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Grammars Within without Recursion: Implications for Evolutionary Studies[1]

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"*The present is the key to the past.*"

Abstract. This paper argues that even in well-known modern languages (including English), underneath the layer of sentential grammar, with a robust system of functional projections and structural relationships (tense, structural case, complementizers), there co-exists a layer of grammar arguably without any such mechanisms, and without a possibility for recursion/embedding. This grammar is instantiated by various types of Root Small Clauses (RootSCs), ranging from irrealis clauses (e.g. *Him worry?!; Her happy?!; Family first!*), to contextually-situated clauses (e.g. *Case closed. Problem solved*.), to unaccusative RootSCs, to exocentric compounds (e.g. *pickpocket, sawbones*). Such RootSCs show no tense or structural case, the lack of tense correlating with frequent non-indicative/irrealis interpretations (Progovac 2006a,b). Importantly, these small clauses cannot embed one within another, suggesting that even languages like English have clauses that are not recursive in this sense (for languages that might use such grammars exclusively, see Everett 2005). If so, then Merge alone cannot capture all the recursive power of language, contra the hypothesis put forth by e.g. Chomsky (2005) and Hauser et al. (2002). Rather, Merge can be seen as a necessary, but not sufficient condition for recursion/subordination.

I further argue that the grammar instantiated by RootSCs can be seen as a vestige/'living fossil' of an evolutionary stage of morpho-syntax which utilized no functional categories such as tense, structural case, or complementizers, and which, *for that reason*, did not allow of recursive subordination (for the idea of syntactic fossils, see Jackendoff 2002). This evolutionary view is consistent with more recently observed grammaticalization processes and finds corroborating evidence in stages in child language development. Not only does this perspective help situate syntax in an evolutionary framework, but it also begins to shed light on the very nature of syntax, including on why every sentence is built upon a small clause (the analysis widely accepted among syntacticians), and on the nature of some otherwise puzzling constraints in syntax, such as Subjacency.

Paper at a glance:

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1. Background: Embedding, recursion, small clauses (SCs)

Recursion understood as the ability to embed syntactic structures iteratively inside one another; here I focus on subordination, embedding of one clause inside another.
Finite subordination (involves a functional category, complementizer, and a finite clause):

(1) Mary believes [CP that John knows [CP that the neighbors noticed [CP that he fell off his motorcycle]]].

ECM subordination (structural ECM (Exceptional Case Marking) and a 'small clause' (SC)):

(2) a) Let [SC it be]. / Peter saw [SC Mike fall]. /I consider [SC the problem solved].
b) ?I will let [SC John imagine [SC Peter see [SC Mike fall off his motorcycle]]].

The commonly accepted analysis of small clauses (Stowell 1981, 1983), adopted also in Chomsky (1995),[2] treats SCs as projections of predicates (as VPs, APs, PPs, etc.), without any (obligatory) internal functional projections, such as Tense). However, the subjects of embedded SCs have a structural (case) relationship with the matrix verb, the so-called ECM case, suggested by the required adjacency (no intervening adverbials) (3), and by required DP (4 vs. 5).[3]

(3) a. **I let sometimes John imagine vividly Mike fall off his bike.*
b. *I consider truly [the problem solved].

(4) a. **I consider [problem solved]*. / **I consider [class in session]*.

(5) *I consider [the problem solved*.] / *I consider [the class in session]*.

Both types of embedding exploit some functional glue to 'cement' the relationship: complementizers or structural case.[4] Complementizer glue is more specific (only used for finite subordination), while structural case glue is less specific. This may be why recursion seems freer with finite subordination (see Deutscher 2000 for claims along these lines; see Section 5). But can there exist clauses which avail themselves of even less specific functional glue, or of no glue at all, and which are consequently not able to (recursively) embed one within another?

1. I argue that there are indeed such syntactic structures, even in English, and these are small clauses whose subjects have no structural relationship with any other word, and are instead used in the 'default case' form. Such clauses are found in isolation, or in root contexts (where I call them 'RootSCs') (Section 2), but also inside other clauses, in which case they are not fully integrated into the syntactic fabric of the matrix clause (where I call them bare SCs) (Section 3). Section 5 shows that they do not embed.

2. It may well be that recursive subordination is only possible if some relatively specific

[2] But see Cardinaletti and Guasti (1995) for different views.

