

Word-Formation by Phase in Inuit

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This paper argues that wordhood in the polysynthetic Inuit language¹ is completely predictable from syntactic structure and that words correspond to the domains of CP and DP. This entails that Inuit's morphological component need not be any more complex than that of more isolating languages and that individual morphemes are not idiosyncratically specified as affixes. As evidence for our approach, we contrast a variety of free and bound elements, showing that in every case, subparts of words are smaller than CP/DP and full words correspond to CP/DP. We also discuss "stem" ellipsis, which we argue is further evidence that the elements which are usually bound in Inuit are not genuinely affixes.

1. Introduction

Inuit has been argued to require more morphological machinery than is commonly assumed for more isolating languages (e.g., the "internal syntax" postulated by Fortescue (1980) for West Greenlandic and de Reuse (1994) for Yupik as well as the morphological module of Sadock (1991)'s theory of Autolexical Syntax). Such a level of computation is meant to deal with polysynthetic phenomena such as noun incorporation, "affixal" verbs, "affixal" adjectives and adverbs, and the presence of various functional morphemes (e.g., negation, mood, modals, etc.) inside verbal complexes. For instance, the following

¹ By Inuit language, we are referring to the Eskimo branch of the Eskimo-Aleut family. Specifically, this includes dialects/languages spoken in Alaska, Canada (the Northwest Territories, Nunavut, Quebec, and Labrador), and Greenland.

single-word sentences contain examples of incorporated objects, verbs, adjectives, adverbs, tense, negation, and the copula:²

- (1) iglu-jjua-liu-lauq-tuq
house-big-make-PAST-DEC.3SG
'He/she made a big house.'
- (2) uqa-limaar-vi-liu(ng)-inna-nngit-tunga
speak-all.of-NOM-make-always-NEG-DEC.1SG
'I was not always making libraries.'
- (3) alaana-u-quuji-juq
Alana-COP-seem-DEC.3SG
'She looks like Alana.'

However, the presence of an extra layer of computation in the grammar (i.e., a generative morphological component beyond Distributed Morphology) raises questions about the role of the syntactic component in such languages. In particular, it is not clear that the operations of such a morphological component are in any way different from those of syntax. For instance, while word order is relatively free in Inuit, the order of morphemes within a word appears to be strictly compositional. Based on observations by Fortescue, Mithun (1999) gives the following examples of morpheme order corresponding to syntactic/semantic composition in the related language Yupik. In these examples, morphological position correlates with semantic scope (p.43):

- (4) yug**pacuaq**
yug-**pag-cuar**
person-**big-little**
'little giant'

² Unless otherwise indicated, Inuit data is from the North Baffin dialect (Igloodik) and was collected by the authors. Abbreviations are as follows: ABS absolutive case, ALLAT allative case, CAUS causative, CONJ conjunction, COP copula, DEC declarative mood (referred to as participial or indicative in most work on Inuit), DIST.PAST distant past, ERG ergative case, FUT future, IMP imperative, INDIC indicative mood, INST instrumental case, INTERR interrogative mood, INTR intransitive, LOC locative case, NEG negation, NOM nominaliser, OBL oblique case, PERF perfective, PL plural, POSS possessive, REC.PAST recent past, SG singular, VRB verbaliser. We follow the standard orthographic conventions of representing [ŋ] with 'ng', [ŋŋ] with 'nng', and [ɕ] with 'jj'.

Working within Chomsky's (1995) Minimalist Programme, and the Strong Minimalist Thesis elaborated in Chomsky (2006, 2007), we show that the polysynthetic phenomena of Inuit can be accommodated without positing a special generative morphological component. Phonological wordhood will be argued to be predictable from the syntax, dispensing with the need to mark individual morphemes as affixes. The goal of this paper is to provide a minimalist account of the morphology of wordhood in Inuit that explains why certain types of morphemes can or must appear word-internally, while other elements must appear as separate words. Our claim is that words in Inuit correspond to syntactic phases.

We assume the analysis of phases developed in Chomsky (1999, 2006, 2007) and elaborated by Svenonius (2004) and Fox and Pesetsky (2004), whereby syntactic structure is sent to the PF and LF interfaces in chunks at various points during the derivation, thus deriving the cyclicity of movement. Chomsky argues these points to be CP and ν P, based on their propositional completeness (suggesting that they should be interpretable at LF) and their phonological independence. Based on parallels with CP, Svenonius argues that DP should also constitute a phase.³

We argue that words in Inuit correspond only to syntactic phases.⁴ Any constituent corresponding to a CP or a DP will thus form a word.^{5,6} We assume that ν P need not be a phase cross-linguistically, based on arguments in Chomsky (2007) for the non-phase status of unaccusative/passive ν Ps in English. In an ergative language like

³ In fact, Svenonius suggests that there may be two nominal phases, QP and nP (or possibly OpP and NumP), that parallel the clausal phases CP and ν P.

⁴ The nP, etc. phases discussed by Marantz (2001, to appear) and Marvin (2002) among others do not correspond to word boundaries in Inuit. It is likely that different types of phases are relevant to languages in different ways. The relevance of the nP type phases to the syntax of Inuit will not be discussed herein.

⁵ See section 2.2 where we discuss the issue of spell-out involving the complement of the phase head.

⁶ Note that Wojdak (2005) also uses CP and DP as types of word boundaries in her analysis of affix linearization of the polysynthetic Wakashan language Nuu-chah-nulth.

Inuit, it is possible that ν does not ever have the uninterpretable ϕ -features responsible for accusative case assignment.⁷ Instead, we assume that structural case is only assigned by T in the language. The approach we assume is similar to that proposed by Bobaljik and Branigan (2006) for Chukchi. The details will not be discussed further herein, but see also Bok-Bennema and Groos (1988) and Johns (2001) for details about how the assignment of “accusative” case in Inuit differs from that in a nominative-accusative language.

We are not concerned with the head-final morpheme order found in the language. Instead, we are dealing strictly with the position of word boundaries. Our analysis is compatible with several approaches to the head-final order (see, for instance, Compton, 2006; Julien, 2002; Johns, to appear; Svenonius, 2007).⁸

The following section outlines the basics of our Inuit word-formation hypothesis. In Section 3, it will be shown that this proposal accounts for the lack of free functional morphemes, the observed patterns of noun incorporation (Sadock, 1980; Johns, to appear), the distribution of adjectives and adverbs, “affixal” verbs, and the presence of phonologically free conjunctions, pronouns, and *wh*-words in Inuit. We also discuss the stem-ellipsis found in some dialects of Inuit (Dorais, 1988; Swift & Allen, 2002). In each case, it will be shown that words correspond to DPs and CPs, while smaller syntactic structures (e.g., APs, AdvPs, bare NPs, etc.) are unable to stand alone as words. Thus, the

⁷ Just as NOMINATIVE must be assigned to an argument in an intransitive clause in English, ABSOLUTIVE, the case assigned to the object of a transitive clause, must be assigned to a DP in an intransitive Inuit clause (although it may be assigned to a covert argument, given that Inuit is a pro-drop language). We take this as evidence for ABSOLUTIVE being assigned in Spec,TP, thus suggesting that ν P does not assign (structural) case in Inuit.

⁸ Note that if a movement approach to inverse morpheme order is adopted, it would not be necessary to posit that the non-phasal status of ν P in Inuktitut is due to ergativity. Instead, the complement of ν P could be spelled out vacuously (e.g., according to Fox and Pesetsky (2004), such an empty phase would not add any new information to the linearization).

polysynthetic nature of words in Inuit can be reduced to syntactic structure. Section 4 contrasts the analysis presented in this paper with some previous approaches to Inuit morphological composition.

2. The Phasal Word-formation Hypothesis

The following analysis assumes Minimalist Syntax (Chomsky, 1995, 2000) and the late-insertion model of Distributed Morphology (Halle & Marantz, 1993, Marantz 1997), although nothing depends crucially on the use of the latter framework. We also employ Fox and Pesetsky's (2004) treatment of phases in which spell-out of a phase results in the creation of an ordering statement for the elements contained therein.

2.1. Inuit Words

We argue that word boundaries in Inuit correspond to phase edges. We consider words in Inuit to be the elements which appear between spaces in Inuit orthography and which speakers consistently identify as words. Sadock (1980) argues that these elements in West Greenlandic possess the properties normally associated with words cross-linguistically. In particular, he notes that (i) "obligatory sandhi processes operate within words"; (ii) the order of morphemes within a word is "entirely fixed by semantics," while the arrangement of words with respect to each other is relatively free; (iii) parts of words cannot be conjoined; (iv) words cannot be interrupted with "pauses or parenthetical material"; and (v) if an error is made, a speaker will return to the beginning of the word. Under our analysis, all of the elements that have been defined as words in the Inuit literature correspond to syntactic phases.

