Challenging the syllabic model of ‘syntax-as-it-is’

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Abstract

In this paper I respond to recent claims by Carstairs-McCarthy (1998, 1999, 2000) that the structure of the syllable formed an evolutionary model for the structure of the clause. I focus on the possible parallels between syllable structure and sentence structure, and consider the plausibility of syllabic origins for the clause on the basis of how successful the proposed parallels are. I suggest that the properties of modern syntax proposed by CM as evidence for the syllabic model do not in fact support it, whilst other properties can be seen as counterevidence. Many crucial features of modern syntax, such as complement structure and subcategorization, embedding, and movement of constituents, cannot, in any case, be accounted for under the ‘syllabic model’, and notions which are central in descriptions of the syllable, such as the sonority hierarchy and phonotactic restrictions, have no counterpart in the syntax. I further argue that the proposed similarity in hierarchical structure between syllable and clause – which is central to the syllabic model – appears purely superficial when examined in detail.

Keywords: language evolution, syntax/phonology parallelisms

1. Introduction¹

Recent work by Andrew Carstairs-McCarthy (1998, 1999, 2000) has proposed that the syntactic structure characteristic of all attested languages evolved – literally – from phonological structure. Specifically, Carstairs-McCarthy (CM) claims that some primitive precursor to ‘modern’ (i.e. attested) syntax existed in the ancestral species *Homo erectus*, and that this kind of syntax was an EXAPTATION of the structure of the syllable, in the sense of Gould & Vrba (1982). This pre-modern syntax, which I will term Initial Syntax, is seen by CM as an evolutionary development which comes later than protolanguage, in the sense of Bickerton (1990, 1998, 2000a) and Calvin & Bickerton (2000): CM envisages ‘a clear-cut stage in syntactic evolution beyond protolanguage but before the fully modern stage’ (1999: 174).

There is of course no direct evidence for the properties of Initial Syntax; it is not clearly observable in the documented languages known to science, whether living or extinct. Nor do any unmistakable residues of an Initial Syntax remain – unlike protolanguage, which Bickerton has argued to be observable synchronically in a number of linguistic contexts, including child language, pidgins, and in ape ‘language’ experiments. So in arguing for the SYLLABIC MODEL for the evolution of syntax, CM relies on a comparison with the properties of the only kind of syntax for which we have evidence, namely fully modern syntax (what CM terms ‘syntax-as-it-is’): ‘In checking modern syntax against the expectations of the syllabic model, we are using modern syntax as a proxy for what the syllabic model more directly relates to: the kind of syntax that arose at the [Initial Syntax] stage of language evolution’ (CM 1999:173). CM assumes that Initial Syntax did not have all the characteristics of modern syntax, but that a number of what are now universal features, such as recursion and movement, evolved subsequent to the development of the earliest syllable-influenced syntax. However, he does not give an account of what he assumes that Initial Syntax did contain, so that we do not know which characteristics he believes were present from the earliest period at which there was any syntax at all, and which evolved later.

This gives rise to the following problem. A proponent of some model of Initial Syntax might suggest that it is unproblematic that the model does not account for some feature X, found in modern syntax, since X must have evolved later on. But no principled method has been proposed for distinguishing those features which are alleged to have occurred in Initial Syntax (and which should therefore be accounted for by any model of Initial Syntax) from those features which are alleged to have evolved later, and which therefore don’t need to be accounted for by the model. The syllabic model suffers from exactly this drawback. It is specifically proposed as an account of Initial Syntax, and by extension, of certain features of modern syntax said to have been inherited from Initial Syntax. But only those features of modern syntax which it seems expedient to ascribe to a syllabic template are attributed to Initial Syntax. This, then, is a serious shortcoming.

In this paper I concentrate largely on the following issues. Since Initial Syntax cannot be examined – there are no fossils of language – and nor can any intermediate stages be reconstructed, then from the linguistic standpoint both proponents and sceptics evaluating CM’s syllabic model must marshal linguistic evidence from modern syntax². But in fact, CM’s scenario explicitly avoids an account of what seem to most syntacticians to be the

central, criterial properties of syntax, such as complement structure and subcategorization, embedding, and movement of constituents (see also Bickerton 2000b; Carr 2000: 90; Carr, this volume; and Tallerman, to appear). I focus on the possible parallels between syllable structure and sentence structure, and consider the plausibility of syllabic origins for the clause on the basis of how successful the proposed parallels are. I suggest that the properties of modern syntax proposed by CM as evidence for the syllabic model do not in fact support it, whilst other properties can be seen as counterevidence.

Section 2 briefly outlines the major features of the syllabic model for the evolution of syntax. Section 3 examines some of the main claims this model makes, looking particularly at the proposed parallels between syllable structure and clause structure, and asks whether the clause could indeed be an exaptation of the syllable. Section 4 considers some issues arising from considerations of syntactic and phonological theory, and investigates how successful various logical extensions to the syllabic model might be. In Section 5 I discuss the emergence of true syntax, in the form of hierarchical structure with a unique set of properties, and suggest that it is not possible to assert that syntactic structure existed at the stage of Initial Syntax without also assuming that true syntax itself was present.

2. Outline of the syllabic model for ‘syntax-as-it-is’

The central claim in CM’s (1999) monograph, the major statement of the syllabic model, is that the traditionally recognized subject/predicate structure of the sentence in (2) results directly from the structure of the syllable in (1), to which it is precisely parallel. Moreover, it is not merely the hierarchical structure of the clause which CM considers to be derived from that of the syllable, but also its content (CM 1999: 172), with nouns corresponding to consonants (i.e. typical syllable margins) and verbs corresponding to vowels (i.e. typical syllable nuclei).

(adopting a traditional view of syllable structure consistent with Fudge 1969, Blevins 1995)

The following quotation encapsulates CM’s views:

[S]ince the syllable appeared as a unit of phonetic and phonological organization as soon as the lowered larynx and other vocal-tract changes made a more modern

style of vocalization possible, it is reasonable to conclude that the neural organization underlying syllable structure was co-opted to provide a syntax for strings of 'words' when the need became pressing. It was natural, therefore, that syntactic structure should possess features reminiscent of syllable structure. This [...] was neither accidental nor analogical but rather homological in the evolutionary sense: [...] it came about because sentence structure had originally the same biological basis in neural organization as syllable structure had. (1999: 148)

CM is well aware that the observation that syllable structure and sentence structure share a surface similarity is not a new one; for some recent work on the idea of a parallelism between syllable and sentence structure, see Pierrehumbert (1990), Durand (1995) and Anderson (this volume), and see Carr (2000: 90ff; this volume) for critical discussion. What is novel in CM's approach is the idea, expressed in the above quotation, that syllable structure is actually exapted for sentence structure, in the sense of Gould & Vrba (1982): this means that a structure which had evolved to fulfil a particular function is co-opted for an entirely different function, as in the case of insect wings, which evolved as heat exchange mechanisms but were exapted for use in flight.