[3] DP is commonly held to be required in argument positions (including subject positions) for structural case checking (e.g. Longobardi 1994).

[4] Of note is also that functional categories typically select a unique complement: e.g. C (complementizer) typically selects a TP (e.g. Abney 1987), implying that a small clause cannot be headed by a CP.

functional glue/category is available. If this is true, then it follows that Merge alone cannot capture all the recursive power of language, contra the hypothesis put forth in Chomsky (2005), Hauser et al. (2002), Fitch et al. (2005) (see e.g. Pinker and Jackendoff 2005 for criticism of such hypothesis). Merge can then be seen as a necessary, but not sufficient condition for recursion.

2. Various types of Root Small Clauses (RootSCs)

2. 1. Some RootSCs in English

'Mad Magazine' examples/'incredulity' clauses (see Akmajian 1984)[5]

(6) a) *Him retire!? (It will never happen*.)
b) John a doctor?! (*I don't think so*.)
c) *Her happy*?! (*I don't think that's possible*).

(Cf. (7)a) *He is going to retire. b) John is a doctor*. c) *She is happy*.)

Imperative/Optative RootSCs:

(8) *Me first*! / *Family first*!/ *Everybody out*!

(Cf. (9)*I am first. / Family should be first. /Everybody must go out*.)

RootSCs anchored in context, such as Here-and-Now; photograph:

(10) *Class in session*. / *Problem solved*. / *Case closed*. / *Me in Rome*.

(Cf. (11)*The class is in session./The problem was solved./The case is closed./I am in Rome*.)

-In fact, every sentence has a RootSC counterpart, rendering RootSCs quite productive.

-In the spirit of the analysis of ECM small clauses (Section 1), Progovac (2006a) analyzes RootSCs as projections of predicates, but with the subject in the default case (in contrast to ECM small clauses, whose subjects check structural case).[6] One argument comes from default accusative case in English; another from the fact that subjects in RootSCs do not require DP, the projection implicated in structural case-checking (e.g. Longobardi 1994); third, one semantic consequence of no tense is the typical non-indicative/irrealis interpretation, especially with verbal RootSCs.[7] Fourth, these clauses cannot embed within each other (Section 5).

Alternative possibility**:** to analyze RootSCs as finite clauses which have undergone deletion/ellipsis of relevant categories, such as finite verbs, articles, etc. In addition to facing the theoretical problem of constraining such deletion/ellipsis, such an analysis cannot explain the properties of RootSCs listed above.

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[5] Potts and Roeper (2006) discuss these constructs, but conclude that they are not really small clauses, but rather involve a coordination of unconnectable concepts – hence the incredulity reading for them (see Progovac et al. 2006b for some discussion of this analysis). On the other hand, Potts and Roeper consider the following clauses to be small clauses, which are necessarily situated in the immediate context, and which, moreover, cannot embed:

(i) You idiot!
(ii) *I consider [you idiot].

[6] See also Roeper's (1999) notion of Default Grammar; see Schütze (2001) for characterization of Default Case.

[7] RootSC can express statements in early child language (Radford 1990; Potts and Roeper 2006; but see Guasti 2002 for different views). This shift in interpretation of root small clauses from childhood to adulthood arguably parallels the historical development of tense/Indicative from Injunctive in pre-IE (see Section 4). Kiparsky (1968): the unmarked tense/mood form, Injunctive, was initially able to express both indicative and non-indicative meanings, but once tense and Indicative emerged in pre-IE, Injunctive specialized only for non-indicative/irrealis readings.

2.2. Unaccusative RootSCs in Serbian (to be presented as Progovac 2007c)

(12) Stigla pošta. /Pala vlada. / Došla zima. / /Umro Petar.
arrived.FSG mail fallen-FSG government come-FSG winter died-MSG Peter
'The mail has arrived/The government has fallen/The winter has arrived/Peter died.'

cf. (13) Pošta je stigla. /Vlada je pala./ Zima je došla. / Petar je umro.
Aux.3SG

(14) ??? Pošta stigla. / ???Vlada pala. / ??Zima došla. / ???Petar umro.

