Restrictions on the Morphosyntactic Marking of Dependencies: What Linkers Tell us[*]

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Abstract: This paper proposes a new generalisation concerning the morphosyntactic marking of grammatical dependencies. Important typological work by Nichols (1986) distinguished marking the head of a grammatical relationship (head-marking) from marking of the dependent (dependent-marking). In addition, the relationship between co-heads in an extended projection may also be marked. To these three forms of marking this paper adds a further parameter: the distinction between affixes and particles as markers of the relevant relationship. Exploring this parameter leads to a more restrictive theory of marking grammatical dependencies, whereby of the three forms of marking, only dependent-marking is available for particles. It will be argued that this restriction can be derived from the assumption that particles head their own projection, whereas affixes do not. The empirical means of testing the theory is provided by linkers – syntactically independent, semantically vacuous particles indicating a relationship between two items. Using data from a variety of languages, it is shown firstly that linkers in the complex noun phrase may be used to mark any head-dependent relationship, and secondly that the linker always marks the dependent: constituency tests from fronting, coordination and deletion, as well as independent morphosyntactic properties, indicate that the linker is invariably attached to the dependent.

1 Introduction

The theory of grammar is to a large extent a theory of grammatical dependencies. Typological work has shown that the overt morphological marking, by phenomena such as case and agreement, of a number of these grammatical dependencies is a widespread phenomenon. Any theory of grammar will therefore not only need to account for the syntactic characteristics of such dependencies, but also address why and how such relationships are reflected by overt morphology.

The contribution of this paper towards answering this latter question will be to motivate a new generalisation, given below in (1):

(1) If the marker of a grammatical dependency is a particle (as opposed to an affix), it must mark a dependent.

Before considering the theoretical argument and empirical evidence supporting this generalisation, which will occupy the major part of this paper, a certain background to the concepts it addresses will need to be given. Section 2 of this paper will identify firstly what is meant here by grammatical dependency, and accordingly what it means to mark a head or to mark a dependent; secondly, criteria for distinguishing particles from affixes will be established. In the light of this, section 3 will then elaborate a theory of morphosyntactic marking, focusing on the role of relational functional heads. The predictions made by this theory will be tested in section 4 using data from linkers in the complex noun phrase from a broad range of languages. The wider theoretical implications of these findings will then be discussed in section 5.

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2 Morphosyntactic Marking of Dependencies

2.1 Grammatical Dependencies and Locus of Marking

Let us first consider the types of grammatical dependency, or syntactic relationship, that have some overt morphological reflex. The majority of these fall into one or other of the following two categories: the head-dependent relationship and the relationship between co-heads in an extended projection. These relationships are illustrated by examples from the extended nominal projection in (2)-(4). The complex noun phrases in (2) and (3) illustrate the head-dependent relationship, where in each case the possessum is the head of the construction, and the possessor the dependent. The examples in (4) show co-heads in the extended nominal projection, the lexical head (the noun) and a functional head (the determiner):

(2) *Head-marking:*
(a) Mari kalap-*ja*-i *Hungarian*
the Mari hat-POSS-PL[1]
'Mari's hats' (Szabolcsi 1994:180, ex 2b)

(3) *Dependent-marking:*
die Geschichte Deutschland-*s* *German*
the.F history Germany-GEN
'Germany's history'

(4) *Marking between heads:*
a) le chapeau *French*
the.M hat(M)
'the hat'
b) la jupe
the.F skirt(F)
'the skirt'

As has been studied at length in typological work by Nichols (1986, 1992:46ff[2]) and as is clear from comparing examples (2) and (3), within the head-dependent relationship there is a further important subcategorisation concerning whether the relationship is marked on the head or the dependent. There are therefore three significant kinds of morphological marking of syntactic relationships that will be considered here: head-marking, dependent-marking, and marking between heads.

In the Hungarian example in (2), displaying head-marking, the possessive relationship is marked on the syntactic head of the construction, the possessum *kalap* ('hat'), by an affix *-ja-*, signalling the presence of a possessor dependent. In the German dependent-marking example in (3), on the other hand, the head of the construction, *Geschichte* ('history'), remains unmarked, while it is instead the possessor, *Deutschland* ('Germany'), as dependent that receives special marking, being inflected with genitive case.

The French examples in (4) display marking of the final syntactic relationship relevant to this paper: marking between co-heads in an extended projection. This relationship is marked on the definite determiner, a functional head, by agreement in gender (or where the noun is plural, number) with the noun, the lexical head.

The head-dependent and head-head relationships exemplified in (2)-(4) I take to be strictly syntactic. The former relationship is concerned with the relationship between a (projection of a) head

[1] Abbreviations in glosses are as follows: ABL ablative; ACC accusative; CL classifier; EXP experiential; F feminine; FV final vowel; GEN genitive; HAB habitual; INSTR instrumental case; LNK linker; M masculine; N nominal; NOM nominative; NT neuter; OM object marker; PRED predicate marker; PST past; PERF perfective; PL plural; POSS possessive; PRES present; REFL reflexive; SG singular; TOP topic marker; 1, 2, 3… noun class markers; = clitic.

[2] While we are indebted to Nichols for bringing to light the significance of locus of marking, the concept itself Helmbrecht (2001:1424) attributes to Milewski (1950), who uses the terms concentric (head-marking) and eccentric (dependent-marking).

in one extended projection and a distinct extended projection as a whole,[3] the latter with heads within the same extended projection. Working definitions of head and dependent are given below:[4]

(5) a) *Head:* Any syntactic head in an extended projection α, this head having content that contributes to the compositional semantics of α.
b) *Dependent:* Any dependent extended projection β within extended projection α (whereby β will either occupy an A-position or be an adjunct in its base-position).

It is important to recognise that the head-dependent, and the head-head, relationships encompass only a subset of syntactic relationships.[5] Of course there are other important syntactic relationships that do not concern either a head and a distinct extended projection or two heads within the same extended projection, such as binding, Ā-movement[6] and chain-formation. These relationships will not be relevant for the concerns of this paper.

The type of marking that is involved will be determined firstly by the type of relationship, and secondly by the morphosyntactic site of attachment of the morpheme marking the relationship, known as its locus of marking (Bickel and Nichols 2005a, 2005b, 2005c, 2007):

(6) a) *Head-marking* occurs where there is a marker of the head-dependent relationship that forms a morphosyntactic constituent with the head.
b) *Dependent-marking* occurs where there is a marker of the head-dependent relationship that forms a morphosyntactic constituent with the dependent.
c) *Marking between heads* occurs where an extended projection α contains a morphosyntactic marker of the relationship between co-heads in α.

To these three types of marking, I propose that a further parameter be added, concerning the status of the marker in the syntax; that is, whether or not the marker projects to head its own functional projection. I will assume here that while independent particles project in their own right, affixes do

[3] These definitions, in their broad outlines, should not I think be controversial. Nichols (1986; 1992) and Bickel and Nichols (2005a:98, b:102, c:106) consistently refer to locus as marking syntactic relations, while Nichols (1993:164-165) appeals for a 'strictly syntactic definition of head and non-head'. Nichols cites the work of Mel'čuk (1974, 1979) as the basis she uses for determining the head category of a constituent, which she defines as follows: 'The head is the word which determines the syntactic type of the entire constituent and hence the privileges of occurrence and syntactic distribution of the constituent. If there is any government (by which I mean requirement of one word in a particular grammatical function by another [i.e. subcategorisation]) within the constituent, it is the head that governs the dependent' (Nichols 1992:46; see also Nichols 1986:57). In practice, this ideology is perhaps – and necessarily – a little confused by ease of methodology. Nichols maintains what Corbett *et al* (1993:5) term the 'head of construction constancy principle', whereby the grammatical category of the head of a given relationship remains uniform across languages. The choice of head/dependent is therefore semantically motivated.

The head/dependent distinction originates with Tesnière's (1959) Dependency Grammar. However, while not necessarily made explicit, the concept is found in a number of theoretical approaches to syntax. Here I define head and dependent using Grimshaw's (2000, building on 1991) notion of the extended projection. I will discuss this in more detail in section 3, where the notion of the functional sequence within the extended projection will become important. The same concept can however also be found in Lexical Functional Grammar, in the notion of co-heads and attributes (cf. Bresnan 2001:100-101).

[4] Note that these are definitions of head-/dependent-marking, as opposed to a theory of head-/dependent-marking. Therefore, as largely pre-theoretical working definitions, they are kept as inclusive as possible. In section 3 we discuss independent locality conditions on the head-dependent relationship, that limit the domain in which this relationship can be established.

[5] The head-dependent relationship itself is made up of other meaningful syntactic relationships, such as sisterhood, the spec/head relationship, and adjunction, while the head-head relationship is concerned with domination.

[6] It is of course debatable whether Ā-movement in some or all instances does not involve a relationship between a head and a distinct extended projection (cf. Rizzi's *Wh*-criterion and topic and focus criteria, Rizzi 1996 and 1997 respectively). Whether or not this is the case, I take the primary relationship in Ā-movement to be that between the antecedent and its trace/copy. In the interests of clarity of results I therefore leave aside these debatable cases for future work.

not. While the existence of both affixes and independent syntactic words or particles as markers of locus has been acknowledged in the literature, the potential significance of the distinction has generally remained unexplored. The main goal of this paper will therefore be to show that a more restrictive theory of locus of marking results by treating affixes and particles as distinct, this restriction taking the form of the generalisation in (1). Before motivating this generalisation, we must first briefly address a more fundamental question, concerning the difference between affixes and particles. In so doing we will uncover the initial indications of an empirical puzzle that justifies taking the distinction between affixes and particles seriously.

2.2 Affixes Versus Particles: A Mismatch

I have proposed that particles and affixes are distinguished by the following property: particles head a projection in their own right; affixes do not. Whether or not a given morpheme projects in its own right in the syntax can be determined by examining a number of different criteria.

The first criterion to be considered is phonological: an affix will always be phonologically bound to its host, whereas a particle may or may not be (– note that, unlike affixes, if a particle is dependent phonologically on some host, it does not necessarily follow that this particle forms a morphosyntactic constituent with this same host, a matter which we will discuss in more detail in subsection 4.3).

Therefore, where a morpheme is phonologically bound, we must consider further factors to determine whether it is an affix or a particle, in which latter case it is known as a clitic (see also Zwicky and Pullum 1983, Miller 1992 and Anderson 2005 on the clitic/affix distinction). One of these factors is concerned with whether or not the relevant features are fusional with some other meaningful element: in a fusional form each feature is affixal. Therefore, while a particle with the sole purpose of marking a syntactic relationship may realise a number of different features pertaining to this relationship, the group of features in this particle cannot be fusional with anything else (modulo a certain amount of allomorphy).

Where the morphology is agglutinating, affixes and particles can be distinguished according to whether they attach to words or phrases respectively. An affix will be highly selective in terms of the category it attaches to (cf. Zwicky and Pullum 1983:503, criterion A): either it will attach to a single word of a designated category within a phrase, or it will attach to multiple potential hosts within a given phrase. A particle, on the other hand, will only appear once in a phrase, being aligned to one or other of its edges. The result is that a particle attaches to whichever word is at the relevant edge of the phrase, irrespective of its category (modulo a low degree of productively motivated selection for special clitics). In some cases the relevant edge of a phrase will always coincide with a word of a particular category (e.g. Japanese, which is uniformly head-final) and it will therefore be impossible to tell by this criterion whether or not the morpheme attaches to the word or the phrase.

In such a case, the final criterion can be used, concerning coordination: particles may show wide scope over coordination, whereas affixes cannot, but must be repeated on each conjunct (Miller 1992).

We are now in a position to return to the question of interest: in marking syntactic relationships, how does the distribution of particles, assumed to be purely relational functional heads, differ from that of affixes? If the syntax does indeed allow functional heads that are purely relational in nature, being otherwise semantically vacuous, it is meaningful to consider how the presence of these heads relates to selectional properties, and accordingly to determine restrictions on their distribution. Most importantly, perhaps, such a study should shed some light on the purpose and behaviour of overt morphosyntactic licensing of syntactic dependencies. Of course, the answers to these issues will be interrelated.

In order to address these issues, let us consider firstly what such examples would look like. While the presence of both affixal and syntactically independent markers of at least the head-dependent relationship is accepted, work on locus of marking has generally devoted most of its attention to the former kind, a matter that is also pointed out by Ansaldo and Matthews (2000). The practical advantages of such an approach for broad typological surveys of the type conducted by Nichols are, I think, obvious: the morphological constituency of an affix is generally uncontroversial. The syntactic constituency of a given particle, on the other hand, is less readily available, involving carefully constructed tests requiring specific configurations. Even when these conditions are met, particularly if the particle is a clitic, the arguments for constituency may be quite subtle.

Extensive work on the purely affixal marking of syntactic relationships has shown that both head-marking and dependent-marking affixes exist, as well as affixes marking the co-head relationship. This is demonstrated by the examples in (7)-(11):

Affixal head-marking:

(7) Juan cant-*ó* mejor que nadie. *Spanish*
Juan sing-PST.3SG better than nobody
'Juan sang better than anybody.'

(8) Juma *a*-li-kuwa *a*-me-pika ch-akula. *Swahili*[7]
Juma 3SG-PST-be 3SG-PERF-cook 7-food
'Juma had cooked food.' (Carstens 2001:150, ex 5a)

(9) Masha pe-l*(-*a*) i tanceva-l-*a*. *Russian*
Masha(F) sing-PST-F and dance-PST-F
'Masha sang and danced.'