CM envisages an evolutionary chain of events in the exaptation of syllable structure, as follows. The initial stage sees an increased repertoire of sounds becoming available to earlier hominids, resulting from a lowered larynx (which was already present to some degree in *Homo erectus*) and from other physiological changes. In particular, a wider range of distinct vowels would be obtainable, due to changes in the configuration of the vocal tract which accompany the descent of the larynx. In turn, this results in the ability to produce a large assortment of different syllables. This much is relatively uncontroversial.

One of the main features of fully-modern language which CM considers to be crucially in need of explanation is its large vocabulary size: human languages have many tens of thousands of vocabulary items, compared to at most a few dozen calls in even the most complex of animal systems. This he considers to be essentially due to an ancient primate principle of synonymy avoidance, which he assumes to have already been in place by the time the syllable repertoire was expanding. Increases in vocabulary are presumed to follow naturally as the range of syllables grows: CM proposes that there is selective pressure for expansion of vocabulary to, as it were, soak up the increased capacity for sound production. One way to expand vocabulary without having a very large but, crucially, closed call system (which imposes too much of a strain on memory) is to acquire the principles of duality of patterning, in the sense of Hockett (1960). At this point, calls start to become analysable, and thus human language alone of all animal communication systems can be analysed in terms of a finite set of combinable (but meaningless) sound segments which form an infinite (and meaningful) set of morphemes, phrases and clauses.

The next main stage envisaged by CM (1999: 134ff) centres on the principle of ONSET MAXIMIZATION in syllable structure. The universal tendency is for consonants, and in particular consonant clusters, to occur in the onset of a syllable rather than a coda (giving, for instance, the syllabification [ek\$strə] rather than [ekst\$ŕə], although both [-ks] and [-kst] are possible coda clusters in English). CM believes that onset maximization must have appeared

early on in the evolution of speech. Some support for this comes from the fact that there are currently a number of languages with only open (CV) syllables, i.e. syllables that lack codas, but very few languages for which it has been claimed that syllables always lack onsets.³ Onset maximization results in the evolution of syllables with an asymmetric structure, in which the onset has prominence in various ways over the coda. Although not all researchers support the classic structure of the syllable proposed in (1), CM reports a general agreement on the existence of three major asymmetries in the structure of the syllable:

(3) **The three asymmetries in structure in the syllable**

- a. **between nuclei and margins:** the nucleus is obligatory, it ‘defines the presence of a distinct syllable’ (1999: 140) and a syllable can in most languages consist solely of a nucleus.
- b. **between the two kinds of margins:** ‘onsets are maximized, some languages permit no codas at all, and the inventory of possible codas in a language tends to be smaller than that of possible onsets’ (1999: 141). Additionally, languages exist in which all syllables must contain an onset.
- c. **between the syllable itself and its constituents:** ‘We cannot replace a nucleus with an onset, or a coda with a rhyme, and still have a well-formed syllable. Above all, we cannot nest syllables in syllables, by filling the onset, nucleus or coda position with a syllable’ (1999: 143).

CM’s claim is that the asymmetries in the structure of the syllable have exact parallels in syntax, as a consequence of syntactic structure being an exaptation of syllable structure. Under this view, the universal S/NP dichotomy follows because syntactic structure evolved with the same division into nucleus vs. margins as the syllable, and this translates into the structure in (2): just as syllable margins are distinct from syllables, so sentence margins (NPs) are distinct from sentences (CM 2000: 253). The three asymmetries in (3), originating in the syllable, are expanded by CM into a checklist of six characteristics which, he argues, can be observed in modern syntax (CM 1999: 151):

(4) **Proposed asymmetries in syntactic structure**

- a. ...[E]ach sentence obligatorily contains a nucleus-like position.
- b. This nucleus-like position is filled by a class or classes of words that are substantially but not completely distinct from the classes of words that fill constituents occupying margin-like positions.
- c. Substantially the same classes of words are found in all constituents occupying margin-like positions.
- d. Some non-nuclear constituent(s) are privileged in onset-like fashion.
- e. A sentence cannot occupy the nucleus-like position in a larger sentence.
- f. A sentence cannot occupy a margin-like position in a larger sentence.

In the following section I will consider the predictions made by the syllabic model in more detail, comparing sentence structure with syllable structure. In particular, I will investigate whether the characteristics predicted actually do occur in modern syntax or not.

3. The asymmetries considered: syllable structure and clause structure

This section considers some specific questions raised by the checklist of asymmetries proposed by CM in (4) above, and also compares explicitly the kinds of relationships that occur in the syllable with those occurring in the sentence, to see if there are genuine correspondences. The results suggest that some of the most crucial properties of syntax-as-it-is cannot have an origin in syllable structure, since they have no counterpart in the behaviour of constituents within the syllable. Conversely, many aspects of behaviour within the syllable have no counterpart in the clause.

3.1 Embedding and recursion

I turn first to the final two points on the checklist, (4)e. and (4)f., which are respectively the least and most problematic. The parallelism proposed in (4)e., '[a] sentence cannot occupy the nucleus-like position in a larger sentence' (CM 1999: 151), runs as follows: in the syllable, it is impossible to replace the syllabic nucleus by another syllable, and in a sentence the verb cannot be replaced by another sentence:

- (5) *The library staff [everyone tidied the heaps of stuff away] all the books.

This point is unproblematic as far as I can see. On the other hand, as evidence for homological structure in the sentence and the syllable, it does not appear strong, particularly when any impact it might have is outweighed so heavily by the failure of the final point on the checklist, (4)f., which says that '[a] sentence cannot occupy a margin-like position in a larger sentence' (CM 1999: 151). This asymmetry does not hold, since although in the syllable, the margins cannot be occupied by another syllable, in the sentence, the margins can of course contain sentences. Recursion within noun phrases and at clausal level probably occurs in all languages, for instance in the form of clausal complements and subjects. Indeed, CM notes this as a 'major mismatch between modern syntax and what the syllabic model predicts' (1999: 155). However, he does not consider this to be problematic:

The evolutionary scenario being sketched here leads us to expect a close match not between syllable structure and *modern* syntax, but rather between syllable structure and the kind of syntax that developed at that stage in language evolution when vocal-tract changes and synonymy-avoidance principles jointly created the need for a syntax of some sort. (1999: 151)

In other words, the syllabic model is specifically intended to account for the properties of Initial Syntax. Now it is true, given this delimitation of what the model should predict, that it would hardly be reasonable to expect it to account for all the properties of fully modern syntax. However, it is reasonable to expect it to account for some properties that are truly syntactic, in the sense that they are relatively uncontroversial syntactic universals in 'syntax-as-it-is'. The clause structure given in (2) does not fall into this category, since, as pointed out below, it is not matched by non-SVO languages. It is therefore prudent to consider other probable syntactic universals. One of these features is certainly embedding.

Is there a possible origin for recursion within the syllable? CM assumes that the syllable does not exhibit the property of recursion, and thus reflects what is probably the standard view in

phonological theory (see Nespor & Vogel 1986:2). Not all phonologists agree this to be the case, however, but Carr, this volume, summarizes the issues and provides arguments against claims for recursion in the rhyme, the syllable and the (English) foot. I will assume, then, that no successful case for recursion at the syllable level has been made. There have also been proposals that recursion exists elsewhere in phonological structure: for instance, Ladd (1986) proposes recursive prosodic structure at the level of the Intonational Phrase. However, the Intonational Phrase is formulated on the basis of syntactic structure, so it must be the case that this phonological level evolved only subsequent to the development of a sufficiently articulated syntactic structure. Thus, the phonology is dependent on (and possibly an exaptation of) the syntax, in this instance: see also the similar views expressed by Elisabeth Delais-Roussarie, this volume.