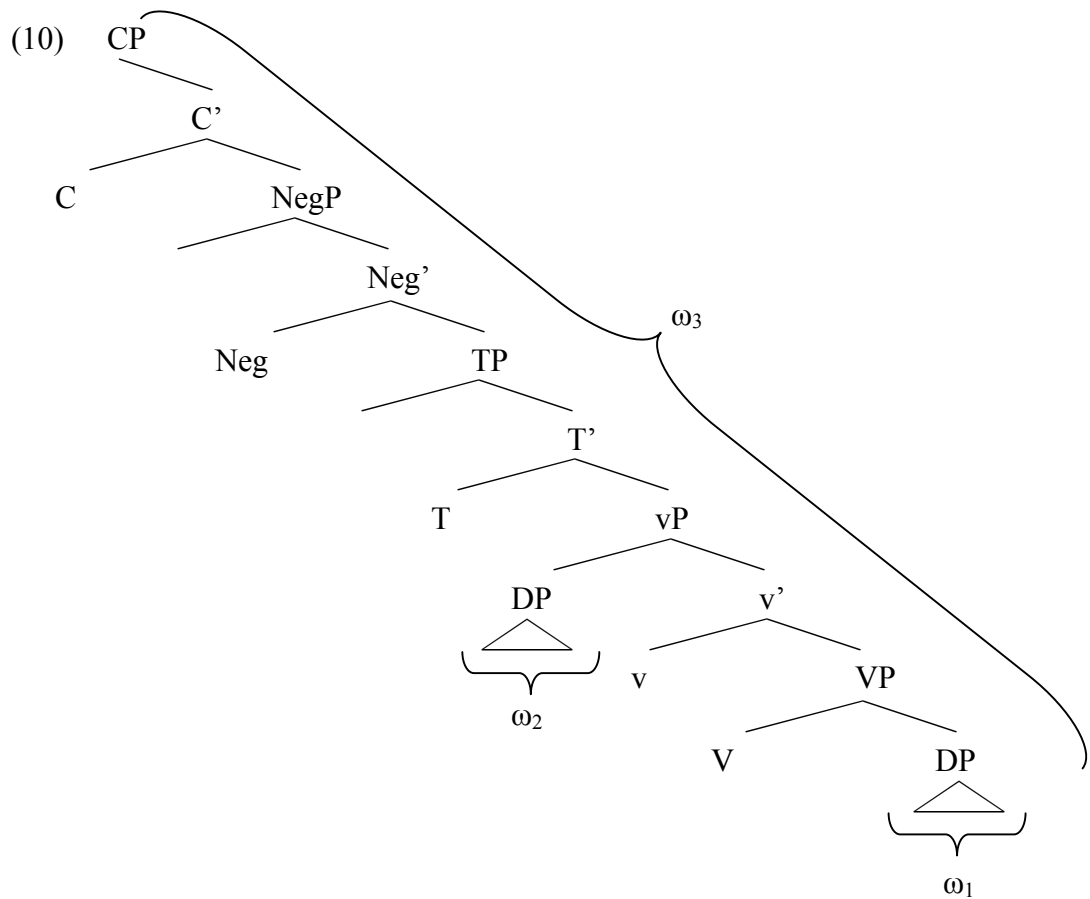
2.2. Phases are Words

Our analysis implicitly rejects the notions of morphological or syntactic words; instead, we adopt the spirit of Distributed Morphology and “syntax all the way down” (Halle & Marantz 1993), contra previous treatments of Inuit that posit a complex set of separate morphological rules to deal with noun incorporation, bound adjectives, bound adverbs, etc..⁹ Wordhood will be treated here as a phonological phenomenon. Given our proposal that syntactic phases are words, we predict that constituents smaller than CP or DP will not be able to form independent words.

Thus, we propose that as each DP and CP phase is spelled-out, the information sent to PF is immediately used to make a phonological word. Consequently, each (non-empty) phase in the syntax will result in one phonological word. Consider the following model:¹⁰

⁹ We discuss the morphological-type approach in Section 4, specifically discussing Fortescue (1980), de Reuse (1994), and Sadock (1991).

¹⁰ We ignore the ultimate position of the arguments and whether they move for case.



While the CP contains DP arguments, the information within each DP has already been spelled out and mapped to phonological words (i.e., ω_1 and ω_2) by the time the CP is spelled out. Finally, the remaining structure in CP is mapped into a complex (polysynthetic) word (i.e., ω_3 in (10)). Similarly, a structure with a subordinate CP would spell out the lower CP (minus its DPs) as a separate word, while the remaining non-DP elements in the higher CP phase would form a separate word (see (33) below, where an example is shown and discussed).

Although we refer to “CP phase” and “DP phase” throughout, note that under the most common treatment of phases it is the complements of phase heads (i.e., the complements of C and D for Inuit) which spell out. While we might expect to observe stranded phase heads, this is not problematic for Inuit since it lacks overt

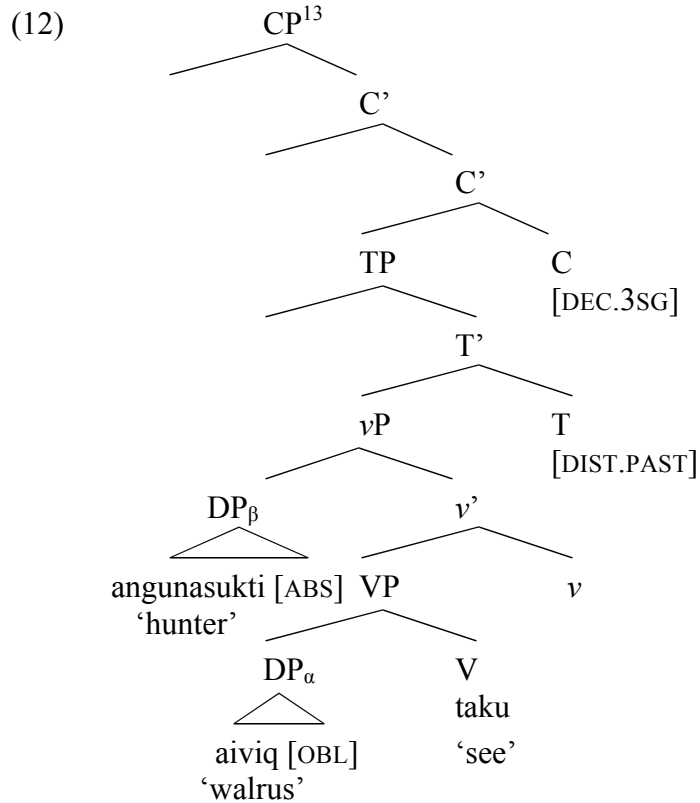
complementisers and determiners. Furthermore, although case (KP) is often assumed to be the highest projection in the expanded DP, and we might predict that case morphemes should be realised in separate phases, the case morphology in Inuit does not necessarily correspond to the K head.¹¹ If we consider a language such as Russian where exponents of case can appear simultaneously on quantifiers, modifying adjectives, and nouns, it seems equally plausible that the case morphology in Inuit is also an instance of case concord, albeit with a covert determiner or case head.¹²

In sum, we argue that in Inuit (and possibly cross-linguistically), PF can begin creating prosodic constituents as soon as a phase is spelled out. Furthermore, while a more isolating language might label phases (or subparts thereof) as phonological phrases, in Inuit each incoming phase is labelled as a phonological word. A sample derivation is provided in (11)-(13). Note that we use a right-headed structure throughout this paper to capture the inverse morpheme order found in the language. Due to the portmanteau nature of mood and agreement in Inuit and to Chomsky's (2007) proposal that ϕ -features are inherited from C, we have placed mood and agreement in the C domain, the distant past tense morpheme has been placed under T, and the matrix verb under V. Arguments have been placed in the canonical AGENT and PATIENT merge positions (ignoring movement for case):

- (11) angunasukti taku-lauq-tuq aiving-mi
 hunter(ABS) see-DIST.PAST-DEC.3SG walrus-OBL
 'The hunter saw the walrus.'

¹¹ Svenonius (2004) also warns against treating a case morpheme as an overt K head.

¹² Similarly, the mood morphology in Inuit need not correspond to the C head. Assuming a more articulated CP layer (see Rizzi, 1997), mood could correspond to a lower projection, while the head which triggers spell-out of the 'CP' phase is higher.



(13) First Phase (DP_α):
 {aiviq > [OBL]}
 → [aiving-mi]_ω

Second Phase (DP_β):
 {angunasukti > [ABS]}
 → [angunasukti]_ω

Third Phase (CP):
 {angunasukti > [ABS] > aiviq > [OBL] > taku > [DIST.PAST] > [3SG] > [DEC]}
 → [taku-lauq-tuq]_ω

By the time the CP is spelled out, and the linear order of non-DP elements is added to the linearisation, the contents of both DPs have already been packaged into words. Thus, only the remaining roots and features in CP are packaged into the final phonological

¹³ Given the various possible analyses for ergative case-checking, we ignore the ultimate position of the arguments. We assume they are spelled out as soon as they are built. However, it is equally possible that they do not spell out until their case features are valued.

word: the verbal complex.¹⁴ Assuming that the spell-out of ordering information to PF is additive only, only adding new information and never altering the ordering statement (as claimed in Fox & Pesetsky, 2004), and that PF must, in any case, keep track of word boundaries, the only differences between Inuit and more isolating languages is that PF in Inuit assigns phonological word boundaries to phases, while in English, for instance, it is the individual linearised elements (i.e. contentful, syntactic heads) that appear to be assigned word status, unless they are marked as affixes.

To summarise, this proposal argues for the correspondence between syntactic phases and phonological words in Inuit. Both CP phases and DP phases will surface as words. In Inuit each phase is labelled as a phonological word, while a strongly isolating language (e.g., Chinese) would label each linearised element (i.e., syntactic head) as a phonological word. There is no need to mark individual bound morphemes in Inuit as affixes since their bound status is determined from their position in the syntax.

In the next section we demonstrate that the phase-based analysis of wordhood proposed in this section explains the distribution of nouns, verbs, adjectives, adverbs, and functional morphemes in Inuit. We also show how our approach can easily account for “stem” ellipsis constructions.

¹⁴ This is not necessarily evidence for any particular word order. Given that the position of arguments is relatively free in Inuit and that ergative and absolutive arguments (which are interpreted as specific/referential; see Wharram, 2003; Compton 2004; among others) appear before the verb, while oblique objects (which are interpreted as non-specific/non-referential) appear after the verb, we propose that their position is determined post-syntactically. Erteschik-Shir and Strahov (2004) argue for such an analysis of scrambling and object shift, observing that many languages mark topic/focus intonationally, which entails that information regarding topic/focus status must be available to PF. Accordingly, we propose that the position of DPs in Inuit is governed by information structure at PF, with specific arguments frequently being fronted and non-specific arguments frequently postposed (see also Sherkina-Lieber, 2004 on the focus-fronting of wh-words in Inuit).

3. Evidence for Words Corresponding to Phases

This section presents evidence for the correspondence between DP and CP phases and words in Inuit. In particular, we concentrate on the distribution of lexical categories and alternations exhibited between polysynthetic and more periphrastic constructions.

3.1. *Lack of Free Functional Elements*

An obvious consequence of words only corresponding to DPs and CPs is that we should not find any free functional morphemes (unless they are the sole members of a DP or a CP). In Inuit, this prediction is borne out by the lack of independent determiners, adpositions, auxiliaries, modals, light verbs, etc. However, pronouns, demonstratives, and conjunctions are exceptions. While it might be argued that pronouns and demonstratives are nouns, and therefore can constitute full DPs, the same conclusion is not obvious for conjunctions. Although the word status of conjunctions appears to be an exception to the observation that words are either clauses or arguments, their status as words will also be shown to fall out from the phase-based analysis. We return to this topic in Section 3.7.

While sometimes referred to as merely verbs, *verbal complexes* in Inuit can consist of main verbs or incorporated bare object nouns, modals, several types of light verbs, various types of adverbs, negation, tense, aspect, agreement, and mood. Consider the following examples:

- (14) iglu-liu-(ng)¹⁵-innaq-sima-junga
house-make-always-PERF-DEC.1SG
'I have always been making houses.'
- (15) niri-gaju-lau-nngit-tunga
eat-always-DIST.PAST-NEG-DEC.1SG
'I wasn't always eating.'

¹⁵ An epenthetic consonant interrupts the hiatus caused by three adjacent vowels.

