Sex and Syntax: Subjacency Revisited

Ljiljana Progovac

Despite the sustained effort of about forty years to analyze Subjacency, to date, there has been no principled account, with the most recent attempts faring not much better than the initial proposals. It is also significant that the seeming arbitrariness of Subjacency has been used to argue that syntax could not have evolved gradually: One does not see why evolution would target a grammar with Subjacency, when its contribution to grammar is not transparent, let alone its contribution to survival. As put in Lightfoot (1991), "Subjacency has many virtues, but … it could not have increased the chances of having fruitful sex". This article turns the argument around, and proposes that subjecting syntax to a gradualist evolutionary approach can in fact shed light on the existence of Subjacency effects. It thereby offers a reconstruction of how communicative benefits may have been involved in shaping the formal design of language.

Keywords: adjunction; co-ordination; evolution; proto-syntax; subjacency

1. What is Subjacency?

Move(ment) plays a crucial role in the mainstream theory of syntax, Minimalism (e.g., Chomsky 1995) and its predecessors alike. So, for example, *wh*-question formation is considered to involve movement of the *wh*-word or phrase from its thematic (underlying) position to the left periphery of the sentence (in English). The following examples illustrate:

(1) What do penguins eat <what>?

(2)   What does Peter think [_CP_ penguins eat <what>]?

(3)   Who(m) did Peter walk with <who(m)>?

(4)   Who(m) did you say [_CP_ Peter walked with <who(m)>]?

In (1)–(2) it is assumed that the *wh*-word *what* originates after *eat* as a complement/theme/object of *eat* (cf. echo questions such as *Penguins eat what?*), and that it subsequently moves to the front of the sentence, to the position of the specifier of CP. (The '<>' notation is used here to represent the original (pre-Move) copy of the *wh*-word.) Similar considerations hold of the *wh*-word 'who(m)' in the examples (3)–(4). It is important to note here that *wh*-movement conceived in this way can sometimes apply long-distance, that is, it can cross clause (CP) boundaries, as is the case in (2) and (4).

        In his dissertation, Ross (1967) noted that there are many types of syntactic islands, that is, constructions out of which it is not possible to move.[1] One such island is coordination — as illustrated with the minimal pairs below, it is not possible to move a *wh*-word out of a conjunct:

(5)   What did Peter eat ham with <what>?

(6)   *What did Peter eat ham and <what>?

(7)   Who(m) did Peter see Richard with <who(m)> yesterday?

(8)   *Who(m) did Peter see Richard and <who(m)> yesterday?

Notice that the echo versions below are grammatical, suggesting that the problem lies with the movement itself, rather than with the semantics.

(9)   Peter ate ham and what?

(10)   Peter saw Richard and who(m)?

In addition, movement out of subjects (11) is less acceptable than movement out of objects (12), and subjects are for that reason also regarded as islands:

(11) ?*Who did [_NP_ your loyalty to <who>] appeal to Mary?

(12)   Who did Bill question [_NP_ your loyalty to <who>]?

The following examples introduce some additional islands: *Wh*-Island, where *wh*-extraction is prohibited out of another *wh*-clause (13); Complex NP Constraint, where Move is prohibited out of a noun phrase which includes a clause, either a nominal complement clause (14), or a relative clause (15); and Adjunct Island, where Move is prohibited out of an adjunct/adverbial (16):

---

[1]   "We say that a phrase is an 'island' if it is immune to the application of rules that relate its parts to a position outside of the island" (Chomsky 1980: 194).

(13) ?*Which book did you ask John [CP where Bill bought <which book>]?

(14) ?*What did Bill reject [NP the accusation [CP that John stole <what>]]?

(15) ?*Which book did Bill visit [NP the store [CP that had <which book> in stock]]?

(16) ?*What did Peter retire [CP after Mary said <what>?]

One of the central questions of syntactic theory, if not the central question, has been what differentiates constructions that allow Move from those that do not. Typically, the assumption among syntacticians is that islandhood, that is, restrictions on Move, is the marked case, in need of explanation. This assumption has led to the expectation that there is some (abstract) principle of syntax, such as Subjacency, which accounts for all or most of the island effects. Syntacticians have thus concentrated on characterizing and defining the principles that are taken to constrain Move, including Subjacency.[2] About forty years after Ross' dissertation, no real progress has been made on this front, however: There is still no principled characterization of islandhood.[3]

Most accounts stipulate which syntactic nodes (S, NP, CP, DP, etc.), and/or which combination of nodes, and/or nodes in which syntactic positions, constitute obstacles to Move (barriers/bounding nodes/phases). The classic accounts are Huang (1982), Lasnik & Saito (1984), and Chomsky (1986). To take one example, very roughly speaking, one can account for the Complex NP constraint (14)–(15) by assuming that the NP is an obstacle to Move, to use neutral terminology. But the NP proves an obstacle only in conjunction with a clause, given that movement is otherwise possible either out of a clause as in (2) and (4) or out of an NP as in (12). Very roughly speaking again, one needs to assume that clauses and NPs are both obstacles, but that the *wh*-phrase can jump over one obstacle (at a time), even though not over two. So far, so good. But then

---

[2] Some more recent accounts (e.g., Boeckx 2008), adopt a pluralistic view of islandhood, that is, a view that islandhood is a result of the application of various principles, not just one unified principle such as Subjacency. Under this view, a unification of all islandhood is not pursued or expected (see fn. 7 for further discussion). In fact, Boeckx considers that the result of each Merge is an island, although typically not an absolute island. For him, island-hood results if too much checking affects a single item. If features to be checked can be distributed over more than one item, such as may be the case with movement leaving a resumptive pronoun, then islandhood is voided or weakened (p. 208). In other words, the islands are relativized to the amount of checking relations established and their configurations. Boeckx does acknowledge, however, that adjoined structures "have a freezing effect" on movement (p. 233), as well as that the islandhood of coordination is not captured by his, or any other syntactic theory (p. 237). Napoli (1993: 401, 409) likewise notes that "while Subjacency accounts for the Complex NP Constraint, […] the Subject Condition, and the *wh*-islands, it cannot account for the ungrammaticality of movement out of coordinate structures and out of adverbial clauses". The islandhood of coordination and adjunction is the central focus of my article.

[3] This is not meant, in any way, to denigrate the quality of research done within this approach. For even when one follows an ill-fated hypotheses, one gathers invaluable data and insights along the way. But however fine and ingenious this research may have been otherwise, and however great its contributions, in my view, it has not yielded progress on this particular front, that is, it has not provided a principled account of islandhood.

this analysis does not really carry over to other islands. When it comes to the Subject island, how does one explain why movement out of the subject NP is illicit, while movement out of the object NP is licit? In both cases, the *wh*-phrases seem to be crossing the same number of obstacles. According to Huang (1982), this is because the subjects (and adjuncts) are not 'properly governed', while objects are. In Chomsky's (1986) version, this is because subjects (and adjuncts) are not L-marked, while objects are. The appeal to either proper government or L-marking only serves to render objects/complements privileged in this respect, implicating the importance of the structural position, in addition to the nature and number of nodes crossed. But there is now no real unification of the Complex NP island, on the one hand, and subject or adjunct islands, on the other. And the problems multiply as one considers additional islands (see, e.g., Postal 1997, 1998).[4]

Within the Minimalist framework, in which proper government and L-marking are not available as theoretical postulates, Chomsky (2001, 2008) attempts to capture some of the island effects by invoking new Minimalist constructs, phases (impenetrable domains), again stipulating that CPs and DPs (former NPs) are phases. Boeckx & Grohmann (2007) note that these most recent phase-based approaches to islandhood do not improve upon the previous approaches, and that "phases are in many ways reincarnations of bounding nodes and barriers" (p. 216). Belletti & Rizzi (2000) report an interview with Chomsky, in which he says that "there is no really principled account of many island conditions".

2.   Why There Is No Principled Account of Islandhood

The persistent view of Islandhood/Subjacency (in Minimalism and predecessors) considers Move to be a default option, while Subjacency (and other restrictions on Move) is treated as a marked option, in need of explanation (Ross 1967, Huang 1982, Lasnik & Saito 1984, Chomsky 1986, 2001, Stepanov 2007). To be more precise, Move in Minimalism is never completely free but is taken to apply only if motivated by a need to check certain (strong uninterpretable) features. But once such features are present in the derivation, it is considered that Move applies freely, in the sense that it applies unless blocked by some specific principle like Subjacency.

Significantly, this view fuels the influential language evolution hypothesis, according to which Merge (which subsumes Move) was the only evolutionary breakthrough for syntax: Once it emerged, it was able to apply freely and recursively (Hauser *et al*. 2002, Chomsky 2005, Fitch *et al*. 2005). In an attempt to reconcile this view with a gradualist approach to syntax, Newmeyer (1991) proposes that a grammar with Subjacency was specifically targeted by natural/

---

[4]   Not only does one have to invoke the nature and number of obstacles, and the syntactic position in which they occur, but it is often necessary to characterize some obstacles as weak and some as strong, in order to explain variation in grammaticality (see e.g., the discussion in Stepanov 2007). See also fn. 2.

sexual selection, over a previous stage of grammar, which presumably had no Subjacency. This implies that this previous stage was characterized by a much freer Move, and that the ungrammatical examples discussed in Section 1 were grammatical in this stage. However, Lightfoot (1991: 69) counters that "Subjacency has many virtues, but […] it could not have increased the chances of having fruitful sex". In other words, it is not clear how or why a grammar with Subjacency would have been naturally/sexually selected over a grammar without Subjacency. Given these and similar considerations, Berwick (1998: 338–339) concludes that "there is no possibility of an 'intermediate' *syntax* between a non-combinatorial one and full natural language — one either has Merge in all its generative glory, or one has no combinatorial syntax at all" (see also Bickerton 1990, 1998, 2007). This kind of reasoning has led many syntacticians to believe that syntax is an all-or-nothing package, which could not have evolved gradually, and which must have been, in its entirety, a product of one single sudden event, possibly one single gigantic mutation.

But there is no need for this drastic conclusion. In fact, there is an alternative possibility to consider regarding Subjacency (mentioned in, e.g., Cinque 1978, Postal 1997, Boeckx & Grohmann 2007, Progovac 2009b, in press), that islandhood is the default state of syntax. Given this view, permitting Move would be a special/marked option. In fact, the constructions that prohibit Move are much more numerous and diverse than those that allow it (for a long inventory of additional island constructions, see, e.g., Postal 1997, 1998). Consider, again, the constructions which constitute islands to Move:

Subjects
(17) ?? Who did [$_{NP}$ your loyalty to <who>] appeal to Mary?

Wh-Clauses
(18) ?*Which book did you ask John [$_{CP}$ where Bill bought <which book>]?