Furthermore, by suggesting that features such as embedding originated later on, ‘during the course of syntactic evolution after it had been kick-started by syllable structure’ (CM 1999: 173), CM merely throws back into the ring the question of how ‘true’ syntax (including recursion) finally emerged. In fact, it seems certain that clausal embedding is hard-wired into the language faculty, since it always emerges when new languages come into existence – under traditional creolization, or in spontaneous language emergence, as in the case of Idioma de Signos Nicaragüense (Nicaraguan Sign Language); see for instance Kegl, Senghas & Coppola (1999). Although it is logically possible that the universal property of embedding emerged after the Initial Syntax stage⁴, we will see in Section 5 that it is reasonable to argue that it emerged as part of a package of properties which characterize true syntax. Therefore, if the syllabic model cannot account for one component of the package, then it is quite likely that it cannot account for any of it.

3.2 Movement

CM assumes that movement also did not evolve at the initial stage of syllable-influenced syntax. Apart from recursion, movement is probably the most significant of the remaining features of modern syntax with no analogue in syllable structure – like recursion, it appears to be a universal syntactic property⁵, and therefore, arguably, it is likely to have evolved early on. So despite the fact that CM’s proposals do not suggest this, could movement processes have evolved from any aspects of behaviour within the syllable?

One possibility for a phonological model is resyllabification, but this does not change the linear order of elements within the syllable, whereas almost the criterial property of syntactic movement rules is that they change linear order. Let us examine two representative samples of syntactic displacement. First, consider subject/auxiliary inversion in English: any finite auxiliary can move to the left of a subject. There are no parallels in the syllable. For instance, languages with CV syllables don’t allow a blanket metathesis which results in permissible VC syllables. Even in languages which allow VC syllables, these are always a restricted class in comparison with CV. Moreover, metathesis as a phenomenon is often a marginal and very restricted event, applying sporadically and in unpredictable ways to random lexical items. And metathesis is not a typical phonological process in the sense of being a typical way of expressing morphophonological alternations. Hence, it is entirely dissimilar to subject/auxiliary inversion and other syntactic movement rules; see also the points made by Carr, this volume.

Second, syntactic movement processes may allow ‘codas’ in the sentence to become ‘onsets’: in English, any truly transitive verb allows passivization, so that its direct object becomes a subject. But there is no nucleus-type in the syllable that allows codas in general to become onsets within the same syllable: we do not find processes of the type: $C_1VC_2 \rightarrow C_2VC_1$. Cross-linguistically, we typically find that not all possible codas constitute possible onsets: so for instance, English has [-ŋ\$], *sang*, but not *[\$ŋ-]. And many complex codas are not permissible as onsets, as in English [-ts\$], *bats*, but not *[\$ts-].

Another possible candidate for a phonological homologue to movement is reduplication, as suggested to me by an anonymous reviewer for *Lingua*. Reduplication could perhaps be seen as analogous to adjunction in syntax, since the reduplicated element directly precedes (or follows) the template, and there is some intuitive sense in which it leaves a trace (or more properly, a resumptive element). But there are more dissimilarities than parallels between reduplication and syntactic movement. The first problem is that reduplication is typically constrained to add material next to its template, but this is certainly not the case for syntactic movement in general (for instance, in the case of NP movement, or ‘unbounded’ wh-movement, where the foot and the head of the chain are not adjacent). Secondly, reduplication differs from syntactic movement in that it is clearly structure building, rather than structure preserving. Thirdly, and perhaps most importantly, syntactic movement is constrained to operate on syntactic constituents, but according to McCarthy & Prince (1995:333) reduplication is not constrained in this fashion: ‘[r]eduplication specifies a templatic target, not a constituent to be copied’. The following data from Ilokano plural formation illustrate one of the typical situations occurring cross-linguistically:

- (6)
a.	pu.sa → <u>pus</u> -pu.sa	‘cats’
b.	jya.nitor → <u>jyan</u> -jya.nitor	‘janitors’
c.	kal.diŋ → <u>kal</u> -kal.diŋ	‘goats’
- (McCarthy & Prince 1995:333)

As McCarthy & Prince note, the syllabic structure of the base form (open or closed) is not relevant to the process of reduplication. Although the reduplicated portion sometimes does happen to be a syllable, as in (6)c., this is merely coincidental, as (6)a. and b. show. McCarthy & Prince note that in fact, reduplication processes do not specify processes such as ‘copy the first syllable’. This is radically unlike movement processes in syntax, which could not, for instance, target one constituent plus part of the following constituent for displacement. Finally, note that there are also reduplication processes which are suffixing (see for instance McCarthy & Prince 1995:334), whereas if Kayne’s (1994) view of syntactic movement is correct, there are no rightward movements in syntax. In sum, reduplication does not appear similar to syntactic movement. It seems unlikely, then, that phonological processes such as metathesis and reduplication could have formed a model for movement in the syntax.

3.3 Nuclei, margins and sonority

Turning next to (4)b., the proposed parallel in sentence/syllable structure is that the ‘nucleus-like position is filled by [a class of elements...] substantially but not completely distinct from the classes of words that fill constituents occupying margin-like positions’ (CM 1999: 151). CM explains that in the case of syllables, vowels typically occupy the nucleus, and

consonants the margins, yet there is also some overlap: for instance, glides [j] and [w], occurring in syllable margins, really differ only in syllabic position (rather than quality) from the high vowels [i] and [u], occurring in syllable nuclei. In the case of the sentence, the idea is that the nucleus is the verb, whilst the margins are subject and object position, and verbs are indeed generally distinct in morphology and syntax from the word classes found in the margins. The overlap effect which CM sees between the categories of nucleus and margins in the sentence concerns the ability for nonnouns to be ‘marginal’ categories, and nonverbs to be ‘nuclear’ categories. So whilst inflected verbs do not typically occur in the margins, words derived from verbs may, e.g. *Writing is tedious*; *I hate singing (quietly)*; similarly, words derived from nouns can acquire verbal inflectional morphology, such as *shelve* and *house* [hauz], and these can then occupy the sentence ‘nucleus’.