Affixal dependent-marking:

(10) lu [wat̲ayi-*ɣamṛa-ma* patʳa-*ma*] pae-ni. *Anguthimri*
he old.man-GEN-ABL canoe-ABL come.out-PST
'He got out of the old man's canoe.' (Schweiger 1995:339, ex 1, citing Crowley 1981)

Affixal marking between heads:

(11) a) het huis *Dutch*
the.NTSG house
'the house'
b) de man
the man
'the man'

In the Spanish head-marking example in (7) the suffix *-ó* on the verb marks the latter's relationship with the subject by cross-referencing the person and number features of the subject; however, it simultaneously marks the tense/aspect/mood features of the verb. Since the agreement morphology is fusional with the verbal features, it is clear that we are dealing with an affix.[8] The same conclusion can be drawn regarding the subject-verb agreement in Swahili, exemplified in (8). This example shows a compound tense construction: the agreement prefix is realised on every verb in the clause, an indication that it is an affix. In the final, Russian, example of affixal head-marking, given in (9), the subject-verb agreement is realised as a suffix on the verb, cross-referencing the gender (or where plural, number) feature of the subject. The coordination criterion shows that this agreement is affixal; since the suffix does not project it cannot scope over two coordinated verbs, but must be realised on each conjunct.

Example (10) shows affixal dependent-marking. This Anguthimri (Northern Paman) example exhibits the phenomenon known as Suffixaufnahme or case-stacking. Here the object of the verb is a complex noun phrase, containing the head noun *patʳa* ('canoe') and its possessor *wat̲ayi* ('old man'). The possessor is marked with genitive case, the direct object as a whole with ablative case, case-marking being a form of dependent-marking. However, the morpheme marking ablative case, *-ma*, appears not only on the head noun of the direct object, or at the edge of the complex noun phrase as a

[7] In referring to Bantu languages, my use of the noun class marker depends on the more common usage. So I refer to 'Swahili' rather than 'Kiswahili', but 'Chichewa' rather than 'Chewa'.

[8] The conclusion that agreement of this kind is affixal, and does not project to head its own functional projection, need not force us to reject its having any head-like properties. Di Sciullo and Williams (1987) introduced the notion of relativised head, whereby specific features of an affix may percolate to word-level along with features of the stem. It is therefore possible for an affix to act as head with respect to certain features, without heading a projection in its own right.

whole, but on both elements – head noun and possessor. As discussed above, this property indicates that it is an affix.

The examples in (11) demonstrate affixal marking between heads. In these Dutch examples, the definite determiner shows agreement with the noun it dominates: the form *het* is used for neuter singular nouns, while a completely different form, *de*, is used elsewhere. Since the agreement morphology marking the domination relationship is completely fusional with the definiteness semantics of the determiner, it is clear that this relational morphology does not have any syntactic status in its own right.

The examples in (7)-(11) therefore provide evidence that head-marking, dependent-marking and marking between heads may all the realised by affixes. If this situation is mirrored as regards particles, we would expect six logical possibilities for the marking of the grammatical dependencies with which we are concerned (in addition to a combination of, or none of, these): affixal head-marking, affixal dependent-marking, affixal marking between heads, particle head-marking, particle dependent-marking and particle marking between heads. In more concrete terms, for examples such as (7)-(11), cross-linguistically we would expect to find parallel examples whereby agreement and case are realised not as affixes, but as independent syntactic words or particles – functional heads in their own right – devoid of any semantics that are not purely relational.

It is fairly easy to find examples of dependent-marking by means of a particle. Bittner and Hale (1996) show examples from a variety of languages. The example below is taken from Japanese, where the fact that the accusative case-marker *o* can scope over two coordinated direct objects provides evidence that it is a (projecting) particle, as opposed to a (non-projecting) affix:

Particle dependent-marking:

(12) John=*ga* [Mary sosite Bill]=*o* mi-ta. *Japanese*
John=NOM Mary and Bill=ACC see-PST
'John saw Mary and Bill.'

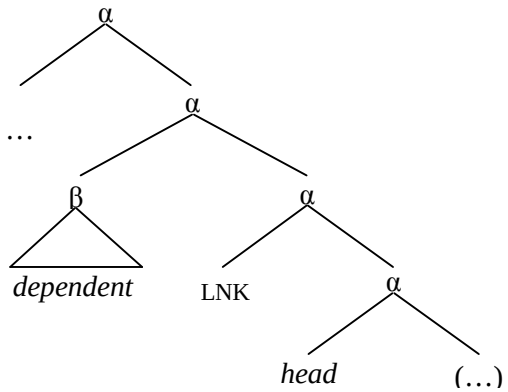
On the other hand, I have not found any examples of head-marking by means of a particle, agreement or otherwise, nor of a particle marking the relationship between co-heads. The theory sketched below regarding the distribution of relational functional heads sheds some light on this state of affairs.

3 Relational Functional Heads

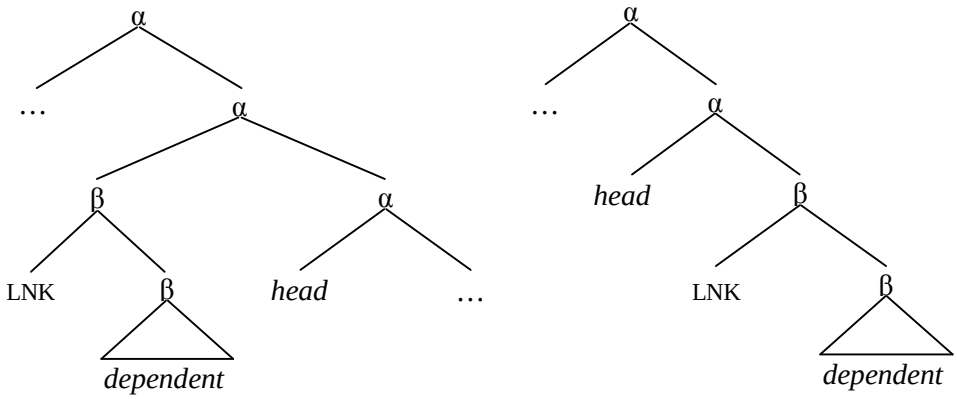
In the previous section we discussed how general assumptions about the morphosyntactic marking of syntactic relationships, and in particular the assumption that it can be realised by independent particles as well as affixally, lead to the prediction that within the syntax will be found functional heads that are purely relational in nature, being otherwise semantically vacuous. Given these assumptions, we are led to ask not only whether such heads are permitted, but also, what will be the restrictions on their distribution?

Firstly, it seems reasonable to assume that any functional head with no other purpose than to mark a relationship between two items should structurally intervene between these two. Where the relevant relationship is a head-dependent relationship between a head in extended projection α and a dependent projection β, therefore, this functional head will structurally intervene between the relevant head in α and β: if the functional head is a head-marker as defined in (6)a), in order to form a constituent with the head it will have to be a functional head internal to the extended projection of the head; if it is a dependent-marker as defined in (6)b), in order to form a constituent with the dependent it will have to be the highest functional head in the dependent extended projection β. Where it is the relationship between two heads in the same extended projection that is relevant, the functional head marking the relationship will intervene between the two. This is exemplified in (13), where the marker of the relevant syntactic relationship, here the relational functional head, is marked LNK. (Note that the trees in (13)-(17) represent purely structure, and do not make any claims about linearisation.)

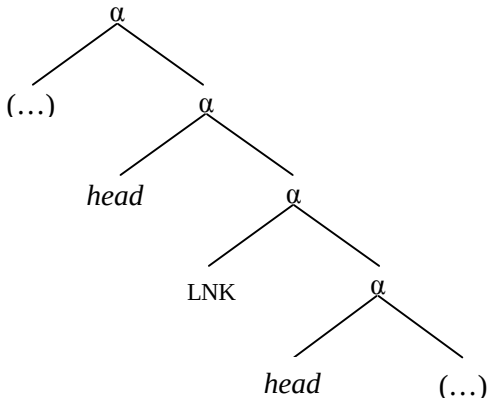
(13) a) *Particle head-marking:*



b) *Particle dependent-marking:*

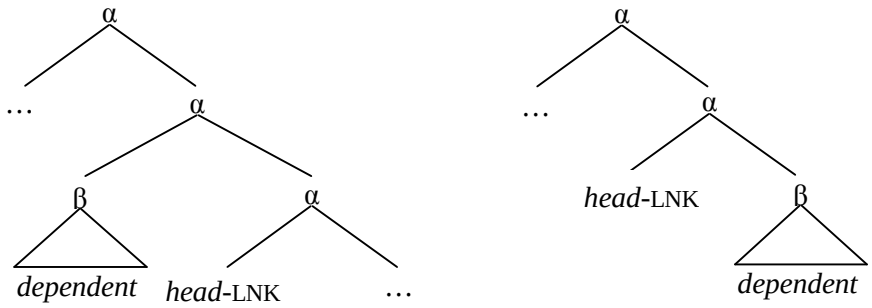


c) *Particle marking between heads:*

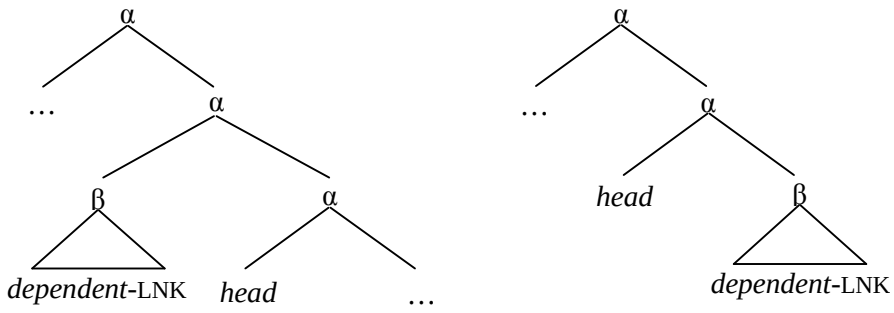


Where the marker of the head-dependent relationship is an affix, intervention is not a relevant issue, since the affix does not project and therefore will be attached directly to either head or dependent. This is schematised below, where in this case the marker LNK represents the relational affix, of the type seen in examples (7)-(11):

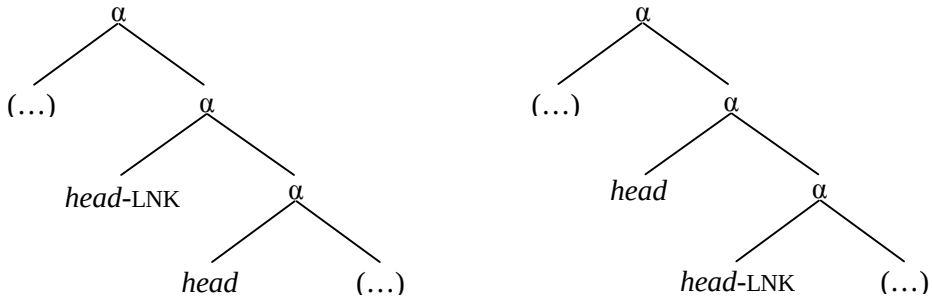
(14) a) *Affixal head-marking:*



b) *Affixal dependent-marking:*



c) *Affixal marking between heads:*



Returning to the particle cases, there are further restrictions on the appearance of LNK as a functional head. There is reason to conclude that a functional head devoid of (non-relational) semantics can only exist if it is the highest head in its extended projection.

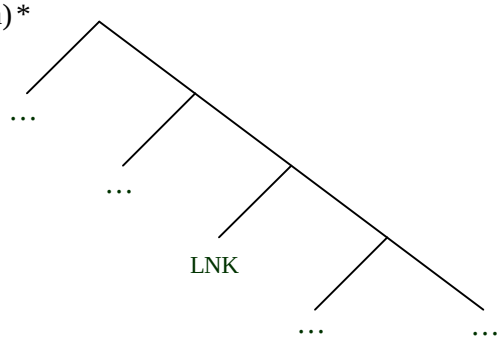
Before considering the reasons for this, it is worthwhile saying a word elucidating the semantic contribution of the marker LNK. I mentioned above that this marker lacks (relevant) semantics, serving only to mark a relationship. That is to say that it does not make any contribution to the compositional semantics of the extended projection of either the head or the dependent; if it has any semantic contribution to make at all, this will concern only the nature of the relationship that it marks. For this reason, the functional head LNK will only be expected to appear where such a relationship exists.

It is generally presumed that functional heads within an extended projection must respect a certain sequence (cf. Cinque 1999; Grimshaw 2000); that is to say that a functional head selects for features of the head that it immediately dominates (cf. Chomsky 1995:54-55). If a head does not have any relevant features – that is, it does not make any contribution to the compositional semantics of its extended projection –, it cannot be selected by any higher functional head; therefore the only position in which a functional head devoid of relevant semantics can appear is as the highest head in the extended projection.

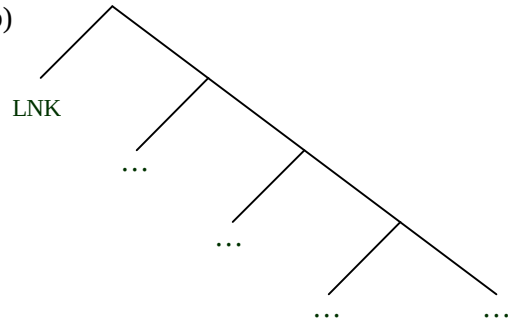
On the other hand, where a syntactic object subcategorises for a distinct extended projection – that is, a dependent – it selects for relevant features of this dependent extended projection as a whole (cf. Grimshaw 2000:§3.1). Since it is not the highest functional head of this dependent projection that is selected specifically, the problem of selecting for features of something that does not have any

features of its own does not arise.[9] Where the dependent projection is merged with the head by adjunction, or pair merge (Chomsky 2000), there is no selection of the dependent involved, so again the issue does not arise. The postulated restriction on the distribution of functional heads lacking (relevant) semantics to highest position is represented in (15):

(15) a) *



b)



We now consider the results if we combine these two hypotheses: the requirement that a purely relational, otherwise semantically vacuous, functional head must sit at the edge of its extended projection, and the assumption that this functional head must intervene between head and dependent. Particle dependent-marking, represented in (13)b), will always be freely available, as the LNK head will always be uppermost in its extended projection, therefore conforming to the requirement represented in (15). On the other hand, particle marking between heads, represented by (13)c), will never be possible, since it is impossible for a head both to sit between two heads in an extended projection and to be uppermost in this same extended projection.