Word Order: Unaccusative verbs (e.g. *arrive, fall*) are typically analyzed as taking an internal (theme) argument, which first merges as a complement of the verb, and then remerges/moves to become the subject of sentence (TP) (e.g. Perlmutter 1978, Burzio 1986, Harves 2002). However, Serbian has quite productive clauses with unaccusative verbs (12) in which such Move does not take place (14), and which, as a result, show an unusual (for Serbian) VS word order. The verbs in (12) are participles, and there is no auxiliary verb supporting tense, in contrast to examples in (13), which have a tense auxiliary and allow movement to the subject position. I analyze (12) as base-generated RootSCs without a layer of TP, and thus without any movement to SpecTP.

Temporal Adverbials. (12) pertains to the "Here and Now," and cannot be modified by e.g. adverbials denoting remote past, such as 'pre tri meseca' ('three months ago'), in contrast to full TPs which can be so modified (see also Footnote 4).

Embedding. Clauses such as (12) do not embed, as will be shown in Section 5.

2. 3. Exocentric compounds as RootSCs

(15) *saw-bones, pick-pocket, scare-crow, kill-joy, dare-devil, Mar-wood, Shake-speare*

(16) cep**i**-dlaka 'split-hair = hairsplitter' der**i**-koža 'rip-skin = who rips you off'
isp**i**-čutura 'empty-bottle = drunkard' jeb**i**-vetar vulgar: 'screw-wind = purposeless person'
mut**i**-voda 'muddy-water = who muddies waters' sec**i**-kesa 'cut-purse = pick-pocket'
raspi-kuća 'waste-house = who spends away property' vrt**i**-guz 'spin-bottom = restless person'
vrt**i**-rep 'spin-tail = restless person' klju**j**-drvo ('peck-wood = wood-pecker')

Progovac (2006b) analyzes such compounds as RootSCs, with a default case complement, and a verb form which preserves ancient mood morphology, which in Serbian happens to have survived as imperative.[8] The distinct imperative ending **i/j** suggests both clausal derivation and ancient structure.[9]

3. Bare small clauses in adjunction and coordination

Small clauses with default case subjects (bare small clauses) can also be found inside other clauses, where their subjects have no way of checking structural case:

-Adverbial SCs, discussed in Jackendoff (2002), who uses them to suggest a pre-TP stage in the evolution of human language:

[8] Fossilized imperative is also found in some dialects of Serbian as so-called Historical Imperative in narratives (cf. the more familiar Historical Present) (*... ja udri, radi od jutra do mraka, a žena opet zavezuj novce ..., mesi, peci ...* 'I go-IMP, work-IMP from morning to dark, and wife again tie-IMP money, knead-IMP, bake-IMP…' (Maretić).

[9] It is commonly held that Slavic imperative descended from the ancient Proto-IE injunctive, possibly via Optative (Kiparsky 1968; Stevanović 1964, Kuryłowicz 1964; Kerns and Schwartz 1974). Injunctive at some point specialized for non-indicative, 'irrealis' moods, expressing wishes, commands, and/or exclamations (cf. English frozen expressions: *Long Live the King*; *God forbid.)*

(17) [Us having left], he reverted to his old ways.
(18) [Him having gone to Rome], I can now focus on my work.
-SCs in coordination (Jespersen 1954)
(19) I am not going to have any woman rummaging about my house, and [me in bed].

These small clauses are not (fully) integrated into the sentential fabric, suggesting that coordination and adjunction still allow Merge of semi-integrated/paratactic structures (see Section 6 on Subjacency for the significance of this observation).

4. Evolutionary perspective: Layering of structure

I have argued that the RootSC grammar can be seen as a vestige/ 'living fossil'[10] of a previous evolutionary stage of moprho-syntax which utilized no functional categories (necessary for embedding) (Progovac 2006b; 2007a,b; see Jackendoff 2002 for the idea of syntactic fossils). Once tense (and/or other functional categories) emerged, they were superimposed on RootSCs, letting them survive, albeit in marginalized roles. Similar stratification accounts have been proposed for brain development, as well as the development of complexity in general, where newly emerged patterns become dominant and 'rework' older patterns into conformity with them (Rolfe 1996; Vygotsky 1981). (See Appendix 1 for various metaphors of layering and dominance in the evolution of complexity).[11]
What I consider here to be preserved is the RootSC syntax, and our ability to tap into it, rather than particular modern-day realizations of such syntax.