- (19) [uqa-limaar-vi]-liu(ng)-inna-nngit-tunga
 [speak/tongue-all.of-LOCATION.NOM]-make-always-NEG-DEC.1SG
 ‘I was not always making libraries.’

cf. uqa-limaar-vi-t
 speak/tongue-all.of-LOCATION.NOM-ABS.PL
 ‘libraries’

- (20) [iglu-jjuaq]-liu-lauq-tunga
 [house-big]-make-DIST.PAST-DEC.1SG
 ‘We made a big house.’

Although the incorporated nouns have the same surface form as the absolutive singular (which is null), there is evidence that in fact the incorporated elements are bare NPs. First, these verbs take intransitive agreement morphology. Non-incorporating bivalent verbs take such morphology only in the anti-passive where the object argument has oblique case.

- (21) pitsi-mik nigi-vunga (Johns 2007, Labrador)
 dried.fish-OBL.SG eat-INDIC.1Sg
 ‘I am eating dried fish.’

This use of the intransitive agreement is parallel to the incorporating structure. If the incorporating noun was case-marked we might thus expect it to take the oblique case and not the (null) absolutive. We take this as evidence that the NP is bare and not an absolutive case-marked NP.

Second, and perhaps more importantly, verb-like adjectives can modify nouns via apposition, matching them in both case and number (see section 3.4 below for discussion of adjectives):

- (22) qimmi-mik qaqor-tu-mik (Sadock 2003, West Greenlandic)
 dog-OBL.SG white-DEC- OBL.SG
 ‘the white dog’

Crucially, an incorporated noun can also have an appositional modifier, in the event of which the modifier takes oblique case (Compton to appear):

- (23) angi-jur-mi iglu-liu-lauq-tunga (North Baffin)
 big-DEC-OBL.SG house-MAKE-DIST.PAST-DEC.1SG
 ‘I made a big house.’

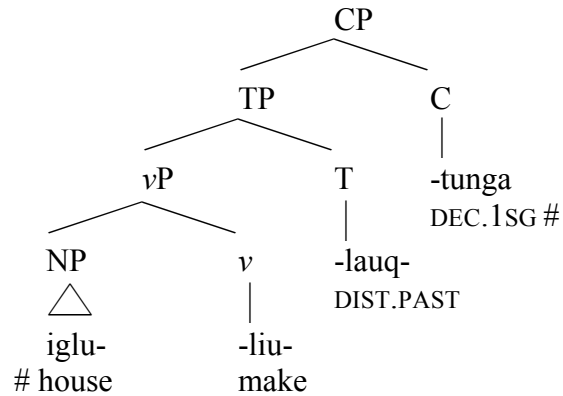
Since such an object would normally have the same case and number as its appositional modifier, we would expect the incorporated noun to take oblique case, and not (null) absolutive case. We take this as evidence that the incorporated noun is in fact a bare NP, and not an absolutive.¹⁶

Johns (2007) demonstrates that noun incorporation in Inuit is restricted to occurring with a closed class of light verbs which obligatorily select and incorporate an NP. She argues that the light verbs involved in the obligatory noun incorporation form a natural and predictable class, stating that “the set of verbs found in noun incorporation are a finite class with a restricted and predictable semantic range” (p.535). For instance, such verbs do not encode manner or change of state (p.542) (for further discussion of semantic distinctions between incorporating and non-incorporating verbs, see Van Geenhoven 1998 for West Greenlandic and Mithun 1999 for Yup’ik). Furthermore, Johns argues that the incorporation complexes are not the result of grammaticalisation (contra Gerdts & Hukari, 2002; Mithun 1997, 1999).

Interestingly, if we take case and number to be indicative of a full DP, the theory presented in Section 2 correctly predicts the phonological distribution of nouns; an NP, without a DP layer, will be part of the same word as the little *v* which selects it, while full DPs (those with case and number) will be separate words:

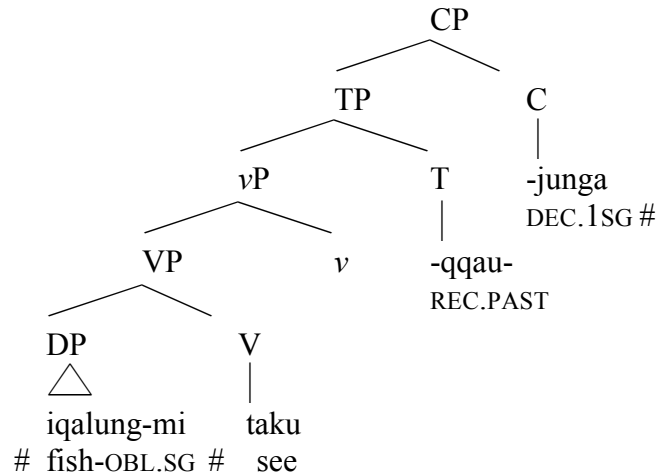
¹⁶ Johns (2007) also argues that incorporated nominals are bare based on the fact that they cannot take possessive or plural morphology.

(24) Noun Incorporation:



iglu-liu-lauq-tunga
 # house-make-DIST.PAST- DEC.1SG #
 'I made a house.'

(25) Full DP object:



iqalung-mi taku-qqau-junga
 # fish-OBL.SG # see-REC.PAST-DEC.1SG #
 'I saw a fish.'

Thus, it is the status of the object as an NP or a full DP (with case and agreement), as subcategorised for by the verb, that corresponds to whether or not the object will undergo incorporation. The phonological incorporation of the noun is not a property of the light

verbs; rather, the type of object they select (i.e., an NP) cannot stand alone as a separate word because it is not a phase.¹⁷

3.3. “Affixal” Verbs

Similar to the class of noun-incorporating verbs described in the previous section, there is also a closed class of predicate incorporating verbs exemplified by *-guma* “want (to),” *-nirraq* “say,” and *-qu* “order/want/tell” (see Grimshaw and Mester, 1985; Johns, 1999; Pittman, 2006a; b; Smith, 1982; Woodbury and Sadock, 1986). These verbs appear to take clausal complements and they are found alongside verbs in the following constructions:

- (26) ani-juma-junga
leave-want-DEC.1SG
‘I want to leave.’
- (27) Miali igla-qu-qau-jara
Mary(ABS) laugh-order-REC.PAST-DEC.1SG/3SG
‘I ordered Mary to laugh.’
- (28) Janni-up niri-nirraq-tanga tuktu Miali-mut
Johnny-ERG eat-say-DEC.3SG/3SG caribou(ABS) Mary-ALLAT
‘Johnny said that Mary ate the caribou.’

¹⁷ One exception to this analysis is presented by Johns (2007). Following Allen (1988), she explains that a small set of verbs describing location and motion appear to incorporate nouns bearing oblique cases such as locative and vialis, as well as possessive inflection and number (p.552):

- (a) illu-ga-no-vunga (Johns, 2007, Labrador)
house-POSS.1SG.-go.to-INDIC.1SG
‘I’m going to my house.’

This is problematic for our analysis because the object bears number and case, suggesting it is a DP and it should therefore result in a separate word. However, Sadock (2002) observes that such verbs (those which allow case, possessive marking and number) appear to be enclitic in West Greenlandic, noting that they can also occur separate from the object. Compare (b) and (c) (p.1-2):

- (b) Nuummiippunga (c) Nuummi ippoq (also: Ippoq Nuummi)
nuuk-mi-it-vunga N.-LOC be.in-INDIC.3SG
N.-LOC-be.in-INDIC.1SG ‘He/she is in Nuuk.’
‘I am in Nuuk.’

While of a full analysis of these optionally attaching verbs is beyond the scope of this paper, we believe they contrast with the set of lights verbs whose objects always incorporate.

Johns (1999) argues that *-guma* is a modal verb, in part because it cannot licence its own DP arguments. Rather, as in (26), the “subject” of *-guma* must be interpreted as identical to the subject of the root verb. Additionally, it can appear with weather verbs and non-agentive subjects in some dialects:

(29) silalu-guma-juk
rain-want-DEC-3SG.
‘It looks like it’s going to rain.’ (Labrador, Johns 1999)

(30) savik siKumi-guma-juk
knife(ABS) break-want-DEC-3SG.
‘The knife is going to break.’ (Labrador, Johns 1999)

As a modal verb, *-guma* occurs within the same CP domain as the verb that appears to its left. This type of affixal verb is arguably similar to a functional restructuring/raising verb (see Wurmbrand, 2001; Cinque, 2001). The constructions then involve a single CP and we correctly predict a single verbal word.

Similarly, Pittman (2006a, b) demonstrates that *-niraq* and *-qu* type verbs are matrix verbs that select complements that are smaller than CP (i.e. TP or *vP*) (see also Li 1990 for evidence that *-niraq*-type verbs select complements smaller than CP). She observes that while *-niraq*-type verbs can take TP complements (as in (31)) that contain tense (i.e., recent past) and *qu*-type verbs can take *vP* complements (as in (32)), neither allows a complement to bear mood (i.e. declarative), which is generally assumed to be part of the articulated CP layer (see Rizzi 2004)¹⁸. These complements are thus smaller than a full clause.

¹⁸ An anonymous reviewer points out that an alternative would be to assume that phase heads spell out with the phase (contra Chomsky 1999, 2006). This is an interesting proposal since it would mean that case and mood could be treated as phase heads. However, we have decided to employ the more standard treatment of phases. Note that our analysis is compatible with either treatment of phases. Crucially, we’re arguing that words correspond to syntactic domains.

- (31) Jaani-up niri-qqau-nira-lauq-tanga tuktu Miali-mut
 Johnny-ERG eat-REC.PAST-say-DIST.PAST-DEC.3SG/3SG caribou(ABS) Mary-ALLAT
 ‘Johnny said that Mary ate the caribou.’
- (32) Jaani-up niri-qu-lauq-tanga tuktu Miali-mut
 Johnny-ERG eat-want-DIST.PAST-DEC.3SG/3SG caribou(ABS) Mary-ALLAT
 ‘Johnny wanted Mary to eat the caribou.’

Furthermore, as noted by Woodbury and Sadock (1986), these verbs demonstrate classic clause-union effects in that the embedded external argument (*Miali-mut* in (31) and (32)) surfaces with dative (sometimes called allative) case when the embedded verb is transitive. This pattern is similar to that found in the clause embedded below a causative in many languages, such as French. These constructions can be viewed as restructuring-type constructions (or reduced non-restructuring in Wurmbrand’s (2001) terms), meaning that the complement is smaller than a CP (see for instance Landau, 2002; Folli and Harley, 2004 for vP complements of causative verbs). If this restructuring-type approach is applied to Inuit (see Pittman 2006a, b), we correctly predict the bound status of the “affixal” verbs; their complements are smaller than CP and the two verbs thus appear in the same verbal word.

Some phonologically independent verbs in Inuit can take full CP complements bearing mood/agreement morphology. This type of construction does not display clause-union effects. The complement is a CP and is expected to form a separate word.

