Coherent nominalizations

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It has long been noted that certain types of nominalizations are quite common in the world's languages, while other types are rare or nonexistent. For example, in English we have verbal gerunds that combine with a subject like a noun does but with an object like a verb does, as in (1a) on your handout, but no gerund that combines with its subject like a verb does but its object like a noun does, as in (1b).

(1)   a. Pat's watching television

      b. *Pat watching of television

Any syntactic analysis of gerunds should be able to account for this fact in an explanatory way.

Croft (1991), drawing on Comrie (1976) and his own survey of the properties of syntactic categories in diverse languages, observes that a similar pattern comes up in other languages with several nominalization types. Take for example the Quiché sentences in (2).

(2)   a. (*š-)   ux-   ātin -naq arētaq
          (PAST-) 1PL.ABS- bathe -PERF when

          'We had already bathed when...'   (Croft 1991:84)

      b. (*š-)   at-   nu-   ¢ukūm   arētaq
          (PAST-) 2SG.ABS- 1SG.POSS- look.for.PERF when

          'I had been looking for you when...'   (Croft 1991:85)

      c. či qa-   ¢aß   eš   ik
          for 1PL.POSS- speak.to -PASS -NOM

          'in order to speak to us' (lit. 'for our being spoken to')   (Croft 1991:85)

In (2a), the nominalized verb takes a direct case subject and object, but not tense marking. In (2b), the nominalized verb takes a direct case object but a possessive subject, and in (2c) neither a direct case subject nor a direct case object is allowed.

These Quiché nominalization types fit into the same implicational hierarchy as the English nominalization types. There is no nominalization type in Quiché that takes a direct case subject but not a direct case object. On the basis of this and other evidence, Croft proposes the universal Deverbalization Hierarchy in (3).

(3) DEVERBALIZATION HIERARCHY
   If a verbal form inflects for tense-aspect-modality like a predicated verb, then it will take subject and object dependents like a predicated verb. If a verbal form takes a subject dependent like a predicated verb, then it will take an object dependent like a predicated verb (Croft 1991:83).

Interestingly, the cross-linguistic data does not support including the choice between adverbial and adjectival modification in the hierarchy.

   Now, this is the sort of cross-linguistic generalization that any analysis of verbal gerunds ought to be able to account for. Most generative treatments of verbal gerunds (e.g., Abney 1987, Pullum 1991, Bresnan 1997) assume that they involve some kind of mixed phrasal projection (i.e. an NP headed by a V). Under this view, the Deverbalization Hierarchy can be derived from a coherence constraint on mixed projections: mixed projections must have a single point of articulation between their nominal and verbal parts. Thus we can have an NP headed by a VP, but not an NP headed by a VP which is itself headed by an NP, as in (4).

(4)   a.   [NP Pat's [VP watching television]]

      b. *[NP [VP Pat [NP watching of television]]]

More generally, the attested nominalization types correspond to different levels of phrasal nominalization. Consider the possible structures in (5).

(5)   a.
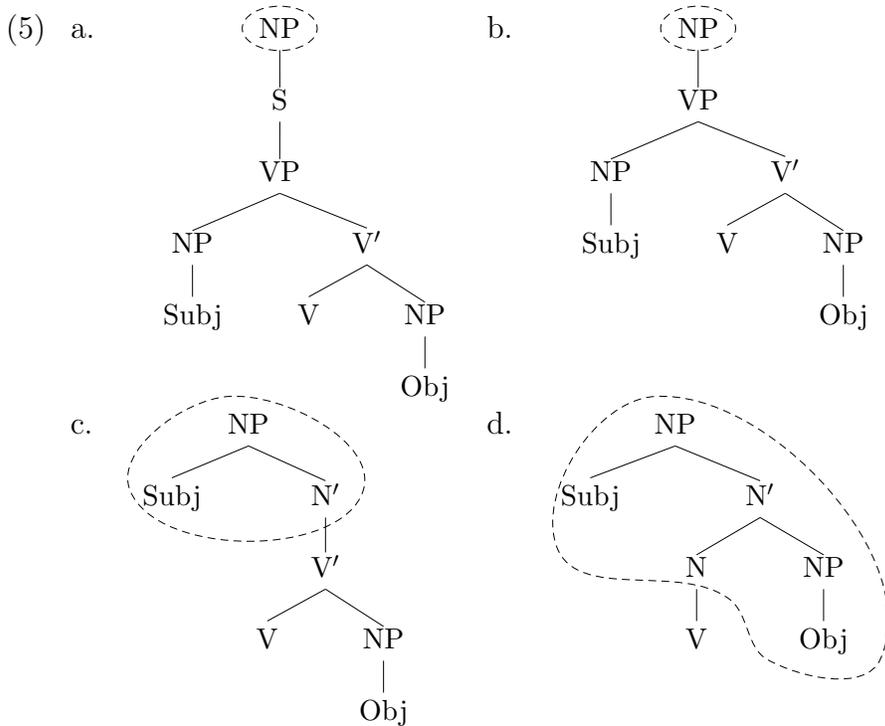
In each case, the fully nominal part of the phrase is limited to the contiguous region within the dotted line. Outside the dotted line, the phrase is fully verbal. In (5a), the NP contains a complete verbal projection and so it'll take tense marking and it'll