When we turn to particle head-marking, the situation is more complicated. Particle head-marking, as represented by (13)a), will only be possible if the dependent sits in the specifier of the relational functional head LNK, which must – by (15) – sit outside the functional sequence in the extended projection.

It is assumed however that this situation will never arise: syntactic theory requires the head-dependent relationship to be established within a smaller domain – that is, within the immediate projection of the lexical head or within the functional sequence. Recall that for the head-dependent relation to be established, the dependent must be either in an A-position or must be a base-generated adjunct (cf. (5)b)). If the dependent is an argument, it must receive a θ-role; the domain for θ-assignment for internal θ-roles is within the maximal projection of the lexical head, and no higher than TP for the external θ-role. The same restrictions apply to place-holders in argument positions. If the dependent is an adjunct, its base-position is determined by its selectional properties (cf. Jackendoff 1972: chapter 3; Ernst 1984, 2002 and further references given in these works). Depending on the particular adjunct, it will select to adjoin to a projection either of the lexical head or of a head in the functional sequence. It will not however select for the semantically empty functional head LNK, which

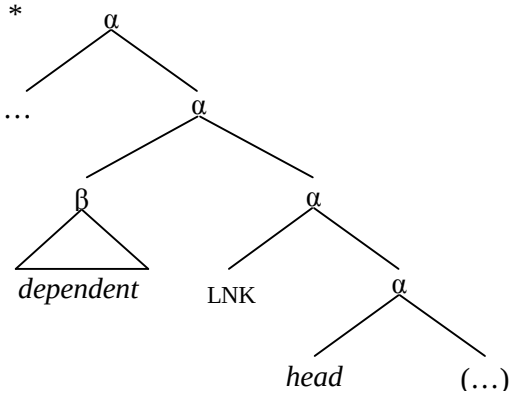
[9] This option does not appear to be available in building an extended projection; that is, it seems that a functional head in an extended projection selects only for the head it immediately dominates, not for features of the partial tree as a whole. This latter option would be overly permissive, allowing any order of functional heads; evidence however overwhelmingly suggests that there is an uninterruptible functional sequence (cf. Cinque 1999; Grimshaw 2000).

sits outside the functional sequence. Evidence that this is the case can be found by considering the position of sentence-level adverbs in embedded clauses. Evaluative adverbs such as *fortunately* are assumed to select for the clause as a whole. However, example (16) below shows that the highest position it can adjoin to is TP; it cannot adjoin to CP, the highest projection in the clause:[10]

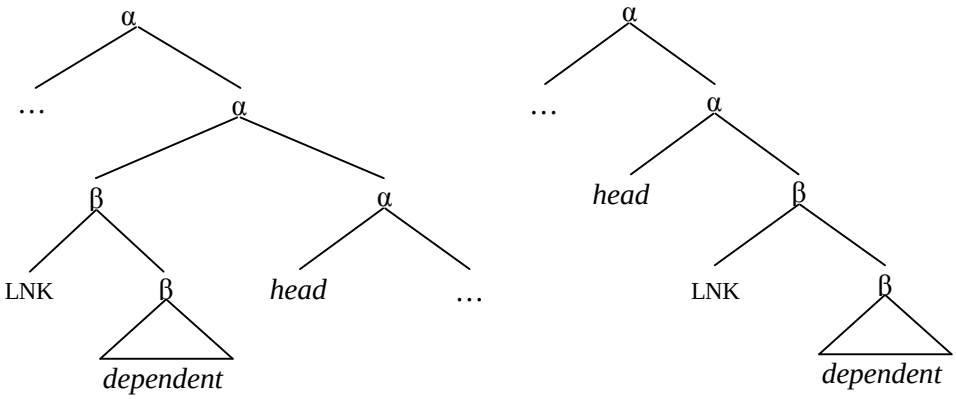
(16) a) I heard [$_{CP}$ that [$_{TP}$ fortunately [$_{TP}$ tomorrow's forecast is sunny]]]. *English*
b) * I heard [$_{CP}$ fortunately [$_{CP}$ that [$_{TP}$ tomorrow's forecast is sunny]]].[11]

It seems then that independent properties of arguments and adjuncts motivate a locality condition on the head-dependent relationship, such that it must be established either within the immediate projection of the lexical head or within the functional sequence. In either case of course the argument or adjunct dependent may move out of this domain, but the relevant head-dependent relationship will have been established prior to this movement. We deduced earlier that particle head-marking will only be available if the dependent sits in the specifier of the relational functional head LNK, which sits outside the functional sequence. Since the locality condition on the head-dependent relationship does not license a dependent in this position, we are forced to conclude that particle head-marking will never be possible.[12] The structures in (13) are therefore too permissive, and we assume that, as an operation involving particles, or relational functional heads, only dependent-marking is available:

(17) a) * *Particle head-marking:*



b) *Particle dependent-marking:*

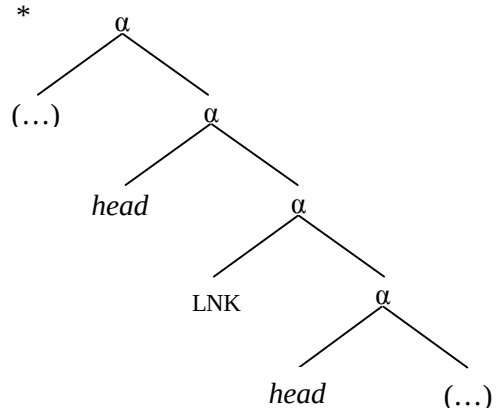


[10] It is probable that the complementiser *that* is in fact an instantiation of the relational functional head LNK. See brief discussion in footnote 14.

[11] This sentence is ungrammatical under the intended meaning. It is of course grammatical if *fortunately* is taken to be adjoined to the matrix clause, but this reading is not relevant for our discussion.

[12] Of course, there are other syntactic relationships besides the head-dependent relationship. Where the relationship marked is movement to the edge of an extended projection, it should be possible for the relationship to be marked by the highest, relational, functional head in this extended projection. This may be the case in matrix V2 clauses and *wh*-questions.

c) * *Particle marking between heads:*



As regards affixes, on the other hand, this prohibition on head-marking and on marking between heads will not apply. Where the marker is an affix, attached directly to either head or dependent, it does not have any syntactic status in its own right; that is, there is no projection headed exclusively by LNK (cf. representations in (14) above). Since LNK as an affix does not head its own projection, its appearance will never interrupt the functional sequence. Therefore the relevant relationship can be established internally to the extended projection of the head without raising any problems. We have seen examples attesting to this in (2), (4), (7), (8), (9) and (11), in addition to the wealth of typological work on head-marked agreement that already exists.

We can therefore return to our point of interest: the place of relational functional heads within syntactic theory, and more specifically in marking grammatical dependencies. On the basis of the theoretical assumptions outlined in this section, the following predictions result: firstly, the syntax allows purely relational functional heads – that is, syntactically independent, semantically vacuous words serving only to mark a grammatical dependency; however, selectional properties place a restriction on their distribution such that they can only be used in dependent-marking. That is to say that if there is a marker of a grammatical dependency, and if this marker meets the criteria for particles and is purely relational in terms of semantics, it must be a dependent-marker.[13]

We have already seen some evidence that this is the case in section 2.2. This evidence was taken from the clausal level, where, firstly, the presence of purely relational particles such as case-markers, complementisers and adpositions is well attested; secondly, the constituency of these – and therefore their status as dependent-markers – is uncontroversial. Purely relational particles internal to the extended projection of the head however do not seem to be attested. Having established that the predictions outlined above seem to hold at the clausal level, we therefore turn our attention to particles for which the constituency has not been determined. In the next section we will see empirical evidence from linkers in the complex noun phrase both of the existence of purely relational functional heads, and of the restriction to dependent-marking.

4 Linkers: Distribution and Constituency

Firstly, there is empirical evidence for the presence of relational functional heads in the form of the morphemes known as linkers. Linkers are generally defined as syntactically independent, semantically empty particles, with the sole function of indicating a relationship between two items (cf. Rubin 2002: chapter 2, Den Dikken and Singhapreecha 2004, Samvelian 2006:26), their usage being most prevalent within the complex noun phrase. Since their function is to mark a relationship, linkers only occur where this relationship exists. Notice that this definition also covers some instantiations of more familiar categories, including purely functional adpositions, such as *of* in English, and in some languages purely structural case-markers, where these are independent syntactic words – that is,

[13] I leave aside here cases of topic and focus particles, the semantics of which are not clear to me, for the reasons discussed in footnote 6.

realisations of the functional head K.[14] Even where items belonging to these categories do make some more significant semantic contribution, this contribution will not relate directly to the compositional semantics of their complement, but will serve only to indicate the nature of the relationship between this complement and some other items.

Linkers in the extended nominal projection are found both in languages with postnominal dependents (including Atlantic-Congo languages (the associative marker), Afro-Asiatic languages, West Iranian languages (Ezafe/Izafe), Romance languages, the Eastern Sudanic language Luo, the Malayo-Polynesian language Rotuman, the Penutian language Tsimshian and Tok Pisin), giving the linear order in (18)a) below, and in languages with prenominal dependents (most Southeast Asian languages (Den Dikken and Singhapreecha 2004:16, fn 11), including Sino-Tibetan languages, Japanese and Korean, but also Indo-Aryan languages, Basque and the Madang language Amele), giving the linear order in (18)b). There are also Malayo-Polynesian languages that allow both orders given in (18). In all these languages, whether the dependent follows or precedes the noun, the linker linearly intervenes between the two. [15]

(18) a) N(P) LNK dependent
b) dependent LNK N(P)

Given the theory outlined in the previous section, it is predicted that the linker – as a purely relational particle – must be a dependent-marker. More concretely, it is predicted firstly that the linker will be used only to mark the relationship between a head noun (phrase) and a dependent, and secondly that the linker will be the highest head in the extended projection of this dependent. The evidence given in the subsections below will show that both predictions are borne out.

4.1 Distribution

As demonstrated by the examples below, linkers may be used to establish a relationship between a head noun and a number of different types of dependent, including possessors (as in (19)), complements (as in (20)-(21)) and attributive modifiers, both in predicate modification (as in (22)-(24)) and where the dependent is demonstrative (as in (25)) or quantificational (as in (26)).[16] Not every relationship will be marked in every language.

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[14] Here I concentrate on the use of linkers in the complex noun phrase, where their usage is best documented, and their constituency least obvious. As well as nouns, relevant heads may be adjectives and possibly prepositions, as in Western Iranian languages (Samiian 1994:23-26; Ghomeshi 1997:730; Samvelian 2007:609, 2008:§2.2 and references cited there). Rubin (2002: chapters 2 & 3) provides evidence of linkers within the clause, some of which are phonologically identical to the linker used in the complex noun phrase. At least in Tagalog this is unlikely to be due to simple homophony, as in both instances of its usage the linker/complementiser has the same fairly idiosyncratic allomorphy (cf. Schachter and Otanes 1972). The striking parallelism between the Tagalog linker/complementiser *na/-ng* and the English complementiser *that/ø* is further pointed out by Richards (1999). Of course, the prediction I am making – that a linker is the highest functional head in the extended projection of the dependent – is uncontroversial for complementisers.

[15] At present, I take this merely as an observation, as opposed to a defining characteristic. Therefore, if there were a purely relational particle serving to mark a head-dependent relationship that did *not* intervene between head and dependent, I would also take this particle to be a linker. A significant potential example is the linker *de* in Pashto; however, as discussed in subsection 4.2, this non-intervention appears to be the result of movement. Two further potential examples of linkers that do not intervene are given in Den Dikken and Singhapreecha (2004): in the Malayo-Polynesian language Takia and Yucatec Maya. In Takia the relevant morpheme forms a constituent with the adjective (as a dependent of the noun) and is therefore unproblematic, in Yucatec Maya with the head noun. However, there is no evidence indicating that these morphemes are independent syntactic words as opposed to affixes.

[16] Which head-dependent relationships are marked by linkers is subject to cross-linguistic variation. The most common usages of linkers occur where head and dependent are of the same category: whether both verbal, in which case we use the term complementiser for the linker, or both nominal. In such cases morphological marking is more likely to be required to disambiguate which is the head and which is the dependent. I know of no language that uses linkers in the complex noun phrase but does not use them where a head noun takes another nominal as its dependent.

(19) wo *de* shu *Mandarin Chinese*
I LNK book
'my book' (Den Dikken & Singhapreecha 2004:34, ex 46b)

(20) gaikoku=e=*no* ryokoo *Japanese*
abroad=to=LNK trip
'trip to abroad'

(21) səmy-a *cə* Habi *Zina*[17]
listen.to-N.F LNK.F Habi
'listening to Habi' (Oprina 2002:124, ex 64d)

(22) hao *de* shu *Mandarin Chinese*
goodLNK book
'good books' (Den Dikken & Singhapreecha 2004:34, ex 46a)

(23) zai Beijing *de* ren
in Beijing LNK people
'people in Beijing' (ex 46c)

(24) wo mai *de* shu
I buy LNK book
'the book that I bought' (ex 46d)

(25) chi *ve* qhaʔ-šɛ nî gâ *Lahu*[18]
this LNK headman two CL
'these two headmen' (Den Dikken & Singhapreecha 2004:36, fn 23, ex iii)

(26) ghayak-i *tə* darra *Zina*
knife.PL-PL LNK.PL many
'many knives' (Demeke 2002:96, ex 74c)

Crucially, however, the linker never marks the relationship between a noun (phrase) and a higher head in its extended projection. This is particularly clear in the Kotoko languages (Chadic). In these languages, the relationship between a head noun (phrase) and any kind of dependent can be marked by a linker, irrespective of the dependent's function or category. However, the relationship between a noun and a determiner is never marked by a linker, even though in some cases the form of the determiner – which does not co-occur with a linker – is identical to a demonstrative – which must co-occur with a linker. This is exemplified below:

(27) a) kitabə de *Zina*
book(M) the
'the book'
b) kitabə *yi*=nde (de)
book(M) LNK.M=this the
'this book'
c) kitabə *y*=adde (de)
book(M) LNK.M=that the
'that book' (Demeke 2002:90-91)

(28) a) gɨlew do *Afade*[19]
dog(M) the.M
'the dog'

[17] Zina (or Jina) is a Chadic language.