Complex NPs
(19) ?*What did Bill reject [$_{NP}$ the accusation [$_{CP}$ that John stole <what>]]?

(20) ?*Which book did Bill visit [$_{NP}$ the store [$_{CP}$ that had <which book> in stock]]?

Adjuncts
(21) ?*What did Peter retire [$_{CP}$ after Mary said <what>?]

Conjuncts
(22) *What did Peter retire and [$_{CP}$ Mary said <what>?]

Basically, Move is possible only out of (a subset of) complements/objects, for example, verbal (non-*wh-*)complements, whether clausal (23) or nominal (24):

(23) Which book did you tell John [$_{CP}$ that Bill bought <which book>]?

(24) Who did Bill question [$_{NP}$ your loyalty to <who>]?

What this means is that constructions which disallow Move (islands) do not form a natural class, while those that allow Move, do. If so, then any attempt to characterize islandhood/Subjacency in unified terms is doomed to fail. On the other hand, it should be possible to formulate a general characterization of non-island constituents, as suggested in Postal (1997).[5]

Furthermore, there are additional cases where Move is illicit, and I list them here to anticipate the discussion in sections 3 and 4. For example, Move does not occur across sentential boundaries, as is well-known, but not discussed in the context of Subjacency:

(25) *Who did Mary see the movie. It featured <who>?

The idea is that the principles of syntax do not extend across sentence boundaries, but it is worth noting here that some sentence-internal boundaries resemble the sentential boundaries in this respect.

Move is also prohibited from paratactically (loosely) attached (small) clauses (26), and from attached bare small clauses (27), the latter example subsumable under Adjunct Islandhood:[6]

(26) *What nothing ventured, <what> gained?
      (cf. Nothing ventured, nothing gained.)

(27) *Where can her having retired from <where>, we finally relax?
      (cf. Her having retired from MIT, we can finally relax.)

Finally, Move is also prohibited from the so-called Root Small Clauses, that is, small clauses used in root contexts, to be discussed further in sections 3 and 4.

(28) *Where her retire from <where>? / *Who(m) retire from MIT?!
      (cf. Her retire from MIT?!)

With these additional examples, it becomes even clearer that constructions that prohibit Move (islands) have no syntactic property in common. It is thus not surprising that in spite of all the effort, to date, there has been no principled analysis of islandhood/Subjacency, as pointed out in section 1 (see also Belletti & Rizzi 2000, Szabolcsi & den Dikken 2003, Boeckx & Grohmann 2007).

For all these reasons, it would be prudent to explore an alternative track, an approach that takes islandhood to be the default state of syntax, and Move a special option, available only in certain privileged constructions.[7] In this view,

---

[5]   According to Postal (1997), *every* English constituent is an island and it is especially difficult to provide an account for the Coordinate Structure Constraint, as also noted by Boeckx (see fn. 2). Boeckx (2008: 250) embraces Postal's idea that domains are islands by default.

[6]   A 'bare' small clause can be characterized as an embedded small clause whose subject does not check structural case (see section 4.1. for various types of small clauses with respect to case properties).

[7]   As mentioned in fn. 2, a reviewer points out that another angle is possible, namely, to adopt a pluralistic view in which islandhood is a result of several independent principles that constrain Move (see, e.g., Boeckx 2008). In addition to not being able to capture the

the question is no longer why Move is impossible out of islands, but rather why Move is possible out of certain complements, and indeed why Move is possible at all. But, first, one needs to wonder why No Move would be the default state of syntax. The next section attempts an answer.

3.   An Evolutionary Explanation[8]

I propose that proto-syntax, based on small clauses and one-word utterances, did not have Move or subordination (Progovac 2007, 2008, in press).[9] Initial clausal combinations may have looked like paratactic, impenetrable constructions such as the following concatenations of two small clauses:[10]

(29)   a.   Nothing ventured, nothing gained.
         b.   Easy come, easy go.
         c.   Monkey see, monkey do.
         d.   Card laid, card played.

Recall from section 2 that such concatenations do not sanction Move (26). The following are some additional examples that illustrate the same point:

(30)   a.   * How easy come, <how> go?
         b.   * Who monkey see, <who> do?

In this view, the kind of syntax illustrated in (29)–(30) was primary, while Move was an evolutionary innovation. While, in agreement with Newmeyer (1991), this proposal advocates a gradualist approach to the evolution of syntax, notice that it is the direct opposite of what Newmeyer proposed, which is that the previous stage(s) of grammar had no restrictions on Move, and that Subjacency was an in-

---

islandhood of coordination and adjunction, the central topic of this article, this view, as noted by the reviewer himself, is also not able to account for the generalization that non-islands seem to form a natural class. Even though the correlation is not perfect, it still holds that if a constituent is *not* a complement, then it is highly likely to be an island. There are many subtleties regarding islandhood, including distinguishing weak from strong islands, that my approach does not address, as rightly pointed out by the reviewer. I hope that future research will address this question within an evolutionary framework. In the meantime, I would like to submit that an evolutionary approach which assumes gradual development of syntax is well-equipped to deal with graded stages. In this respect, one would need to consider the three stages explored in this article, Adjunction, Coordination, and Subordination (see also section 4), as just three idealized points in the evolution of language, with transitional stages certainly a possibility.

[8]   As pointed out by Cedric Boeckx, syntactic theories of Subjacency, and locality in general, should be compatible with findings in neuroscience and evolutionary biology: "Up to now, compatibility with neuroscience and evolutionary biology has been a rather weak constraint on theory construction in linguistics" (Boeckx 2008: 4).

[9]   I use the term 'subordination' here in a rather narrow sense, to refer to the embedding of one clause within another, where the embedded clause serves as the complement of the main verb.

[10]   A reviewer points out that analyzing examples in (29) as simple concatenations may be problematic. I return to this issue below.

novation (section 1).[11] In my proposal, islandhood, or lack of Move, characterized the previous stage(s) of grammar, while Move was introduced later, probably in conjunction with more complex, layered, hierarchical syntax, as well as in conjunction with specialized functional categories and projections, such as TP and CP (section 4).

This scenario meshes quite well with Kiparsky's (1995) account of Indo-European proto-language clause structure (see also Hale 1987).[12] According to Kiparsky (1995: 155), a major characteristic of Indo-European syntax, best preserved in Sanskrit, Hittite, and Old Latin, was that finite 'subordinate' clauses were not embedded but adjoined (Watkins 1976, Hock 1989). According to Kiparsky, Indo-European proto-language lacked the category of complementizer and had no CP or any syntactically embedded sentences. What looked like finite subordinate clauses, including relative clauses and sentential complements, were syntactically adjoined to the main clause, still exhibiting main clause properties, such as topicalization of constituents to clause-initial position. Kiparsky (1995: 145) calls these adjoined finite clauses 'embedded root clauses', for they exhibit properties of main clauses, and yet seem to be interpreted as embedded. This is exactly the transitional scenario toward developing subordination that I am proposing worked for language evolution. Kiparsky further claims that the introduction of complementizers coincided with the shift from adjunction to embedded subordination, which is in line with Kayne's (1982) assumption that only CPs can function as sentential arguments (see also Holmberg 1986 and Taraldsen 1986).

A reviewer points out that my analysis of (29) as simple concatenation/ parataxis (see also section 4) may be problematic, given some recent analyses of correlative constructions of the type illustrated in (31) below:

(31)   The more you read, the less you understand.

Culicover & Jackendoff (2005: 508) argue that such correlative constructions involve a paratactic (quasi-coordinate) syntax with conditional semantics. However, den Dikken (2005: 503) counters that their approach "condone(s) a mismatch between syntax and semantics" and proposes a syntactically more complex derivation. The conditional semantics, however, does not follow even from den Dikken's treatment of correlatives, as he himself acknowledges. But, at any rate, this same friction between syntax and semantics seems to carry over to my examples in (29).

First of all, I would like to suggest that, at least in the case of examples such as (29), one is not dealing with a mismatch, but rather with underspecification/ vagueness. The paratactic attachment only signals that there is a relationship between the two clauses, but it does not specify what that relationship is exactly. According to Culicover & Jackendoff (2005: 528), parataxis is "grammatically the most primitive way to combine linguistic elements, one that leaves the semantic

---

[11]   A similar idea can be found in, for example, Boeckx's (2008: 244) statement that bounding nodes are solutions that the language faculty has developed to ensure that syntactic objects are unambiguous.

[12]   Thanks to an anonymous reviewer for pointing me to Kiparsky's paper.

relations among the elements to be determined by their inherent semantic possibilities or by pragmatic considerations". As further discussed in section 4, concatenations such as (29) typically rely on iconicity of word order to express temporal and/or causal relations, rather than on any syntactic devices (see also Stump 1985: 307, Deutscher 2000).

Furthermore, the correlative structures in (31) are clearly more complex than the paratactic attachment of small clauses in (29), both clause-internally and clause-externally. Internally, both clauses in (31) are finite, showing tense and agreement, as well as a left-peripheral position before the subject, implicating Move, or at least a(n additional) functional projection above TP. In contrast, the small clauses in (29) are just that — small clauses which show no tense, no agreement, and no Move. Externally, each of the small clauses in (29) can be a root construct on its own, not requiring another clause to complete it (e.g., *Nothing ventured!*). This is in contrast to correlative constructions in (31), whose individual clauses are clearly dependent (*The more you read*), possibly suggesting some additional external mechanism of clause cohesion, not available in (29). In addition, as pointed out by a reviewer, external ATB movement out of correlatives such as (31) is possible:

(32)   This is a book that the more you read, the less you understand.

This is not to deny the obvious similarities between the constructions in (29) and the correlatives in (31). The correlatives in (31) may represent modern complications of ancient correlatives, the latter more closely approximated by the examples in (29).

In his detailed consideration of absolute constructions, such as the underlined string in (33) below, which also seem to involve parataxis, Stump (1985: 302) concludes that the logical relation between an absolute and its superordinate clause is often determined inferentially. He defines 'inference' as "anything which is not part of the literal meaning of some expression but which language users judge to be part of the intended meaning of that expression" (304).

(33)   She clapped her hands like a child, <u>her lucid eyes sparkling</u>.

(Stump 1985: 332)

The issue of vagueness and underspecification deserves special attention in an evolutionary framework. If language developed gradually, then it is to be expected that not all the grammatical tools that we use today to express logical relations with some precision were available in the previous stages of grammar. This should not have prevented our ancestors from speaking in however imprecise and underspecified ways. It is also important to keep in mind that, however precise we may believe that our language is today, it is still vastly underspecified with respect to so many distinctions that could in principle be made. The ever increasing precision in what we can express with language, and the increasing match between syntax and semantics, may have marked *one* of the directions in which language evolved. But there is no reason to believe that a

perfect syntax–semantics match has been achieved, or that it is even desirable to achieve.