take its subject and complements like a verb does. In (5b), the gerund will combine with its subject and complements like a verb does, but since it lacks an S there'll be no tense marking. In (5c), the gerund will only combine with its complements like a verb does, and its subject will be realized as the specifier of an NP. Finally, in (5d), the gerund is fully nominalized and will show no non-lexical verbal properties.

So, the explanation for the Deverbalization Hierarchy offered by mixed-projection analyses is that in a mixed projection there must be a single point of articulation dividing the nominal part of the phrase from the verbal part. Since this line of argument derives the cross-linguistic distribution of gerunds from a condition on possible structures, I'll call this the **Phrasal Coherence Hypothesis**.

(6) PHRASAL COHERENCE HYPOTHESIS
Mixed projections must have a single point of articulation between their nominal and verbal parts.

A nominalization that, say, combined with its subject like a verb does but its complements like a noun does would have to have the structure in (7).

(7)
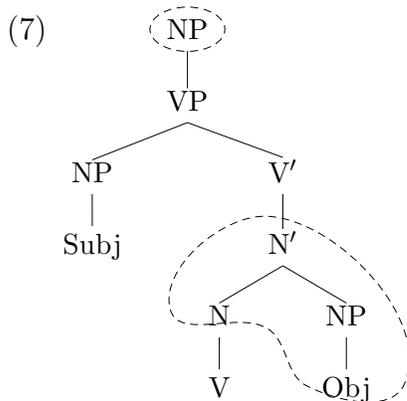
In this case, the nominal part of the phrase is split into two regions by an intervening verbal projection, violating Phrasal Coherence.

In contrast to the Abney-style mixed projection analysis of gerunds, others (Malouf 1996; Malouf to appear) have argued that verbal gerunds are better viewed as mixed lexical categories: gerunds are a kind of noun and so project NPs, but have the subcategorization properties of verbs. Under this view, gerund phrases don't involve any mixed projections. Instead, their hybrid properties follow from their mixed nominal/verbal feature specifications, which in turn are derived in the lexicon. Any verbal properties the phrase might have stem from verb-like selectional properties of the nominalized head and not from the presence of a verbal projection.

A potential objection that might be raised against this kind of analysis is that it does not by itself offer any explanation for the Deverbalization Hierarchy. Without additional constraints on the cross-linguistic distribution of feature values, we would expect that all mixed combinations of lexical feature values should be attested in the world's languages.

Clearly though, not all combinations of feature values are equally likely. Consider an example from the domain of phonology: cross-linguistically sonorant consonants

tend to be voiced while obstruent consonants tend to be voiceless (Greenberg 1966). This is an instance of what we might call **local markedness** (Tiersma 1982; Croft 1990). The unmarked value for voicing depends on the manner of articulation. For the sake of discussion, we can represent this kind of local markedness via GPSG-style Feature Specification Defaults (Gazdar *et al.* 1985) as in (8).

(8)   a. $\begin{bmatrix} \text{MANNER} & obstruent \end{bmatrix} \supset \begin{bmatrix} \text{VOICE} & - \end{bmatrix}$

      b. $\begin{bmatrix} \text{MANNER} & sonorant \end{bmatrix} \supset \begin{bmatrix} \text{VOICE} & + \end{bmatrix}$

These constraints should be interpreted to mean that all things being equal, if something is a sonorant, it will be voiced and if something is an obstruent, it will be voiceless. Using this same kind of representation, we can represent the Deverbalization Hierarchy as a pair of local markedness constraints on lexical signs as in (9).