In fact, the intended parallel with the syllable appears insubstantial at best. I consider first the sonority hierarchy. Although consonants (typical occupants of margins) don’t normally occupy the syllable nucleus, they may do so, as in Berber [tɾglt] ‘you locked’, [tɣzpt] ‘you stored’, [tftkt] ‘you sprained’ (Kenstowicz 1994: 278). But when consonants appear as the syllabic nucleus, they do not become vowels; they may well be the highest element on the sonority hierarchy within the syllable, but nonetheless they are not vowels. However, verbs derived from nouns truly are verbs: they no longer have the characteristics of the nouns they derive from, but instead acquire new properties which nouns cannot have, such as the ability to be transitive, and to take tense and other verbal inflections. Unlike (say) the glide [j] and the vowel [i], the noun *house* and the verb [hauz] do not differ merely in position, but in every aspect of their syntactic and morphological behaviour.⁶

An obvious question is whether there is genuinely any syntactic parallel to the sonority hierarchy itself, which is of fundamental importance within the syllable. Sonority restrictions are a set of organizing principles which constrain the form of the syllable universally, determining to a large extent the order in which elements occur within the syllable. The sonority hierarchy has vowels at the most sonorous end and obstruents at the other extreme, with nasals, liquids, and glides in between. CM suggests (1999:164, 172) that the parallel within the clause is the distinction between nouns and verbs: ‘an object-action hierarchy, with action lying at the high end’ (1999:164); ‘verbhood and nounhood are two ends of a continuum that is the syntactico-semantic counterpart of sonority within the syllable’ (1999:172). This, according to CM, is why languages do not contain expressions such as *The boy balled the kick* – the natural ‘nuclear’ element ought to be the verb, not a noun. Various problems arise with this notion.⁷

First, if there really is a syntactico-semantic hierarchy, it ought to have gradations of nounhood and verbhood, and some categories in between. The other syntactic categories, though, are not in any sense intermediate between nouns and verbs: adjectives are perhaps more verb-like than noun-like in that they can (typically) be predicates, but nouns can also be predicates; prepositions, on the other hand, are unlike either nouns or verbs, not midway between the two categories. In this sense, a putative syntactico-semantic hierarchy does not appear to be at all similar to the sonority hierarchy. There have, however, been arguments in the literature in favour of syntactic hierarchies. In the 1970s, for instance, a number of papers by J. R. Ross (for instance, 1973a, 1973b, 1975) put forward detailed arguments for scalar categories in syntax, and suggested that continua (Ross’s term is squishes) exist not only

within syntactic categories, but also between them. The idea of prototypicality is also taken up more recently within functional grammar (see for instance Croft 1991), though Newmeyer (1998: ch.4) argues against the concept of squishes and fuzzy categories in general, and defends the idea that ‘categories have discrete boundaries, [and] are not organized around central “best cases”’ (1998:208). Overall, there appears to be no support for the idea that ‘noun’ and ‘verb’ might be at opposite ends of a noun-verb continuum, whether or not major categories are themselves defined in terms of prototypes, as Croft proposes.⁸

It is worth noting, nonetheless, that one of the very continua proposed by Ross (1973b), the Nouniness Squish, is a continuum between sentences and NPs: Ross grades various types of clauses and nominal expressions in terms of their degree of nominality. Yet it is the very distinction between S and NP which CM regards as crucial support for his hypothesis (see for example CM 2000 for a succinct summary); as noted in Section 2, one of his central claims is that the S/NP distinction reflects (is homologous to) the distinction between the syllable and the syllable margins. Ross’s view is highly controversial, but it is in any case true that if there were no clearcut distinction between S and NP, then the syllabic model would be further undermined, because a key explanandum in CM’s scenario would be removed.

Second, the sonority hierarchy determines not just that the most sonorous element in the syllable will be in the nucleus, rather than the onset or coda, but it also determines a universal order for elements within complex onsets and complex codas, so that we expect to find onset sequences of [\$bl-] in many languages, but not *[\$lb-]; or [\$gr-], but not *[\$rg-]. Nothing within the clause appears analogous to this. Whilst CM would argue that nouns appear canonically at the clause margins, just as obstruents appear at the syllable margins, there is no way that verbs (or verb-like elements – auxiliaries, perhaps?) appear just to the inside of nouns, but still within the subject or object NPs, as is the case with the complex onsets and codas above.

Third, the sonority hierarchy broadly operates on a mirror-image principle on either side of the nucleus, so that the closer to the nucleus a segment occurs, the more sonorous it will be, working outwards towards the least sonorous elements at either margin. Hence we expect to find phonological segments occurring in opposite orders around the nucleus, as in <plea> vs. <alp>, <flee> vs. <elf>. Again, there appear to be no parallels within the clause. To be sure, we generally expect elements that express the morphosyntactic categories associated with verbs to appear close to the verbal ‘nucleus’. So for instance, markers of tense, aspect etc. will normally be represented either as bound morphemes on the verb stem or free morphemes either before or after the verb – but such markers are part of the verbal nucleus, rather than forming a constituent with the subject or object, and so are not parallel with the consonant clusters which are, of course, entirely within the syllable margins.

As well as the foregoing questions, a major problem with the entire notion of a nucleus vs. margins distinction – assumed by CM to form a major parallel between the syllable and the sentence – is that it could only work straightforwardly for SVO languages. For SOV languages and verb-initial languages, word orders which together represent well over half the languages currently spoken in the world, the verb fails to occur in the position of the nucleus of the sentence as premised in the structure in (2). These word order types do also have verbal elements with a syntax and morphology distinct from other parts of the sentence, in other words reflecting two distinct universal syntactic categories (one nominal and one verbal), but

the structural parallel with the syllable ‘nucleus’ and ‘margins’ can hardly be maintained.

Similarly, proposal (4)c. concerns elements occupying the sentence margins: ‘[s]ubstantially the same classes of words are found in all constituents occupying margin-like positions’ (CM 1999: 151). The idea here is that, again transparently for SVO languages, the same set of elements appear in each of the sentence margins – for instance, NPs and clauses. This property is said to parallel syllable structure in the sense that ‘sounds that can appear in the coda are of the same broad class as those ... in the onset—namely consonants’ (CM 1999: 162). Again, it is true for languages which are not subject initial that they too have the same classes of elements in, say, subject and object position. But if the idea of the sentence margins is taken literally, as it surely must be if the model is to receive empirical support, then (4)c. also fails to apply to verb-initial or verb-final languages. What, then, remains for these language types of the case proposed by the syllabic model? Since their hierarchical syntactic structure does not reflect that of the syllable in any straightforward sense, then presumably in linguistic terms we are left with just the idea that the syntax has two major universal categories, noun and verb, in imitation of the two major categories in the phonology, consonant and vowel. As evidence for an evolutionary link between the two modules of the grammar, this appears very tenuous indeed, most particularly because, as this section argues, the relationships and properties exhibited by consonants and vowels within the syllable are not paralleled by those of nouns and verbs within the clause.

CM is of course aware of the problem posed by the existence of VSO, VOS, and SOV languages – in other words, of clausal constituent orders that do not match the structure in (2). His basic position on verb-initial orders (1999:157ff) is that they are not genuinely verb-initial, and therefore do not pose a problem.⁹ SOV languages are also unproblematic according to CM, because he considers the fact that all non-verbal elements (i.e. the subject and object) precede the sentence ‘nucleus’ in SOV order to be analogous to onset maximization within the syllable. Although he dismisses the obvious problem here – namely that the elements within a complex syllable onset form a constituent, whereas the subject and object do not – this seems to me to be an insuperable obstacle to any proposal for a syllabic origin for SOV languages.¹⁰

3.4 Phonotactic restrictions and argument structure

An important way in which the syllable appears not to parallel sentence structure concerns phonotactic restrictions. At first glance it might seem that there is a direct parallel: in the clause, we have subcategorization requirements, which, like phonotactic statements, constrain what elements can appear next to each other. However, the domains over which these statements are made are not parallel. In the clause, two basic relationships must be considered: i) that between a head and its complements, and ii) that between a predicate phrase consisting of head + complement(s), and the external argument of this predicate.