-Small clauses are both pervasive and robust syntactic constructs, occurring in root contexts (as RootSCs, Section 2), as integrated ECM small clauses (Section 1), as loosely attached adjuncts and conjuncts (Section 3), and more (see below). Moreover, RootSCs arguably characterize a stage in language acquisition (see below) and are frequently resorted to in agrammatic aphasia (e.g. Kolk 2006 and references cited there; Siple 2006; see also Jakobson 1941; Ouhalla 1991; Gil 2005).

-Not only that: modern syntactic theory (including Chomsky 1995) analyzes every clause/sentence as initially a small clause, which gets transformed into a full/finite clause only upon subsequent merger of Tense and/or other comparable functional projections, and the subsequent Move of the subject to T(ense)P(hrase) (e.g., Stowell 1981, 1983; Burzio 1981; Kitagawa 1985, 1986; Koopman & Sportiche 1991; Chomsky 1995; Hale & Keyser 2002). In that sense, the layer of TP is superimposed upon the layer of small clause:
(20) [TP is [AP John [A' happy]]] → [TP John [T' is [AP t [A' happy]]]]
(21) [TP will [VP John [V' worry]]] → [TP John [T' will [VP t [V' worry]]]]

-Parker (2006, 285): why have Move, in addition to Merge, given that Move is more costly?
-If the small clause core of the sentence can be seen as a vestige of the evolutionary tinkering in building clausal/sentential structure, then Move can be seen (metaphorically) as a force which connects different layers of clausal derivation as determined by such evolutionary tinkering (almost as if sentence building retraces evolutionary steps). Neither bottom-up sentence building, nor small-

[10] According to Ridley (1993, 525), living fossils are species that have changed little from their fossil ancestors in the distant past (such as e.g. lungfish).
[11] For example, note how the adaptation that led to black coloration in leopards still preserves the previous layer of orange spots (Appendix 1, Section 5).

clausal beginnings of the sentence, nor Move, are conceptual necessities (for Subjacency, see Section 6)

-Corroborating evidence for a RootSC evolutionary stage comes from 'living fossils' found in modern-day languages, as discussed, as well as from language acquisition (see Rolfe 1996, Lock & Peters 1996, Appendix 2, for some recent and some old views on ontogeny and phylogeny). So-called two-word stage in L-1 can be characterized as involving root small clauses, as well as by probable absence of Move (see e.g. Radford 1988, 1990; Guilfoyle & Noonan 1992; Lebeaux 1989, 1990; Ouhalla 1991; Platzak 1990; Vainikka 1990; 1993/1994, Potts & Roeper 2006).[12]

-Grammaticalization: the path from a pre-TP stage to a finite/TP stage is both possible and attested: according to Kiparsky (1968), the unmarked tense/mood form, Injunctive, was initially able to express both indicative and non-indicative meanings in pre-IE, but once tense and Indicative emerged, Injunctive specialized only for non-indicative/irrealis readings. The emergence of Tense/TP in children shows a similar path (see also Footnote 6).

-Specialization/Division of Labor: If tense and structural case emerged at a later point in evolution, as an additional layer of structure, then there should be evidence that RootSCs have been pushed into elsewhere functions, which is typical of other linguistic additions, including lexical borrowings (cf. *beef* vs. *cow*) (Progovac et al, 2006b); this is the case with the adult irrealis/non-indicative uses of RootSCs (6;8), which show elsewhere/non-indicative interpretations.

As put in Carroll (2005, 170-171), "the erroneous notion … has been that the intermediate stages in the evolution of structures must be useless – the old saw of 'What use is half a leg or half an eye?' … (But the) multifunctionality and redundancy create the opportunity for the evolution of specialization through the division of labor…" [13]

-Evolutionary mechanism and time span: According to Pinker and Bloom (1990), there would be 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 (Stringer and Andrews, 1988), in the unlikely event that early Homo Sapiens was the first. They suggest as an evolutionary mechanism the Baldwin Effect, the process by which environmentally-induced responses set up selection pressures for such responses to become innate, triggering conventional Darwinian evolution. Not all linguistic innovations need begin with a genetic change in the linguistic abilities of speakers (see also Deacon 1997).

- Tiny selective advantages are sufficient for evolutionary change. According to Haldane's (1924) classic calculations, for example, 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. Even in long-lived humans this fits comfortably into the evolutionary timetable. Fixations of different genes can go in parallel (Pinker and Bloom, 1990).

5. Bare small clauses cannot embed/are not recursive

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[12] For references and discussion of the alternative views, according to which even two-word utterances in L-1 acquisition must be characterized by full sentential structure, see e.g. Guasti 2002.