- (33) ani-juit¹⁹ qaujima-junga
 leave-DEC.3PL know-DEC.1SG
 ‘I know that they left.’

In parallel to our results with nouns, we see that only full CPs form separate phonological words. Smaller units such as TP, vP , and VP cannot stand as words.

¹⁹ There is variation in the dialect of our consultant between *-jut/-tut* and *-juit/-tuit* (DEC.3PL).

3.4. Adjectives

In addition to the alternations observed between free and incorporated nouns and free and “affixal” verbs, we also observe two distinct classes of adjectives in Inuit: (i) verb-like adjectives²⁰ and (ii) purely attributive adjectives.²¹

Verb-like adjectives can act as main clause predicates and can serve as complete sentence/utterance, as shown in (34) - (36) below:

- (34) taki-juq
tall-DEC.3SG
'He/she is tall.'
- (35) sanngi-junga
strong-DEC.1SG
'I am strong.'
- (36) nanuq angi-juq
polar.bear(ABS) big-DEC.3SG
'The polar bear is big.'

Furthermore, verb-like adjectives can appear in other moods, such as the interrogative, and take tense morphology, as in the following examples:

- (37) taqa-vii
tired-INTERR.2SG
'Are you tired?'
- (38) aannia-lauq-tunga
sick-DIST.PAST-DEC.1SG
'I was sick.'

Their ability to act as full clauses, as well as their interaction with mood and tense, suggest that these adjectival words are full CPs.

These adjectives can also modify arguments:

²⁰ Dixon (2004a) argues for a distinction cross-linguistically between noun-like adjectives, verb-like adjectives, and adjectives which bear no relation to either nouns or verbs.

²¹ Dixon (2004b) demonstrates the existence of a similar class of adjectives in Jarawara (Arawá family).

- (39) taki-juq²² angunasukti natti-∅-qqau-juq
 tall-DEC.3SG hunter(ABS) seal-get-REC.PAST-DEC.3SG
 ‘The tall hunter caught a seal.’
- (40) angi-juq nanuq taku-lauq-tuq natting-mi
 big-DEC.3SG polar.bear(ABS) see-DIST.PAST-DEC.3SG seal-OBL.SG
 ‘The big polar bear saw the seal.’

Given their ability to act as clauses, one might conclude that the adjectives in (39)-(40) are acting as relative clauses when they modify nouns. However, when modifying arguments whose case morphology is overt (i.e., cases other than absolutive), a different picture emerges (examples (41) and (43) repeated from (22)-(23) above):

- (41) qimmi-mik qaqor-tu-mik (Sadock 2003, West Greenlandic)
 dog-OBL.SG white-DEC-OBL.SG
 ‘the white dog’
- (42) illu-ttsinnut angi-suu-mut (Sadock 2003, West Greenlandic)
 house-ALLAT.1PL.SG big-DEC-ALLAT.SG
 ‘to our big house’
- (43) angi-jur-mi iglu-liu-lauq-tunga
 big-DEC-OBL.SG house-make-DIST.PAST-DEC.1SG
 ‘I made a big house.’

These examples show that adjectives agree in case with the modified argument, albeit covertly in the absolutive singular (as in (39)-(40) above), which is phonological null. Since bearing case is not a property we expect of clauses, and since these adjectives can also stand as arguments (see (44) below), this data suggest that adjectives modifying nouns are appositive DPs (as proposed in Johns (1987) for nouns and deverbal modifiers and relative clauses). Moreover, the fact that the adjectives can also act as arguments supports the conclusion that when they modify nouns they are in fact DPs:

²² The declarative mood (traditionally called participial in the Eskimoan literature) serves the additional function of nominalising a verb.

- (50) *jjuaq
big
'the/a big one/thing'
- cf. angi-jur-mi iglu-liu-lauq-tunga
 big-DEC-OBL.SG house-make-DIST.PAST-DEC.1SG
 'I made a big house.'
- (51) *jjuaq-tuq
big-DEC.3SG
'It is big.'
- cf. angi-juq
 big-DEC.SG
 'He/she/it is big.'
- (52) *jjuaq-liu-lauq-tuq
big-make-DIST.PAST-DEC.3SG
'He/she made a big one/thing.'

This contrast suggests that while verb-like adjectives correspond to full CPs and (de-adjectival) DPs, attributive adjectives are merely APs. Remarkably, members of the former set (CPs and DPs) are always separate phonological words, while the latter set (APs) are always affixes on a noun. This dichotomy is predicted by the analysis of Inuit word boundaries corresponding to phases; as APs, the attributive adjectives will never constitute a separate phase. In Section 3.6 we return to the topic of adjectives, arguing against an analysis in which attributive adjectives are simply specified in the lexicon as affixal.

3.5. *Adverbs*

A similar dichotomy exists among the two kinds of adverbs in the language: true adverbs and derived adverbs. While true adverbs (arguably Adv heads or phrases in the syntax) appear inside verbal complexes, derived adverbs appear as separate words.

True adverbs are a closed class of elements that appear in various positions to the right of the verbs they modify inside a verbal complex, as in examples (53)-(55) below:²³

- (53) ani-**saali**-juit
leave-**early**-DEC.3PL
'They left early.'
- (54) ani-**anik**-qqau-juit
leave-**already**-REC.PAST-DEC.3PL
'They already left.'
- (55) ani-qu-**quu**-lauq-tara (Mittimatalingmiutut)
leave-tell-**probably**-DIST.PAST-1SG/3SG
'I probably told him/her to leave.'

These adverbs can never appear alone and never take case morphology. Derived adverbs, on the other hand, appear independently of the elements they modify and appear to require oblique case, as in the following examples:

- (56) qakkuti-kku iglu-liu-qattaq-tunga
when-VIALIS house-make-HABITUAL-DEC.1SG
'Sometimes we make a house.'
- (57) nipikit-tu-mi pisuq-qqau-junga
quiet-DEC-INST.SG walk-REC.PAST-DEC.1SG
'I walked quietly.'
- (58) uqalimaa-lauq-tara sukkait-tu-mi
read-DIST.PAST-DEC.1SG/3SG slowly-DEC-INST.SG
'I read (it) slowly.'

In (56), the *wh*-word meaning *when* is converted into *sometimes* using vialis case, while in (57)-(58), adjectives are converted into adverbs via instrumental case.²⁴ Although these

²³ Fortescue (1980) presents examples illustrating that the position of these “affixal” adverbs is determined by scope, for instance:

- | | | | |
|-----|--|-----|---|
| (a) | tikinngikk allar p <u>uq</u>
tikit-nngit- gallar -vuq
come-NEG- still -INDIC.3SG
'He <u>still</u> has not come.' | (b) | tikik kallan ngilaq
tikit- gallar -nngit-vuq
come- still -NEG-INDIC.3SG
'He still hasn't come <u>yet</u> .' |
|-----|--|-----|---|

However, the same is true of the position of adverbs and negation in English. Consequently, we assume the same syntactic principles are responsible for position of adverbs and negation in Inuit.

²⁴ These adverbs are perhaps better translated as “with quietness” and “with slowness.”

elements are being used adverbially, the use of case morphology suggests that they are DPs in the syntax. If this is correct, the phonological independence of derived adverbs is predicted under the analysis that CP and DP phases are mapped to phonological words. Similarly, the set of true adverbs are correctly predicted to appear inside the CP word (the verbal complex), since as AdvPs they do not correspond to either DPs or CPs.

3.6. On the Distribution of Lexical and Functional Elements

Importantly, the membership of the closed classes of (i) noun-incorporating verbs; (ii) predicate incorporating verbs; (iii) purely attributive adjectives; and (iv) true adverbs offer a strong argument against an analysis that posits that affixal status is marked on each lexical item. It is no coincidence that each of these sets contains a highly predictable class of semantically related elements and that they occur in specific syntactic environments.

To begin, Johns (2006, to appear) demonstrates that noun-incorporating verbs are in fact light verbs, based on their relative semantic underspecification and their full productivity²⁵ (see also Mithun 1999). This set consists of items with such meanings as *have, lack, be, become, get, lose, make, consume, seek*, etc. Notice also that many of these verbs have a wide array of polysemous uses in other languages such as English. An analysis that approached noun incorporation in terms of each of these verbs being marked in the vocabulary as affixal would essentially treat their semantic relatedness and affixal status as a coincidence.

Similarly, the set of predicate incorporating verbs examined by Johns (1999) and Pittman (2006a, b) appears to form a salient class that Dixon (2006) labels “secondary

²⁵ For instance, the NI verb *-tuq-* ‘consume’ can mean *eat, drink, or smoke* depending on the object.

concepts,” which includes, among other things, complement-clause-taking verbs and modals.²⁶ He observes that, cross-linguistically, these verbs cannot be used alone and require another verb (either overtly or implicitly). Again, it would be advantageous to explain why this related class of verbs and modals are all affixal.

The set of purely attributive adjectives also appear to form a salient semantic class. Partee (2007) (following Montague 1970, inter alia) describes three semantic types of adjective denotations; intersective, subsective, and privative. While intersective adjectives such as *purple* or *carnivorous* will satisfy the meaning postulate in (59), having denotations that simply intersect the nouns they modify, subsective adjectives such as *good* or *skillful* select a particular subset of the noun they modify as in (60), while privative adjectives such as *counterfeit* or *fake* will also require a more complicated denotation than mere intersection, as shown in (61) (p.151):

$$(59) \quad \llbracket \text{CARNIVEROUS N} \rrbracket = \llbracket \text{CARNIVROUS} \rrbracket \cap \llbracket \text{N} \rrbracket$$

$$(60) \quad \llbracket \text{SKILLFUL N} \rrbracket \subseteq \llbracket \text{N} \rrbracket$$

$$(61) \quad \llbracket \text{COUNTERFEIT N} \rrbracket \cap \llbracket \text{N} \rrbracket = \emptyset$$

Compton (to appear) argues that the set of purely attributive adjectives in Inuktitut consists only of adjectives with non-intersective denotations; specifically, adjectives with privative and subsective denotations. Adjectives of this type with intersective denotations, such as colours, geometric shapes, materials, origin, etc. are completely absent. For instance, in Fortescue (1980)’s list of “nominal modifiers”, not a single item with adjectival meaning satisfies the meaning postulate in (59) above. Instead we find

²⁶ Dixon’s use of the term *complement clause* does not appear to imply the syntactic level CP. For instance, he uses the term to refer to non-finite/ECM constructions where the CP layer may be absent in recent formulations of Minimalism, in which agreement features are inherited from C (Chomsky 2006, 2007).

adjectives with meanings such as *-araq* ‘small’, *-tsiaq* ‘fair-sized’, *-kkajaq* ‘rather big’, *-pajuk* ‘bad’, *-tsialaq* ‘good/nice’, *-(r)piaq* ‘real’, *-nnguaq* ‘small/dear’ (also meaning ‘counterfeit’ or ‘pretend’ in Canadian dialects), *-taaqaq* ‘new’, *-tuqaq* ‘old’, etc.; all of which have non-intersective meanings.²⁷ Yet again, an affixal analysis whereby these adjectives were labelled individually would treat membership in this highly predictable class as coincidental.