The first relationship may initially appear to have some parallels within the syllable: see Anderson, this volume. For instance, there are cases in English where specific vowels in the nucleus can only occur if the syllable has a coda – but any coda will suffice. To illustrate, lax vowels such as [ɪ, æ] cannot occur as nuclei unless there is a coda, so we have [bɪt, bæt] or else [bi:] but not *[bæ, bɪ]¹¹. There are also prohibitions by particular nuclei of certain coda elements: for instance, English allows complex codas following diphthongs in words like

round but not **rounk* ; compare *hand*, *sank*, which have monophthongs and complex codas. The constraint is that a diphthong occurs only if the final C in a following complex coda is a coronal element.¹² A proponent of the syllabic model might wish to interpret these restrictions as the phonological equivalent to subcategorization, yet the similarity to complement selection and selectional restrictions in the syntax does not stand up to close scrutiny (see also Carr, this volume). There are certainly instances where, for example, a verb must be transitive – where the sentence ‘nucleus’ requires a ‘coda’. But unlike in the syllable, it is not the case that just any coda – any NP – will suffice, and crucially, we do not typically find language specific and incidental inconsistencies in syntactic subcategorization, as we do in syllable structure. A verb such as *assassinate*, for instance, requires a complement that is not only +HUMAN but also +SOCIALY PROMINENT; this is not a fact about English, but a fact about the concept of ‘assassinate’, and is thus presumably universal. Moreover, whereas restrictions on the type of ‘coda’ element that occurs with a particular verbal ‘nucleus’ are absolutely standard in the syntax, restrictions on the syllabic coda following specific nuclei are far less common. Given their rarity, it seems improbable that they could have been the evolutionary model for a syntax in which all ‘nuclear’ elements have their own selectional restrictions.

On the other hand, the second relationship, for instance between a VP predicate and a subject, appears to have no counterpart whatever – and therefore no possible origin – within the syllable. Consider the following examples:

- (7) a. Kim threw the ball.
 b. Kim threw a party.
 c. Kim threw a fit.
 d. Kim threw up her hands in despair.
 e. The pitcher threw 10 innings.
 f. The bright sun threw the mountains into relief.
- (8) a. Kim weighed the apples.
 b. Kim weighed ten stone.

We only get the appropriate semantics associated with the subject in each case by knowing the specific combination of V + complement: it’s the predicate phrase as a whole which determines the thematic rôle of the subject, not the verb alone. But there are no cases in syllable structure whereby the onset is determined or affected by the particular combination of nucleus and coda: a complex rhyme does not influence the syllable onset.

Conversely, the type of phonotactic restrictions which are commonplace within the syllable appear to have no counterpart in the syntax. For instance, many languages allow complex onsets, providing their phonotactic requirements are met: English, for example, allows [Cw-] clusters but the C cannot be a labial, giving *[bw-], *[pw-] but [kw-], [dw-], etc. But there appears to be nothing analogous to complex onsets (or, for that matter, codas) in the syntax. Complexity in syntax, but not in the syllable, is a matter of embedding within an onset or coda position: a subject that is modified by a relative clause, for instance, has a sentence within an NP.

It appears, in sum, that the relationships which are most prevalent and significant within the syntax are not mirrored in the syllable, and conversely, the facets of syllable structure

normally considered most central by phonologists are not matched by similar relationships within the clause. Nor are there correspondences between the central properties that consonants have in syllables and that nouns and noun phrases have in clauses, and the properties of vowels are similarly not matched by verbs. We might, though, conclude that the correspondence between the hierarchical structures themselves (as in (1) and (2)) is robust enough to support CM's argument (modulo the problems of non-SVO languages). In Sections 4 and 5, however, I argue that this is not the case.

4. Logical extensions and theoretical considerations

So far I have only addressed in passing the question of how the syllabic model relates to either contemporary phonological theory or syntactic theory. In this section I briefly consider some issues that arise for the syllabic model in light of general views in these quarters. I also consider some possible extensions of the syllabic model that have been discussed in the recent literature.

First, it is worth noting that there are phonological frameworks which take very seriously a presumed analogy between syntactic structure and phonological structure (as CM himself points out, 1999: 145). One of these models is Government Phonology, which does not support the notion of the 'syllable' as an independent entity at all; nor does Articulatory Phonology (see for instance Browman & Goldstein 1986). Harris (1994: 45f) argues that at least in English, no phonological phenomena 'make reference to an independent node directly corresponding to the syllable'; Harris also remarks that 'the notion has no pre-theoretical standing' (ibid). What is more, under the assumptions of Government Phonology (see for instance Kaye 1990; Kaye, Lowenstamm & Vergnaud 1990) a word such as <pit> is not syllabified in the way the syllabic model seems to expect, i.e. into an onset and rhyme, the latter consisting of nucleus and coda. Instead, under the principle of Coda Licensing, a rhymal adjunct (i.e. a coda) can only be licensed by a following onset, so that 'a form such as <pit> contains two onsets, each of which is licensed by a following nucleus, the second of which is not phonetically expressed' (Harris 1994: 161):

(9)	O	N	O	N
	[x	x	x	x]
	p	i	t	

In other words, the <t> is not a coda but the onset of a second syllable, which has a phonetically empty nucleus. As Harris notes (1994: 160), it is this principle of Coda Licensing that gives rise to the onset maximization effect. Now of course, there is no guarantee that this model of phonology is correct, but it is surely significant that despite the close links in this framework between syntax and phonology, it contains no direct phonological analogue to the simple transitive sentence. Yet in CM's syllabic model that clause type is considered the basic starting point for syntax. Nor are there any parallel proposals in syntactic quarters that 'onset maximization' causes the direct object of a simple sentence to be analysed as the subject of a second clause, which in turn has an empty verb as head. If the Government Phonology model does turn out to have general support, then the evolutionary links between phonology and

syntax as proposed by CM appear even more tenuous, firstly because there may be no ‘syllable’ to act as the model for syntax, and secondly because the phonological principle of onset maximization, on which CM places much emphasis, does not have a defensible syntactic counterpart.