(9)   Lexical Coherence Hypothesis

      a. $\begin{bmatrix} word \\ \text{VFORM} & fin \end{bmatrix} \supset \begin{bmatrix} \text{SUBJ} & \langle \text{NP} \rangle \end{bmatrix}$

      b. $\begin{bmatrix} word \\ \text{SUBJ} & \langle \text{NP} \rangle \end{bmatrix} \supset predicator$

What this means is that if a word is finite (that is, if it shows tense/aspect/modality marking), then it selects for a subject like a finite verb does. And, if a word takes a subject, then it's a predicator and it inherits all the constraints on the linking of argument positions to grammatical functions that apply to verbs. In other words, if a word selects for its subject like a verb does, it will also select for its other arguments like a verb does. Since this approach derives the Deverbalization Hierarchy from a markedness condition on lexical entries, we can call this position the **Lexical Coherence Hypothesis**.

At first glance, the Phrasal Coherenece Hypothesis may seem clearly superior to its lexical alternative. For languages more or less like English they make more or less the same predictions, and the Phrasal Coherence Hypothesis does so with a simple condition on structures. But, for languages whose structure is rather different from that of English, the predictions made by the two hypotheses diverge. In each case, the Lexical Hypothesis makes the correct predictions where the Phrasal Hypothesis does not.

The first problem with the Phrasal Coherence Hypothesis is that it requires that the division between the nominal part of the phrase and the verbal part be tied to the hierarchical structure of the phrase. This predicts that all words associated with the nominal part of the phrase should appear outside those associated with the verbal part. And, indeed, in many langauges (including English) this prediction is borne out. But, in SVO and SOV languages, the verb and its object are adjacent, so the phrasal hypothesis and the lexical hypothesis actually make the same predictions.

When we look at VSO languages, however, the two hypotheses diverge. Take for example Standard Arabic. Arabic has fairly strict noun-possessor order within noun phrases, as we see in (10).

(10)   a. zur-tu   ʔumm-a   r-rajul-i
              visited-I mother-ACC the-man-GEN

           'I visited the man's mother.'   (Fassi Fehri 1993:223)

        b. *zur-tu   r-rajul-i   ʔumm-a
              visited-I the-man-GEN mother-ACC

Any additional nominal modifiers or complements come after the possessor, as in (11).

(11)   a. daxtal-tu daar-a   r-rajul-i   l-waasiᶜat-a
              entered-I house-ACC the-man-GEN the-large-ACC

           'I entered the large house of the man.'   (Fassi Fehri 1993:218)

        b. daxtal-tu daar-a   r-rajul-i   l-latii   ḥtaraq-at
              entered-I house-ACC the-man-GEN the-that-F burned-3.F.S

           'I entered the man's house which burned.'

These facts can be accounted for most simply if we assume that in Arabic a noun must combine with its specifier first, before any other dependents. This would give the NP in (11a) the structure in (12).
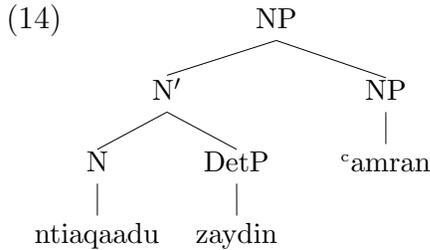
(12)
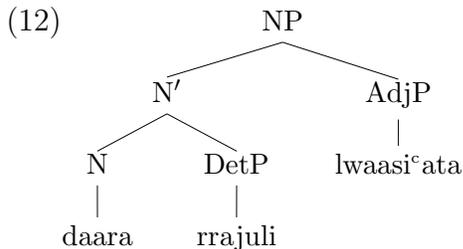
This is similar to the proposal presented by Borsley (1995).

    What is potentially troubling for the Phrasal Coherence Hypothesis is that this same NSO order is found in the maṣdar construction, comparable to the English verbal gerund, shown in (13).

(13)   a. ʔaqlaqa-nii ntiqaad-u   zayd-in   ᶜamr-an
              annoyed-me criticizing-NOM Zayd-GEN Amr-ACC

           'Zayd's criticizing Amr annoyed me.'   (Fassi Fehri 1993:223f)

        b. *ʔaqlaqa-nii ntiqaad-u   ᶜamr-an   zayd-in
              annoyed-me criticizing-NOM Amr-ACC Zayd-GEN

        c. *ʔaqlaqa-nii ᶜamr-an   ntiqaad-u   zayd-in
              annoyed-me Amr-ACC criticizing-NOM Zayd-GEN

Again, the most straightforward analysis of this construction is that the maṣdar combines first with its genitive subject, then with its accusative object, as in (14).