The set of true adverbs is similar. Among the many “verbal modifiers” listed by Fortescue, thirty-four are grouped under “degree,” twenty-two are labelled “frequency and duration,” and twenty-five are called “manner” (although many of these involve time, speed, and movement).²⁸ Once again, this set of elements appears to form a natural class, coinciding with the functional projections proposed in Cinque (1999). For instance, the following projections correspond to Fortescue’s “degree” adverbs (Cinque, p.106; Fortescue, pp. 276-277):

(62) $Asp_{\text{prospective}}$ (e.g., *almost*)

-ngajaq
‘almost’

(63) $Asp_{\text{SgCompletive(I)}}$, $Asp_{\text{PlCompletive}}$ (e.g., *tutto*), and $Asp_{\text{SgCompletive(II)}}$ (e.g., *completely*)

-(r)luinnar
‘completely’

-qqig
‘completely’

-vig, -vissur
‘really/completely’

²⁷ The adjectives listed in Fortescue (1980) also appear to correspond to what Dixon (2004) calls the “four core semantic types, which are typically associated with both large and small adjective classes” (p.3); DIMENSION, AGE, VALUE, and COLOUR. While the first three types are represented among this class of attributive adjectives in Inuit, colour adjectives are notably missing, arguably because they have intersective meanings. Dixon also notes that there exist other languages whose adjective can only be used attributively to modify a noun, such as Malayam (Dravidian), Hua (Papuan region), Yoruba (Kwa/Niger-Congo), and Dagbani (Gur/Niger-Congo) (p.28).

²⁸ Fortescue also includes a class of “phase of completion” adverbs; however, many of these affixes subsume negation and aspect. We assume that these elements correspond to NEG and ASP heads in the syntax.

Similarly, the following projections seem to encompass all the “frequency and duration” adverbs in Fortescue’s list.

- (64) Asp_{habitual} (e.g., *usually*) and Asp_{frequentative(I)} (e.g., *often*)
- | | | |
|----------------------|--------------------|--------------------|
| -(s)ar(i) | -gajug | -kalua(ar) |
| ‘repetition/habit’ | ‘often/habitually’ | ‘often/habitually’ |
|
 |
 |
 |
| -saannar | -sar | |
| ‘often/all the time’ | ‘repetition/habit’ | |
- (65) Asp_{repetitive(I)} (e.g., *again*)
- | | | |
|-------------------|-------------------|-----------------|
| -(sur) | -qattar | -qqig |
| ‘repeated action’ | ‘again and again’ | ‘again/further’ |
- (66) Asp_{continuative} (e.g., *still*)
- | | |
|----------------------------|----------------------|
| -gallar | -juar |
| ‘still/for the time being’ | ‘continuously/still’ |
- (67) Asp_{perfect(?)} (e.g., *always*)
- | | |
|----------------------|----------------------|
| -(tu)innar | -juaannar |
| ‘always/continually’ | ‘always/continually’ |
- (68) Asp_{durative} (e.g., *briefly*)
- | | |
|---------------------|-----------------|
| -llatsiar | -mmirsur |
| ‘for a short while’ | ‘for some time’ |

Notably absent from Fortescue’s extensive list are adverbs describing emotion (e.g., *happily, nervously, jealously, etc.*), adverbs describing an opinion of the situation (e.g., *interestingly, luckily*), and adverbs referring to specific points in time (e.g., *yesterday, now*). Many such concepts appear instead to employ the derived (i.e., nominalised) adverbs discussed earlier, while others appear to be inherently nominal (e.g., *today, here, now, etc.*). Once again, there is no principled reason that such a consistent class of adverbs should all be marked as affixes in the lexicon. Instead, we suggest that such

adverbs correspond to the functional projections proposed by Cinque, while other, perhaps less functional adverbs must be derived from nouns and verbs. This analysis strongly predicts that no bound adjective or adverb will be highly contentful.

In sum, an analysis where lexical items are haphazardly marked as affixal would fail to capture the generalisation that membership in the sets of light verbs, “affixal” verbs, attributive adjectives, and true adverbs is highly predictable and that they form strongly related semantic classes. Instead, it is the semantic properties of each set that determine its subcategorisation properties or position in the syntax; noun-incorporating verbs select bare NPs, predicate incorporating verbs select for either ν P or TP, purely attributive adjectives can occur inside bare NPs, and true adverbs can select for (or be selected by) an unknown number of projections inside CP.

3.7. Conjunctions, Pronouns, Demonstratives, and Wh-words

Further evidence that words in Inuit are mapped from CP and DP phases comes from the phonological behaviour of conjunctions, pronouns, demonstratives, and wh-words.

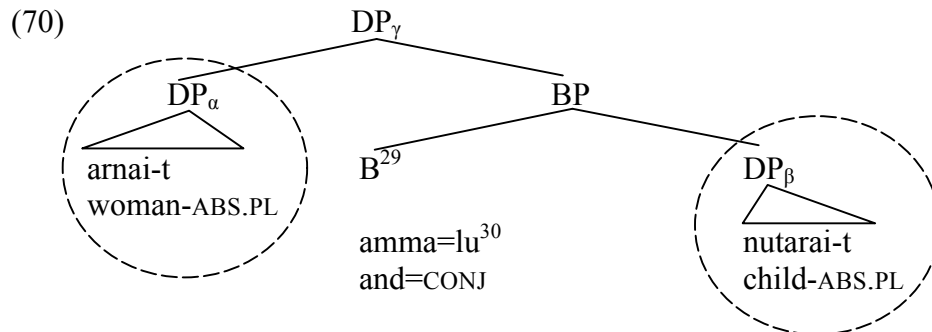
Given the analysis that CPs and DPs form words, we might expect to find conjunctions affixed onto clauses and arguments, since they should not be able to form a phases alone. However conjunctions surface as separate words, as in (69):

- (69) *arnai-t* *amma=lu* *nutarai-t* *sanangua-liu-lauq-tuit*
 woman-ABS.PL and=CONJ child-ABS.PL carving-make-DIST.PAST-DEC.3PL
 ‘The women and the children made carvings.’

While each conjunct consists of a DP, the entire expression is also a DP (see Munn 1993).

After each conjunct is spelled out, the conjoining element is the only element unique to

the larger DP phase, and thus is realised alone as a separate word, as schematised in (70) below:



A similar analysis seems appropriate for conjoined CPs. It should be noted that VPs and APs do not appear able to be conjoined.

Finally, we must account for the phonological behaviour of demonstratives, wh-words, and pronouns. We claim that these too are nominal, allowing the same case and number morphology as other nominals, as illustrated in (71)-(73) below. Furthermore, they can act as arguments, as in (74), and are able to appear with the bound (attributive) adjectives, as in (75):

(71) una inuk³¹
 this.one(ABS) person(ABS)
 ‘this person’ (Sadock 2003, West Greenlandic)

(72) uva-ptun pi-ung
 1SG.PRONOUN-SIMILARIS do-IMPER.2SG/3SG
 ‘Do it like me!’ (Lowe 1985, Siglit)

²⁹ It might also be the case that the conjunction is internally complex, possibly even constituting a DP.

³⁰ We ignore the enclitic *lu* which on its own also seems to possess the meaning of ‘and’/‘also’. This clitic can also occur on both conjuncts. The following examples are from Harper (1979).

- a) uvanga=lu
 I.SG(ABS)=lu
 ‘Me too.’
- b) arnar=lu anguti=lu
 woman=lu man=lu
 ‘a man and a woman’

³¹ When acting as modifiers, demonstratives appear to be in apposition with the arguments they modify.

- (73) su-min qai-vit
 who-ABLAT come-INTER.2SG
 ‘Where did you come from?’ (Lowe 1985, Siglit)
- (74) sana-lauq-tara una
 make-DIST.PAST-DEC.1SG.3SG this.one(ABS)
 ‘I made this one.’
- (75) taimna-aluk
 that.one(ABS)-old/former
 ‘that one from a long time ago’ (Lowe 1984, Siglit)

These examples show that when demonstratives, pronouns, and wh-words bear case and number, they form separate phonological words.

However, when they do not have case and number morphology, wh-words can also undergo incorporation, as illustrated in Sadock (1980) (p.312):

- (76) su-mik neri-vit (West Greenlandic)
 what-INST eat-INTERR.2SG
 ‘What did you eat?’
- (77) su-tor-pit (West Greenlandic)
 what-eat-INTERR.2SG
 ‘What did you eat?’

Again, with case and number the wh-word in (76) is a separate phonological word, while without case and number morphology a wh-word must incorporate, as in (77).³²

As illustrated earlier for nouns, the phonological behaviour of pronouns, demonstratives, and wh-words appears to correlate with morphological exponents of the

³² This suggests that wh-words (in this dialect, at least) are nouns. It may be that there is dialectal variation as to whether wh-words, pronouns, and demonstratives can incorporate. Our analysis might attribute this to their category as either nouns or determiners. In dialects where they can undergo incorporation, they are nouns (see Panagiotidis 2002 for an analysis of Japanese and Thai pronouns as nouns), while in other dialects where they do not incorporate, they correspond to entire DPs or intransitive determiners.

DP layer. Furthermore, the phonological independence of conjunctions is predicted under the present analysis.³³

3.8. “Stem” Ellipsis

We have been arguing that simply specifying that morphemes are affixes misses the generalization that affixhood is predictable in the language. One might surmise that, in Inuit, morphemes are in fact specified as to whether or not they are affixes but that only certain classes of morphemes are able to be specified as such. Alternatively, it could be that classes are specified as affixal in Inuit rather than individual morphemes, thus

³³ An anonymous reviewer points out that there is a small set of uninflected words in WG (and probably all Inuit dialects) that are referred to as particles in the literature (see Fortescue 1984). The reviewer gives the following two examples from Fortescue (1984, pp.101-103):

- a) *assut kusanar-tuq*
very be-pretty intr.-part.
'very pretty'
- b) *imaallaat filmi taana Nuum-mi taku-ara*
luckily film that Nuuk-loc see-1s-3s-ind
'Luckily I saw that film in Nuuk.'

