixi, Daiyu ze xie *(de) hen kuai.
PN write LNK very careful PN but write LNK very quick
‘Baoyu writes carefully, but Daiyu writes quickly.’
(b) Baoyu xie de hen zixi, Daiyu ze xie de hen kuai.
PN write LNK very careful PN but write LNK very quick
‘Baoyu writes carefully, but Daiyu quickly.’

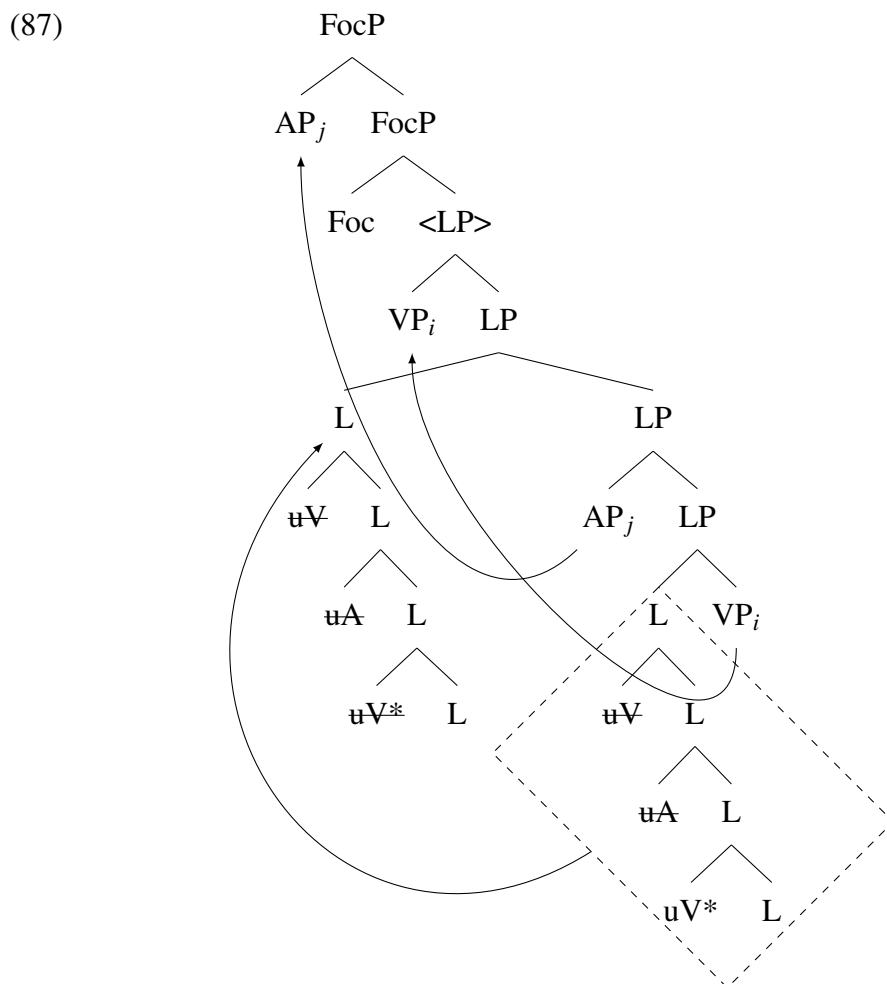
⁶⁰Rubin (1994, 55ff.) discusses the specifier position of Mod but in each of the cases discussed the specifier is filled by unpronounced material.

⁶¹The existence of such gapping-like constructions is noted by Wei (2011, 62ff.). See Ernst (2014) for an overview of descriptive complement constructions (without ellipsis) in Chinese. A notable property of such constructions is that no direct object may follow the verb, though it may precede it in certain cases.

⁶²The example in (86) has been adapted from those in Zhang (2009, p. 103), but the gapping data is my own.

Under the narrow-constituent analysis, the linker and ‘very quick’ form a constituent, and are therefore expected either delete together or not at all.⁶³ It is then unexpected that the postverbal linker obligatorily elides under descriptive complement gapping but AP cannot.

In contrast, the analysis proposed in Section 3 may generate the above pattern. Illustrated in (87) is the lower part of the second clause of (86b).



We are dealing with the word-order type H–Lnk–XP (with H=V and X=A), so, following the analysis in Section 3.2, I assume that we have head reprojection of L and movement of VP to the specifier of the reprojected L. However, because the AP of each clause is contrastively focused in (86b), it is plausible both covertly raise to the specifier of a focus head, which I assume here is available at their respective vP peripheries (for an overview of this kind of analysis, cf. Johnson, 2018 and references cited there). Then the highest LP projection in the first clause matches the one in the second clause, so that the latter may elide. In such a configuration, VP and L are deleted but AP is not, just as in (86b).