[13] "… The simple tube-like walking limbs of Cambrian lobopodians became efficient articulated swimming, walking, and respiratory appendages in crustaceans, gills in aquatic insects, wings in terrestrial insects…. None of these later structures were invented from scratch; they are all variations on an ancient limb design." (quote continued from text)

Significantly, small clauses with default case subjects (bare small clauses), introduced in sections 2 and 3, cannot embed one within another/are not recursive:

English

(22) a. **Him worry [(that) me first]?!*
*b. *Her happy [(that) Peter retire]?!*
*c. */If problem solved, (then) me first!*
*d. *I consider [problem solved]/[case closed].*

Serbian unaccusative small clauses

(23) *Ja znam da stigla pošta. / *Ja znam da pala vlada. / *Ja znam da umro Petar.

Cf. (24) Ja znam da je pošta stigla/vlada pala /Petar umro.
I know that AUX mail arrived /government fallen/ Peter died.

Exocentric compounds

(25) *scare-pick-pocket (one who scares pickpockets)
(26) *dare-saw-bones (one who dares sawbones)
(27) *muti-ispi-čutura (Serbian; one who confuses drunkards)

In contrast, the English *–er* (endocentric) compounds are recursive (although not the *–ac* compounds in Serbian); they involve an affix (a functional piece), as well as word-order rearrangement (possibly Move; see Progovac 2005 and references there for an analysis of the two types of compounds along these lines):

(28) *truck-driver admirer*; *house-keeper overseer*

Parataxis. Although they cannot embed within one another, small clauses can participate in a loose paratactic relationship, as in e.g. proverbs or pidgin languages:

(29) Nothing ventured, nothing gained. / Easy come, easy go. / No pain, no gain.
(30) Mi o vuku, vuk na vrata. (Serbian)
We about wolf, wolf at door. ("Lupus in fibula")
(31) No money, no come. (Winford 2006; pidgin languages)

Winford (2006) points out that embedding is virtually nonexistent in pidgins; instead parataxis (i.e., juxtaposition, loose joining) is used. The following example is from Korean Pidgin English.[14]

(32) *Aena tu macha churen, samawl churen, haus mani pei. beri haad taim, no moa moni ... pua*
and too much children small children house money pay very hard time no more money poor
'And I [had] too many children, small children, I [had] to pay the rent. [It was a] very hard time, I had no money, [we were] poor'

-Reliance on iconicity of word order, temporal and/or causal. Iconicity becomes increasingly more difficult to compute if more than two clauses are paratactically attached.

-Deutscher (2000) argues that the development of finite subordination (CP complementation) in Akkadian had an adaptive advantage of breaking away from such iconicity (comparable arguments can

[14] Sparsity or nonexistence of subordination has been repeatedly reported for early stages of child speech (e.g. Radford 1990; Potts and Roeper 2006); also for agrammatic aphasia (e.g. Kolk 2006).

be made for the emergence of Tense/TP), which led to higher inter-clausal cohesion.[15] He reconstructs stages proceeding from least syntactically integrated (parataxis), to more integrated (coordination), to most integrated (specialized functional words/projections).[16] These are typical stages reported in grammaticalization of finite subordination (e.g. Trauggot and Heine 1991, Deutscher 2000, and references there).

(33) He is crazy – you know it. / As you know, he is crazy. (Parataxis)
(34) He is crazy, and you know it. (Coordination)
(35) You know that he is crazy. (Subordination)

-It is probable that appropriate functional categories/projections need to be in place to license syntactic embedding of clauses, whether an ECM mechanism or finite subordination (see e.g. Deutscher 2000; Progovac et al., 2006b). For a possible evolutionary scenario in the development of TP/CP, from small clauses, through proto-coordination stage, through specialized functional category stage, see Appendix 3. These stages reflect different levels of syntactic integration and cohesion (see also next section). More reliance on syntax permits less reliance on context.

-Languages that do not make use of finite subordination have been reported to exist today (e.g. Dixon 1995 for Dyirbal; Mithun 1984 for various Native American languages).

-Most recently, Everett (2005) has reported that Pirahã lacks recursion altogether, and has emphasized its reliance on the immediate context and iconicity.

6. A different angle on Subjacency/Island effects

If different constructions involve different degrees/layers of integration into the syntactic fabric, and if, moreover, constructions with different degrees of integration can find themselves in the same sentence (see below), this opens a possibility to look at Subjacency in a different light.