[18] Lahu is Tibeto-Burman.

[19] Afade (or Afadɨ) data is taken from material written by Madam Alifa Kassala, a native speaker, during an SIL course directed by James Roberts.

b) gɨlew *an* do
dog(M) LNK.M the.M
'this dog'
c) gɨlew *an* to do
dog(M) LNK.M that the.M
'that dog'

Having established that the linker is used only to mark the head-dependent relationship, and not the relationship between co-heads, we now turn to the second question of interest: the locus of the linker's marking. It is predicted that the linker is a dependent-marker, and therefore, as the highest functional head in the dependent's extended projection, forms a constituent with the dependent. In other words, the linearisations in (18) should always have the following constituency:

(29) a) N(P) [LNK dependent]
b) [dependent LNK] N(P)

Constituency tests that apply within the complex noun phrase are limited. It is perhaps for this reason that, while there are a number of works approaching linkers from a theoretical viewpoint (see, for example, Rubin 1997, 2002, 2003; Carstens 2001:151ff; Den Dikken and Singhapreecha 2004; Rebuschi 2002, 2005:§4; Den Dikken 2006; Simpson 2001, 2002 on Mandarin Chinese; Holmberg and Odden 2004 on the West Iranian language Hawrami), and while these theories necessarily make predictions concerning the constituency of linkers, whether these predictions are borne out empirically has remained an unanswered question.

Here I will argue that data from fronting (subsection 4.2), coordination (4.3) and deletion (4.4) are best accounted for if the linker uniformly forms a constituent with the dependent, as predicted. Moreover, I will show that this constituency is more in keeping with general morphosyntactic properties, both of individual languages and typologically (subsection 4.5).

4.2 Fronting

One of the most robust constituency tests is movement. However, it is well known that movement out of a complex noun phrase is generally difficult, if not impossible. Nevertheless, there are languages with linkers that allow either movement or some other kind of fronting operation of the dependent of a noun. Fronting of the linker with the dependent should only be possible if the two form a constituent. Fronting of this kind can be found in certain languages with *wh*-movement, such as French and English. This is shown in the examples below, where *de* is the linker in French and *of* in English (cf. Den Dikken and Singhapreecha 2004). These examples show pied-piping of the linker with the *wh*-moved dependent:

(30) a) Elle est la [femme [*de* [François]]]. *French*
she is the.F woman(F) LNK François(M)
'She is François's wife.'
b) [*De* [quel mari]] est -elle la [femme]?
LNK which husband(M) is she the.F woman(F)
'Of which husband is she the wife?'

(31) a) We need to fix the [roof [*of* [the third house]]]. *English*
b) [*Of* [which house]] do we need to fix the [roof]?

In French, pied-piping of the linker is obligatory, while in English it is optional. For our purposes, however, this contrast is irrelevant; in order to show that the linker, whether *de* or *of*, forms a constituent with the dependent possessor, it is sufficient to show that pied-piping of the linker is possible.

Similar examples can be found from topicalisation. In the following examples from the Bantu language Chichewa, the possessor or attributive NP is obligatorily introduced by a linker (known as the associative marker) *-a*, which is marked for agreement in noun class with the head noun. Where

this possessor is topicalised in clause-initial position, in (32)c), it is accompanied by the linker.[20] Note that this must be due to pied-piping of the linker; the linker itself cannot be part of the topic, since it has no semantic contribution:

(32) a) [Anyaní [*á* mísala]] a-ku-(chí-)pwány-a [chipanda [*ch-á* kazitápé]]. *Chichewa*
2baboons 2LNK 4madness 2-PRES-7OM-smash-FV 7calabash 7-LNK 1a.spy
'The mad baboons are smashing the spy's calabash.'

b) Chipanda [anyaní [*á* mísala]] a-ku-chí-pwány-a [*ch-á* kazitápé].
7calabash 2baboons 2LNK 4madness 2-PRES-7OM-smash-FV 7-LNK 1a.spy
'The calabash, the mad baboons are smashing the spy's.'

c) [*Ch-á* kazitápé][anyaní [*á* mísala]] a-ku-chí-phwány-a [chipanda].
7-LNK 1a.spy 2baboons 2LNK 4madness 2-PRES-7OM-smash-FV 7calabash
'Of the spy, the mad baboons are smashing the calabash.'

(Morimoto & Mchombo 2004:355, ex 16)

These examples therefore bear out the prediction that any linker, as a semantically empty functional head serving only to mark a head-dependent relationship, must form a constituent with the dependent.

A similar, though perhaps more subtle, argument can be made for the linker *de* in Mandarin Chinese. Cinque (2005) and Abels and Neeleman (2007, 2009) propose the unmarked word order in the extended nominal projection is derived from the universal base-generated hierarchy of demonstrative > numeral > adjective > noun (where '>' indicates c-command). In Chinese, the hierarchy demonstrative > numeral > noun is fixed, but adjectives and relative clauses accompanied by *de* may appear in any prenominal position within the extended nominal projection (Aoun and Li 2003:146-147, citing Tang 1990, Li 1998, 1999a, 1999b). Therefore where the adjective precedes the numeral it must be a derived structure. What is relevant as regards constituency is that when the adjective is fronted, as in (33)b) and c) below, it must be accompanied by *de*, supporting our prediction that *de*, as a linker, must form a constituent with the dependent, here the adjective. Examples (33)d) and e) show that *de* cannot be stranded by fronting of the adjective.

(33) a) na san ben [[youqu *de*] shu] *Mandarin Chinese*
that three CL interesting LNK book

b) na [[youqu *de*] [san ben shu]]
that interesting LNK three CL book

c) [youqu *de*] [na san ben shu]
interesting LNK that three CL book
'these three interesting books'

d) * na youqu san ben *de* shu
that interesting three CL LNK book

e) * youqu na san ben *de* shu
interesting that three CL LNK book

It has been proposed that adjectives accompanied by *de* are in fact predicates in relative clauses (Li and Thompson 1981:118; Huang 1987:47, fn 3; Sproat and Shih 1988, 1991). If this were the case, it would explain the free distribution of such adjectives in Chinese, without recourse to derived structure. However, Aoun and Li (2003:148) and also Paul (2005:§2) show that there are certain adjectives that can appear with *de* as noun phrase modifiers, but cannot be used predicatively,[21] with

[20] Morimoto and Mchombo (2004) and Mchombo (2006) do not state whether fronting of the associative marker with the possessor in Chichewa in examples such as (32)b) is obligatory, though this seems probable. However, it is sufficient for our argument to show that pied-piping of the linker is *possible*, which Morimoto and Mchombo's example certainly demonstrates.

Topicalisation of a constituent internal to the complex noun phrase in Chichewa is dependent on the presence of an object marker co-referential to the complex noun phrase with which this fronted constituent is associated (Mchombo 2001, 2004:§4.9, 2006; Morimoto and Mchombo 2004).

[21] Sproat and Shih (1991:574) justify their relative clause analysis by citing Huang's (1987) observation that *qian* ('former') and *wei* ('fake') can occur neither as *de*-modifiers nor as predicates. However, Aoun and Li (2003:251-252, fn 15) provide evidence that these are not adjectives, but prefixes.

co-occurrence of either the intensifier *hen* ('very') or the negator *bu* constituting evidence of predicatehood. Compare the behaviour of *zhongyao* ('important') in (34), which can be predicative, with *zhuyao* ('main') in (35), which cannot be:

(34) a) [zhongyao *de*] shiqing *Mandarin Chinese*
important LNK matter
'important matters'
b) Zhe jian shiqing (hen / bu) zhongyao.
this CL matter very/not important.
'This matter is (very/not) important.'
c) [[hen / bu zhongyao] *de*] shiqing
very/not important LNK matter
'very/not important matters'

(35) a) [zhuyao *de*] daolu
main LNK road
'main road'
b) * Daolu (hen / bu) zhuyao.
road very/not main
c) * hen / bu zhuyao *de* daolu
very/not main LNK road (Aoun & Li 2003:147-8)

Moreover, such non-predicative adjectives, accompanied by *de*, show the same free distribution as any other adjective, with fronting of the linker *de* with the adjective obligatory:

(36) a) na san tiao [[zhuyao *de*] daolu] *Mandarin Chinese*
that three CL main LNK road
b) na [[zhuyao *de*] [san tiao daolu]]
that main LNK three CL road
c) [zhuyao *de*] [na san tiao daolu]
main LNK that three CL road
'those three main roads' (Aoun & Li 2003:150, ex 45)
d) * na zhuyao san tiao *de* daolu
that main three CL LNK road
e) * zhuyao na san tiao *de* daolu
main that three CL LNK road

Therefore, since the modifiers showing this free distribution are genuine APs, the examples where the adjective precedes the numeral must be derived structures, and the fact that *de* must accompany the adjective in these derived structures constitutes evidence that the adjective and *de* form a constituent.

Finally, we consider examples from the Southeast Iranian language Pashto. This language has the word order LNK-dependent-noun, where *de* is the linker:

(37) [*de* Asad] [moţar] *Pashto*
LNK Asad car
'Asad's car' (Larson in press: 15, ex 56)

Larson (in press) argues that this word order is result of movement of the possessor, accompanied by *de*. His argument is based on the fact that where the relevant extended nominal projection is the complement of a preposition, the linker and possessor precede this preposition, as exemplified in (38) below. Compositional semantics suggests that in such cases the possessor must have moved out the nominal complement of the preposition.

(38) [*de* Asad] [pə [chāqú]] *Pashto*
LNK Asad with knife
'with Asad's knife' (Larson in press: 15, ex 58a)

Whether or not examples such as (37) are also the result of movement is for our purposes immaterial, as the word order alone indicates that the linker forms a constituent with the dependent.

4.3 Coordination

A second means of testing the constituency of linkers is found in coordination. It is predicted that, where two or more dependents of a single head noun (phrase) are conjoined, the linker will be able to appear with each conjunct, but where two or more head noun (phrase)s are conjoined, with the same dependent associated with each conjunct, the linker will only appear once (modulo Right/Left Node Raising), taking the dependent as its complement.

We have already seen evidence from fronting supporting our prediction that the linker *de* in Mandarin Chinese forms a constituent with the dependent that precedes it, as opposed to the noun (phrase) that follows it. This same conclusion is reached by Aoun and Li (2003:250), on the basis of coordination data; in the example below, a coordinated adjective and relative clause modifying the unique noun *shiqing* ('matter') are each (optionally) followed by a separate occurrence of *de*:

(39) a) [[[zhuyao] *de*] erqie [[women yijing taolun guo] *de*]] shiqing *Mandarin Chinese*
important LNK and we already discuss EXP LNK matter
(Aoun & Li 2003:150, ex 48a)

b) [[zhuyao] erqie [women yijing taolun guo]] *de*] shiqing
important and we already discuss EXP LNK matter
'the main matters that we have discussed'

This conclusion is confirmed by the following example, where a single AP *hen da* ('very big') modifies two conjoined head nouns:

(40) [[hen da] *de*] [mao he (* *de*) gou] *Mandarin Chinese*
very big LNK cat and LNK dog
'very big [cat and dog]'

Taken together, the evidence from these examples that *de* must form a constituent with the dependent is strong. However, Huang (1987:70-72, 1989:41-42) draws the opposite conclusion – that *de* forms a constituent with the head noun or noun phrase – from the following example, a marked construction found only in literary Mandarin; the possessor *beiyapozhe* ('the oppressed') has scope over all conjuncts, yet *de* is repeated before each noun:

Mandarin Chinese

(41) Yinwei cong nei limian kanjian-le [[[bei-yapozhe *de*] [[shanliang *de*]
because from that inside see-PERF the-oppressed LNK benevolent LNK
linghun]], [[*ø de*] xinsuan], [[*øde*] zhengzhi]]…
soul LNK heart.sour LNK struggle
'Because from there, one saw the oppressed ones' [good soul, bitterness, struggle]…'
(Lu Xun, cited in Chao 1968, cited in C.-R. Huang 1987:71, ex 34 and 1989:42, ex 34)

The issue can be resolved by considering the intonation of the apparently contradictory examples in (39) and (40) and in (41). The intended interpretation in the marked construction in (41) is only possible with 'comma' intonation after each conjunct. This, together with the fact that its usage is limited to literary contexts, indicates that (41) is in fact an example of Left Node Raising. The examples in (39) and (40), on the other hand, are compatible both with neutral intonation and ordinary spoken language. It therefore seems that Aoun and Li are correct in concluding that *de* forms a constituent with the prenominal dependent.[22]

An analogous argument can be made for genitive case marker, *no*, in Japanese, which acts as a linker, being a purely relational syntactically independent particle that is otherwise semantically empty. The view that *no* is a linker is also taken by Den Dikken and Singhapreecha (2004) and Den Dikken (2006), while Kitagawa and Ross (1982), Simpson (2001) and Simpson and Wu (1999) point out the significance of its similarity to Mandarin *de*. Like Mandarin, Japanese has prenominal