Going back to islands, we can now envision an answer to the question of why some constructions still disallow Move (e.g., coordination or adjunction), while others facilitate it (subordination). My claim is that our grammars, courtesy of gradual evolutionary development, show a range of constructions that fall between the two opposites, (i) two completely separate utterances/sentences and (ii) syntactically fully integrated expressions. The intermediate possibility is to be loosely attached (semi-integrated) into sentential fabric, and this is arguably the case with, for example, clausal adjuncts and conjuncts, on which I focus in this article (see also the concatenation of small clauses discussed above (29)).[13] Only the most integrated of constructions (subordination) allow Move across clause boundaries.[14]

Clausal conjuncts and adjuncts have been repeatedly noted not to be fully integrated into syntactic fabric.[15] First, they are often parsed as separate intonation phrases (Selkirk 1978, Stowell 1981, Nespor & Vogel 1986, Zec & Inkelas 1990), which is consistent with them sitting in semi-integrated, 'non-canonical', syntactic positions, as put in An (2007). Next, adjuncts have been analyzed in syntax as merging in a different plane (e.g. Chomsky 2001; see also Chomsky 2004), and conjuncts as sitting on parallel planes (Goodall 1987). According to Lebeaux (1988), adjuncts can be merged into structure acyclically, that is, independently of the main cycle of the derivation. According to Stepanov (2001), adjuncts are necessarily Merged post-cyclically, that is, after the cyclic portion of the derivation is complete. According to Adger (2003), adjuncts do not even involve Merge, but rather an operation distinct from Merge, which can be called Adjoin. Chomsky (2004: 117) acknowledges that "there has never […] been a satisfactory theory of adjunction". It is very clear that adjunction and coordination are not fully integrated into the fabric of syntax.[16]

---

[13] Even though I will not discuss subject islands in this article, it is worth noting that syntactic theory recognizes that subjects/specifiers are more loosely integrated than objects/complements in various ways. While their objects/complements are merged directly with the verbs (First Merge), subjects/specifiers are typically introduced as sisters to intermediate projections (Second Merge). In addition, subjects typically undergo Move out of verbal projections, further contributing to their syntactic instability.

[14] This is not to say that subordination was necessarily one big solid monolithic stage — as pointed out repeatedly in this article, sub-stages and transitions may well have existed, and may account for a number of present-day constructions which are ambivalent in this respect (see, e.g., section 4).

[15] Note also that both adjuncts (i) and conjuncts (ii) can be instantiated by bare small clauses (see also fn. 6, as well as the discussion above regarding absolute constructions). Such bare small clauses exhibit subjects without structural case, bearing resemblance to concatenated small clauses in (29):

    (i)   He reverted to his old ways, <u>us having left</u>.   (Jackendoff 2002)

    (ii)   I am not going to have any woman rummaging about my house, and <u>me in bed</u>.
                                                    (Jespersen 1954)

[16] Note also that c-command, the central postulate of syntax, does not seem to extend into conjuncts or adjuncts in all cases (see Progovac 2003 for some discussion). With negative polarity licensing, it is possible to license the negative polarity item *ever* in an embedded subordinate clause (i), but not in a conjunct clause (ii) or an adjunct clause (iii):

Once again, the question is why human grammars should avail themselves of this range of possibilities for clause combination, and moreover such 'imperfect' possibilities, as are coordination and adjunction. According to, for example, Traugott & Heine (1991) and Deutscher (2000), grammaticalization of subordination (36) typically proceeds through exactly these three stages, including parataxis (adjunction) (34) and coordination (35), from least syntactically integrated to most integrated:[17]

(i)   Mary did not say [that she ever met Peter].   *Subordination*

(ii)   * Mary did not say it, [but she ever met Peter].   *Coordination*
         (cf. Mary did not say it but she never met Peter.)

(iii)   * Mary did not say it, [after she ever met Peter].   *Adjunction*

In a similar fashion, Principle C effects, clearly visible with subordination (iv), do not seem to extend into conjuncts (v): While *she* and *Mary* cannot co-refer in (iv), co-reference is possible in (v). The judgment is less clear with an adjoined clause in (vi). To me, as well as a native speaker I consulted, it seems that (vi) is slightly better than (iv), but the reviewer, as well as an informant of his, ranks it equally ungrammatical as (iv).

(iv)   * She$_i$ never mentioned [that Mary$_i$ is a bartender].   *Subordination*

(v)   She$_i$ never mentioned it, [but Mary$_i$ is a bartender].   *Coordination*

(vi) $^{?}$* She$_i$ never mentioned it, [after Mary$_i$ became a bartender].   *Adjunction*

Given that both negative polarity and Principle C extend across clause boundaries, I use clausal coordination and adjunction here to illustrate c-command effects, just as I use clausal subordination. These should thus constitute good minimal pairs.

However, there are processes dependent on c-command which nonetheless seem to extend into conjuncts, as pointed out by a reviewer: ATB extraction (vii), Principle C into a coordinated embedded clause (viii), and bound anaphora (ix):

(vii)   Which book does Peter like and Mary hate?

(viii)   She$_i$ said that John saw Mary$_{*i}$ and Bill saw Sue$_{*i}$.

(ix)   Every boy$_i$ said that he$_i$ is going to play football and there's nothing you can do to stop him$_i$.

To complicate matters further, some Principle C effects seem to overlap with the effects of the pragmatic precedence principle, which operates across independent sentences (x), and can thus not be reduced to c-command (see Progovac 2003 for some discussion):

(x) $^{???}$He$_i$ finally arrived. John$_i$'s cousin accompanied him.

Given this, one is not clear if it is syntactic c-command or pragmatic precedence that excludes co-reference in either (viii) or (iv) and (vi). Clearly, this issue deserves further investigation. It may be that the (un)grammaticality of these various examples is due to a curious interplay of more than one factor, including syntactic c-command and pragmatic precedence, whose domains seem to partly overlap. Could it be that an ancient, pragmatic principle of precedence got grammaticalized into c-command, which can realize its full potential only in the subordination stage?

[17]   The following example may also be seen as involving parataxis, but in a clause-internal position:

(i)   He, as you know, is a linguist.

(34)   He is a linguist — (as) you know.   *Parataxis*

(35)   He is a linguist, and you know it.   *Coordination*

(36)   You know that he is a linguist.   *Subordination*

If comparable stages characterized language evolution, with adjunction and coordination constituting intermediate steps between separate utterances (no syntactic integration, no Move) and subordination (full integration, free(er) Move), then such evolutionary 'tinkering' left us with multiple possibilities which partly overlap in function, that is, with redundant means for expressing similar meanings (34)–(36).[18,19] In the spirit of Charles Darwin (e.g., Darwin 1964), and as elaborated in Jacob (1977), evolution is taken to be a 'tinkerer', rather than an engineer. Unlike engineering, which designs from scratch, with foresight and plan, and with perfection, tinkering involves cobbling together, out of bits and pieces that happen to be available, clumsily, with no long-term foresight. Evolution is also taken not to throw a good thing away, but to build upon it, or to add to it. So, if adjunction and conjunction proved to be useful syntactic mechanisms in a proto-syntactic stage (see also section 4), the later stages did not have to discard them, but could continue to use them in specialized functions. This is also the case with grammaticalization of subordination. As put in Carroll (2005: 170f.), "multifunctionality and redundancy create the opportunity for the evolution of specialization through the division of labor". Overlap and (partial) specialization are properties of evolutionary tinkering, rather than of optimal design.

Still, one would like to know what might have been the advantages of each stage, which assured its survival? I propose in section 4 that the conjunction stage has a clear advantage over the adjunction stage in that it provides more robust evidence for Merge, including segmental. But what about subordination — does it provide any concrete advantage over either conjunction or adjunction, and moreover an advantage that could have been targeted by natural or sexual selection?

As it turns out, in addition to facilitating Move, subordination also provides a recursive mechanism for embedding multiple viewpoints one within another, unavailable with either coordination or adjunction, privileging in this

---

[18]   This is not meant to imply that there were exactly three syntactic steps in the evolution of language, or that the subordination stage was a single solid stage. Finer sub-stages are very likely to have existed, and even modern languages show constructions that are transitional in nature, as pointed out throughout this article (see especially section 4). For the purposes of this article, it is sufficient to identify these three rough stages.

[19]   Notice that my claim here is *not* that subordination automatically licenses Move. I am only saying that subordination is a necessary condition for Move, not sufficient. Other conditions clearly need to be met to allow Move, including the existence of the landing site for Move (e.g., CP for *wh*-movement). Given this, the fact that not all subordinate constructions allow Move, but only a subset of them do, is not directly a problem for my analysis, even though it raises the question why. The analysis proposed here posits a different question than the traditional analyses: The question here is not what non-complements and complement islands have in common, the question pursued by Subjacency accounts, but rather how complement islands differ from complement non-islands. Exploring this question further may give new insights into the nature of Move.

respect (39) over (37)–(38):

(37)   [As you know,] [as Mary knows,] he is a linguist.

(38)   He is a linguist, [and you know it,] [and Mary knows it].

(39)   You know [that Mary knows [that he is a linguist]].

Only in (39) is it possible to report on one person's knowledge about another person's knowledge. Thus, if subordination (as well as Move) is an innovation resulting from evolutionary tinkering, then subordination would have significantly increased the expressive power of language, in a concrete and tangible manner, and thus, unlike Subjacency, constitutes a plausible target for natural/sexual selection.

In this evolutionary perspective, rather than a system designed from scratch in an optimal way, syntax is seen as a patchwork of structures incorporating various stages of its evolution, giving an impression, or an illusion, of Subjacency. It follows that Subjacency is not a principle of syntax, or a principle of any kind, but rather just an epiphenomenon. Subjacency or islandhood can be seen as the default, primary state of language, due to an evolutionary base of language which was without Move. This default state can be overridden in certain evolutionarily novel constructions, such as subordination.

While this article does not answer the question of how exactly complex syntax evolved, or how exactly humans proceeded from an adjunction or conjunction stage to the subordination stage (see section 4 for the characterization of these stages), it at least provides a framework in which these questions can be asked, and eventually answered. It also identifies concrete communicative advantages that subordination has over its more primary counterparts: The increase in the expressive power of language, making possible, with syntactic means, the recursive embedding of multiple viewpoints one within another. The next section characterizes in more detail the three postulated stages, as well as possible advantages of the coordination stage over the adjunction stage.

As kindly put by a reviewer, this article is not only about looking for evolutionary fossils and postulating possible paths of language evolution, but this particular evolutionary scenario offers a reconstruction of how communicative/functional benefits may have been involved in the shaping of the formal design of language itself (see also Progovac 2008, 2009a).