At first glance *assut* and *imaallaat* appear to be adverbials, and thus should not form separate words under our proposal. Such words constitute potential counter-examples to our proposal. However, it is interesting to note that Fortescue states that these particles “may also be exclamatory, conjunctive, etc.” (p.98) and furthermore that some are “deictic adverbials sharing the same underlying stem with corresponding demonstrative pronouns”. As argued above, conjunctions and pronouns are compatible with our analysis, but what about the adverbials in (a) and (b)?

It turns out that these also appear compatible with our analysis. Although *assut* is translated as ‘very’ in Fortescue’s example, in Berthelsen et al. (1990)’s dictionary of WG it is also listed as meaning “hurry up”. Furthermore, the cognate *aksut* in Spalding (1998)’s West Coast Hudson Bay Inuktitut is classified as an “exhortation” with such varied meanings as “do it with force!”, “that’s right!”, and “very much so!” (p.5), suggesting to us that it is actually an interjection. Fortescue seems to support this conclusion when he states that “there are a large number of uninflected particles of an exclamatory nature which may form complete utterances” (p.29). Following Chomsky (2006), we assume that interjections lack edge features and thus are unmerged elements; “a full expression in itself” (p.5). As such, it is not surprising that these exclamatory particles are separate words.

As for *imaallaat*, its status as an adverbial also seems suspect. In Schultz-Lorentzen (1967)’s dictionary of WG *imâgdlât* (which is *imaallaat* in the older orthography) is translated as ‘even thus (against expectation)’ and ‘however’; arguably conjunctions.

Given that of the two examples of particles pointed out to us both turn out to be listed in dictionaries as other categories, we are confident that on closer inspection all such particles will be found to be interjections, conjunctions, or pronouns (as suggested in Fortescue’s discussion of them). As such, they are compatible with the analysis presented herein.

capturing the pattern that we have been discussing. However, evidence against labelling morphemes as affixes in any way comes from ellipsis in Arctic Quebec Inuit.

Dorais (1988) notes that in Arctic Quebec Inuit, speakers can optionally omit contextually salient bases (p.10):

- (78) -juujar-tuq
 -seem-DEC.3SG
 ‘looks like’
- (79) -jja-ngit-tuq
 -really-NEG-DEC.3SG
 ‘does not really’

Similarly, he observes that endings (e.g. mood/agreement) can also be dropped (p.11):

- (80) qanui-nngi-
 have.something.wrong-NEG-
 ‘doesn’t matter’

This phenomenon is discussed at length by Swift and Allen (2002). They provide evidence that this phenomenon is robust and is heard frequently among children (the source of the majority of their data) and adults. They also give many examples that show how the context allows for the ellipsis. The following dialogue contains two examples of ellipsis. The context sentence is in (81) and we see ellipsis in (82) and (83). Both examples of ellipsis show a usually bound modal verb (discussed in section 3.3 above) without its base/stem.

- (81) Anaanaa, qamutinnguarani aitsigumalirtunga
 anaana qamutik-nnguaq-ganik ai-tsi-guma-liq-junga
 mother sled-imitation-MOD.1SG get-ATP-want-ING-PAR.2SG
 ‘Mother, I want to get my toy sled now.’
- (82) Gunnailutit!
 Ø-gunnaiq-lutit
 ELLIP-no.longer-ICM.2SG
 ‘Don’t you [get it]!’

- (83) Gumavunga!
 Ø-guma-vunga
 ELLIP-want-IND.1SG
 ‘I want to [get it]!’
 (Arctic Quebec Inuit, Swift and Allen 2002, p. 146)

Such data are problematic for an affixation account since the usually bound morphemes are in their expected position, despite not having a stem to which to attach. However, they can be simply analysed as cases of ellipsis in a syntactic phase-based account of Inuit wordhood; in fact, we believe that an ellipsis account would only be possible in an approach where the non-ellided elements are not marked as affixes in the lexicon. This is because ellipsis is not usually able to target a stem, leaving behind affixal material.

- (84) *Kenji is happy but Marco is un-.
 (intended meaning: Kenji is happy but Marco is not.)

Under the present account, the utterance initial elements in the Inuit ellipsis sentences are not affixes and thus are not required to be bound. They are usually surface-attached to a stem due to their status within a larger phase. Note that these ellipsis utterances are still phases; it is simply that the lower parts of the structure have been elided. We contend that only approaches where the morphemes are not specified as affixes can easily account for the above ellipsis constructions.³⁴

³⁴ Note that not all dialects allow forms with ellipsis. We attribute this to dialectal differences whereby dialects that allow such forms permit syntactic ellipsis of constituents such as VP and (incorporated) NP, while other dialects require pro-forms such as *pi-*, which Fortescue (1984) refers to as the ‘empty stem’. This morpheme can replace both verbs (see (72) above) and incorporated nouns (Johns 2007, p.559):

- a) pi-qa-nngit-tuq
 dummy-have-neg.-intr.part.3s
 He has nothing. [Literally: He does not have something.]

3.9. Review of Evidence for Phase-Based Wordhood

In sum, constituents smaller than DPs and CPs (such as incorporated nouns, incorporated predicates, purely attributive adjectives, and what we have called true adverbs) appear inside the DPs and CPs that contain them, while constituents which correspond to DPs and CPs (such as free nouns, main verbs, verb-like adjectives, and derived adverbs) appear as separate words. Furthermore, no phonological word appears to correspond to a constituent larger than a DP or a CP: (i) noun-incorporating verbs take complements smaller than DP; (ii) predicate incorporating verbs take complements smaller than CP; (iii) attributive adjectives take complements smaller than DP; and (iv) true adverbs take complements smaller than CP.

The phonological behaviour, corresponding syntactic structure, and evidence for the structure of each of the lexical categories discussed in this section is summarised in the table below. The shaded rows indicate phonologically free elements (again, corresponding to DPs or CPs) while the unshaded rows indicate smaller constituents which must appear inside larger CP/DP words:

Fig. 1 Summary of Word-hood evidence

Element	Phonological Word Status	Evidence for Constituency	Syntax
nouns (open class)	free from verbal complexes	case; number	$\begin{array}{c} \text{VP}^{35} \\ \wedge \\ [\text{DP}]_{\omega} \text{ [V... } \omega \end{array}$
incorporated (object) nouns (selected by a closed class of v^0)	part of a verbal complex	no case; no number	$\begin{array}{c} \text{vP} \\ \wedge \\ [\text{NP} \text{ v... } \omega \end{array}$
verbs (open class)	can be the sole verbal element in a verbal complex	mood; use as sole predicate	$\begin{array}{c} \text{CP} \\ \wedge \\ [\text{V...}]_{\omega} \end{array}$
'predicate incorporating' verbs (closed class)	cannot be the sole verbal element in a verbal complex	no mood on lower predicate (TP/vP)	$\begin{array}{c} \text{VP} \\ \wedge \\ [\text{TP/vP} \text{ V}^0 \text{... } \omega \end{array}$
verb-like adjectives (open class)	free from nouns/verbs	can be used as an argument; can bear case	$\begin{array}{c} \text{DP}_{\text{MODIFIER}} \\ \wedge \\ [\text{AP...}]_{\omega} \end{array}$
		can be used as the main verb; can bear tense, mood	$\begin{array}{c} \text{CP} \\ \wedge \\ [\text{AP...}]_{\omega} \end{array}$
attributive adjectives (closed class)	part of the modified NP	no case, no number; no use as arg./pred.; no tense, mood	$\begin{array}{c} \text{NP/AP}^{36} \\ \wedge \\ [\text{N(P)} \text{ A(P)... } \omega \end{array}$
"derived" adverbs (open class)	free from nouns/verbs	case morphology	$\begin{array}{c} \text{DP}_{\text{ADVERBIAL}} \\ \wedge \\ [\text{XP}^{37} \text{...}]_{\omega} \end{array}$
"true" adverbs (closed class)	part of the verbal complex	no case	$\begin{array}{c} \text{XP/AdvP} \\ \wedge \\ [\text{X(P)} \text{ Adv(P)... } \omega \end{array}$

³⁵ To ease comparison with the data, we use right-headed structures.

³⁶ Whether adjectives and adverbs are specifiers of the elements they modify or whether they instead head projections that dominate the elements they modify is beyond the scope of this paper.

³⁷ These adverbs can be derived from various categories (see examples (56)-(57) above).

As illustrated in Fig. 1, there is no evidence of phonological words containing more than a single CP or DP, as schematised in (85) below.

$$(85) \quad *[[\dots]_{CP/DP\dots}]_{XP=\omega}$$

Instead, we have observed a consistent correlation between DP and CP constituents and words in the language.

We have argued that the semantic unity of the closed classes of noun-incorporating verbs, predicate incorporating verbs, attributive adjectives, and true adverbs conflicts with an account which posits that affixal properties are diacritic (i.e., properties of individual lexical items). Instead, their apparent affixal status is predicted by their selectional properties and the theory presented in section 2.

Similarly, the wordhood of conjunctions, pronouns, demonstratives, and wh-words, all of which are functional elements, is evidence against an account which proposes a PF constraint in the language requiring that phonological words contain lexical roots (see Johns 2007 for wh-words as roots). Once again, the phonological independence of these functional items is predicted under our analysis.

Finally, we argued that the ellipsis constructions found in some dialects of Inuit offer further evidence that morphemes are not specified as affixal in the language. Instead, the usual bound status is a result of the syntactic structures in which the morphemes are usually found.

4. Alternative Accounts of Inuit Morphology

In this section, we examine previous analyses of Inuit morphology. We argue that previous accounts require a special generative morphological component (i.e. specific word-formation rules) and the idiosyncratic marking of affixes. We will see that in

requiring an additional generative component for a polysynthetic language such as Inuit, this type of approach is more complicated than the analysis we have proposed above.