Finally, consider the typological predictions that the narrow-constituent analysis makes with respect to word-order. Assuming that Mod may either precede or follow its complement XP and

⁶³Note that the literature on descriptive complement constructions often assumes that *de* is an affix on the verb. See C.-Y. E. Tsai (2018) for a recent analysis along such lines. This would capture the ellipsis facts but it would not be able to extend to occurrences of *de* in other syntactic contexts.

that ModP itself may either precede or follow H (whether as an adjunct or a specifier), we can generate every order in which Mod and XP are adjacent (Philip, 2013). Problematic is the apparent typological fact, discussed in Section 2.3, that one of these orders, (88d) is unattested.

(88) *Word-orders generated by the narrow-constituent hypothesis*

- (a) $[_{HP} [_{MODP} XP \text{ Mod}] H] \mapsto XP\text{--}Lnk\text{--}H$ (Chinese, Japanese, ...)
- (b) $[_{HP} H [_{MODP} XP \text{ Mod}]] \mapsto H\text{--}XP\text{--}Lnk$ (Daasanach, Middle Elamite, ...)
- (c) $[_{HP} H [_{MODP} \text{ Mod } XP]] \mapsto H\text{--}Lnk\text{--}XP$ (Persian, Bantu, ...)
- (d) $[_{HP} [_{MODP} \text{ Mod } XP] H] \mapsto *Lnk\text{--}XP\text{--}H$ (No languages)

Philip (2013) notes that the typical formulation of the Final over Final Constraint (FOFC) (e.g., Biberauer et al., 2014) does not rule out the unattested order (d). The FOFC states that a phrase with a head-initial complement must itself be head-initial, where the heads of both phrases are in the same extended projection. But ModP is not the complement of H, but rather an adjunct or specifier, so FOFC does not apply (cf. Roberts, 2017, p. 152).

There is also reason to believe that the Head Final Filter (HFF) of Williams (1982) cannot rule out (d). The HFF states that a prenominal modifier cannot have “post-head material.” For example, the DP complement of a preposition follows the P head, so the HFF rules out a prenominal position for prepositional phrases. The HFF is a descriptive generalization that holds of certain languages, but is regularly violated in Greek, Bulgarian, Russian and other languages (Cinque, 2010, 43ff.), so that it is unlikely to be universal, and does not rule out word-order (d) from appearing in *some* language.

To avoid the generation of (d), Philip (2013) proposes a “Head-Proximate Filter,” according to which the highest head in an extended projection (e.g., Mod) must be adjacent to the lexical head of the projection dominating it (e.g., H). While this does rule out (d), it also rules out (b), which we saw in Section 2.3 is attested in at least two languages. In contrast, the analysis of word-order variation presented in Section 2.3 was argued to generate all and only the attested orders (a-c).

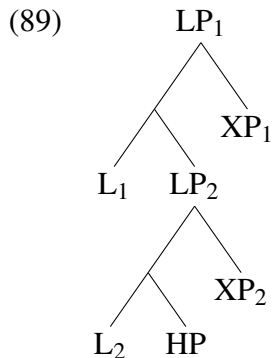
The final issue mentioned here for the narrow-constituent analysis is that a linker appears to select both for the category of its associate and of the dominating extended projection, as discussed in Sections 2.2 and 3.1. But under the narrow-constituent hypothesis, ModP is a specifier or adjunct within HP, so there appears to be no way for Mod to select for H.

4.2 Adjunct analyses

We have seen several arguments against analyses of linker constructions in which the linker and its associate form a narrow constituent that excludes the head of the dominating extended projection. Assuming, then, that such a constituent does not exist, let us consider the possibility that the linker’s associate is an adjunct, rather than a specifier.

There are several issues for an adjunct analysis of weak-dependent constructions. First, it is unclear how the generalization (9) could be accounted for, according to which linkers stand in a one-to-one relation with their associates. The assumption that linkers are functional heads within an extended projection H and that adjuncts may be iterated incorrectly predicts that modifiers should be able to occur in a many-to-one relationship with linkers.

Another empirical problem for the adjunct analysis arises with respect to word-order. A structure in which linkers are heads hosting their associates as adjuncts vastly overgenerates. Adjunction-based theories typically require that right-adjunction is possible (Ernst, 2004); then each of the six logically-possible word-orders stated in Table 1 can be generated. In fact, when multiple modifiers are present, as in (89), we can generate what we can call the unattested “chiasmic” order (90), based on its resemblance with chiasmic constructions in classical languages.