4.   Excursus: Hypothesized Evolutionary Stages of Syntax

Based on some present-day constructions, as well as based on the trends in grammaticalization processes, one can reconstruct the following three rough stages in the evolution of syntax, each of which could have, of course, proceeded through sub-stages:

(A)   Parataxis/Adjunction stage, with no hierarchical structure, where prosody/suprasegmentals provide the only glue for merger (Jackendoff 1999, 2002).

(B)   Proto-coordination stage, where, in addition to prosody, the conjunction provides all-purpose *segmental* glue to hold the utterance together.

(C)   Specific functional category stage, where, in addition to prosody, specific functional categories provide specialized syntactic glue for clause cohesion, including tense elements and subordinators/complementizers. It is in this stage that Move seems to become available.

The following subsections explore each of these postulated stages.

4.1.   *Parataxis/Adjunction Stage*

This stage can be characterized by flat concatenation, where the merger of two constituents (e.g. two words or two clauses) to form a single constituent does not build hierarchical structure, and where it is only intonation and prosody (supra-segmentals) that hold the constituents together. Some version of this proposal can be found in, for example, Dwyer (1986), Bickerton (1990), Jackendoff (1999, 2002), Burling (2005), Deutscher (2005), Progovac (2007, 2009b).[20] According to Jackendoff (1999, 2002), adjunction has proto-linguistic flavor, and it can be seen as an evolutionary fossil. Adjunction in present-day languages is typically taken to involve flat/non-hierarchical structure (cf. Merge vs. Adjoin of Adger 2003, as discussed in section 3).

Furthermore, Progovac (2007, 2008, 2009a) argues that this adjunction/parataxis stage not only can be found fossilized in several constructions used today (such as *Nothing ventured, nothing gained*, as introduced in section 3, or root small clauses discussed below), but that such paratactic constructions provide a foundation upon which hierarchical syntax is built.

Consider the following instances of Root Small Clauses (RootSCs), that is, small clauses used in root contexts:

(40)   Me first! Everybody out! Him apologize?! Me worry? Case closed. Problem solved. Point taken.

While RootSCs of (40) are hardly ever a subject of syntactic inquiry, having been relegated to the 'periphery', similar (but not identical) small clauses (SCs), which

---

[20]   Note in this respect that Jordens (2002) argues that there is a stage in the acquisition of Dutch where all constituents are attached by adjunction, and where certain modal verbs and negation serve as proto-functional categories. According to Jordens, the stage lacks evidence for functional categories, the properties of finiteness are absent, and the ordering in this stage is driven by pragmatic/conceptual factors. Thanks to an anonymous reviewer for pointing me to this reference. See section 5 for more discussion regarding language acquisition.

occur in embedded contexts, have been recognized and studied in syntax.[21]

(41)   He wants [$_{SC}$ everybody out]. He imagined [$_{SC}$ the problem solved].

There are competing analyses of the bracketed SCs in (41), including some that ascribe quite complex structure to them (see, e.g., Cardinaletti & Guasti 1995). However, the tendency is still, overwhelmingly, to label them 'SCs', suggesting hesitance to commit to an analysis that renders them projections of their predicate, or of something else. In fact, they may be paratactic creations, in which subject and predicate are loosely concatenated/adjoined. Uriagereka (2008) looks at the embedded SCs such as the ones in (41), and concludes that their structure is rather basic, and may involve finite-state syntax, the simplest type of syntax in Chomsky's hierarchy. One of the arguments Uriagereka invokes for the primitive nature of (embedded) small clauses is the long-noted observation that these clauses do not have an internal source of structural case, and are thus assigned case by an external element, the verbs *want* or *imagine* in (41).

According to Progovac (2006), RootSCs in (40) do not have a structural mechanism for assigning case to their subjects, providing another argument that they are creations similar to embedded SCs. Since with RootSCs there is no external source of case either (they are not embedded under a verb), their subjects surface with what can be analyzed as default case (in the sense of, e.g., Schütze 2001) — witness the accusative on the pronominal subjects in (40). The evolutionary perspective sheds light on the existence of both embedded SCs and RootSCs — both can be seen as 'living fossils' of a proto-syntactic stage in which, presumably, clauses were put together by a process akin to adjunction.[22]

What is of interest for the considerations of this article is the fact that these RootSCs cannot be manipulated by Move, as already pointed out in section 2.[23]

(42)   a.   *Who(m) first?
       b.   *Where everybody?
       c.   *To whom him apologize?
       d.   *What solved?

---

[21]   See Progovac (2006) for surface, structural, and semantic differences between embedded ECM small clauses and RootSCs. Structurally, RootSCs are akin to 'bare' small clauses in that neither has any source of structural case for their subject position (fn. 6; see also section 3). As Progovac (2006) argues, constructs such as (40) are true RootSCs, rather than TPs/IPs which have undergone selective ellipsis/deletion. The arguments against analyzing such clauses as TPs/IPs include the (default) accusative case on the subject, the lack of agreement/tense marking, the possible lack of articles even with singular count nouns (e.g., *Case closed*), and the marked interpretation possibilities (such as irrealis, formulaic).

[22]   In biological literature, 'living fossils' are defined as species that have changed little from their fossil ancestors in the distant past, such as, for example, lungfish (Ridley 1993). Bickerton (1990) and Jackendoff (1999, 2002) introduced the idea of language fossils. In syntax, one can define living fossils as constructions which exhibit rudimentary syntax/semantics, not accounted for by the principles of modern (morpho)syntax, but which nonetheless show some continuity with it. One postulated syntactic fossil would be RootSCs, as discussed above.

[23]   A reviewer points out that (i) is acceptable to him/her, but that it may be elliptical:

       (i)   O.K. — who first?

If these are indeed proto-syntactic fossils, then this is consistent with my claim that proto-syntax did not have Move. It is also consistent with the more specific claim that Move is unavailable in the paratactic stage of grammar, which these RootSCs arguably instantiate.

Even though they do not permit Move, these small clauses can concatenate, where intonation, rather than any functional category, provides the glue holding the two clauses together. These kinds of concatenations occur cross-linguistically, and are typically preserved in formulaic, proverb-like sayings:[24]

(43) a. Nothing ventured, nothing gained.
      b. Easy come, easy go.
      c. Monkey see, monkey do.
      d. Card laid, card played.

(44) a. Na psu rana,   na psu i   zarasla.   *Serbian*
          on dog wound on dog and healed
          'No big deal!'

      b. Preko preče,   naokolo bliže.
          across shorter around   closer
          'Shortcuts are not always best.'

What I am proposing here is that both clausal combinations such as (43)–(44), and predicate–argument combinations in (40), are created by the same type of grammar — paratactic grammar. This grammar is exocentric, lacks functional categories (e.g., TP, CP), and lacks Move. Also, as pointed out in the following sub-section, the same proto-coordinator can sometimes be used both clause internally and externally, suggesting that the two followed a similar evolutionary path. That is why I believe that the internal structure of these clauses is (indirectly) relevant for understanding the structure of clause combination: Arguably, both are products of the same exocentric, paratactic grammar.

To appreciate the role of prosody / intonation, consider (45) as a report from a business trip, with falling intonation rendering these two clauses as two separate utterances.

---

[24] Comparable concatenations are more productive in pidgin languages, such as in *No money, no come* (e.g., Winford 2006). Bickerton (1990) in fact considers that pidgin languages are indicative of our ability to tap into the proto-linguistic stage. However, in his view, pidgin languages (or child language) have no syntax, and in fact do not count as real language. In my view, the proto-syntactic stages clearly show continuity with the more innovative stages of syntax. Not only that — my argument is that proto-syntax provides a foundation, a necessary stepping stone into more complex, hierarchical syntax (see especially Progovac 2008, 2009a). Notice in this respect that Culicover & Jackendoff (2005) argue that there is continuity between what are typically considered to be 'core' syntactic phenomena and the 'periphery', quirky-looking syntactic constructions, which include at least some of the root small clauses in (40). A reviewer wonders if non-hierarchical structures can be considered as syntax. My view on this is that parataxis is an important aspect/layer of syntax, upon which hierarchical syntax rests. For example, the wide-spread view regarding sentence building is that a sentence starts to unfold from a small clause, which essentially can be analyzed as a paratactic/exocentric structure (see discussion in the text above). This initial paratactic structure gets integrated into layered syntax by various syntactic processes, including Move.

(45)   Nothing ventured. Nothing gained.

The interpretation in (45) is that nothing was ventured, and that nothing was gained. Cross-linguistically, falling intonation implies assertion/certainty/completion, while rising intonation signals uncertainty/incompleteness (e.g., Burling 2005: 170). In contrast, (43) combines the two clauses into a single utterance, using rising intonation as glue. In addition to intonation, concatenations such as (43) and (44) typically rely on iconicity of word order to express temporal and/or causal relations, as mentioned in section 3. Deutscher (2000) argues that the development of finite subordination (CP complementation) had an adaptive advantage of breaking away from such iconicity. Prosody and intonation are still used cross-linguistically to signal grammatical functions, such as interrogative mood in (46). When they are used in conjunction with syntactic processes, such as Subject–Auxiliary Inversion in (47), the result is substantial redundancy and robustness, hallmarks of evolutionary tinkering.

(46)   Mary is already at home?

(47)   Is Mary already at home?

Intonation and prosody, which are modulated analogically, rather than discretely, have been proposed by many to have been available before syntax, given that they have significant analogs in other species (e.g., Deacon 1997, Piattelli–Palmarini & Uriagereka 2004, and Burling 2005). Also, intonation and prosody may remain intact even in cases of severe lexico-syntactic deficits (confabulatory paraphasia and jargon aphasia: Wernicke 1874, Broca 1878, Joanette *et al.* 1990, Brain & Bannister 1992, Pulvermüller 2002). According to Deacon (1997), speech prosody is essentially a mode of communication that provides a parallel channel to speech; it is recruited from ancestral call functions. Like these systems, prosodic features are primarily produced by the larynx and lungs, and not articulated by the mouth and tongue. But unlike calls of other species, prosodic vocal modification is continuous and highly correlated with the speech process (Deacon 1997: 418); the human larynx must be controlled from higher brain systems involved in skeletal muscle control, not just visceral control (243). It is as though we have not so much shifted control from visceral to voluntary means but superimposed intentional cortical motor behaviors over autonomous subcortical vocal behaviors.

Of note here is also that many RootSC types, in particular the incredulity RootSCs such as *Me worry?!* (see (40)) are characterized by exaggerated intonation, possibly compensating for the lack of functional categories, and tapping into the proto-linguistic ability to create clauses using prosody/intonation as the only glue.

In conclusion, postulating a paratactic stage in the evolution of syntax is consistent with, and supported by, the 'living fossils' of this stage found in modern languages (RootSCs and their paratactic combinations, as discussed above), as well as by the neurological and comparative studies of intonation and prosody. Section 5 provides some further corroborating evidence. As illustrated

above, neither RootSCs nor their combinations can be manipulated by Move. This is consistent with my proposal that constructions that do not allow Move are evolutionarily primary, and those that allow Move evolutionary innovations.