Recall from Section 3. that bare small clauses (syntactically not integrated SCs) occur both as adjuncts (36) and conjuncts (37), as well as in isolation (38) (Section 2):

(36) [Us having left], he reverted to his old ways.
(37) I am not going to have any woman rummaging about my house, and [me in bed].
(38) Me in bed!?

Coordination and adjunction are also among the islands for extraction, i.e. extraction/Move is not allowed out of them (see e.g. Ross 1967, Huang 1982, Chomsky 1986):

(39) *Which surgeon did Kim date [a lawyer and _____]? (Coordination)
(cf. Kim dated [a lawyer and which surgeon?])
(40) *Which surgeon did Kim date a lawyer [after she met ___]?(Adjunction)
(cf. Kim dated a lawyer [after she met which surgeon?])

Recall that bare small clauses (i.e. unintegrated small clauses) are not possible in complement

[15] Notice, on the other hand, that the paratactic (loose) attachment already affords a great advantage over just two isolated utterances, which need not be interpreted as causally related:
(i) Nothing ventured. Nothing gained.

[16] Lehmann (1980) mentions that ancient IE languages used finite complements the least, which can explain why ancient texts seem so unidiomatic; the sparser use of subordination meant greater reliance on time iconicity (Deutscher, 2000).

positions (Section 1); complement positions also happen to be the freest when it comes to extraction. It may be that adjuncts and conjuncts, because they are not fully integrated into the syntactic fabric, do not allow movement to flow across their boundaries. Movement may require a well-defined ladder of specialized functional projections along which the moved element can travel, metaphorically speaking (cf. e.g. the notion of 'extended functional projections').

If so, Subjacency may be seen as an epiphenomenon of the degree of syntactic integration of various constructions, which in turn can be seen as a residue of gradual evolutionary development (see also Appendix 3 for possible stages of development of cohesion in syntax), rather than an independent monolithic principle in its own right, which would have had to evolve independently.[17] To date, there has been no good analysis of Subjacency: most accounts stipulate which syntactic nodes, and/or which combination of nodes, and/or nodes in which syntactic positions, constitute barriers/obstacles to movement (see, e.g., some classic accounts in Huang 1982; Lasnik & Saito 1984, Chomsky 1986).[18]

Instead of assuming that Move just become available automatically and freely with Merge, and then needed to be constrained by certain abstract principles such as Subjacency, assume rather that syntactic Move became possible (and indeed motivated) only upon the development of layers of specialized functional projections, along which Move could operate. If adjuncts and conjuncts were to have such functional ladder leading into a containing clause, they would arguably cease to be what they are: conjuncts and adjuncts, and would rather become instantiations of subordination.

Thus, contrary to the general view that Subjacency cannot be captured by gradual emergence of syntax, it may be that gradual emergence of syntax, and the vast residue of intermediate stages of such development, is the only way to approach Subjacency.

[17] As noted in Pinker and Bloom (1990), the recent theory of linguistics provides numerous examples where a newly-discovered constraint is first proposed as an explicit statement listed as part of a grammar, but is then shown to be a deductive consequence of a far more wide-ranging principle.

[18] Moreover, some of these obstacles are weak and some are strong, and some *wh*-phrases are not subject to the same island constraints to which other *wh*-phrases are (see Szabolcsi & den Dikken 2003: 232). The reference also quotes a recent interview with Chomsky, in which he says that "there is no really principled account of many island conditions" (for the complete interview, see Belletti & Rizzi 2000).

Appendix 3: Possible (rough) stages in clause development

Stages proceeding from syntactically least integrated (parataxis) to more integrated (proto-coordination) to most integrated (specialized functional words/projections)

1. RootSC stage: Parataxis with intonation/prosody (supersegmental glue)
First syntax stage: two-word stage: Combinatorial breakthrough: Merge (see e.g. Jackendoff 2002, Deutscher 2005; Chomsky 2005, for discussion)
(cf. the pre-syntax stage, protolanguage in the sense of Bickerton (1995, 1998, In Press): one-word utterances with no syntactic Merge (cf. children's one-word stage))
-Intonation/prosody likely served as first glue (supersegmental) to hold two words together in a single utterance: paratactic attachment (see Burling 2005, 170; Dwyer 1986):

(i)	Pre-syntax:	Her. Happy.	Syntax:	Her happy.
(ii)		Me! First!		Me first.