[22] Huang (1987, 1989) offers a second argument for *de* forming a constituent with the head noun (phrase). While the head noun (phrase) will consistently be of the same semantic type, the semantic type of its dependent varies; therefore, assuming *de* itself has a single lexical entry and accordingly does not vary in semantic type, it cannot combine with items of varying semantic type – i.e. the dependent. However, since the linker itself does not have any semantics, this argument does not apply.

dependents and therefore the word order in (18)b). Coordination data in Japanese shows the same properties as for *de* in Mandarin Chinese, therefore supporting the looked-for result; the linker *no* cannot be repeated when two coordinated head nouns are under the scope of a single possessor, as in (42), but may be where a single head noun has two possessors, as in (43):

(42) [John=*no*] [tuma sosite(*=*no*) kodomo] *Japanese*
John=LNK wife and=LNK child
'John's wife and child'

(43) a) [[John=*no*] sosite [Taroo=*no*]] kokuseki
John=LNK and Taroo=LNK nationality
b) [[John sosite Taroo]=*no*] kokuseki
John and Taroo=LNK nationality
'[John and Taro]'s nationality'

These results are again seen in Hindi-Urdu, another language with prenominal dependents. The linker in Hindi-Urdu has the form *k-*, with a suffix marking agreement in number and gender with the head noun.[23] Where the head noun is masculine singular, the suffix also varies depending on whether the head noun phrase as a whole is nominative or non-nominative (see Von Prince 2008:§3 for greater detail).[24]

(44) [Rām *k-ī*] [billī aur (* *k-ā*) sher] *Hindi-Urdu*
Ram(M) LNK-F cat(F) and LNK-MSG.NOM lion(M)
'Ram's cat and lion'

(45) a) [[Nādyā *k-ī*] aur [Rām *k-ī*]] billī
Nadya(F) LNK-F and Ram(M) LNK-F cat(F)

b) [[Nādyā aur Rām] *k-ī*] billī
Nadya(F) and Ram(M) LNK-F cat(F)
'[Nadya and Ram]'s cat'

We have seen then evidence from coordination in three languages with prenominal dependents that the linker forms a constituent with the dependent, as predicted. The evidence is mirrored in languages with postnominal dependents. We begin with English, for which we have already used evidence from *wh*-movement to show that the linker forms a constituent with the dependent. This result is confirmed by coordination data given in (46)-(47) below; like Mandarin Chinese, Japanese and Hindi-Urdu, the linker, *of*, cannot be repeated when two coordinated head nouns are under the scope of a single dependent, but may be where a single head noun has two dependents:

(46) the [[branches (**of*)[25] and leaves] [*of* [the tree]]] *English*

(47) a) pictures [[*of* trees] and [*of* flowers]]
b) pictures [*of* [trees and flowers]]]

Evidence from coordination data can also be found in two further languages with postnominal dependents, Persian (or Farsi) and Lagwan (or Logone), a Chadic language of the Kotoko group. The phonological properties of the linker in these two languages, however, are such that the argumentation for constituency must be more subtle.

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[23] The linker in Hindi-Urdu is usually described either as a genitive case-marker or as a (functional) postposition. Of course, in neither case would this be incompatible with its also being a linker, since it would be a semantically vacuous, purely relational, functional head, sitting at the edge of the dependent's extended projection. See however Von Prince (2008:§3.2) and references cited there for evidence that *k-* does not share the same distribution as postpositions.

[24] It is debatable whether this marking of the head noun's case is true agreement with the head noun, or whether case is rather assigned to the extended nominal projection as a whole, and therefore marked on all its members that are capable of expressing it morphologically. See discussion of this issue in general terms in Corbett (2006:133-137). Neither analysis has any bearing on the thesis defended in this paper.

[25] Repetition of *of* on each conjunct may be possible with Right Node Raising intonation.

The linker *-(y)e* in Persian, known as the ezafe or izafe(t), is a phonological enclitic that attaches to the right-edge of a noun phrase where this noun phrase has a postnominal dependent.[26] The ezafe in Persian has received considerable attention, both as a phenomenon in itself (Samiian 1983, 1994; Ghomeshi 1997; Ortmann 2002, 2003; Larson and Yamakido 2008; Samvelian 2006, 2007, 2008 and references cited in these works) and in its capacity as a linker (Den Dikken and Singhapreecha 2004:§6.4). However, while the analyses in these works generally make predictions regarding the ezafe's constituency, any empirical evidence for the constituency of this particle, has not, as far as I am aware, been discussed. Fronting cannot be used as a test, since movement out of the ezafe domain is impossible (Samvelian 2006:4) (perhaps because the enclitic ezafe would have to move with the (syntactic) dependent, but would have no phonological support). There is however relevant coordination data, given in examples (48) and (49):

(48) [kolâh(* =*e*) va lebâs][=*e* Maryam] *Persian*
hat=LNK and dress=LNK Maryam
'Maryam's hat and dress.'

(49) ahâli[=*e* [Gilân va(*=*ye*) Mâzandarân]]
population=LNK Gilân and=LNK Mâzandarân
'the population of Gilân and Mâzandarân'

In (48), which is analogous to the Chinese, Japanese, Hindi-Urdu and English examples in (40), (42), (44) and (46), two coordinated NPs are under the scope of a single dependent, the possessor *Maryam*. As in the previous equivalent examples, the linker may only appear once, adjacent to the dependent. This can be readily explained if, as hypothesised, the ezafe forms a constituent with this dependent.

Where the Persian data differ from the languages we looked at earlier in this section lies in (49), where it is two dependents that are coordinated; it is not possible to repeat the ezafe on each conjunct. However, the ungrammaticality here can be accounted for by the phonological properties of the ezafe, which is known to cliticise to the material to its left; it is quite conceivable that the ezafe cannot be cliticised to a coordinating conjunction.

On the other hand, there does not seem to be any independent reason why repetition of the ezafe on each conjunct in (48), where the site of attachment is the right edge of a noun phrase, is ungrammatical. The ungrammaticality of the ezafe cliticised to the first conjunct is particularly striking when contrasted with the behaviour of other phonological enclitics attaching to noun phrases. The data below show that, in analogous examples, a pronominal clitic (in (50)) and the partitive marker[27] (in (51)), both of which we would expect to form a constituent with the noun phrase to which they attach, may optionally be repeated on each NP:

(50) a) [kolâh=aš]va [lebâs=aš] *Persian*
hat=3SG and dress=3SG
'her/his hat and his/her dress'
b) [kolâh va lebâs]=aš
hat and dress=3SG
'her/his hat and dress'

(51) a) [kolâh=i] va [lebâs=i]
hat=PART and dress=PART
'a hat and a dress'
b) [kolâh va lebâs]=i
hat and dress=PART
'a hat and dress'

The simplest explanation for the coordination data in (48) and (49) therefore seems to be the same as for the Chinese, Japanese, Hindi-Urdu and English data we have previously looked at – that

[26] The ezafe also occurs within the AP and arguably within the PP (Samiian 1994; Ghomeshi 1997; Samvelian 2007, 2008 and references cited there).

[27] See discussion of this particle in footnote 29.

the linker/ezafe forms a constituent with the dependent –, the only difference being that in Persian the phonological environment also comes into play.[28,29]

Before leaving Persian for the time being, it is worth pointing out that the coordination data in (48) and (49), where the ezafe must have scope over both conjuncts, constitutes strong evidence that the ezafe is indeed an independent syntactic word – that is, a clitic, as opposed to an affix (cf. section 2.2) – and therefore a linker. The conclusion that the ezafe is an independent syntactic word is also reached by Bögel *et al* (2008). They show that certain restrictions on the occurrence of the ezafe highlighted by Samvelian (2007), leading the latter to a phrasal-affix analysis at the word-level, are not incompatible with the properties of clitics. Under the phrasal-affix analysis, on the other hand, and as acknowledged by Samvelian (2007:631), (48) remains mysterious.

I am therefore analysing the Persian ezafe here as a form of dependent-marking by the definition in (6)b, on the grounds that the data suggest that the ezafe forms a constituent with the dependent. In Nichols' (1986, 1992), work, however, the Persian ezafe is consistently cited as an example of head-marking. It is clear though that Nichols uses the term with reference to the morpheme's phonological site of attachment.[30] Therefore my analysis is not in any direct conflict with Nichols': as pointed out by Zwart (2006:§2.1), if a morpheme is phonologically expressed on the head, syntactically it may still serve as a dependent-marker.

The conclusion that the Persian coordination data naturally result when a language has postnominal dependents and enclitic linkers is supported by finding the same data in a genetically and

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[28] That is to say that this is the simplest explanation that maintains the assumption that the ezafe has some status as a morphosyntactic object. Samiian (1994, following 1983) and Ghomeshi (1997) consider the ezafe to be purely phonological, inserted at PF. This explanation of course could also account for the data in (48) and (49). See discussion in section 5.1.

[29] It is worth briefly mentioning another particle in Persian, that has been described by some researchers as an allomorph of the ezafe (Ortmann 2002, 2003; Rebuschi 2005), although not by those concentrating on Persian. This particle has the form *-i* and appears as an enclitic on the head noun (phrase) when it is followed by a restrictive relative clause. It differs from the ezafe in a number of ways: it is only used with restrictive relative clauses, whereas the ezafe is used with both restrictive and non-restrictive attributes; the presence of the demonstrative renders *-i* optional, whereas the ezafe remains obligatory; unlike dependents introduced by the ezafe, the restrictive relative clause can be extraposed (leaving *-i* behind). The most serious difference however concerns constituency; coordination data indicates that *-i* forms a constituent with the head noun (phrase):

i) a) [[doxtar=i] va [zan=i]] [*ke* diruz âmad-and] *Persian*
girl=PART and woman=PART that yesterday came-PL
b) [[doxtar va zan]=i] [*ke* diruz âmad-and
girl and woman=PART that yesterday came-PL
'the [girl and woman] that came yesterday'

The evidence that *-i* forms a constituent with the head noun (phrase) is only problematic if it meets the criteria for linkerhood, namely that it is syntactically independent, appears only where the head noun has a dependent and does not contribute to the compositional semantics of either the head's or the dependent's extended projection. My research into this particle reveals that it fails to meet the latter two criteria. Various scholars of Persian, including Hincha (1961), Lazard (1966) and Jahani (2000, 2008) consider the restrictive relative clause particle *-i* to be the same morpheme as the so-called 'indefinite' *-i*, both having a partitive reading, and therefore having some semantic contribution to the head. This particle can also be used, giving the partitive reading, in the absence of a restrictive relative clause, as exemplified in (51) above. Comparing this example with i) above demonstrates their identical distribution. Similarly, both may optionally co-occur with the demonstrative, moreover confirming that there is no indefinite reading, even in the absence of a restrictive relative clause. Further historical and comparative arguments can be made: Lazard (1966:264) and Jahani (2000) both point to the same historical source for both instantions of *-i*; while Jahani (2008) shows that fellow West Iranian language Balochi also uses the same particle for both functions.

[30] 'As in Nichols (1986), constructions are described as head-marking if the morphological marker of the syntactic relation or constituent type is affixed, *cliticized*, or otherwise attached to the head of the constituent' (Nichols 1992:68-69, my italics).

In later work, however, Bickel and Nichols use constituency to define whether head-marking or dependent-marking is involved where the marker of the relevant relationship is an independent syntactic word (Bickel and Nichols 2005b:102).

geographically distinct language with these same properties. This can be seen by considering the following coordination data from the Chadic language Lagwan, spoken predominantly in Cameroon. Here the linker in question, like the Bantu associative marker, is used to mark a possessive relationship, and again like the associative marker agrees with the head noun: *na* if the head noun is feminine singular; *a* elsewhere.[31]

(52) [[Ùfú (* =*ná*) ká dùghùm][=*á* m̀ghè]] í b̀bí. *Lagwan*
goat(F) =LNK.F.POSS and ox(M) =LNK.POSS chief 3PL be.good
'The chief's goat and ox are good.'

(53) ǹslà [=*ná* [mènì kà (*=*ná*) gɨǹɨm]]
cow(F) =LNK.F.POSS man(M) and =LNK.F.POSS woman(F)
'the man and woman's cow'

In example (52), a single possessor, *m̀ghè* ('chief'), has scope over two coordinated possessums. The linker can only appear once, adjacent to the possessor *m̀ghè*, as is predicted by the hypothesis that the linker forms a constituent with the dependent, here the possessor. Where two possessors of a single head noun, *ǹslà* ('cow'), are coordinated, as in (53), the linker again can only appear once. However, as in Persian, the ungrammaticality of repetition of the linker in example (53) can be accounted for by the enclitic status of the linker, which presumably cannot attach to a coordinating conjunction.

The above analysis is of course dependent on the claim that linkers in Lagwan are phonological enclitics; if linkers in Lagwan were not phonologically dependent on the material to their left, the ungrammaticality of (53)b would remain a problem. Indeed, we would expect precisely the results found in (52) and (53) if linkers in Lagwan were *pro*clitics and formed a constituent with the head noun. It is therefore crucial to show that there is a phonological dependency between linkers in Lagwan and the material on their left, and none between these linkers and the material on their right. There is evidence from both syllabification and tone for the enclitic status of linkers in Lagwan.