(14)

```
                    NP
              _____
             N′          NP
           _____          |
          N    DetP     ᶜamran
          |     |
      ntiaqaadu zaydin
```

This construction is the same as its English counterpart in many respects. The maṣdar combines with a specifier like a noun does and a complement like a verb does, and the entire phrase has the distribution of an NP. However, unlike the English construction, the verbal part of the phrase is not strictly inside the nominal part.
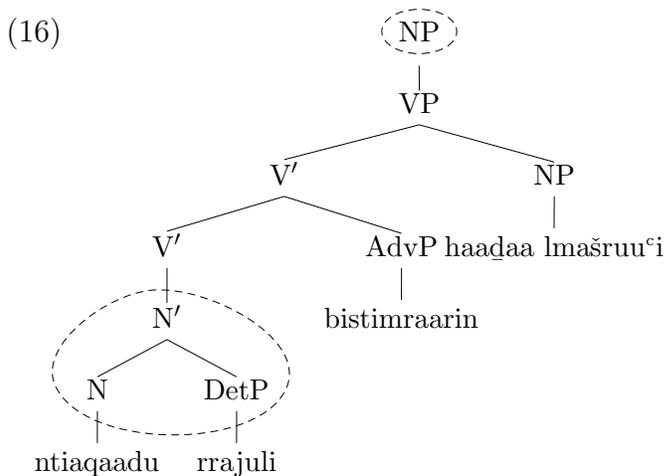
This problem is even more striking when we look at modification. Maṣdars, like English verbal gerunds, take adverbial modifiers. In Arabic, modifiers appear after the genitive subject, as in (15).

(15) Ɂaqlaqa-nii ntiqaad-u   r-rajul-i   bi-stimraar-in   haaḏaa
      annoyed-me criticizing-NOM the-man-GEN with-persisence-GEN this
      l-mašruuᶜ-i
      the-project-ACC

'The man's persistent criticizing of the project annoyed me.'

(Fassi Fehri 1993:240)

According to a mixed projection analysis, gerunds take adverbial modifiers because they contain a partial verbal projection. This means there must be a verbal projection between the lowest nominal projection (which gives the phrase its nominal specifier) and the highest (which gives the phrase its NP distribution).

(16)

```
                           (NP)
                            |
                            VP
                     _____
                    V′               NP
              _____              |
             V′      AdvP  haaḏaa lmašruuᶜi
             |         |
             N′    bistimraarin
           _____
          N   DetP
          |     |
      ntiaqaadu rrajuli
```

This structure, shown in (16), is exactly the kind of structure which is ruled out by the Phrasal Coherence Hypothesis: the nominal part of the phrase is divided into two discontinuous regions.

But, under the Lexical Hypothesis, this is precisely what we would expect to find in a VSO language. Arabic maṣdars, like their English counterparts, subcategorize for a specifier like a noun does but for complements like a verb does. The differences between English verbal gerunds and Arabic maṣdars follow from more general differences between the two languages.

Now, this is not to say that it is impossible to give an analysis of Arabic maṣdars that is compatible with the Phrasal Coherence Hypothesis. So, Fassi Fehri's analysis of examples like (15) preserves Phrasal Coherence by assigning maṣdars an underlying SVO structure. This gives a contiguous nominal projection at D-structure and the observed surface order at S-structure, but at considerable methodological cost. Phrasal Coherence has been proposed by authors working in widely divergent frameworks (e.g., Lapointe (1993) in GPSG, Bresnan (1997) in LFG, Borsley and Kornfilt (to appear) in GB), so it may have seemed at first that the choice between the two alternative explanations for the Deverbalization Hierarchy was a theory-neutral one. It should be clear though from these examples that the Phrasal Coherence Hypothesis can only be preserved within the context of a framework that makes crucial use of head movement or an equivalent device. Furthermore, if we can posit highly abstract underlying structures to avoid violations of Phrasal Coherence in attested languages, it calls into question whether Phrasal Coherence Hypothesis can be said to make any predictions at all about which nominalization type cannot occur.

The second problem for the Phrasal Coherence Hypothesis comes up for languages with synthethic tense/aspect marking. For languages in which tense, aspect, and modality are indicated by inflectional morphology on the verb, the Phrasal Coherenece Hypothesis and the Lexical Coherence Hypothesis make similar predictions. Under either, it would be surprising to find a language which shows tense/aspect marking like a finite verb but whose subject is marked like a possessor. However, for a language that does not mark tense and aspect on the verb, the two hypotheses make divergent predictions. Under Phrasal Coherence, such languages would be expected to be the same as languages which mark tense and aspect synthetically. On the other hand, verbs in analytic tense-marking languages need not be lexically specified for tense. Since Lexical Coherence is a constraint on lexical structures only, it would not rule out a gerund with a genitive subject and analytic tense/aspect marking like a main verb. For at least one language, Boumaa Fijian (Dixon 1988), this seems to be the correct prediction.

In Fijian, a sentence minimally consists of a subject pronoun and a predicate. The reference of the subject can be further specified by an NP within the predicate coindexed with the subject pronoun, as in (18).