4.2. Proto-Coordination Stage

As pointed out in the previous section, paratactic combinations rely solely on *supra-segmental* information to provide evidence of merger. Following this argument, one can see conjunctions as segments providing all-purpose *segmental* glue to hold an utterance together. This would be a stage in which a functional category emerged, a proto-coordinator, whose sole purpose was to hold the utterance together by more than just prosodic means, consolidating Merge. The proto-coordination stage most probably built upon the paratactic stage by adding a segment (conjunction) to the already existing intonation, providing now two indicators of Merge, one segmental and one supra-segmental.[25] It would have been only later that such proto-coordinators differentiated into specific functional categories, such as aspect markers, tense markers, or complementizers (section 4.3). Needless to say, the proposal in this section is speculative in nature, and the data presented below are merely suggestive of this possibility.

A reviewer points out that there may have been other advantages to the emergence of (proto-)conjunctions, such as the ability to now use different types of conjunctions, not just the neutral connective 'and'. As pointed out in Payne (1985: 9) and references cited there, in languages such as Vietnamese and Japanese, a coordinator is used for the adversative conjunction (e.g., 'but'), even though in non-adversatives the strategy involves simple juxtaposition of the conjuncts with no intervening conjunction.[26] This state of affairs also points to the continuity/fluidity between adjunction and conjunction. According to Payne, the paratactic strategy, where the conjuncts are simply juxtaposed, with no additional markers of conjunction, is probably available to all languages. In many

---

[25] My initial formulation was that segmental glue (conjunction) provides a more robust cohesive mechanism than intonation. A reviewer takes issue with this and suggests that intonation can be considered as a morpheme, and a conjunction is also just a morpheme. Even if the reviewer's suggestion is correct, the point remains that the proto-coordination stage utilizes two mechanisms for identifying Merge, intonation and conjunction, and two mechanisms will necessarily yield more robust evidence for Merge than just one of them alone. Present-day *yes–no* questions tend to keep the rising intonation even in the presence of segmental/syntactic evidence for interrogative mood (see examples (46)–(47) in the text.) But I also doubt that intonation/prosody in paratactic constructions (e.g., (43)), or in yes-no questions such as (46) in the text, can be considered as morphemes. For one thing, this kind of paratactic/interrogative intonation is not language specific, but seems to occur as a device across unrelated languages; if it is a morpheme, it would be some kind of universal morpheme. Second, if prosody signaling e.g. paratactic attachment were a morpheme, then this morpheme would have a rather unspecified meaning, given the range of interpretation possibilities it can have (see section 3). Moreover, prosody/intonation typically stretches over the whole utterance, which would also not be typical of a morpheme. But, clearly, intonation/prosody of the kind used in parataxis/question formation shows some continuity with modern cases of suprasegmental morphemes, such as tone in tone languages.

[26] One also finds combination of both the neutral conjunction ('and') and an adversative conjunction (e.g., English *and yet* and Standard Arabic *wa lakin* 'and but', as noted in Payne (1985: 15), suggesting that the neutral coordinator can serve as a mere connector, without a specified meaning (see section 3 for similar conclusions regarding parataxis).

languages, such as for example, Turkish, it is a normal alternative, existing side by side with other strategies. The classical languages, including Sanskrit and Latin (cf. *Veni, vidi, vici* 'I came, I saw, I conquered') also widely permit the juxtaposition strategy for coordination (Payne 1985: 25).

Notice also that several recent accounts of coordination invoke adjunction as an integral part of the analysis. For example, Munn (1993) proposes that the second conjunct right adjoins (with its &P) to the first conjunct, while Kayne (1994) argues that the first conjunct left adjoins to the &P containing the second conjunct. Coordination as adjunction has also been explored by, for example, Schwartz (1989a, 1989b) for comitative/asymmetric conjunct (second conjunct in asymmetric coordination).[27] In several other respects as well, the conjunction is a head unlike other functional heads, falling somewhere between adjunction and subordination (see Progovac 2003 for an overview of various analyses that reduce coordination to adjunction, or vice versa). Considerations like this give credence to the gradualist evolutionary approach, for they provide evidence of continuity and overlap between stages.

Relevant to this discussion is also the existence of the so-called 'fillers' in language acquisition. Some children acquiring various languages use such fillers in their first multi-word utterances, typically in places where one would expect functional categories (e.g., auxiliaries or determiners). These fillers are reported to be closely tied to prosody, particularly rhythm and melody, although there is no unified approach to describing fillers (see Braine 1963, 1976, Bloom 1970, Dressler & Karpf 1995, Peters 1999, and Veneziano & Sinclair 2000). Initially, such fillers may be undifferentiated in form and occur in various positions, but later they become more specialized for the position (from Peters & Menn 1993):

(48)   [m] pick [ə] flowers   (*English*, age 1;6)

Very tentatively — these fillers might correspond to proto-conjunctions/proto-functional categories (see section 5 for the relationship between EVO (evolution in species) and DEVO (development in children)).

Predication may have also gone through a proto-coordination stage. German incredulity RootSCs take an optional conjunction (Potts & Roeper 2006, Progovac 2006, 2009b):

(49)   Ich   (und) Angst   haben?   *German*
       I   (and) fear   have.INF
       'Me afraid?!'

Akkadian, a Semitic language spoken between c. 2,500 to 500 BC, used the co-ordinative particle –*ma* in predicative functions (50) (Deutscher 2000: 33f.). The

---

27   One example of such a transitional comitative construction is the following Russian sentence from Crockett (1976):

    (i)   [my   s   Petej]   poedem   segodnja   za   gorod.
           1PL-NOM   *with* *Peter-INSTR* *will-go*   *today*   *beyond* *city*
           'I and Peter will go to the country today.'

absence of verbal copula possibly suggests the use of RootSCs:

(50)   'napišti māt-im   eql-um-<u>ma</u>   *Akkadian*
         soul.of   land.GEN field.NOM.CONJ
         'The soul of the land is the field.'

In addition, Bowers (1993) analyzes English *as* as a realization of the head of PrP (Predication Phrase):

(51)   She regards [$_{SC}$ Mary <u>as</u> a fool/crazy.]

Of note here is that English *as* (and Akkadian *–ma*) can serve as glue for both predication (interclausally, as in (51)) and to connect clauses (extraclausally, as in (52)):

(52)   a.   Peter will be late, as will John.
         b.   As she was approaching, the door opened.

Note also that *as* is used to solidify/cement predication only in small clauses, where, arguably, there are no other functional projections that can do the job.

   As pointed out in fn. 20, Jordens (2002: 741, 750) has argued that Dutch children pass through a stage which is characterized by the use of proto-functional categories, which are syntactically adjoined, rather than integrated into the head/complement structure (his 'conceptual-ordering' stage). These proto-functional categories, according to Jordens, are linking elements between the topic and the predicate (p. 744). In the next, 'finite-linking stage', these proto-functional words are grammaticalized into auxiliaries, which now serve as heads in head-complement structures (p. 750). This would mark the beginning of the specific functional category stage, as discussed in the following subsection.

   In sum, this section hypothesizes that (proto-)conjunctions may have been the first functional categories to emerge, for the primary purpose of solidifying Merge, that is, of providing more robust (duplicated) evidence of Merge than just supra-segmentals can do. If 'and' emerged as a default connector, as a proto-functional category, then it is not surprising that 'and' exhibits exceptional behavior in comparison to the other functional categories. Finally, if Merge was advantageous to our ancestors, then providing robust and unambiguous evidence of Merge would have constituted a clear and concrete advantage, which could have been targeted by natural/sexual selection.

4.3.   *Specific Functional Category Stage*

Finally, such particles/conjunctions could have grammaticalized into specific functional categories, such as predication head or tense head or complementizer — another syntactic breakthrough and the beginning of modern syntax, which can now not only use functional words as glue to connect words/phrases/clauses, but which can also use them to build specialized functional projections, such as TP/IP or CP, which now both motivate and facilitate Move. A modern

functional category such as a modal verb, or a complementizer, can be seen as providing not only segmental glue/evidence of Merge, but also, simultaneously, an expanded structural space, as well as additional nuances of meaning. It may well be that the innovation of Move coincided with the introduction of specialized functional categories, which both serve as landing sites for Move, and as 'probes' (triggers) for Move.

Given this view, one can expect to find transitional constructions, those straddling the boundary between coordination and subordination, and such are not difficult to find. To take one example, the most neutral, prototypical of conjunctions, 'and', can express subordinating relationships, such as consequence:

(53) a.   Give him an inch, and he will take an ell.

(Oxford English Dictionary)

 b.   Speak one word, and you are a dead man!

(Oxford English Dictionary)

 c.   One more can of beer and I am leaving.

(Culicover & Jackendoff 2005: 474)

In (53) above, the relationship between the two clauses is best paraphrased as involving a conditional, *if–then* sequence. Culicover & Jackendoff (2005: 474) call this use of *and* 'left-subordinating and'.

Of course, the functional category stage may have divided into finer-grained sub-stages, as pointed out by a reviewer. Perhaps there was a stage in which aspect was grammaticalized, but not tense yet. Perhaps there was a stage in which TP could be built, but not CP yet (see also the discussion regarding proto-Indo-European in section 3). Perhaps gender/number agreement (e.g., on participles) emerged before person agreement (see Progovac 2008).[28] Perhaps a stage where the verb takes only one argument (intransitive stage) emerged before a transitive stage. But my primary focus in this article is on the first two hypothetical stages, paratactic and coordination stages, on envisioning what our grammars might have looked like in those initial stages, and how these initial stages may have provided the foundation for building layered syntax. My purpose was also to show how postulating these hypothetical stages can shed light on the quirks and complexities of present-day syntax.

Another question that arises is whether the advent of functional categories automatically leads to a hierarchical, subordination stage. In this respect, Kiparsky (1968) has argued convincingly that proto-Indo-European syntax was characterized by optional adverbial temporal particles, which did not build TPs. It is really the emergence of functional heads which take complements, and which build their own functional projections, that constitutes the hierarchical breakthrough. This leads to layers and layers of hierarchical structure, which can now be connected by Move. In other words, it is not a temporal adverbial particle adjoined to a SC that creates hierarchical syntax; it is a TP superimposed over the SC, which moreover may interact with the subject of the small clause by attracting it to its own specifier by Move (Progovac 2008).

---

[28]   Boeckx (2008: 119) suggests that Agree may have emerged after Merge.