4.1. Fortescue (1980)

In order to derive the morphology of West Greenlandic, Fortescue (1980) presents a set of recursive derivation rules. The seven word-structure rules are as follows³⁸ (p.261):

- (86)
- a. $V \rightarrow V_b (+ V_s) + \text{Infl}$
 - b. $V_b \rightarrow \left\{ \begin{array}{l} V_b \\ N_b + V_r \end{array} \right\} (+ V_e) (+ V_{\text{neg}}) (+ V_{\text{mod}})$
 - c. $V_s \rightarrow (V_{\text{ten}}) (+ V_{\text{ep}}) \left\{ \begin{array}{l} (+ V_{\text{neg}}) (+ V_{\text{sub}}) \\ (+ V_{\text{conj}}) \end{array} \right\}$
 - d. $V_{\text{mod}} \rightarrow V_{\text{mod}} (+ V_{\text{mod}})$
 - e. $V_{\text{sub}} \rightarrow V_{\text{sub}} (+ V_{\text{sub}})$
 - f. $N_b \rightarrow \left\{ \begin{array}{l} N_b \\ V_b + N_r \end{array} \right\} (+ N_e) (+ N_{\text{mod}})$
 - g. $N_{\text{mod}} \rightarrow N_{\text{mod}} (+ N_{\text{mod}})$

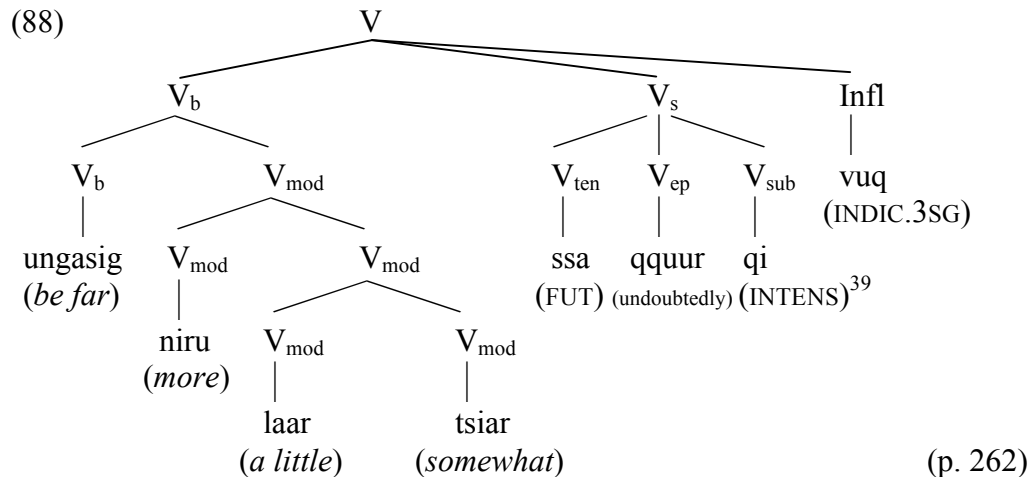
In addition to these rules, Fortescue posits a “global scope rule” whereby “each successive affix simply modifies what is immediately to its left, that is, is superordinate in scope to everything to its left within the word” (p.260). Thus, a ‘verb’ such as (87) below (p.261-262) can be derived by first applying rule (85a) to obtain a verbal base, a

³⁸ Fortescue’s abbreviations include: V_b verbal base, N_b nominal base, V_s sentential verbal affix, V_r verbalizing affix, N_r nominalizing affix, V_e verbal base-expanding affix, N_e nominal base-expanding affix, V_{neg} negation, V_{mod} verbal modifier, N_{mod} nominal modifier, V_{ten} tense, V_{ep} affix of epistemic modality, V_{conj} conjunctive affix, and V_{sub} affix of subjective/narrative coloration.

domain of sentential affixes, and inflection, followed by (85b) to add modifiers, rule (85d) to obtain recursive modification, and finally (85c) in order to add tense, an epistemic affix, and a subjective/narrative affix to the sentential domain.

- (87) ungasinnirulaatsiassaququaaq
 ungasig-niru-laar-tsiar-ssa-qquur-qi-vuq
 be.far-more-a.little-somewhat-FUT-undoubtedly-INTENS-INDIC.3SG
 ‘It will undoubtedly be somewhat further off.’

The rules employed to create the above “verb” also allow Fortescue to generate the hierarchical structure in (88) below:



Notice that the specific order of verbal modifiers in this example is determined by the global scope rule; *tsiar* ‘somewhat’ modifies *laar* ‘a little,’ which in turn modifies *niru* ‘more.’

Fortescue admits that his rules overgenerate, permitting combinations of affixes that do not occur, such as an epistemic affix (e.g., *qquur* ‘undoubtedly’) with interrogative mood. In addition to the rules outlined above, he concludes that “semantic filtering” is required to rule out these combinations. While we do not consider this filtering mechanism in detail, we assume it would resemble LF in minimalist theory.

³⁹ While Fortescue glosses this morpheme with an exclamation mark, in the text he refers to it as an intensifier.

While Fortescue maintains that the system of “internal syntax” (i.e., morphology) that he is analysing must be treated separately from “external syntax” (i.e., the syntax of isolating languages), the rules in (86), the global scope rule, and the semantic filtering he suggests bear a striking resemblance to the syntax (and semantics) of more isolating languages. For instance, the global scope rule parallels the c-command and dominance relations, semantic filtering resembles selection and semantic composition at LF, and the rules in (85d), (85e), and (85g) simply allow recursive modification, a basic property of any language. Moreover, the remaining rules mirror the commonly assumed order of functional projections (cf. Cinque 1999). For example, consider rules (85a)-(85c). Together, they delineate the following maximal order (ignoring iteration and noun incorporation):

- (89) verbal base > verbal extender > negation > verbal modifier > tense > epistemic modality > negation > subjective/narrative > inflection

If we note that the set of “verbal extenders” listed in Fortescue are in fact the types of “affixal” verbs discussed in section 3.3 (e.g., *ar/ur* ‘say’, *tit* ‘think that’, etc.), and that both “verbal modifiers” (e.g., *jaar* ‘early,’ *juaannar* ‘always/continually,’ etc.) and the set of “subjective/narrative” affixes (e.g., *(s)innar* ‘just’) appear to correspond to different types of adverbs, the following picture begins to immerge:

- (90) V > V/v > Neg > Adv > T > Modal > Neg > Adv > Infl⁴⁰

This is clearly an inverted string of the contents of a CP. Similarly, rule (85f) echoes the order of elements inside an NP, with “nominal extender” corresponding to derivational

⁴⁰ *Infl* here refers to the mood/agreement morphemes.

morphemes⁴¹ (e.g., *miu(q)* ‘inhabitant of,’ which similarly has derivational equivalents in English: ‘(Vancouver)-ite,’ ‘(Boston)-ian,’ (New York)-er,’ etc.) and “nominal modifier” being the class of attributive adjectives discussed in section 3.4.

In sum, the data presented in Fortescue (1980) and the descriptive generalisations contained within his rules can be accounted for with minimalist syntax. Furthermore, as we have argued in sections 2 and 3, a theory in which phonological words correspond to phases can account for which constituents can and must appear inside a given word, something which is lacking in Fortescue’s system. For example, in his system it is simply stipulated that tense (or negation, or modals, etc.) must appear within the verbal complex, while our system predicts that this is due to the fact that such items are not full CPs or DPs. In addition, the conclusion that such functional items do indeed correspond to the functional projections observed in other languages (e.g., CP, TP, *v*P, etc.) is favourable since it suggests that Inuit and more familiar languages employ the same generative mechanisms. It is not the case that Inuit employs a morphological component while more isolating languages employ a distinct syntactic component; instead, a single syntactic component derives both Inuit and isolating languages. Under Fortescue’s model it is not clear what role, if any, syntax would have.

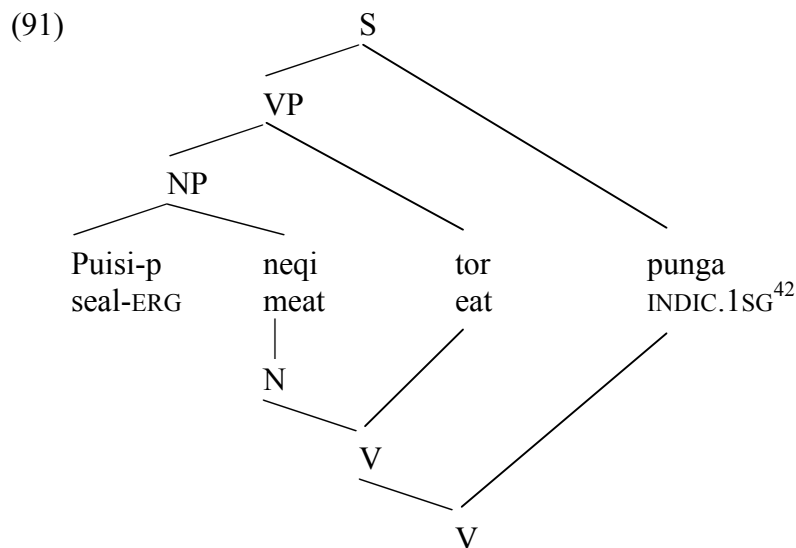
4.2. Sadock (1991)

In *Autolexical Syntax*, Sadock presents an alternative model of grammar in which syntax, morphology, and semantics are housed in separate modules that work simultaneously to generate utterances. While a full critique of this theory and Sadock’s

⁴¹ Fabb (1988) argues that even derivational morphology can be accounted for in terms of selection, contra a level-ordering analysis. He notes that “level-ordering does no extra work in ruling out suffix pairs beyond that done by independently needed selectional restrictions” (p.538).

application of the theory to a number of grammatical phenomena in various languages is beyond the scope of this paper, we will summarise the central claims of the theory and briefly discuss the theory’s treatment of noun incorporation in West Greenlandic.

The theory of Autolexical Syntax aims to explain mismatches between syntax, morphology, and semantics, in particular, the dual syntactic and morphological properties of cliticisation, noun incorporation, and affixation. Sadock proposes that strings possess not only syntactic structure, but also distinct hierarchical structures in separate modules of morphology and semantics. Accordingly, syntactic constituents need not necessarily correspond to morphological or semantic constituents, and vice versa. To illustrate this redundancy and modularity, Sadock uses dual structures such as (91) below:



‘I ate seal meat.’

(p. x)

Thus, while in the higher syntactic tree, the possessor *puisip* ‘seal’s’ modifies *neqi* ‘meat’ and the latter is also the object of the verb *tor* ‘eat,’ in the lower morphological structure, *neqi*, *tor*, and the inflectional ending form a “verb” and *puisip* is a separate word. Sadock

⁴² Morphemic gloss and translation added.

argues that a theory employing separate modules can account for such discrepancies between syntax and morphology.

In his examination of noun incorporation, Sadock demonstrates that West Greenlandic differs from a language like Mohawk in which incorporation appears to be purely morphological. Instead, he argues that noun incorporation in West Greenlandic (and other languages) also displays syntactic properties, such as productivity⁴³ (contra the argument that noun incorporation is lexicalised), referentiality (introducing discourse referents and even proper names), the complementary distribution of objects and incorporated objects, and the stranding of object modifiers. Sadock concludes that West Greenlandic noun incorporation necessitates a dual analysis to reconcile these syntactic properties with the surface morphology.

However, it is not clear that noun incorporation provides evidence for a separate generative morphological component.⁴⁴ As we have argued, the surface phonological position of incorporates, as well as a number of other constituents, is predictable from their syntax. Positing a distinct morphological module with its own set of rules is unnecessary. Furthermore, our analysis simultaneously accounts for the position of incorporated nouns, purely attributive adjectives, predicate incorporating verbs, true adverbs, and a number of functional projections. Under Sadock's account, each of these phenomena would require a separate treatment, or, at the very least, affixal properties

⁴³ Sadock numbers the possible grammatical combinations of nouns, incorporating verbs, nominal and verbal modifiers in West Greenlandic at approximately two and half billion (p.84).