Like many languages, Lagwan prohibits onsetless syllables (Ruff 2005:46). Where a morpheme is vowel-initial, the preferred repair strategy is to resyllabify the coda of the preceding syllable as this morpheme's onset; if the preceding morpheme is vowel-final, this final vowel deletes (Ruff 2005:49). This is demonstrated with the masculine/plural definite determiner *álé*, a phonological enclitic:

(54) /làymún/ + /=álé/ → [lèj.mú.ná.lé] *Lagwan*
lemon(M) =the 'the lemon'

(55) /sxè/ + /=álé/ → [sχá.lé]
field(M) =the 'the field'

This resyllabification/deletion strategy is however only available where the morpheme in question forms a single prosodic word with the morpheme that precedes it; elsewhere, an onset is provided by the insertion of a glottal stop (Ruff 2005:41), shown by the following example:

(56) /àm/ + /=álé/ → [ʔà.má.lé] *Lagwan*
water(PL) =the 'the water'

Consider now the following examples, where the possessive linker *a* introduces a vowel-initial possessor:

(57) /bùskwàn/ + /=a/ + /Ádám/ + /=álé/ → [bùs.k^{w}à.ná.ʔá.dá.má.lé] *Lagwan*
horse(M) =LNK.POSS Adam(M) =the 'Adam's horse'

(58) /àsɨ̀/ + /=a/ + /Áyshà/ + /=álé/ → [ʔà.sá.ʔáj.ʃà.lé]
foot(M) =LNK.POSS Aïcha(F) =the 'Aïcha's foot'

Since the possessum and the enclitic linker *a* form a single phonological word, resyllabification in (57) and vowel deletion in (58) take place in order to provide an onset for the linker. Where the

[31] Lagwan does not as yet have an official orthography; the system I use here is provisional, based on the standardised alphabet for Cameroonian languages and the findings of Ruff (2005). In addition, I mark tones.

possessor, *Ádám* in (57) and *Áyshà* in (58), is vowel-initial, on the other hand, this strategy is not available, since there is no phonological dependency between the linker in Lagwan and the material that follows it; an onset can only be provided by last-resort insertion of a glottal stop.

Besides the above evidence from syllabification, the tone of the possessive linker in Lagwan is determined by the head noun to which it attaches. It seems that if the possessive linker forms a disyllabic foot with this noun, the tone of this noun spreads onto it, if not, the possessive linker is realised with high tone (Ruff 2005:45-46, 2007:115). This is illustrated in the examples below:

(59) /dàr/ + /=a/ + /ẃ/ → [dà.ɾà.ʷú] *Lagwan*
gun(M) =LNK.POSS my 'my gun'

(60) /tày/ + /=a/ + /ẃ/ → [tà.jà.ʷú]
pestle(M) =LNK.POSS my 'my pestle'

(61) /gɨm/ + /=na/ + /ẃ/ → [gɨm.nà.ʷú]
millet.cane(F) =LNK.F.POSS my 'my millet cane'

(62) /sà/ + /=na/ + /ẃ/ → [sà.nà.ʷú]
beer(F) =LNK.F.POSS my 'my beer'

In the above examples, the possessum is always a monosyllabic noun with low tone. Therefore the linker forms a disyllabic foot with this noun, and the low tone spreads onto the linker. This contrasts with examples where the head noun is polysyllabic, and so cannot form a foot with the linker:

(63) /m̀s'àl/ + /=a/ + /ẃ/ → [m̩.s'à.lá.ʷú] *Lagwan*
hair(M) =LNK.POSS my 'my hair'

(64) /m̀bìy/ + /=a/ + /ẃ/ → [m̩.bì.já.ʷú]
clothes(PL) =LNK.POSS my 'my clothes'

(65) /ǹgùn/ + /=na/ + /ẃ/ → [ŋ̩.gùn.ná.ʷú]
stomach(F) =LNK.F.POSS my 'my stomach'

(66) /m̀tì/ + /=na/ + /ní/ → [m̩.tì.ná.ní]
death(F) =LNK.F.POSS his 'his death'

In these examples, therefore, the possessive linker receives high tone. Note that the tone of the possessive linker is sensitive only to the tone of the preceding material, not the following material; in all the above examples, the possessive linker is followed by a monosyllable with high tone, yet receives low tone in (59)-(62) and high tone in (63)-(66).

4.4 Deletion

A further means of testing constituency is provided by deletion. Within the complex noun phrase there are two possibilities for deletion: ellipsis of the head noun phrase and, where available, *pro*-drop of a dependent possessor. As with any case of deletion, it is assumed that the deleted material must be a constituent. In the case of NP-ellipsis, therefore, ellipsis of the linker with the head noun phrase should only be possible if the two form a constituent; similarly, if the linker is deleted with a *pro*-dropped possessor, this will be taken as evidence that the linker forms a constituent with this dependent.

Clear cases are provided by Chinese and Japanese, which allow both *pro*-drop of the possessor and NP-ellipsis. Starting with Mandarin Chinese, where the possessor is *pro*-dropped, as in (67) and (68) below, the linker *de* is also deleted, indicating that it must form a constituent with the dependent possessor:

(67) Ni you mei you hai ø guo fei bing? *Mandarin Chinese*
you exist not exist suffer EXP lung disease
[ø (* *de*) Tingjue] zenme-yang?
LNK hearing how-manner
'Have you ever had tuberculosis? How is (your) hearing?'

(68) Zhangsan, [*ø* (* *de*) che] hen hao.
Zhangsan LNK car very nice
'Zhangsan, (his) car is very nice.'

In Mandarin Chinese, it is sometimes possible to omit *de* with an overt pronominal possessor, although usually only where the possessum is a kinship term (Li and Thompson 1981:115-116). Therefore, in order for the *pro*-drop examples in (67) and (68) above to be meaningful as evidence that *de* has been deleted with the possessor, it is important to show that *de* is obligatory where the pronominal possessor is overt. This is demonstrated below:

(69) Wo zhen xianmu [[ni *(*de*)] tingjue]. *Mandarin Chinese*
I really admire you LNK hearing
'I really admire your hearing.'

(70) Wo xihuan [[ta *(*de*)] che].
I like he LNK car
'I like his/her car.'

Regarding the example in (68), it is further important to show that the possessor position is filled by a covert pronoun, and not by the overt *Zhangsan*. This can be shown by considering the intonation: the comma following *Zhangsan* in (68) indicates that there is an intonational break between this dislocated topic and the rest of the sentence – its comment. The topic is associated with its comment by a resumptive possessor pronoun, which is *pro*-dropped.[32] The sentence contrasts with the example in (71) below where *Zhangsan* is not a dislocated topic co-refential with a *pro*-dropped possessor, but is the possessor itself. In this case there cannot be a break following *Zhangsan*, and, as in (70), where there is also no dislocation, *de* is obligatory:

(71) [[Zhangsan *(*de*)] che] hen hao. *Mandarin Chinese*
Zhangsan LNK car very nice
'Zhangsan's car is very nice.'

We now consider the other deletion operation, ellipsis of the head NP. In contrast to deletion of the dependent, where the head noun phrase is deleted *de* must remain overt:

(72) [[Ta *de*] shu] hen pianyi, keshi [[wo *(*de*)] *ø*] hen gui.[33] *Mandarin Chinese*
he LNK bookvery cheap but I LNK very expensive
'His/Her book is very cheap, but mine is very expensive.'

(73) Wo juede [[huang *de*] chensan] bi [[hong *(*de*)] *ø*] haokan.
I think yellow LNK shirt compared.to red LNK pretty
'I think yellow shirts are prettier than red (ones).'

The *pro*-drop and ellipsis data therefore support the conclusion drawn from the Mandarin fronting and coordination data in the previous subsections – that, as predicted, the linker *de* forms a constituent with the dependent, not the head noun (phrase).

We can draw the same conclusion from the equivalent data in Japanese. The examples below show that in the *pro*-drop case, like other case-markers, the linker *no* is deleted as part of the *pro*-dropped pronoun (in (74)), while in the ellipsis case, *no* must remain overt (in (75)):[34]

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[32] The dislocation operation of course cannot be the result of movement, since the putative extraction site would be internal to the subject. Moreover, if this were movement, we would expect some overt realisation of *de*.

[33] This sentence is possible without the second *de*, but the intended reading is impossible, since there is no NP ellipsis; *wo* ('I') can only be interpreted as the head:

ii) [[Ta*de*] shu] hen pianyu, keshi wo hen gui. *Mandarin Chinese*
he LNK book very cheap but I very expensive
*'His/Her book is very cheap, but mine is very expensive.'
'His/Her book is very cheap, but I am very expensive.'

(74) [*ø*(*=*no*) Mimi]=ga nagai. *Japanese*
=LNK ear=NOM long
'*pro*'s ears are long.'

(75) [[Kare=*no*] hon]=wa yasui ga [[boku*(=*no*)] *ø*]=wa totemo takai.[35]
he=LNK book=TOP cheap but I=LNK=TOP very expensive
'His book is cheap, but mine is very expensive.'

In languages that do not allow *pro*-drop of possessors, the evidence can only be taken from ellipsis and is therefore less clear. Below data are given from Hindi-Urdu[36], Swahili and Lagwan, English and French. The evidence we have seen in the preceding subsections from fronting and coordination, suggesting that the linker forms a constituent with the dependent, rather than the head noun, lead us to anticipate that it will be impossible for the linker to be elided with the head noun phrase. This prediction is borne out. (Note that in Lagwan, the elided NP is replaced by a dummy nominal *x(i)-*, presumably required as phonological support for the linkers, all of which are enclitics. Similarly in English and French a dummy nominal is required, *one* in English and *celui* (masculine singular) / *celle* (feminine singular) / *ceux* (masculine plural) / *celles* (feminine plural) in French.)

(76) [[Jaldī *k-ā*] kām] to [[shaitān *(*k-ā*)] *ø*] hotā hai.[37] *Hindi-Urdu*
speed(F) LNK-MSG.NOM work(M) indeed devil(M) LNK-MSG.NOM be.HAB is
'The work of haste is really (the work) of the devil.'

(77) Hi-ki ni [ki-tabu [*ch-a* mw-alimu]. *Swahili*
this-7 PRED 7-book 7-LNK 1-teacher.
Ki-ngine ni [*ø* [*(* *ch-a*) [bibi [*y-a*=ke]]]].
7-other PRED 7-LNK grandmother 9-LNK=his
'This is the teacher's book. The other one's his grandmother's.'[38]

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[34] Japanese is often analysed as having two particles with the form *no*, one a genitive-case-marker/linker and the other a dummy nominal used in ellipsis. Other researchers take both usages to be realisations of a single, linker, particle (cf. Kitagawa and Ross 1982). Under the two-morpheme analysis, there is an alternative explanation available for example (74), whereby the linker *no* is elided with the head noun, the elided constituent being replaced with the other *no*, the dummy nominal. Note however that in some dialects, two occurrences of *no* are possible in ellipsis contexts, suggesting that in these cases linker *no* is not elided (Simpson & Wu 2001:260, citing Murasugi 1991, citing Yuzawa 1944):

iii) kore=wa [[watashi=*no*]=no] dewaarimasen. *Japanese*
this=TOP I=LNK=one not.be
'This one is not mine.' (Simpson & Wu 2001:260, ex 48)

More seriously, if linker *no* is analysed as forming a constituent with the head noun, the *pro*-drop data in (74), the coordination data in (42)-(43), and general morphological inconsistencies (see 4.5) remain a mystery.

[35] Like the Chinese example in (72), this sentence is in fact possible without the second *no*, but in this case the intended reading is impossible, since there is no NP ellipsis; *boku* ('I') can only be interpreted as the head:

iv) [[Kare=*no*] hon]=wa yasui ga boku=wa totemo takai. *Japanese*
he=LNK book=TOP cheap but I=TOP very expensive
*'His book is cheap, but mine is very expensive.'
'His book is cheap, but I am very expensive.'

[36] Although Hindi-Urdu is a radical *pro*-drop language, the *pro*-drop test does not apply here, as pronominal possessors are generally not accompanied by *k-*.

[37] Like the Japanese and Mandarin ellipsis examples, this will also be grammatical without the second linker, but the intended reading is impossible:

v) [[Jaldī *k-ā*] kām] to shaitān hotā hai. *Hindi-Urdu*
speed(F) LNK-MSG.NOM work(M) indeed devil(M)be.HAB is
*'The work of haste is really (the work) of the devil.'
'The work of haste is really the devil.'

[38] In some varieties of Swahili, *bibi* is translated as 'wife'.

(78) [ǹslà [=*ná* ménî] kà [xɨ̀[*(=*nà*) gìnɨ̀m]] *Lagwan*
cow(F) =LNK.F.POSS man and one=LNK.F.POSS woman
'the man's cow and the woman's (one).'

English

(79) John took a [picture [*of* [the Eiffel Tower], while Mary took [one [*of* [an eye-catching passer-by]]].

(80) Je préfère la [coiffure [*de* Jeanne], à [celle [*(*de*) Sophie]]. *French*
I prefer the.F hairstyle(F) LNK Jeanne(F) to the.one.F LNK Sophie(F)
'I prefer Jeanne's hairstyle to Sophie's.'

However, these examples by themselves cannot be taken as direct evidence that the linker does not form a constituent with the head noun. If the linker were a functional head in the extended projection of the head noun, there could be independent reasons why the linker cannot be elided; one could postulate that an overt functional head is required to license the ellipsis site in NP ellipsis as in VP ellipsis (cf. Lobeck 1992, 1995). Nevertheless, if we take the ellipsis data from Hindi-Urdu, Swahili, Lagwan, English and French together with the data from fronting and coordination, the conclusion that the linker forms a constituent with the dependent remains the simplest explanation.

4.5 General Morphosyntactic Properties

We have seen then that data from fronting, coordination and deletion, from a variety of languages, support the prediction that linkers, as functional heads serving only to mark a syntactic relationship, being otherwise semantically empty, will always act as dependent-markers. In addition to this more concrete evidence, it is worth pointing out that in a number of cases implicational evidence from general morphosyntactic properties, either language-internal or cross-linguistic, lends support to this conclusion.