I turn next to syntactic concerns. As Section 2 shows, CM takes a conservative view of sentence structure: he assumes a simple bifurcation into subject and predicate, reflecting a very traditional view of syllable structure; see (1) and (2). However, the alternative view of the syllable in (10), in which the syllabic nucleus projects into a full syllable, would actually give a closer parallel to typical contemporary views of sentence structure. For instance, in Chomskyan frameworks, at least since Chomsky (1986), I(nflection) or some equivalent functional category (T, i.e. Tense, in later work; cf. Chomsky 1995) has been regarded as the head of the clause, and thus its nucleus in CM’s sense, as shown in (11):

(cf. Levin 1985)

Furthermore, as Levin (1985) notes, the structure in (10) would seem to carry over not just into the structure of the clause, but in standard generative theory, into phrases of any category, with a specifier position (onset), a head (nucleus) and a complement (coda) – at least, such is the case if we are dealing with languages in which heads precede their complements, or if we assume that all languages are underlyingly head initial. Since most contemporary models of syntax treat sentences as just another type of phrase, then the syllabic model plainly predicts that phrases in general should manifest the properties proposed in CM’s checklist in (4).¹³

It is clear that there is a striking superficial resemblance between the structure in (10) and that assumed by syntacticians for phrases in general. Unfortunately, the similarity seems to be no more than superficial. The parallelisms with the syllable seem even less secure than in the case of the sentence. ‘Onsets’ in phrases would presumably be specifiers (just as the subject position in (11) is the specifier of IP), but unlike the syllable onset, and indeed unlike the subject position in the sentence, the onsets of phrases in general are typically filled only optionally.¹⁴ And just as we saw in Section 3 with respect to the complements of lexical verbs in the sentence, the ‘codas’ of phrases, namely the complements of the head, are consistently selected by the head in a way that seems to have no analogue in the syllable. Furthermore, the

predictions made in (4)c. suggest that margins should be occupied by similar sorts of phrases. Whilst this works in a limited sense for clauses – i.e., providing they are SVO – the ‘onsets’ and ‘codas’ of various other phrase types (e.g. AP, PP, DP) do not each contain the same categories, as pointed out by Newmeyer (2000: 289). Clearly, this is contrary to the syllabic model. Carr, this volume, also argues cogently against any parallel notion of ‘headhood’ in phonology and in syntax. In both general terms and in the specifics, then, the syllable does not seem a promising model for the evolution of phrase structure.

A further syntax/phonology parallel which might extend the syllabic model is suggested by Anderson (this volume): the proposal is for a correspondence between complement and adjunct in syntactic phrases and in the syllable. Just as adjuncts are ordered outside of complements (in English, though by no means in all languages: see van Riemsdijk (1992); Carr, this volume), according to Anderson we can consider the consonants in a cluster such as [-pt] in *capped* to consist of a complement, [p], and an adjunct [t] – hence the illformedness of the alternative *[-tp]. The adjunct [t] may also occur as a complement, as in *cat*. The problem with this proposal is that in the syllable, we do not find instances in which some segment can occur in the ‘adjunct’ position (i.e. in the outside position in a cluster) but can never occur in the complement position. In phrase structure, on the other hand, this situation is absolutely standard, as in the following representative example:

- (12) a. The gunman assassinated [the President]. (complement)
 b. The gunman assassinated [the President] [with a revolver]. (complement, adjunct)
 c. *The gunman assassinated [with a revolver].

The canonical situation illustrated here is that the verb has an NP complement and a PP adjunct, and the adjunct cannot become a complement or occur in the complement position. In syntax, adjuncts are typically, and crucially, of a different syntactic category than complements – for instance, PPs and APs rather than NPs and IPs – whereas the ‘complement’ and ‘adjunct’ in syllables are commonly of the same category, as in the examples discussed above, where both are voiceless stops – even the same stop occurs in either position. Certainly, the prototypical complements to verbs are object NPs, and adjuncts are often PPs. But even where the adjunct is an NP, it does not fulfil the same function as the complement of a verb:

- (13) *The gunman assassinated [NP this afternoon]/[NP last week].

It therefore seems improbable that the syllable truly exhibits any relationships parallel to complement and adjunct in the syntax.

Turning our attention next to the sentence ‘nucleus’, there are important ramifications for the syllabic model of the assumption that it is not the lexical verb that is the head of the sentence, but rather, an inflectional element (such as) I: see Tallerman (to appear). Consider, for instance, the generalization concerning word order in a verb-second language such as German. The requirement is for the finite element in the root clause to occur in second position; this may indeed be a lexical verb, but alternatively it might be an auxiliary, and the lexical verb will in that case be non-finite. The generalization therefore must refer to the finiteness of the inflectional element – it is this that constitutes the nucleus, at least in terms of word order. But nothing in the syllabic model leads to the expectation that some element with less lexical

content than the main verb could act as the sentence nucleus in this way: if a lexical verb is the most ‘verby’ element within the clause, then it should always be the sentence nucleus in the same way that the most sonorous element in the syllable is always the nucleus. This is problematic for the syllabic model, since it proposes that noun and verb appeared as the only two universal lexical classes because they ‘cop[ie]d] the distinction between precisely two classes of sounds: consonants (typically marginal in the syllable) and vowels (typically nuclear)’ (CM 1999:172). If the verb is not in fact the sentence nucleus, then the parallel does not stand.¹⁵

If the clause is analysed as a projection of a functional category then we have another important mismatch between the syllable and phrase structure: in morphosyntax, there is a critical and principled universal distinction between functional categories (such as auxiliaries and determiners) and lexical categories. Yet nothing analogous to this distinction appears to exist in syllable structure. As we have noted, the syllabic model takes a simplified view of clause structure (as in (2)) and so this problem is sidestepped because functional categories are not discussed. In fact this is a serious shortcoming. As Bickerton argues (see for instance Calvin & Bickerton 2000:146ff), it is likely that grammatical morphemes developed in the earliest forms of true language, via the well-known processes of grammaticalization, just as they do in documented cases of language birth such as creolization (as well as in fully-fledged languages). Bickerton sees this development as crucially beginning between the protolanguage stage and the true language stage – presumably, then, at the stage which CM’s work is investigating, and which I have called Initial Syntax. Grammatical morphemes are so central to language that it is impossible to envisage anything beyond protolanguage existing without them: see also Tallerman (to appear). If the syllable does not provide a model for grammatical morphemes, and it appears not to, then a syntactic feature which arguably was present at the stage of Initial Syntax must have evolved without any input from the structure of the syllable. Thus we have a good contender for a feature present in syntax early on in its evolution which could not have an origin within the syllable.

In sum, the syllabic model seems problematic not just from an empirical standpoint, as I have argued throughout earlier sections, but also in light of theoretical assumptions made both by (most) syntacticians and (some) phonologists.

5. Concluding remarks: on syntax and structure

We saw in the Introduction and in Section 3.1 that the syllabic model is explicitly intended to account for the properties of what we call here Initial Syntax. It is assumed by CM that this kind of syntax had important properties that are observable in modern syntax, such as hierarchical structure. For this reason, then, the syllabic model is also intended as a model of knowable syntax-as-it-is, rather than merely a model of unknowable Initial Syntax. However, many central properties of modern syntax, such as recursion and displacement, are assumed not to be present in Initial Syntax, but to have developed later.

Here I have argued that parallels proposed by the syllabic model between aspects of clause structure and syllable structure are unsuccessful, or are problematic in various ways. From a linguistic point of view, what is left intact?¹⁶ In essence, what remains is the idea that nouns and verbs were (respectively) exaptations of consonants and vowels.