⁴⁴ Equally, it is not clear that discrepancies between the syntactic position and the surface phonological position of clitics or affixes constitute evidence for a morphological module. Clitics might well be repositioned for purely phonological reasons. Also, many other morphology/syntax mismatches can be captured with a late-insertion model, such as Distributed Morphology. For example, a single vocabulary item might correspond to two or more heads in the syntax or several vocabulary items might correspond to the features of a single head.

marked on all of the relevant lexical⁴⁵ and functional items, which would obscure the observation that they each involve a predictable set of elements and a predictable structure (i.e., structures smaller than DP or CP).

In sum, the perceived mismatches between syntax and morphology in noun incorporation are better analysed as differences between the syntax and phonology of West Greenlandic as compared with more analytic languages. First, West Greenlandic like all other Inuit dialects, possesses a set of light verbs that select bare noun phrases (although these may contain modifiers). Second, these languages apply a different level of the prosodic hierarchy to syntactic structure (i.e., phases are mapped to phonological words, as opposed to phonological phrases, as may be the case in other languages). Essentially, Sadock's theory does not offer a wider answer as to why certain constituents must form words, while others cannot. The mismatches are simply stipulated.

4.3. De Reuse (1994)

De Reuse (1994) examines the other branch of Eskimo-Aleut, analysing Central Siberian Yupik (CSY). Like Fortescue, he posits a distinction between “external syntax” and “internal syntax,” and formulates a word structure grammar to account for the latter. Furthermore, he adopts Sadock's theory of Autolexical Syntax, thereby situating the morphological analysis below in a separate module. The following rules are intended to explain the order of morphemes in polysynthetic verbs (p.95):⁴⁶

⁴⁵ We leave open the question of whether light noun-incorporating verbs are technically lexical or functional. Johns (2006, 2007) provides evidence for the latter option. The important points for the present analysis are that these verbs form a salient class and, unlike other verbs, select bare NPs.

⁴⁶ The various Vbase levels (i.e. -4, -3, -2, -1) are needed by in order to allow subparts of these “verbs” to be negated, be modified by an adverb, or contain additional verbal material. As such, these levels appear to mirror X-bar theory as well as syntactic projections such as *v*P.

- (92)
- a. V → Vbase⁻⁴ INFL⁻¹
 - b. Vbase⁻⁴ → Vbase⁻³ (NEG)
 - c. Vbase⁻³ → Vbase⁻² (CLASS-FREE)
 - d. Vbase⁻² → Vbase⁻¹ (PreAUX)
 - e. Vbase⁻¹ → Vbase (PreAUXvce)
 - f. PreAUX → PreAUX $\left\{ \begin{array}{l} \text{(PreAUXvce)} \\ \text{(PreAUX)} \end{array} \right\}$
 - g. NEG → NEG (CLASS-FREE)
 - h. CLASS-FREE → CLASS-FREE (CLASS-FREE)
 - i. INFL⁻¹ → (AUX) INFL
 - j. AUX → (MODAL) (PST) (PROG) $\left\{ \begin{array}{l} \text{(FUT)} \quad \text{(EVID)} \\ \text{(FRUSTR)} \text{ (IMP)} \\ \text{(NEG)} \end{array} \right\}$
 - k. IMPUTATIVE → IMPUTATIVE (MODAL) (PST) (PROG)
 - l. INFL → MOOD Person markers

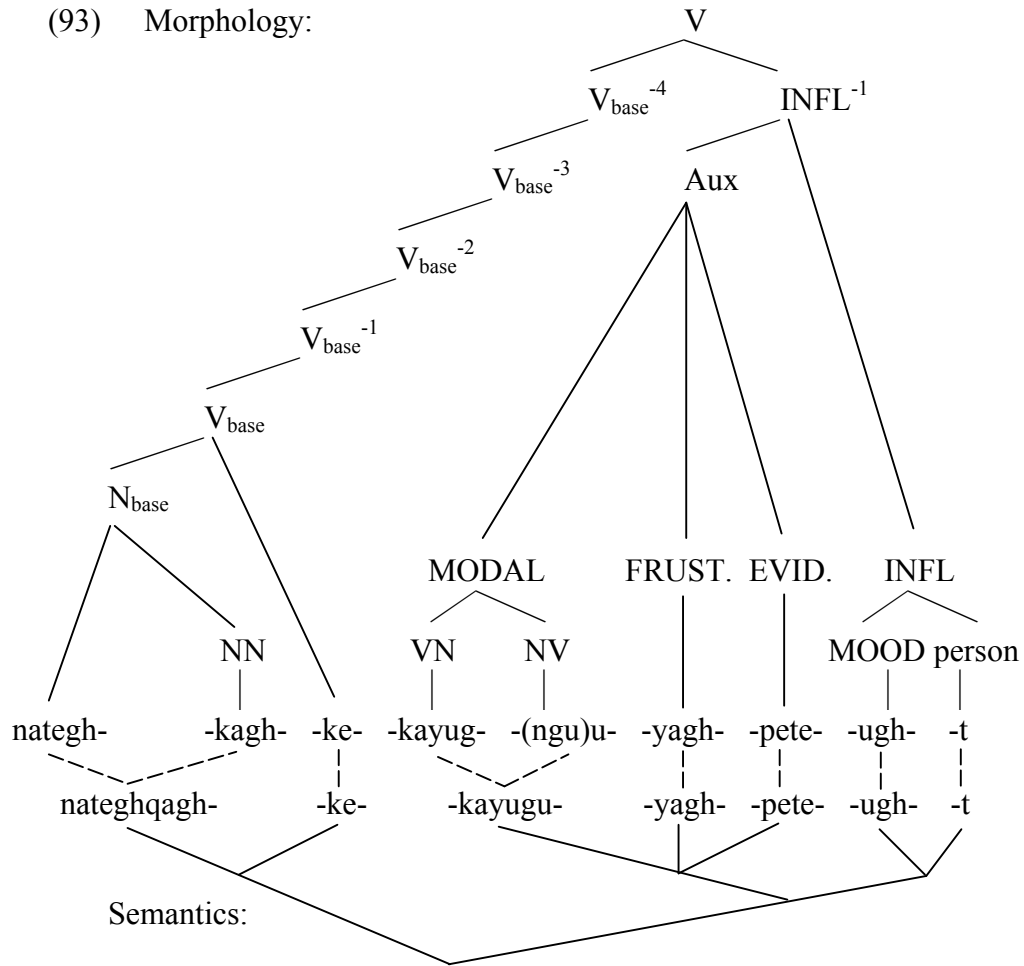
Notably, in order to improve upon the system proposed by Fortescue, de Reuse distinguishes between more types of postbases (the traditional term for such affixes in the Inuit language literature) than Fortescue, despite the fact that CSY has a much smaller inventory of verbal postbases (only 197, according to de Reuse, p.77).

While many of the categories above are self-explanatory, PreAUX and CLASS-FREE need further explanation. The PreAUX postbase type includes elements dealing with transitivity (e.g., causativisation), copular verbs (e.g., *be*, *become*, etc.), “affixal” verbs such as those in earlier sections on noun and predicate incorporation (e.g., *want*, *try*, etc.), adverbs (of degree, speed, difficulty, etc.), and aspect. According to de Reuse, the

set of CLASS-FREE postbases “all refer to a qualitative or quantitative judgement of the speaker.”

De Reuse employs the following tree to illustrate the application of some of the rules in (92) above to create a word:

(93) Morphology:



⁴⁷ De Reuse omits the derivational morphology from his gloss.

⁴⁸ Verbal and nominal category markers removed from glosses. These categories are predictable from the meaning of the morphemes (i.e., *pete* 'evidently' modifies a verb, *ke* 'have as one's' takes a noun, *kayugu* 'be able to' takes a verb, and *yagh* 'in vain' modifies a verb). Also, the inflectional abbreviations have been modified to be consistent with the rest of the paper.

The upper structure in (93) corresponds to the word formation rules, while the lower structure represents de Reuse's interpretation of the combination of elements in the semantic module.

As was observed with respect to Fortescue's analysis, the hierarchy of elements described by these rules strongly mirrors that of clauses in more analytic languages. While rules (c), (h), (g), and to some extent (d)-(f), deal with the position of different types of adverbs, Cinque (1999) also demonstrates the need for a number of positions for different classes of adverbs cross-linguistically throughout the clause. Furthermore, as illustrated in (93), the position of modals, evidentials, mood, and adverbs at the right edge of the structure is not a coincidence. The rules in (92) essentially capture an articulated CP domain (i.e., rules (a), (i)-(l)), recursive modification by adverbs (i.e., rules (c), (g), (h)), predicate negation (i.e., rule (b)), and predicate-incorporating verbs (i.e., rules (d)-(f)), all of which are amenable to a purely syntactic analysis. Moreover, like Fortescue's account, de Reuse's analysis fails to explain why such a set of rules should exist. De Reuse provides no reason why certain sets of elements form words while other combinations are impossible (e.g., non-compositional or template-like combinations). Once again, the analysis proposed in section 2 and 3 has the advantage of explaining why word classes with predictable membership consistently appear word-internally.

5. Conclusion

In this paper, we have proposed a phase-based analysis of wordhood in Inuit, arguing that CP and DP phases are mapped to phonological words at PF. This treatment of words explains the behaviour of nouns, adjectives, verbs, and functional items; constituents bearing the morphology of CPs and DPs surface as independent

phonological words, while smaller structures cannot do so. The predictable nature of noun- and predicate-incorporating verbs, attributive adjectives, and true adverbs was used as evidence against marking affixal properties in the lexicon. A syntactic approach also allows for a simple account of the “stem” ellipsis constructions.

We have formulated an analysis that explains why only certain types of morphemes can appear word-internally (a result of PF assigning phonological word boundaries to syntactically determined⁴⁹ phases). It appears that Inuit does not require its morphological component to be any more powerful than that of a more analytic language. If derivational morphology in other languages is shown to require a separate concatenating morphological component, such a component is probably necessary for Inuit. However, if derivational morphology in such languages can be accommodated within the syntax (as suggested by proponents of Distributed Morphology), the same should be possible in Inuit. We have shown that it is more than possible, and is in fact likely, that affixhood is not idiosyncratically specified on morphemes in Inuit, but that wordhood is predictably determined from the syntactic structure.

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⁴⁹ Phases are syntactically determined since it is the properties of the phase heads in the syntax which trigger spell out (e.g., v versus v^* in Chomsky 2006).

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