The gradualist approach to the development of syntax sketched in this section, which assumes a progression in stages, guided by natural/sexual selection, is in the spirit of the general vision outlined in Pinker & Bloom (1990). Pinker & Bloom assume the Baldwin Effect for syntax, the process whereby environmentally-induced responses set up selection pressures for such responses to become innate, triggering conventional Darwinian evolution (see also Hinton & Nowlan 1987 and Deacon 1997).[29] Tiny selective advantages are sufficient for evolutionary change: According to Haldane (1927), a variant that produces on average 1 per cent more offspring than its alternative allele would increase in frequency from 0.1 per cent to 99.9 per cent of the population in just over 4,000 generations. This would still leave plenty of time for language to have evolved: 3.5–5 million years, if early *Australopithecines* were the first talkers, or, as an absolute minimum, several hundred thousand years, in the unlikely event that early *Homo Sapiens* was the first (Stringer & Andrews 1988). In addition, sexual selection can trigger a runaway effect, which can speed the process up significantly (Fisher 1930; see also Miller 2000 and Hurford 2007). Also, fixations of different genes can go in parallel.

A reviewer wonders if my third, subordination stage may not have coincided with the postulation of the 'Middle to Upper Paleolithic transition/revolution', around 43–35,000 BP (before present), based on some recent archeological findings. According to Mellars (2002) and others, this period was characterized by major changes, all reflecting shifts in many different dimensions of human culture and adaptation: New forms and complexity of stone, bone and other tools; explosion of explicitly decorative or ornamental items; representational art carving of animal and human figures; increase in human population densities.[30] To many this 'symbolic explosion' is exactly what one might anticipate from a major shift in the structure of complexity of language patterns, possibly associated with corresponding shifts in the neurological structure of the human brain (Mellars 1991: 35, Bickerton 1995, Pinker 1995, Mithen 1996). Many see this explosion as potentially indicative of the emergence of relatively complex language patterns (Mellars 1991: 41). Klein (2000) has pointed out that there is no way that we can exclude the possibility of relatively sudden punctuational

---

[29] Many evolutionists have adopted the Baldwin effect as an evolutionary force, including Dawkins (1999) and Deacon (1997). Pinker & Bloom (1990) and Briscoe (e.g., 2000) have applied it to language evolution. However, as pointed out by a reviewer, Longa (2006) questions the Baldwin effect for language evolution, as well as for evolution in general. He argues that the effect lacks empirical support, and that some authors who invoke it conflate it with the Waddington's effect, wrongly. Longa's point is that the Baldwin effect cannot be conflated with Waddington's effect because the two differ with respect to the timing at which a mutation occurs. With the Baldwin effect, he argues, the mutation necessarily occurs after the environmental change, while with Waddington's effect, the mutation was present even before the environmental effect. As far as I can see, my data and analysis are consistent with the preexisting mutation scenario. Suppose that an innovation occurs in a community: For example, one or two people begin to merge words by using (proto-) conjunctions. Suppose, further, that this innovation becomes useful for survival, or perhaps attractive to the opposite sex. Those who have a pre-existing mutation which facilitates the use of language in this way will leave more offspring than the others, contributing to the spread of the mutation.

[30] In fact, an increase in population size may have itself accelerated sexual selection with respect to language, due to more competition.

developments in human behavior and mentality, potentially as a result of either major population bottlenecks or of genetic mutations influencing the structure of the brain.

These findings are often interpreted to mean that language (or syntax) *in its entirety* arose through one single gigantic event, such as a mutation (Hauser *et al*. 2002, Chomsky 2005, Fitch *et al*. 2005). However, even in Klein's and Mellar's work, the suggestion is only that *more complex* forms of language might have coincided with this event. So, in a gradualist evolutionary framework, it could have been the stage which introduced the first proto-coordinator, or it could have been the emergence of the subordination stage, which includes the CP projection. In this scenario, protolanguage could have existed, and could have been evolving, for a long time before that. But it is also difficult to exclude even the possibility that complex language, comparable to present-day languages, was in use for a long time before any cultural revolution took place. Definitive conclusions in this regard are especially difficult to draw given the common assumption, based on present-day cultures, that it is possible to have a highly complex language in the absence of any complex culture.[31]

5. Some Corroborating Evidence

Language acquisition arguably likewise begins with a root small clause stage (or root infinitive stage) (e.g., Radford 1988, 1990, Lebeaux 1989, Platzak 1990, Ouhalla 1991, Jordens 2002; see Guasti 2002 for many more references and also for opposing views). Also, subordination and CP, as well as Move, seem to emerge later in children. According to Studdert–Kennedy (1991) and Rolfe (1996), present-day views of ontogeny/phylogeny warrant the use of ontogeny, development in children, to *corroborate* hypotheses about phylogeny, development in species.[32] The emergence of TP/IP and CP in phylogeny, just as it does in ontogeny, would have created opportunities for specialization and division of labor among small clauses, TPs/IPs, and CPs, leading to many complexities of syntax.

Agrammatism is another potential source of corroborating evidence. Kolk (2006, and many references there) argues that with Dutch and German agrammatic speakers, preventive adaptation results in a bias to select simpler types of

---

[31]   In addition, the significance of one of the archeological findings, the use of decorative/ ornamental items, needs to be reevaluated in the context of some non-humans, such as bower birds, who build intricate homes, and decorate them extensively, most probably in order to attract females. As mentioned in Miller (2000), males that build superior bowers can mate up to ten times a day with different females. It is possible that decorating in humans was also done for sexual attraction purposes (see fn. 30). In any event, human language and symbolic thought, which is often associated with it, do not seem to be necessary prerequisites for elaborate decorating.

[32]   For some old and some recent views on the relationship between ontogeny/DEVO (development in children) and phylogeny/EVO (development in species), see also Ridley (1993), Fitch (1997), Carroll (2005), Locke & Bogin (2006), Locke (2009). As mentioned in Ridley, the relationship between ontogeny and phylogeny has been a classic question in evolutionary studies, even though strict recapitulationist views are no longer held. Given these considerations, I am assuming here that any parallelism provides some corroborating evidence, even though clearly not decisive proof.

constructions, often sub-sentential (including root small clauses and root infinitives). These clauses show morphology and basic word order (with no Move), distinct from what one finds in finite clauses:

(54) a.   Koffie   drinken.   *Dutch*
            coffee   drink.INF
      b.   Portemonnai   verloren
            wallet   lost.PAST-PART
      c.   Tedereen   naar buiten
            everybody   to   outside

Whereas control speakers produced 10% non-finite clauses, aphasics produced about 60%. In children, the overuse of non-finite clauses decreased with age: from 83% in the 2-year-olds, to 60% in the 2.5-year-olds, to 40% in the 3-year-olds. Recent computational and brain-imaging work indicates that the selection of these sub-sentential forms is task dependent, arguably used to prevent computational overload. A PET study by Indefrey *et al*. (2001) shows that non-finite clauses require less grammatical work. The use of subordination/CP is also affected in agrammatic patients (see, e.g., the 'tree-pruning approach' of Friedmann & Grodzinsky 1997 and Friedmann 2002).

The data introduced in the previous sections, the 'living fossils' of syntax, are characteristically formulaic/stereotypical expressions (e.g., *Case closed; Me first; Nothing ventured, nothing gained*). According to, for example, Code (2005: 317), non-propositional, stereotypical/formulaic uses of language might represent fossilized clues to the evolutionary origins of human communication, given that their processing involves more ancient processing patterns, including more involvement of the basal ganglia, thalamus, limbic structures, and the right hemisphere (see, e.g., Lieberman 2000 for an extensive argument that subcortical structures, basal ganglia in particular, play a crucial role in syntax). Basal-limbic structures are phylogentically old and the aspects of human communication associated with them are considered to be ancient, too (van Lancker & Cummings 1999, Bradshaw 2001). For example, a stroke to the right basal ganglia can lead to the loss of overlearned/formulaic speech, including swearwords, prayers, and counting (Speedie *et al*. 1993, van Lancker & Cummings 1999). Robinson (1972) proposed that two levels of the human nervous system are responsible for speech/language: An older system, and a newer cortical system. These considerations are consistent with the gradualist approach to syntax explored in this article.

6.   Conclusion: Back to Subjacency

This article has concluded that syntactic islands do not form a natural class, but that non-islands do, and that, for this reason, there can never be a principled account of islandhood/Subjacency. My proposal is that Subjacency is not a specific principle of syntax, but rather the default state of syntax, dating back in time to the evolutionary beginnings of language, in which Move was unavailable. I have hypothesized two intermediate stages in the development of syntax,

in which Move (e.g., across clause boundaries) was unavailable: The adjunction/parataxis stage (à la Jackendoff 1999, 2002), and the coordination stage. In this view, Move and subordination are later innovations, probably made possible by the emergence of specialized functional categories and their projections, such as TP and CP. Various syntactic constructions in present-day use still preserve the state of syntax lacking Move, giving an illusion of Subjacency.

My proposal reverses the direction of syntactic evolution hypothesized in Newmeyer (1991), who also explores a gradualist approach. While Newmeyer assumes that the initial stages of syntax were characterized by Move free of Subjacency, I propose exactly the opposite, that islandhood (or the state with No Move) was the norm in the previous stages, and that Move was an innovation. This reversal allows me to kill three birds with one stone. First, it provides some rationale for characterizing islandhood/Subjacency as the default state of grammar, rather than as a constraint on grammars. Second, this allows me to explain the existence of various fossilized expressions (arguably 'living fossils' of this proto-syntax stage), which cannot be manipulated by Move.

Third, and most importantly, this allows me to address the question of how or why the progression took place from the proto-syntactic stages with no Move and no subordination, to the stage(s) with Move and subordination. Instead of targeting the abstract and obscure Subjacency by natural/sexual selection, as in Newmeyer's (1991) proposal, my proposal targets the emergence of subordination (Move emerging in conjunction with it). In comparison to its more primary counterparts, adjunction and coordination, subordination provides a clear and concrete advantage in the expressive power. One such advantage is that subordination, and only subordination (57), affords the possibility to recursively embed multiple viewpoints one within another, as seen in these repeated examples:

(55)   [As you know,] [as Mary knows,] he is a linguist.   *Adjunction*

(56)   He is a linguist, [and you know it,] [and Mary knows it].   *Coordination*

(57)   You know [that Mary knows [that he is a linguist]].   *Subordination*

This communicative advantage is concrete enough that it could have been targeted by natural or sexual selection.

This article offers a hypothesis which is consistent with a lot of language data, with how grammaticalization processes work, as well as with many studies in language acquisition and processing. Moreover, this proposal offers a reconstruction of how communicative/functional benefits may have been involved in shaping the formal design of language itself. Finally, an important advantage of this proposal is that it does not force us into conclusion that syntax is all or nothing, and that the evolution of syntax as a whole had to have been a sudden, passive, and inexplicable event, inexplicable in the sense that the nature of its evolution has nothing to do with its design. The approach explored here leaves open the possibility that syntax played an active role in evolving human beings. If we do not explore this kind of approach, in order to prove it or disprove it, we will never know.