-Intonation is still used for such purposes in modern-day languages, often in combination with functional categories, resulting in substantial redundancy.[19] Rising intonation signals uncertainty (iconically), while falling intonation implies assertion/certainty/completion (Burling, 2005, 170):

(iii) Is Mary already at home? / Mary is already at home?

-Intonation and prosody, which are modulated analogically, rather than discretely, must have been available before syntax; e.g. they have significant analogs in other species[20] (Deacon 1997; Piattelli-Palmarini and Uriagereka 2004; Burling 2005); See Appendix 1, Section 7, for more details.

-Notice that e.g. incredulity small clauses are characterized by exaggerated intonation (Section 2).

2. Possible proto-coordination stage (all-purpose segmental glue) (very tentative section)
-Typical stages of grammaticalization of finite subordination: parataxis, coordination, true subordination/complementation (e.g. Trauggot and Heine 1991, Deutscher 2000).
-Predication may also go through a coordination stage: evidence from 'living fossils:' German incredulity root small clauses take an optional conjunction (Potts and Roeper 2006):

(iv)	Ich	(und)	Angst	haben?	('Me afraid!?)
	I	and	fear	have-INF	

-Akkadian uses coordinative particle *–ma* in predicative functions (vi) (Deutscher (2000: 33-34); there was no verbal copula: possible use of root small clauses (v):

(v)	Ul	ab-ī	atta	'You are not my father.'
	not	father-my	you.MSG.Nom	
(vi)	'napišti	māt-im	eql-um-**ma**	'The soul of the land is the field.'
	soul.of	land-GEN	field-NOM-MA	

-Bowers (1993): English *as* analyzed as a realization of the head of Pr(edication) P(hrase) (vii):[21]

[19] In English, focus and topic/comment are mostly marked by intonation.
[20] Also, these components may remain intact even in cases of severe lexico-syntactic deficits (confabulatory paraphasia and jargon aphasia (Brain & Bannister, 1992; Broca, 1878; Wernicke, 1874; Pulvermüller 2002; Joanette, Goulet & Hannequin 1990).
[21] According to Deutscher (2000, 38), when the particle *–ma* combined with a preposition *kī*, it formed an adverbial conjunction *kīma*, whose three basic functions were: comparative/manner (*like, as, according to*); temporal (*when, as soon as*); causal/purpose (*because*). Deutscher argues that a very similar development is attested with the English word *as*, as well as German *als*. The original use for all was comparative, indicating similarity, likeness, which would have been suitable as a marker of predication.

(vii) She regards [Mary as a fool./crazy.]
(viii) Peter will come to the party, as will John. /As she was approaching, the door opened.

English *as* (and Akkadian *–ma*) can serve as glue for both predication (vii), and to connect clauses (viii). Note that *as* is used for predication only in small clauses.

-'Fillers' in language acquisition: some children acquiring various languages use 'fillers' in their first multi-word utterances, typically in places where one would expect functional categories (e.g. auxiliaries or determiners); reported to be closely tied to prosody, particularly rhythm and melody; no unified approach to describing fillers (see Bloom, 1970; Braine, 1963, 1976; Peters, 1999, In Press; Dressler and Karpf, 1995; Veneziano and Sinclair, 2000)

Initially, such fillers may be undifferentiated in form and occur in various positions, but later they become more 'specialized' for the position:

(ix) [m] pick [ə] flowers (English; age 1;6; from Peters and Menn, 1993)

Very tentatively: these fillers might correspond to proto-conjunctions/proto-functional categories.

3. Specific functional category stage
Finally, such particles/conjunctions could have grammaticalized into specific functional categories, such as Predication head or Tense head - another syntactic breakthrough and the beginning of modern syntax, which not only can use functional words as all-purpose glue to connect words/clauses, but which can now use them to build specialized functional projections, such as TP.[22] Finite subordination and CP could emerge only after the evolution of finiteness. Abney (1987) points out that functional categories tend to select unique categories as their complements, e.g. C selects a TP. At the very least, this can be interpreted to mean that a C cannot select a small clause.

[22] See Rolfe (1996) for claim that the 'epistemic stage,' the stage which can unambiguously express fact and truth (which probably requires indicative and tense), is a rather recent stage in evolution.