(90) *L₁ L₂ H XP₂ XP₁

If we reject right-adjunction and prohibit iterated adjuncts, however, then we are essentially left with a structure like (39) for linker constructions.

Suppose, then, that one adopts the weaker position that linker constructions have the structure (39), but that modification constructions *without* overt linkers nonetheless adhere to an adjunct analysis along the lines of Abels and Neeleman (2012), in which adnominal modifiers are iterated adjuncts to NP. Presumably, the variation in the availability of linker constructions can be derived from parametric variation in the availability of linker heads, without which adjunction is the only strategy available for modification. But adjunction, whether achieved via a primitive operation such as pair-merge (Chomsky, 1995; et seq.) or somehow via set merge, would presumably remain universally available. But then languages like Persian are predicted not to exist, where nearly all postnominal modifiers require an overt linker. We are compelled, then, to parameterize adjunction itself, which runs counter to the Borer-Chomsky conjecture and is thereby explanatorily suspect. It is preferable, then, to analyze *all* modification constructions as linker constructions, with variation reduced to the morphological realization of the linker head, which we independently know to be possible.

5 Conclusions

To review, the primary claims and arguments of this paper are presented below.

- We proposed the cross-linguistic generalization (9), according to which linkers associate in a one-to-one fashion with syntactically optional dependents of the lexical head of an extended projection (Section 2.1).
- Generalization (9) was argued to be a consequence of the general constituent structure of constructions involving syntactically optional, or “weak” dependents, in which each weak

dependent is merged as the specifier of a linker head that selects for the category of the extended projection (38; Section 3.1).

- Linker constructions were also argued to be subject to the word-order generalization (36), according to which a linker and its associated phrase must be adjacent, and the linker must follow either its associate or the head of the extended projection.
- In particular, the word-order type H–XP–Lnk was shown to be attested in at least two unrelated languages, namely, Daasanach (East Cushitic) and Middle Elamite (isolate), both unambiguously satisfying the linker diagnostic (9). Linkers were thereby shown not to be subject to a universal requirement of intervening between head and dependent.
- The word-order generalization (36) was argued to be a consequence of the base-generated configuration described by (38) together with the condition that a probe feature must be checked by a goal that immediately c-commands it. This condition motivates internal merge and reprojection of the linker head, creating a head chain. A parameter determining the relative order of Chain Reduction and cliticization generates the attested word-order differences (Section 3.2).
- Alternative analyses in which a linker forms a narrow constituent with its associate or in which modifiers are merged as adjuncts were shown to be empirically inadequate, based on diagnostics from selection, ellipsis, coordination, and movement (Section 4).

This paper has been an initial attempt at developing an explanatory theory of syntactically optional, or “weak” dependency, viewed primarily through the lens of its functional structure in what we have called “linker” constructions. Perhaps the central idea has been that modification and other weak dependent constructions involve the same structure-building operations through which arguments are integrated into the clause, namely the application of set Merge and feature-checking local to a selecting head. We have not touched on the possible role that pair-merge or another adjunction operation plays in coordination and other constructions that might motivate one (cf. Chomsky, 2020). Recent experimental work suggests that adjunct island effects are not universal, however, eroding the need for such an operation (Bondevik et al., 2020; Kush et al., 2019). A strong hypothesis is that one does not exist, so that there is no formal basis for the traditional argument-adjunct distinction. Many optional phenomena would then be reduced to a single, likely presyntactic source, namely, the choice of syntactic feature bundles in the numeration that serves as the input to syntactic derivations. Showing this to be the case would be a significant step towards explaining the deterministic processes of natural language.

Abbreviations

1	first person	CAUS	causative
2	second person	CLF	classifier
3	third person	CMPR	comparative
AN	animate	CONJ	conjunction
APPL	applicative	DAT	dative

DEF	definite	NOM	nominative
DET	determiner	OBJ	object
DIST	distal	PL	plural
EXP	experiential aspect	PN	proper name
F	feminine	POSS	possessive
FOC	focus	PRF	perfect
GEN	genitive	PROX	proximal
I	noun-class 1	PRS	present
II	noun-class 2	PST	past
III	noun-class 3	PTCP	participle
INAN	inanimate	RED	reduplicant
IND	indicative	SG	singular
INDF	indefinite	SUBJ	subject case
IV	noun-class 4	TOP	topic
LNK	linker	VII	noun-class 7
LOC	locative	XIII	noun-class 13
M	masculine	XIV	noun-class 14
N	neuter	XVII	noun-class 17
NEG	negative		

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