Whether or not this idea stands further scrutiny, it is clear that we cannot take the further step that CM himself takes in proposing that the structures in which consonants and vowels occur were exapted for clause structure. Setting aside all the details of my arguments against the notion of parallels in syllables and clauses, the reason that this further step is impossible is that if we assume the existence of structure at the stage of Initial Syntax, then we assume the existence of (some kind of) syntax itself. But what form could that syntax take? It contains no movement, no recursion, no configurationality, no binding of anaphors, no subcategorization, no dependencies of any kind and no functional categories. But these elements are syntax: when clauses have hierarchical structure, they have all the attendant relationships and properties that go along with it. Otherwise there is no syntax¹⁷. A proponent of the syllabic model might assume, for instance, that there is a stage in evolution which does have a subject-predicate clause structure but which does not allow the arguments of verbs to be moved around, or to be null provided that their thematic roles can be deduced from the syntax. But it is only the presence of syntactic features like these that enable us to say that there is clause structure of any kind. Without them, we do not have the hierarchical structure of true syntax, but the unstructured and unordered word strings that form protolanguage.

Furthermore, if Bickerton's work is correct, the central properties of true syntax occur as a package. Bickerton (1990) proposes the following five characteristics distinguishing modern syntax from a syntaxless protolanguage:

- (14)
1. Ordering of constituents is always significant (e.g. it distinguishes between presupposed information and asserted information);
 2. the occurrence of null elements is principled and predictable;
 3. the subcategorized arguments of verbs must either be overtly expressed or else systematically related to null elements;
 4. recursion is present;
 5. function words are present.

These properties are largely interdependent (see Bickerton 1998:356), so it is logically impossible to have a syntax that only contains (say) a significant ordering of elements, but no other criterial features. In other words, one cannot have the structure of the clause that CM assumes (or for that matter, any other structure) without a concomitant package of syntactic effects, a raft of features from binding to movement.

We are left, then, with little more than the proposal that nouns correspond to consonants, and verbs to vowels – but, if the arguments in the foregoing sections are correct, the syntactic properties of each must have evolved without reference to the syllable, since the predicted correspondences in the properties of these elements are not in fact observed (in either direction), and relationships in the clause are not matched by those in the syllable, or vice versa. I conclude that a detailed examination of both syntax and phonology does not support the idea that syntactic structure is an exaptation of syllable structure.

References

- Anderson, John (this volume).
- Bickerton, Derek (1990). *Language and species*. Chicago: University of Chicago Press.
- Bickerton, Derek (1998). Catastrophic evolution: the case for a single step from protolanguage to full human language. In Hurford et al. (eds.) 341-358.
- Bickerton, Derek (2000a). How protolanguage became language. In Knight et al. (eds.) 264-284.
- Bickerton, Derek (2000b). Calls aren't words, syllables aren't syntax. Review of Carstairs-McCarthy (1999). *Psychology* 11 (114). Available at: <http://www.cogsci.soton.ac.uk/cgi/psyc/ptopic?topic=language-origins>
- Blevins, Juliette (1995). The syllable in phonological theory. In John Goldsmith (ed.) *The handbook of phonological theory*. Oxford: Blackwell. 206-244.
- Breen, Gavan & Rob Pensalfini (1999). Arrernte: a language with no syllable onsets. *Linguistic Inquiry* 30, 1-25.
- Browman, Catherine P. & Louis Goldstein (1986). Towards an articulatory phonology. *Phonology Yearbook* 3, 219-252.
- Calvin, William H. & Derek Bickerton (2000). *Lingua ex machina: reconciling Darwin and Chomsky with the human brain*. Cambridge, MA & London: MIT Press.
- Carr, Philip (2000). Scientific realism, sociophonetic variation, and innate endowments in phonology. In Noel Burton-Roberts, Philip Carr & Gerard Docherty (eds.) *Phonological knowledge: conceptual and empirical issues*. Oxford: Oxford University Press. 67-104.
- Carr, Philip (this volume). Universal Grammar and syntax/phonology parallelisms.
- Carstairs-McCarthy, Andrew (1998). Synonymy avoidance, phonology and the origin of syntax. In Hurford et al. (eds.) 279-296.
- Carstairs-McCarthy, Andrew (1999). *The origins of complex language: An inquiry into the evolutionary beginnings of sentences, syllables and truth*. Oxford: Oxford University Press.
- Carstairs-McCarthy, Andrew (2000). The distinction between sentences and noun phrases: an impediment to language evolution? In Knight et al. (eds.) 248-263.
- Chomsky, Noam (1986). *Barriers*. Linguistic Inquiry Monograph 13. Cambridge, MA: MIT Press.
- Chomsky, Noam (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.
- Croft, William (1991). *Syntactic categories and grammatical relations*. Chicago: University of Chicago Press.
- Delais-Roussarie, Elisabeth (this volume).
- Durand, Jacques (1995). Universalism in phonology: atoms, structures and derivation. In Jacques Durand & Francis Katamba (eds.) *Frontiers of phonology*. London: Longman. 267-288.
- Fudge, Erik (1969). Syllables. *Journal of Linguistics* 5, 253-286.
- Giegerich, Heinz (1992). *English phonology: an introduction*. Cambridge: Cambridge University Press.
- Gould, Stephen Jay & Elisabeth Vrba (1982). Exaptation – a missing term in the science of form. *Paleobiology* 8, 4-15.
- Harris, John (1994). *English sound structure*. Oxford: Blackwell.
- Hockett, Charles (1960). The origin of speech. *Scientific American* 203/3, 88-96.
- Hurford, James, Michael Studdart-Kennedy & Chris Knight (eds.) (1998). *Approaches to the*

- evolution of language: social and cognitive bases*. Cambridge: Cambridge University Press.
- Kaye, Jonathan (1990). 'Coda' licensing. *Phonology* 7, 301-330.
- Kaye, Jonathan, Jean Lowenstamm & Jean-Roger Vergnaud (1990). Constituent structure and government in phonology. *Phonology* 7, 193-231.
- Kayne, Richard (1994). *The antisymmetry of syntax*. Cambridge, MA: MIT Press.
- Kegl, Judy, Ann Senghas & Marie Coppola (1999). Creation through contact: sign language emergence and sign language change in Nicaragua. In Michel DeGraff (ed.) *Language creation and language change: creolization, diachrony, and development*. Cambridge, MA: MIT Press. 179-237.
- Kenstowicz, Michael (1994). *Phonology in generative grammar*. Cambridge, MA and Oxford: Blackwell.
- Knight, Chris, Michael Studdert-Kennedy & James Hurford (eds.) (2000). *The evolutionary emergence of language: social function and the origins of linguistic form*. Cambridge: Cambridge University Press.
- Ladd, D. Robert (1986). Intonational phrasing: the case for recursive prosodic structure. *Phonology Yearbook* 3, 311-340.
- Levin, Juliette (1985). *A metrical theory of syllabicity*. PhD dissertation, MIT.
- McCarthy, John J. & Alan S. Prince (1995). Prosodic morphology. In John A. Goldsmith (ed.) *The handbook of phonological theory*. Oxford: Blackwell. 318-366.
- Nespor, Marina & Irene Vogel (1986). *Prosodic phonology*. Dordrecht: Foris Publications.
- Newmeyer, Frederick J. (1998). *Language form and language function*. Cambridge, MA: MIT Press.
- Newmeyer, Frederick J. (2000). Three book length studies of language evolution. *Journal of Linguistics* 36, 383-395.
- Pierrehumbert, Janet (1990). Phonological and phonetic representation. *Journal of Phonetics* 19, 375-394.
- van Riemsdijk, Henk (1992). Complements, adjuncts and adjacency in phrase structure. In Liliane Tasmowski & Anne Zribi-Hertz (eds.) *De la musique à la linguistique. Festschrift for Nicolas Ruwet*. Ghent: Communication & Cognition. 498-512.
- Ross, John R. (1973a). A fake NP squish. In Charles-James N. Bailey & Roger W. Shuy (eds.) *New ways of analyzing variation in English*. Washington, DC: Georgetown University Press. 96-140.
- Ross, John R. (1973b). Nouniness. In Osamu Fujimura (ed.) *Three dimensions of linguistic theory*. Tokyo: TEC Corporation Ltd. 137-258.
- Ross, John R. (1975). Clausematiness. In Edward L. Keenan (ed.) *Formal semantics of natural language*. Cambridge: Cambridge University Press. 422-475.
- Tallerman, Maggie (to appear). Initial Syntax and modern syntax: an examination of the syllabic model. To appear in *Studies in the Evolution of Language* volume 3. Oxford: Oxford University Press.