References

Adger, David. 2003. *Core Syntax: A Minimalist Approach*. Oxford: Oxford University Press.

An, Duk-Ho. 2007. Clauses in non-canonical positions at the syntax–phonology interface. *Syntax* 10, 38–79.

Belletti, Adriana & Luigi Rizzi. 2000. *An Interview on Minimalism, with Noam Chomsky*, the University of Siena, November 8–9, 1999; revised March 16, 2000. [http://www.media.unisi.it/ciscl/pubblicazioni.htm.]

Berwick, Robert C. 1998. Language evolution and the Minimalist Program: The origins of syntax. In James R. Hurford, Michael Studdert–Kennedy & Chris Knight (eds.), *Approaches to the Evolution of Language: Social and Cognitive Bases*, 320–340. Cambridge: Cambridge University Press.

Bickerton, Derek. 1990. *Language and Species*. Chicago: University of Chicago Press.

Bickerton, Derek. 1995. *Language and Human Behavior*. Seattle, WA: University of Washington Press.

Bickerton, Derek. 1998. Catastrophic evolution: The case for a single step from protolanguage to full human language. In James R. Hurford, Michael Studdert–Kennedy & Chris Knight (eds.), *Approaches to the Evolution of Language: Social and Cognitive Bases*, 341–358. Cambridge: Cambridge University Press.

Bickerton, Derek. 2007. Language evolution: A brief guide for linguists. *Lingua* 117, 510–526.

Bloom, Lois. 1970. *Language Development: Form and Function in Emerging Grammars*. Cambridge, MA: MIT Press.

Boeckx, Cedric. 2008. *Bare Syntax*. Oxford: Oxford University Press.

Boeckx, Cedric & Kleanthes K. Grohmann. 2007. Putting phases in perspective. *Syntax* 10, 204–222.

Bowers, John. 1993. The syntax of predication. *Linguistic Inquiry* 24, 591–656.

Bradshaw, John L. 2001. *Developmental Disorders of the Frontostratial System*. Hove: Psychology Press.

Brain, Walter Russell & Roger Bannister. 1992. *Clinical Neurology*, 7th edn. Oxford & New York: Oxford University Press.

Braine, Martin D.S. 1963. The ontogeny of English phrase structure: The first phase. *Language* 39, 1–13.

Braine, Martin D.S. 1976. *Children's First Word Combinations*. Chicago: University of Chicago Press.

Briscoe, Ted. 2000. Grammatical acquisition: Inductive bias and co–evolution of language and the language acquisition device. *Language* 76, 245–296.

Broca, Paul. 1878. Anatomie comparée des circomvolutions cérébrales: Le grand lobe limbique et la scissure limbique dans la série des mammifères. *Revue anthropologique* 1, 385–498.

Burling, Robbins. 2005. *The Talking Ape: How Language Evolved*. Oxford: Oxford University Press.

Cardinaletti, Anna & Maria Teresa Guasti (eds.). 1995. *Small Clauses*. San Diego, CA: Academic Press.

Carroll, Sean. B. 2005. *Endless Forms Most Beautiful: The New Science of Evo Devo and the Making of the Animal Kingdom*. New York: W.W. Norton & Co.

Chomsky, Noam 1980. *Rules and Representations*. New York: Columbia University Press.

Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A Life in Language*, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2004. Beyond explanatory adequacy. In Adriana Belletti (ed.), *Structures and Beyond: The Cartography of Syntactic Structures*, vol. 3, 104–131. Oxford: Oxford University Press.

Chomsky, Noam. 2005. Three factors in language design. *Linguistic Inquiry* 36, 1–22.

Chomsky, Noam. 2008. On phases. In Robert Freidin, Carlos P. Otero & Maria Luisa Zubizarreta (eds.), *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud,* 133-166. Cambridge, MA: MIT Press.

Cinque, Guglielmo. 1978. Towards a unified treatment of island constraints. In Wolfgang U. Dressler & Wolfgang Meid (eds.), *Proceedings of the Twelfth International Congress of Linguists, Vienna, August 28 – September 2, 1977*, 344–348. Innsbruck: Universität Innsbruck.

Code, Chris. 2005. First in, last out? The evolution of aphasic lexical speech automatisms to agrammatism and the evolution of human communication. *Interaction Studies* 6, 311–334.

Crocket, Dina B. 1976. *Agreement in Contemporary Standard Russian*. Cambridge, MA: Slavica Publishers.

Culicover, Peter W. & Ray Jackendoff. 2005. *Simpler Syntax*. New York: Oxford University Press.

Darwin, Charles. 1964. *On the Origin of Species*, facsimile edn. Cambridge, MA: Harvard University Press.

Dawkins, Richard. 1999. *The Extended Phenotype: The Long Reach of the Gene.* Oxford: Oxford University Press.

Deacon, Terrence W. 1997. *The Symbolic Species: The Co–Evolution of Language and the Brain*. New York: W.W. Norton & Co.

Deutscher, Guy. 2000. *Syntactic Change in Akkadian: The Evolution of Sentential Complementation*. Oxford: Oxford University Press.

Deutscher, Guy. 2005. *The Unfolding of Language: An Evolutionary Tour of Mankind's Greatest Invention*. New York: An Owl Book, Henry Holt & Co.

den Dikken, Marcel. 2005. Comparative correlatives comparatively. *Linguistic Inquiry* 36, 497–532.

Dressler, Wolfgang U. & Annemarie Karpf. 1995. The theoretical relevance of pre- and proto-morphology in language acquisition. In Geert Booij & Jaap van Marle (eds.), *Yearbook of Morphology 1994*, 99–122. Dordrecht: Kluwer.

Dwyer, David. 1986. What are chimpanzees telling us about language? *Lingua* 69, 219–244.

Fisher, Ronald A. 1930. *The Genetical Theory of Natural Selection*. Oxford: Clarendon Press.

Fitch, W. Tecumseh. 1997. Vocal tract length and formant frequency dispersion

correlate with body size in rhesus macaques. *Journal of the Acoustical Society of America* 102, 1213–1222.

Fitch, W. Tecumseh, Mark D. Hauser & Noam Chomsky. 2005. The evolution of the language faculty: Clarifications and implications. *Cognition* 97, 179–210.

Friedmann, Na'ama. 2002. Question production in agrammatism: The tree–pruning hypothesis. *Brain and Language* 80, 160–187.

Friedmann, Na'ama & Yosef Grodzinsky. 1997. Tense and agreement in agrammatic production: Pruning the syntactic tree. *Brain and Language* 56, 397–425.

Goodall, Grant. 1987. *Parallel Structures in Syntax: Coordination, Causatives and Restructuring*. Cambridge: Cambridge University Press.

Guasti, Maria Teresa. 2002. *Language Acquisition: The Growth of Grammar*. Cambridge, MA: MIT Press.

Haldane, John Burdon Sanderson. 1927. A mathematical theory of natural and artificial selection. Part V: Selection and Mutation. *Proceedings of the Cambridge Philosophical Society* 23, 838–844.

Hale, Mark. 1987. Notes on Wackernagel's Law in the language of the Rigveda. In Calvert Watkins (ed.), *Studies in Memory of Warren Cowgill*. Berlin: De Gruyter.

Hauser, Mark, Noam Chomsky & W. Tecumseh Fitch. 2002. The language faculty: What is it, who has it, and how did it evolve? *Science* 298, 1569–1579.

Hinton, Geoffrey E. & Steven J. Nowlan. 1987. How learning can guide evolution. *Complex Systems* 1, 495–502.

Hock, Hans Henrich. 1989. Early Indo-European syntactic typology: A different approach. Paper presented at the *Eighth East Coast Indo–European Conference*, Cambridge, MA. [Harvard University, 10 June 1989.]

Holmberg, Anders. 1986. Word order and syntactic features in the Scandinavian languages and English. Stockholm, University of Stockholm dissertation.

Huang, James. 1982. Logical relations in Chinese and the theory of grammar. Cambridge, MA: MIT dissertation.

Hurford, James R. 2007. *The Origins of Meaning: Language in the Light of Evolution*. Oxford: Oxford University Press.

Indefrey, Peter, Collin M. Brown, Frauke Hellwig, Katrin Amunts, Hans Herzog, Rüdiger J. Seitz & Peter Hagoort. 2001. A neural correlate of syntactic encoding during speech production. *Proceedings of the National Academy of Sciences of the United States of America* 98, 5933–5936.

Jackendoff, Ray. 1999. Possible stages in the evolution of the language capacity. *Trends in Cognitive Sciences* 3, 272–279.

Jackendoff, Ray. 2002. *Foundations of Language: Brain, Meaning, Grammar, Evolution*. Oxford: Oxford University Press.

Jacob, François. 1977. Evolution and tinkering. *Science* 196, 1161–1166.

Jakobson, Roman. 1941. *Child Language, Aphasia and Phonological Universals*, transl. published in 1968. The Hague: Mouton.

Jespersen, Otto. 1954. *A Modern English Grammar.* Part III: *Syntax*. London: Allen & Unwin.

Joanette, Yves, Pierre Goulet & Didier Hannequin. 1990. *Right Hemisphere and*

Verbal Communication. New York: Springer–Verlag.

Jordens, Peter. 2002. Finiteness in early child Dutch. *Linguistics* 40, 687–765.

Kayne, Richard. 1982. Predicates and arguments, verbs and nouns. *GLOW Newsletter* 8, 24.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge: MIT Press.

Kiparsky, Paul. 1968. Tense and mood in Indo-European syntax. *Foundations of Language* 4, 30–57.

Kiparsky, Paul. 1995. Indo-European origins of Germanic syntax. In Adrian Battye & Ian Roberts (eds.), *Clause Structure and Language Change*, 140–169. Oxford: Oxford University Press.

Klein, Richard G. 2000. Archeology and the evolution of human behaviour. *Evolutionary Anthropology* 9, 17–36.

Kolk, Herman. 2006. How language adapts to the brain: An analysis of agrammatic aphasia. In Ljiljana Progovac, Kate Paesani, Eugenia Casielles & Ellen Barton (eds.), *The Syntax of Nonsententials: Multidisciplinary Perspectives*, 229–258. Amsterdam: John Benjamins.

Lasnik, Howard & Mamoru Saito. 1984. On the nature of proper government. *Linguistic Inquiry* 15, 235–289.

Lebeaux, David. 1988. Language acquisition and the form of the grammar. Amherst, MA: University of Massachusetts dissertation.

Lieberman, Philip. 2000. *Human Language and Our Reptilian Brain: The Subcortical Bases of Speech, Syntax, and Thought*. Cambridge, MA: Harvard University Press.