Nichols' (1986) seminal study of locus of marking resulted in the following two implicational generalisations:

(81) If a language has major, salient, head-marking morphology anywhere, it will have it at the clause level. (Nichols 1986:75, ex 52)

(82) If a language has dependent-marking morphology at the clause level, it will have it at the phrase level. (ex 53)

These generalisations are motivated by languages that have split systems of locus. For example, Bantu languages have a split system whereby the clause uses exclusively head-marking, in the form of agreement on the verb, while internally to the complex noun phrase only dependent-marking is used. On the other hand, there are no attested languages where the opposite situation holds; that is, there are no languages that use head-marking in phrases but do not do so at the clausal level. This motivates the generalisation in (81). Similarly, Nichols (1986:75) lists Basque, the Northeast Caucasian language Batsbi, Burushaski, Georgian and the Gunwingguan language Mangarayi as examples of languages that employ double-marking in the clause, but only dependent-marking elsewhere. Such languages serve as examples of both generalisations in (81) and (82).

Applying these generalisations to Chinese, Japanese, Hindi-Urdu, Persian and English, it is predicted that these languages will use dependent-marking in the complex noun phrase. The fronting, coordination, *pro*-drop and ellipsis data we have seen from these languages suggest that this prediction is borne out. The first statement, in (81), predicts that a language cannot make use of head-marking within the complex noun phrase unless it also has head-marking within the clause. Neither Chinese nor Japanese has any head-marking in the clause or elsewhere; therefore it should be impossible for these languages to use head-marking within the complex noun phrase. As regards the second generalisation, any language that makes use of dependent-marking in the clause should also use it in the complex noun phrase. Japanese uses only dependent-marking, while Hindi-Urdu, Persian and English also have dependent-marking at the clause level.[39] In Persian this second generalisation is

[39] Lagwan also has some, though limited, dependent-marking at the clause level: the weak form of pronouns is marked for case. Strong pronouns and nouns are invariable.

particularly significant, since, the ezafe aside, there is no other form of dependent-marking in the complex noun phrase;[40] therefore considering the ezafe as a form of dependent-marking, as we have good reason to do, allows us to maintain the generalisation in (82) as universal.[41]

Concerning Japanese and Hindi-Urdu, there are further, language-internal, reasons for anticipating that the linker should form a constituent with the nominal dependent it follows. Considering firstly Japanese, as a case-marker, we expect *no* to be the highest functional head in the extended projection of the dependent – precisely the distribution I am proposing is predicted of any linker. Secondly, the morphosyntax of Japanese is not only consistently dependent-marking, but also uniformly head-final. If, as both predicted, and implied by the coordination, *pro*-drop and ellipsis data, *no* is the highest functional head in the extended projection of the dependent, it serves as a further example of head-finality and of dependent-marking. If, on the other hand, it forms a constituent with the head noun (phrase) – that is, it is a functional head internal to the extended projection of the head noun – it will stand out as an apparently unmotivated exception to two well-established properties of a morphologically otherwise perfectly consistent language. The result that *no* forms a constituent with the dependent is therefore both desired and expected.

Similar arguments can be made for Hindi-Urdu, another language that is consistently head-final.[42] The coordination and ellipsis data we have seen for this language suggest that the linker *k*- forms a constituent with the dependent that precedes it, taking this dependent as its complement. The linker therefore is consistent with the uniform head-final nature of Hindi-Urdu. Again, if the linker *k*- serves as a case-marker,[43] we would also expect it to be the highest head in the dependent's extended projection. A further argument can be made with regard to the agreement suffix. The linker *k*- shares precisely the same inflectional paradigm as attributive adjectives (see Von Prince 2008:§3.1.7), the agreement suffix serving as a form of dependent-marking.

Regarding Bantu as well, the linker's forming a constituent with the dependent – and therefore acting as a form of dependent-marking – is generally consistent with patterns of locus of marking and agreement in Bantu. While Bantu is head-marking at the clausal level, the extended nominal projection consistently uses dependent-marking. This dependent-marking is expressed by agreement in noun class with the head noun, realised as a prefix on the relevant dependent. Presumably the reason this strategy cannot be employed where the dependent is nominal is that this nominal is the only category that already is marked with a noun class of its own. Therefore the agreement with the head noun is hosted by a semantically empty independent syntactic word that heads the extended projection of the dependent nominal.[44]

Indeed, the agreement itself in both Bantu and Hindi-Urdu can be used as a supporting argument for constituency. Where the sole purpose of a morpheme is to mark a syntactic relationship between two distinct extended projections – that is, a head-dependent relationship, we would expect the primary agreement on this morpheme to cross-reference features not of the projection of which it is a part, but of the projection with which it serves to establish a relationship.[45] Therefore the primary agreement in head-marking should cross-reference features of the dependent, while conversely the

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Chinese languages also have some dependent-marking at the clause level: adverbs are introduced by a linker. In Mandarin Chinese this linker has the same phonological form as the linker used in the complex noun phrase, *de*.

[40] Unlike many other West Iranian languages, adjectives and demonstratives in Persian are invariant.

[41] Since Nichols classes the ezafe as head-marking, on phonological grounds, she is forced to consider Persian as a counter-example to the otherwise well-supported generalisation in (82). When we take the constituency as the defining characteristic of locus of marking, as in (6), on the other hand, Persian is perfectly compatible with the generalisation in (82).

[42] An exception is the ezafe in Urdu, a loan from Persian (see Bögel *et al* 2008).

[43] See footnote 23.

[44] If this reasoning is correct, the motivation for using the associative marker is similar to the use of *do*-support in English.

[45] Of course, where the relationship marked by agreement remains within a single extended projection, as in marking between heads, by the same reasoning agreement necessarily cross-references features of (a head within) its same extended projection.

primary agreement in dependent-marking should cross-reference features of the head (cf. Nichols 1986:58, also Zwart 2006:56-57). By this reasoning, the fact that the agreement on the linker in Bantu and Hindi-Urdu cross-references not features of the dependent, but features of the head noun, is suggestive that the linker serves as a form of dependent-marking.

As pointed out by Zwart (2006:56), this argument carries over to the West Iranian ezafe. While the ezafe in Persian is invariable, in other West Iranian languages such as the Kurdish languages it cross-references the gender or number feature of the head noun,[46] demonstrated by the examples below:[47]

(83) a) kur[=*ê* ganç] *Kurmanji*
boy(M)=LNK.M young
'young boy'
b) kur[=*ên* ganç]
boy(M)=LNK.PL young
'young boys'

(84) a) kaç[=*â* ganc]
girl(F)=LNK.F young
'young girl'
b) kaç[=*ên* ganc]
girl(F)=LNK.PL young
'young girls' (Samvelian 2008, ex 33)

We have seen that the linker in Lagwan also marks the number or gender feature of the head noun. However, in Lagwan the linker also marks properties of the dependent. There are in fact three types of linker found in the Lagwan complex noun phrase: one set is used if the dependent is a possessor (as in (85)); another is used for any other dependent that is nominal (as in (86)); and a final set is used for any other dependent (AP, PP, relative clause, demonstrative or quantifier, as in (87)).[48] For each type, the form of the linker of course varies according to the number or gender of the head noun, with some syncretism. This is exemplified below:

(85) a) dàr [=*à* ú] *Lagwan*
gun(M) =LNK.POSS my
'my gun'
b) béké [=*ná* ú]
mistake(F) =LNK.F.POSS my
'my mistake'
c) àl [=*à* ú]
eyes(PL) =LNK.POSS my
'my eyes'

(86) a) lúxt [=*è* sàmá]
season(M)=LNK.M.N rain(F)
'rainy season'

[46] In these languages the form of the ezafe also marks definiteness. As with any instance of definiteness-marking on dependents in the extended nominal projection, however, it is debatable as to whether this is true agreement with the definiteness feature of the head noun, or whether definiteness is a feature of the extended projection as a whole, and therefore marked on all its members that are capable of expressing it morphologically. See discussion of this issue in Corbett (2006:133-137).

[47] Zwart applies this argument to another West Iranian language, Zazaki (or Dimli). However, like Lagwan, this language marks not only the number or gender feature of the head noun, but also varies according to the type of dependent, distinguishing genitival and adjectival dependents (see Larson and Yamakido 2008:67 and references given there). Cf. discussion of Lagwan below.

[48] We have actually given evidence for constituency only as regards the set of linkers used for the possessive relationship. Data for the other two types is not available in my fieldnotes; showing the constituency for these will be a matter for future research.

b) ǹk'ɨ́ná [=*ì* ásɨ́]
finger(F) =LNK.F.N foot(M)
'toe' (lit. fingers of foot)[49]
c) màndɨ̀gy-èn [=*í* gɨ́mí]
cat-PL =LNK.PL bush(M)
'wild cats'

(87) a) ì̀ghwàd̀ [=*á* [á gùrà zí yá]]
ground(M) =LNK.M 3SGM.PERF cultivate REFL REALIS
'ground that has been cultivated'
b) gɨ̀nɨ̀m [=*ḿ* [ghùyè í á mtì yà]][50]
woman(F)=LNK.F husband her 3SGM.PERF die REALIS
'woman whose husband has died'
c) gɨ̀nàm [=*í* [[máw [=*á* tɨ́n]] y-á mtì yà]]
woman.PL =LNK.PL men(PL) =LNK.POSS them 3PL-PERF die REALIS
'women whose husbands have died'

Since the linker in Lagwan marks properties of both head and dependent, this marking cannot be taken as evidence for either head-marking or dependent-marking.[51] Nevertheless, it is certainly worth noting that in other Afro-Asiatic languages, including the closely related Kotoko language Zina, agreement on the linker cross-references only features of the head noun (cf. also (21), (26), (27)):

(88) a) [[dar [*y*=awa]] [*yi* nguna]] [*yi*=nde] *Zina*
gun(M) LNK.M=my LNK.M big LNK.M=this
'this big gun of mine' (Demeke 2002:98, ex 80)
b) tusa [*cə*=nde]
foot(F) LNK.F=this
'this foot' (p89, ex 47b)
c) [[aw-i [*tə* Omar]] [*tə* mangwani]] [*t*=ade]
goat-PL LNK.PL Omar LNK.PL big.PL LNK.PL=that
'those big goats of Omar's' (p95, ex 68)

This comparative evidence then suggests that in the related language Lagwan the agreement with the head should also be regarded as the primary agreement. Indeed, the implicational evidence extends beyond Afro-Asiatic, since, while there are Bantu and Indo-Aryan languages that also show agreement on linkers only with the head noun, I have found no record of any linker in any language that agrees only with properties of the dependent.

5 Theoretical Implications

The empirical evidence from linkers presented in the previous section bears out the predictions made by the theoretical reasoning given in section 3. Having established the empirical support for the theory, we are now in a position to consider more far-reaching consequences – that is, the broader implications for theories of morphosyntax (subsection 5.2). Before taking this step, however, we must be sure that no previous theory of linkers can capture the data equally well. Therefore we will first

[49] Note that this seems to be a syntactic object, rather than a compound, since the dependent can be referential:

vi)ǹk'ɨ́ná [=*ì* ás [=*á* ú]] *Lagwan*
finger(F) =LNK.F.N foot(M) =LNK.POSS my
'my toe' (lit. fingers of my foot)

[50] Lagwan does not use linkers for kinship terms.

[51] The extent to which the marking of properties of the dependent is pure agreement, as opposed to contributing some semantics, is debatable, and a matter I hope to explore further in the future. For the moment, it is sufficient to point out that whatever stance we take in this respect is compatible with the view that the linker constitutes dependent-marking. If the linker does contribute some semantics as to the relationship of the dependent, it cannot possibly be part of the extended projection of the head.

briefly discuss some previous theories of linkers and the predictions they make regarding the status, constituency and distribution of linkers.

5.1 Theories of linkers

The data presented and discussed in section 4 provide evidence that linkers have some status as syntactic objects, being functional heads that form a constituent with a (relevant) dependent of a (relevant) head (a noun in all the cases we have looked at). This dependent can be anything that meets the definition in (5)b). The brief discussion given here of some previous theories of linkers will show that none of them captures all of the above properties.

Firstly, linkers have sometimes been analysed as morphemes whose status is purely phonological, not syntactic, being inserted only at PF. This view is espoused by Kitagawa and Ross (1982) for Mandarin Chinese and Japanese, by Watanabe (2006) for Japanese and by Samiian (1994, following 1983) and Ghomeshi (1997) for the Persian ezafe. However, the constituency tests conducted in sections 4.2-4.4 showed the linker to have a syntactic site of attachment, indicating that it is present in the syntax.[52] Another argument in favour of according linkers morphosyntactic status is offered by Samvelian (2006:28) for the West Iranian ezafe, on the grounds that in some languages it agrees with features of the head noun (cf. examples (83)-(84)). Agreement with the head noun is also a property of linkers in Atlantic-Congo, Afro-Asiatic and Indo-Aryan languages. Given that head-dependent agreement serves to mark a syntactic, rather than phonological, relationship, we would expect the selection of the appropriate agreement to apply prior to PF.

Other theories of linkers recognise their status as syntactic objects, but attribute their appearance to different functions. Rubin (1997, 2002, 2003) proposes that linkers are overt realisations of a functional head Mod, which selects a modifier as its complement, giving the following structure:

(89) $[[_{ModP}$ Mod° [dependent]] N'] (adapted from Rubin 1997:435, ex 11)

His theoretical motivation is to provide a means for the narrow syntax to determine that the operation pair-merge (adjunction) is required, as opposed to set-merge; by according modifiers a unified syntactic structure, pair-merge will always and only apply to the postulated ModP. Rubin's theory therefore correctly predicts that linkers form a constituent with the modifier they introduce; that is, that they are the highest functional head in the extended projection of the modifier. However, the theory provides an explanation for only a subset of the data: it cannot account for the fact that linkers may also head the extended projections of possessors and complements of verbal nouns (cf. (19) and (21) respectively). Concerning this problem in Mandarin Chinese, Rubin (2002:chapter 2, §3.3) suggests the possibility that *de* when used in modification and *de* used to mark the possessive relationship are distinct, homophonous, morphemes. This seems very unlikely, given that a number of genetically and areally diverse languages also use an identical morpheme for both modifier dependents and possessor dependents. Even in Bantu languages and in Hindi-Urdu, which only use a linker where the dependent is nominal, the same linker is used irrespective of whether the head-dependent relationship is possessive or attributive. The theory of linkers as dependent-markers, on the other hand, accounts for the use of linkers with modifiers, possessors and complements, without requiring any additional stipulations.