1. An earlier version of parts of this paper was presented at the Fourth Evolution of Language Conference, Harvard University, March 2002. Thanks to that audience for encouragement and helpful feedback. I am also very grateful to Derek Bickerton, Phil

Carr, Mike Davenport, S.J. Hannahs, Patrick Honeybone, Anders Holmberg, April McMahon, Gary Miller, Fritz Newmeyer, and two unidentified referees for *Lingua*, for many useful suggestions and for their perceptive and searching comments on previous drafts. None of the above should be assumed to endorse what follows.

2. CM also proposes a number of non-linguistic sources of evidence for his model, including properties of the brain and aphasia, and philosophical logic, and he also considers imaginable but non-existent alternatives to modern syntax. Given the context of the current paper, as well as space restrictions, I set aside here this supporting evidence, and undertake an evaluation of the model which concentrates on the known properties of fully modern syntax.
3. One language for which it has been argued that underlying syllables have no onsets is Arrernte; see Breen & Pensalfini (1999).
4. CM does not assume that only what was present in Initial Syntax can be hard-wired in modern *Homo sapiens*, as is particularly emphasized by CM (2000).
5. Not all models of syntax recognize the existence of displacement as such, but in those that do not, such as HPSG or LFG, there are alternative but parallel mechanisms for handling phenomena (such as wh-questions) which have an ‘extraction site’. I will use the term ‘movement’ as a cover term, without prejudicing the question of whether syntactic movement per se is the right mechanism to handle these constructions.
6. Whilst denominal verbs appear to be simply verbs, deverbal nominals often retain verbal characteristics, as is well known for instance in the case of English gerundive nominals, which can continue to take objects and to be modified by adverbs. A referee for *Lingua* suggests, though, that denominal verbs are not necessarily all that verblike, citing instances such as the Turkish verb ‘telephone’, *telefon etmek*, which uses a light

verb *etmek* ‘do’ plus a (borrowed) nominal: see also CM (1999:170). The same kind of light verb construction of course occurs in English, as in *do the washing-up*, and extensively in Japanese, as in *benkyoo su-ru* (study(N) do-NONPAST) ‘study (V)’.

Nonetheless, the light verbs *do* and *su-ru* truly are verbs, as we can tell from the fact that they display characteristics such as tense and (in English) number agreement.

7. CM is of course perfectly aware that not all sentences have a verbal predicate, and that nominal and adjectival predicates are commonplace. These are not inherently problematic for the syllabic model, since the prediction is that ‘words that are relatively low in the syntactic or semantic counterpart of sonority’ may nonetheless be nuclear elements (CM 1999:153), just as we have seen that consonants may be nuclear within the syllable.
8. Proposals that syntactic categories are not primitives but consist of bundles of syntactic features, such as $[\pm N, \pm V]$ are not particularly relevant here: the point under discussion is whether there are gradations of nounhood or verbhood in the way that there are gradations of sonority.
9. A detailed discussion of CM’s position on verb-initial languages and a set of counter-arguments can be found in Tallerman (to appear).
10. Space restrictions prevent a full discussion of the issue, but Tallerman (to appear) argues in detail that there is no syntactic counterpart to a ‘privileged onset’ position in the syllable, contrary to the prediction made in (4)d.
11. The relevant constraint can also be formulated in terms of a contrast between light and heavy syllables: see for instance Giegerich (1992: 143ff). But crucially, there is no syntactic counterpart to the ‘light’ vs. ‘heavy’ distinction.
12. Thanks to April McMahon for suggesting these cases to me.
13. CM (1999: 145ff) mentions the possible parallelisms between phrases in general and

the syllable, but just in the context of arguing for phonology as the evolutionary source for syntax; the specifics of whether phrases do in fact show the predicted properties are not discussed.

14. Within Chomskyan frameworks, a subject position is often occupied by non-overt material such as the null pronominal *pro*, or PRO in non-finite clauses, but the position itself is not empty, since it receives whatever thematic rôle the predicate has to assign to the subject. In the case of verbs that do not assign a thematic rôle to the subject, the position is typically filled by an expletive element (covert or overt). An anonymous referee for *Lingua* takes issue with the idea of the subject position being obligatorily present in the sentence. If it is not, then the alleged parallels between the clause and the syllable are even less solid, since it is the unmarked case that cross-linguistically, syllables do have onsets.
15. A referee for *Lingua* suggests that if the head of the clause is I rather than the lexical verb, this in fact supports the syllabic model, since it indicates that when there isn't a readily available lexical head, we utilize whatever is available in order to 'accommodate to the syllabic template with minimum semantic inconvenience'. But if 'head' and 'complement' are not in fact valid concepts within the syllable (see also Carr, this volume), then there is no appropriate template to accommodate to. Furthermore, if the syllabic model is intended to account for the evolution of an Initial Syntax without functional categories such as I, there is no reason to believe that once these had evolved, the resulting true syntax would continue to emulate the syllabic template, but utilizing the different categories now available to it. This is important because CM apparently believes that many features of modern syntax did not evolve from syllable structure, but as noted in the Introduction, he does not suggest a

principled way to distinguish those features that are descendants of an Initial Syntax from those which are not.

16. As seen in note 2, a variety of (non-linguistic) supporting evidence for the syllabic model is considered by CM, especially in his 1999 monograph. Of course, this indirect evidence deserves careful evaluation by specialists in the various fields it encompasses, from philosophy to palaeoanthropology to neurology, but that task is beyond the scope of this paper.
17. There are, of course, languages which are purported to be ‘non-configurational’, for instance having very free word order (in the most literal sense) and numerous discontinuous dependencies. However, I am assuming that there is indeed a level at which all languages are configurational, on the basis that non-configurational languages appear to share the kinds of syntactic features and processes exhibited by ‘conventional’ configurational languages.