Lightfoot, David. 1991. Subjacency and sex. *Language & Communication* 11, 67–69.

Locke, John L. 2009. Evolutionary developmental linguistics: Naturalization of the faculty of language. *Language Sciences* 31, 33–59.

Locke, John L. & Barry Bogin. 2006. Language and life history: A new perspective on the evolution and development of linguistic communication. *Behavioral and Brain Science* 29, 259–325.

Longa, Victor M. 2006. A misconception about the Baldwin Effect: Implications for language evolution. *Folia Linguistica* 40, 305–318.

Mellars, Paul A. 1991. Cognitive changes and the emergence of modern humans. *Current Anthropology* 30, 349–85.

Mellars, Paul. 2002. Archeology and the origins of modern humans: European and African perspectives. In Tim J. Crow (ed.), *The Speciation of Modern Homo Sapiens*, 31–47. Oxford: Oxford University Press.

Miller, Geoffrey A. 2000. *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*. London: William Heinemann.

Mithen, Steven. 1996. *The Prehistory of the Mind: A Search for the Origins of Art, Religion, and Science*. London: Thames and Hudson.

Munn, Alan B. 1993. Topics in the syntax and semantics of coordinate structures. College Park, MD: University of Maryland dissertation.

Napoli, Donna Jo. 1993. *Syntax*. Oxford: Oxford University Press.

Nespor, Marina & Irene Vogel. 1986. *Prosodic Phonology*. Dordrecht: Foris.

Newmeyer, Frederick J. 1991. Functional explanation in linguistics and the origin of language. *Language and Communication* 11, 1–28.

Ouhalla, Jamal. 1993. Functional categories, agrammatism and language acqui-
    sition. *Linguistische Berichte* 143, 3–36.
Payne, John. 1985. Complex phrases and complex sentences. In Timothy Shopen
    (ed.), *Language Typology and Syntactic Description*, vol. 2: *Complex Con-
    structions*, 3–41. Cambridge: Cambridge University Press.
Peters, Anne M. 1999. The emergence of so–called 'functional categories' in
    English: A case study of auxiliaries, modals and quasi–modals. In Shin ya J.
    Hwang & Arle R. Lommel (eds.), *LACUS (The Linguistic Association of
    Canada and the United States) Forum XXV, Fullerton, CA*, 179–188.
Peters, Ann M. & Lise Menn. 1993. False starts and filler syllables: Ways to learn
    grammatical morphemes. *Language* 69, 742–777.
Piattelli–Palmarini, Massimo & Juan Uriagereka. 2004. Immune syntax: The evo-
    lution of the language virus. In Lyle Jenkins (ed.), *Variation and Universals
    in Biolinguistics*, 341–377. Oxford: Elsevier.
Pinker, Steven. 1995. *The Language Instinct*. Harmondsworth: Penguin Books.
Pinker, Steven & Paul Bloom. 1990. Natural language and natural selection.
    Behavioral and Brain Sciences 13, 707–784.
Platzak, Christer. 1990. A grammar without functional categories: A syntactic
    study of early child language. *Nordic Journal of Linguistics* 13, 107–126.
Postal, Paul M. 1997. Islands. Ms., New York University.
Postal, Paul. 1998. *Three Investigations of Extraction*. Cambridge, MA: MIT Press.
Potts, Christopher & Tom Roeper. 2006. The narrowing acquisition path: From
    ex-pressive small clauses to declaratives. In Ljiljana Progovac, Kate
    Paesani, Eugenia Casielles & Ellen Barton (eds.), *The Syntax of Non-sen-
    tentials: Multidisciplinary Perspectives,* 183–201. Amsterdam: John Benjamins.
Progovac, Ljiljana. 2003. Structure for Coordination. In Lisa Cheng & Rint
    Sybesma (eds.), *The Second GLOT International State-of-the-Article Book: The
    Latest in Linguistics*, 241–288. The Hague: de Gruyter.
Progovac, Ljiljana. 2006. The syntax of nonsententials: Small clauses and phrases
    at the root. In Ljiljana Progovac, Kate Paesani, Eugenia Casielles & Ellen
    Barton (eds.), *The Syntax of Nonsententials: Multidisciplinary Perspectives*, 33–
    71. Amsterdam: John Benjamins.
Progovac, Ljiljana. 2007. Sex and syntax: Another angle on subjacency. Paper
    presented at the *Annual Meeting of Michigan Linguistic Society*, Ypsilanti.
    [Eastern Michigan University, 10 November 2007.]
Progovac, Ljiljana 2008. What use is half a clause? In Andrew D.M. Smith, Kenny
    Smith & Ramon Ferrer i Cancho *(eds.), Evolution of Language: Proceedings of
    the 7*th *International Conference (EVOLANG7), Barcelona, Spain, 12–15 March
    2008*, 259–266. New Jersey: World Scientific.
Progovac, Ljiljana. 2009a. Layering of grammar: Vestiges of evolutionary
    development of syntax in present–day languages. In Geoffrey Sampson,
    David Gil & Peter Trudgill (eds.), *Language Complexity as an Evolving Vari-
    able*, 203–212. Oxford: Oxford University Press.
Progovac, Ljiljana. 2009b. What is there when little words are not there: Possible
    implications for evolutionary studies. In Ronald P. Leow, Héctor Campos
    & Donna Lardiere (eds.), *Little Words: Their History, Phonology, Syntax, Se-
    mantics, Pragmatics, and Acquisition, 99–108*. Washington, DC: Georgetown

University Press.

Progovac, Ljiljana. In press. When clauses refuse to be recursive: An evolutionary perspective. In Harry van der Hulst (ed.), *Recursion in Human Language*, 193–211. Berlin: Mouton de Gruyter.

Pulvermüller, Friedemann, 2002. *The Neuroscience of Language: On Brain Circuits of Words and Serial Order*. Cambridge: Cambridge University Press.

Radford, Andrew. 1988. Small children's small clauses. *Transactions of the Philological Society*, 86, 1–43.

Radford, Andrew. 1990. *Syntactic Theory and the Acquisition of English Syntax*. Oxford: Blackwell.

Ridley, Mark. 1993. *Evolution*. Oxford: Blackwell.

Robinson, Bryan W. 1972. Anatomical and physiological contrasts between human and other primate vocalizations. In Sherwood L. Washburn & Phyllis Dolhinow (eds.), *Perspectives on Human Evolution 2*, 438–443. New York: Holt, Rinehart & Winston.

Rolfe, Leonard. 1996. Theoretical stages in the prehistory of grammar. In Andrew Lock & Charles R. Peters (eds.), *Handbook of Human Symbolic Evolution*, 776–792. Oxford: Clarendon Press.

Ross, John R. 1967. Constraints on variables in syntax. Cambridge, MA: MIT dissertation.

Schütze, T. Carson. 2001. On the nature of default case. *Syntax* 4, 205–238.

Schwartz, Linda. 1989a. Thematic linking in Hausa asymmetric coordination. *Studies in African Linguistics* 20, 29–62.

Schwartz, Linda. 1989b. Asymmetrical syntax and symmetrical moprhology in African languages. In Paul Newman & Robert Botne (eds.), *Current Approaches to African Linguistics* 5, 21–33. Dordrecht: Foris.

Selkirk, Elisabeth O. 1978. On prosodic structure and its relation to syntactic structure. In Thorstein Fretheim (ed.), *Nordic Prosody II*, 111–120. Trondheim: TAPIR.

Selkirk, Elisabeth. 1984. *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge, MA: MIT Press.

Speedie, Lynn J., Eli Wertman, J. Tair & Kenneth M. Heilman. 1993. Disruption of automatic speech following a right basal ganglia lesion. *Neurology* 43, 1768–1774.

Stepanov, Arthur. 2001. Late adjunction and minimalist phrase structure. *Syntax* 4, 94–125.

Stepanov, Arthur. 2007. The end of CED? Minimalism and extraction domains. *Syntax* 10, 80–126.

Stowell, Timothy. 1981. Origins of phrase structure. Cambridge, MA: MIT dissertation.

Stringer, Christopher B. & Peter Andrews. 1988. Genetic and fossil evidence for the origin of modern humans. *Science* 239, 1263–1268.

Studdert–Kennedy, Michael. 1991. Language development from an evolutionary perspective. In Norman A. Krasnegor, Duane M. Rumbaugh, Richard L. Schiefelbusch & Michael Studdert–Kennedy (eds.), *Biological and Behavioral Determinants of Language Development*, 5–28. Hillsdale, NJ: Erlbaum.

Stump, Gregory T. 1985. *The Semantic Variability of Absolute Constructions*. Dor-

drecht: D. Reidel.

Szabolcsi, Anna & Marcel den Dikken. 2003. Islands. In Lisa Cheng & Rint Sybesma (eds.), *The Second GLOT International State-of-the-Article Book: The Latest in Linguistics*, 213–240. The Hague: de Gruyter.

Taraldsen, Knut Tarald. 1986. On verb second and the functional content of syntactic categories. In Hubert Haider & Martin Prinzhorn (eds.), *Verb Second Phenomena in the Germanic Languages*, 7–26. Dordrecht: Foris.

Traugott, Elisabeth C. & Bernd Heine. 1991. *Approaches to Grammaticalization*, Vol. II: Typological Studies in Language 19. Amsterdam: John Benjamins.

Uriagereka, Juan. 2008. *Syntactic Anchors: On Semantic Structuring*. Cambridge: Cambridge University Press.

van Lancker, Diana & Jeffrey L. Cummings 1999. Expletives: Neurolinguistic and neurobehavioral perspectives on swearing. *Brain Research Reviews* 31, 83–104.

Veneziano, Edy & Hermine Sinclair. 2000. The changing status of 'filler syllables' on the way to grammatical morphemes. *Journal of Child Language* 27, 461–500.

Watkins, Calvert 1976. Towards Proto-Indo-European syntax: Problems and pseudo-problems. *CLS Parasession on Diachronic Syntax*, 305–326.

Wernicke, Carl. 1874. *Der aphasische Symptomencomplex: Eine psychologische Studie auf anatomischer Basis*. Breslau: Cohn und Weigert.

Winford, Donald. 2006. Reduced syntax in prototypical pidgins. In Ljiljana Progovac, Kate Paesani, Eugenia Casielles & Ellen Barton (eds.), *The Syntax of Nonsententials: Multidisciplinary Perspectives*, 283–307. Amsterdam: John Benjamins.

Zec, Draga & Sharon Inkelas. 1990. Prosodically constrained syntax. In Sharon Inkelas & Draga Zec (eds.), *Phonology–Syntax Connection*, 365–378. Chicago: Chicago University Press.

Ljiljana Progovac
Wayne State University
Department of English
Linguistics Program
5057 Woodward
Detroit, MI 48202
USA
progovac@wayne.edu