Rebuschi (2002, 2005) argues that the need for the category Mod can be dispensed with if both head and modifier are considered arguments not of the head Mod, but of a coordinating conjunction, linkers being overt realisations of this conjunction head. This is schematised below:

(90) $[_{Conj.NP}[_{ConjP}$ NP $[_{Conj'}$ Conj° [dependent]]]]

That an intersective connective is required semantically in predicate modification structures is generally accepted. Under Rebuschi's approach, this intersective connective is not independently and

[52] To be fair to Samiian and Ghomeshi, as I mentioned in footnote 28, the Persian data we have seen would actually also be compatible with the PF analysis. This analysis is not possible for the other languages we have looked at though, or even for the ezafe that shows agreement in fellow West Iranian languages (see below). Given that we want our theory of grammar to be as economical as possible, and that we require the linker-as-syntactic-object analysis for other, including quite closely related, languages, it is preferable in the absence of further, conclusive, data to apply this analysis to the Persian ezafe as well.

uncompositionally introduced into the semantic component, but can be read directly off the syntactic structure. Whatever its conceptual attractiveness, Rebuschi's theory faces the same problem as Rubin's, in that not all appearances of the linker are accounted for; since the intersective connective is only required semantically in predicate modification, we would expect linkers to surface only where the head-dependent relationship involves the intersection of two sets. However, linkers may also appear with complements of verbal nouns (example (21)), demonstratives ((25) and (88)) and quantifiers ((26)), as well as non-intersective adjectives (below; see Ortmann 2003:24 for further examples):[53]

(91) [weilai *de*] laoshi *Mandarin Chinese*
future LNK teacher
'future teacher' (Ortmann 2003:24, ex 61b)

(92) moallem[=*e* qabli] *Persian*
teacher=LNK former
'former teacher' (ex 60a)

Moreover, we have seen that, if the phonological properties of the linker permit it, the linker can be used in combination with a regular coordinating conjunction (cf. examples (39), (43), (45), and (47)).

Den Dikken and Singhapreecha (2004) and Den Dikken (2006), by studying a variety linkers in a broad range of languages, brought to light the cross-linguistic pervasiveness of linkers in the complex noun phrase, recognising a single phenomenon and therefore the need for a uniform analysis. They propose that the linker is a form of nominal copula used in predicate inversion. By their theory, the dependent has a predication relationship with its NP subject, encoded through a small clause. The dependent predicate inverts round the NP subject. This is possible only where a functional head F, hosting the linker, merges with the small clause, creating a specifier position for the dependent predicate to raise to. The linker therefore is analogous to the copula in examples of predicate inversion in the clause. This derives the word order for languages with prenominal modification, such as Chinese, Japanese and Hindi-Urdu:

(93) $[_{FP}$ dependent $[_{F'}$ LNK $[_{SC}$ NP $t_{dependent}]]]$

For languages with postnominal dependents, further movement takes place, actually restoring the original order of head NP and dependent, prior to inversion. This movement is possible where the extended noun phrase includes a classifier projection (ClfP);[54] the remnant of the small clause moves to [Spec, ClfP], while the linker raises to ClfP. This movement is 'arguably' motivated by the need for Clf to check a feature against NP (Den Dikken and Singhapreecha 2004:22)[55]:

(94) $[_{ClfP}$ $[_{SC}$ NP $t_{dependent}]$ $[_{Clf'}$ LNK $[_{FP}$ dependent $[_{F'}$ t_{LNK} $t_{SC}]]]]$

This theory essentially faces the same problem as Rebuschi's (2002, 2005); it only offers an analysis of examples where the dependent is predicative, leaving examples with complements of verbal nouns, demonstratives, quantifiers and purely attributive adjectives[56] unaccounted-for.

More seriously, Den Dikken and Singhapreecha's theory makes incorrect predictions regarding constituency. The representations in (93) and (94) predict that in languages with prenominal dependents, the linker will form a constituent with the head NP, but in languages with postnominal

[53] I do not mention possessors here or in the discussion of Den Dikken and Singhapreecha (2004) and Den Dikken (2006), as it is not entirely clear whether the possessive relationship can involve the intersection of two sets, or whether the possessor can be predicative.

[54] In examples with multiple dependents, Clf will have to recur.

[55] Clf does not seem to have this need in languages with prenominal modification (cf. (33), (36)).

[56] Den Dikken and Singhapreecha (2004:13, fn 9) acknowledge that the fact that non-predicative adjectives can be used with the linker *de* in Mandarin Chinese and the Persian ezafe is problematic for their analysis. They suggest that the ban on the predicative use of these adjectives is 'not a deep but a surface one'. Even if this speculation is correct, the use of linkers with complements of verbal nouns, demonstratives and quantifiers remain unexplained.

dependents, the linker will form a constituent with the dependent. However, the constituency tests we conducted in section 4 indicated that the linker always forms a constituent with the dependent, irrespective of linear order; we saw from fronting, coordination, *pro*-drop and ellipsis data that in at least three languages with prenominal dependents – Mandarin Chinese, Japanese and Hindi-Urdu – the linker forms a constituent with the dependent.

The same problems are faced by Simpson's (2001, 2002) analysis of Mandarin Chinese *de*. Simpson proposes an antisymmetric analysis of *de* in Chinese, based on Kayne's (1994: chapter 8) model of relativisation and possession, whereby a determiner takes a CP complement containing the NP to be relativised or possessed. This NP then raises to [spec, CP]. In Mandarin Chinese, Simpson considers *de* to be the determiner. Since *de* does not contribute any definiteness, or indeed any semantics at all, Simpson considers it to be a semantically empty determiner. The word order in Mandarin Chinese is attributed to the phonological properties of *de*. Under this analysis, since *de* is a phonological enclitic, it attracts dependents[57] to its specifier for phonological support, with the result that *de* forms a surface constituent with the noun (in [spec, CP]). The resulting structure is as follows:

(95) $[_{DP}\,[_{IP}$ dependent $t_{NP}]\,[_{D'}$ *de* $[_{CP}$ NP $t_{IP}]]]$

Besides making incorrect predictions regarding constituency, this analysis again predicts that *de* should only occur with predicative categories, and therefore cannot account for its use with purely attributive adjectives, as in (35). Moreover, Simpson's analysis requires the stipulation that determiners can be semantically vacuous, a claim for which there does not appear to be any independent evidence.[58] While the theory proposed in this paper also allows for semantically empty realisations of otherwise familiar, semantically meaningful, categories, such as P, C and K, the set of such categories is restricted such that they must always be the highest head in their extended projection; within this class, the evidence for semantically empty, purely functional, members is cross-linguistically well-attested.

At the conclusion of our analysis of previous theories of linkers, we have found that none of them encompasses the full range of data captured by the alternative proposal presented in this paper. Therefore, it now seems meaningful to consider what broader implications this proposal has regarding theories of morphosyntax.

5.2 Theories of Morphosyntax

Firstly, the findings of this paper have implications for theories of functional heads, and more particularly those that are purely relational in nature. Whether or not syntactic theory allows for functional heads that serve only to mark a relationship – that is, semantically vacuous heads that have no intrinsic features – is a contentious issue, and one that is generally argued, not on the basis of empirical evidence, but purely from a theoretical standpoint. Thus, while the Minimalist Program in its earliest form made use of such heads with the label Agr (Chomsky 1995, following Pollock 1989[59]), Chomsky (1995:§4.10) later speculates that these heads might, and perhaps should, be dispensed with. Later developments in the theory, such that a head without its own interpretable features will ultimately delete, forced the conclusion that such heads cannot exist, at least where the head selects another syntactic object (Chomsky 2000:138-139). On the assumption that a syntactic

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[57] Simpson (2001:147, fn 14; 2002:21, fn 14) suggests that the enclitic *de* selects exclusively for IP as phonological support, explaining why the head noun does not instead raise to [Spec, DP].

Of course, *de* is only present when the noun has some kind of dependent. Simpson (2002:§4.1) argues that determiners frequently may appear only when there is some modification present, as below:

vii) the sweater of John's *(that you showed me last night) *English*
(Simpson 2002:20, ex 58-59)

[58] Simpson (2001) gives a number of diachronic examples where semantically null elements have been derived from determiners. However, in these cases, synchronically the relevant element is no longer a determiner.

[59] While Pollock (1989) does in fact make his argument for AgrP on the basis of empirical evidence, this argument is only for the need of two distinct functional heads within the clause; the empirical evidence does not provide an argument for the presence of a semantically vacuous, relational, functional head. Indeed even this argument for AgrP has been called into question (Iatridou 1990).

marker of a grammatical dependency would have to intervene between head and dependent, this would mean that such a marker could never exist, as it would necessarily be a functional head devoid of features of its own and a selector of either the dependent or of a projection of the head (cf. (13)). Chomsky (2000) therefore predicts that marking of a grammatical dependency can never occur by means of a particle. We have shown however by the data in section 4 that Chomsky's theory is too strong; linkers provide evidence that there are indeed independent morphemes lacking features of their own that serve only to mark a relationship. Moreover, we have seen that these morphemes must be syntactic objects; that is, Chomsky's theory cannot be saved by arguing that linkers are introduced into the derivation only at PF (cf. discussion in subsection 5.1).

While the predictions made by Chomsky's (2000) theory of syntax are too strong, approaches to locus of marking as a typological phenomenon are too weak, because they fail to maintain a consistent distinction between locus as it is realised affixally and by syntactically independent particles. Typological surveys such as Nichols (1986, 1992) concentrate purely on the affixal expression of locus in terms of data, while yet stating as theoretical background that locus may be realised either affixally or by an independent word. Her contribution regarding the expression of locus by means of particles is limited to the following: 'Languages of the isolating type will be left out of the discussion entirely – although their "grammatical words", "function words", "empty words" etc. presumably also exhibit head-marking and dependent-marking tendencies' (Nichols 1986:59). According to the evidence we have seen, however, this presumption is overly permissive; independent function words do *not* exhibit head-marking tendencies.[60]

Given this distinction between marking by affixes and marking by particles, there are wider implications for theories of morphosyntax in general, and not just specifically as regards the marking of grammatical dependencies. The theory presented here, for which we have seen the empirical evidence, is based on the assumption that particles project in the syntax in their own right, whereas affixes do not. Before concluding, it is worth mentioning that such an assumption is more in the spirit of theories that assign morphology and syntax to separate modules, as proposed for example by theories such as Lexical Functional Grammar and by Di Sciullo and Williams (1987), and argued convincingly on independent grounds for example by Ackema and Neeleman (2002, 2007).

Therefore any theory of syntax will have to allow for purely relational functional heads, whilst restricting their role to that of dependent-marking. Such a theory was sketched in section 3. Moreover, in order to maintain this restriction to dependent-marking for particles, whilst still permitting both head- and dependent-marking and marking between heads for affixes, our theory of morphosyntax should find some means of differentiating affixes and particles.

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[60] Bickel and Nichols (2005b:102) offer the following, from the Australian language isolate Tiwi, as an example of head-marking by an independent syntactic word, with the b) example showing that the independent pronoun *ŋara* ('he') forms a constituent with the head:

viii)a) jərəkəpai (ŋara) tuwaɪa *Tiwi*
crocodile he tail
b) ŋara tuwaɪa jərəkəpai
he tail crocodile
'crocodile's tail' (Bickel & Nichols 2005b:102, exx 6, 8, citing Osborne 1974:74-75)

The constituency however is immaterial for our purposes here, since *ŋara* is a pronoun, and therefore the dependent itself, rather than a semantically empty relational marker. The optionality of *ŋara* in a), and the free distribution of *jərəkəpai* ('crocodile') when *ŋara* is present, indicate that the pronoun *ŋara* is the dependent, which is coreferential with *jərəkəpai*, which is dislocated as an adjunct.

Similarly, Ansaldo and Matthews (2000) attempt a study of head- and dependent-marking in isolating languages, using data from comparatives in Sinitic languages. They conclude by means of constituency tests that both head-marking and dependent-marking can and do occur by means of an independent syntactic word. However, in all their examples the alleged head-marking particles are actually the comparative morphology. By the criteria used in this paper these comparative particles do not constitute markers of a relationship. Firstly, the comparative morphology is present irrespective of whether there is a standard of comparison. Secondly, the comparative morphology serves to introduce a relationship (Cresswell 1976, Heim 2001, Kennedy 2005, 2009, among others), rather than to mark the presence of an existing relationship.

6 Conclusion

In this paper I have argued that, if we want to understand the place within syntactic theory of semantically empty, relational functional heads, we need to approach the question not only from a theoretical standpoint, but also consider relevant data where grammatical dependencies are marked by such heads. Conversely, if we wish to further our understanding of how grammatical dependencies are expressed by the grammar, we need to take into account the expression of such relationships by means of both affixes and particles. Doing so not only gives us a broader typological basis for any generalisations, but also allows us to explore to what distinguishes morphology from syntax.

A study of locus of marking as realised by linkers has enabled us to shed some light on some of the issues outlined above. Specifically, I provided evidence that linkers serve as particles marking dependents. I argued that this is part of a wider pattern, whereby dependent-marking is the only option available for particles as regards marking a grammatical dependency. Particles have such a restriction placed on them due to their syntactic status; I proposed that particles, unlike affixes, head their own projection, and are therefore subject to selectional requirements.

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