(17) a. era la'o
         3PL go

         'They are going.'   (Dixon 1988:33)

      b. era la'o a   gone
         3PL go   ART child

         'The children are going' (lit: 'they are going, the children')

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A predicate consists of a predicate head (typically a verb) together with its complements and any modifiers. A predicate can also contain particles indicating tense and aspect, which come between the subject pronoun and the predicate head, as in (18). The head of the predicate carries no tense/aspect marking or agreement itself.

(18) a. au sa-na vala gaa o yau dua-dua
          1SG ASP-FUT fight MODIF ART 1SG one(REDUP)

          'I'll just fight all by myself.'   (Dixon 1988:325)

      b. au aa sa taa-niu oti i-na mata'a ni'ua
          1SG PAST ASP chop-copra FINISH in-ART morning today

          'I was cutting copra this morning (and have) completed (the job).'
                                                             (Dixon 1988:73)

The structure of an NP in Fijian is parallel to the structure of a clause. An NP minimally consists of an article and a nominal head. Any dependents or modifiers follow the nominal head, as we see in (19).

(19) a. a   'oro
          ART village

          'the village'   (Dixon 1988:35)

      b. a   drau ni pepa yai
          ART sheet of paper this

          'these sheets of paper'   (Dixon 1988:102)

There are several constructions used to indicate possession, but the most common one places a possessive pronoun between the article and the head of the NP. As with the subject pronoun, the reference of this possessive pronoun can be elaborated by an NP occurring after the head, as shown in (20).

(20) a. a   o-na   waqa
          ART CL-3SG boat

          'his/her boat'   (Dixon 1988:37)

      b. a   o-na   waqa a   cauravou
          ART CL-3SG boat ART youth

          'the youth's boat'   (Dixon 1988:37)

A Fijian gerund, or 'clausal NP', consists of an article and a predicate, with the subject of the predicate indicated as if it were the possessor of an NP. This is shown in (21).

(21) a. o   lesu   mai
          2SG return here

          'You return here.'   (Dixon 1988:37)

b. au aa rai-ca [a o-mu lesu mai]
1SG PAST see-TR ART CL-2SG return here

'I saw your returning here.' (Dixon 1988:37)

The range of possibilities for the predicate of a clausal NP is the same as that for the predicate of a main clause. Clausal NPs never include subject pronouns, but beyond that can include anything that a predicate can. This includes the tense and aspect particles, as we see in (22).

(22) a. au tadra-a [a o-mu aa/na la'o mai]
1SG dream-TR ART CL-2SG PAST/FUT go here

'I dreamt that you had/will come.' (Dixon 1988:132)

b. … i-na qou saa soli-i au tale gaa vei 'emudrau
in-ART CL.1SG ASP give-TR 1SG again MODIF to 2DU

'(I have told a story) with my giving of myself again to the two of you' (i.e., 'I have given of myself to you two in telling the story')
(Dixon 1988:132)

These are the key examples. The heads of the clausal NPs combine with a subject like a noun does but show tense/aspect marking like a main verb, exactly what the Deverbalization Hierarchy leads one to expect will not happen.

The examples in (22) pose a serious problem for the Phrasal Coherence Hypothesis. According to standard GB assumptions, tense and aspect marking is at some level analytic in all languages. Fijian differs from, say, English, in that its tense and aspect markers can stand as independent words and so do not trigger verb raising to Infl. In either case, tense marking is associated with some functional projection higher than the subject at D-structure. So, since the Fijian clausal NP shows tense and aspect marking, it must include a verbal projection higher than the subject. However, since the clausal NP takes a possessive subject pronoun, it must include a nominal functional projection lower than the highest verbal projection. The Fijian clausal NP therefore is a clear violation of the Phrasal Coherence.

On the other hand, clausal NPs present no problem for the Lexical Coherence Hypothesis. The feature specification default in (9a) is a constraint on lexical entries, and there is no evidence that Fijian verbs are lexically specified for tense or aspect. Indeed, there is no evidence for a contrast between finite and non-finite verbs at all in Fijian.

So, what have we shown. For VSO languages and languages with analytic tense marking, the Lexical Coherence Hypothesis and the Phrasal Coherence Hypothesis make divergent predictions. To account for these constructions as phrasally coherent, one would have to either modify the coherence constraint or posit a perhaps unmotivated structure which satisfies the coherence constraint at some more abstract level. Either move greatly weakens any predictive power that the constraint might have. However, both construction are completely consistent with the Lexical Coherence as it stands, lending further support to a lexicalist treatment of verbal gerunds.

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