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2002

[Link to publication](#)

Citation for published version (APA):

Beijer, F. (2002). *On the Relative Order of IP-adverbials*. (The Department of English in Lund: Working Papers in Linguistics, Vol 1). <http://www.englund.lu.se/research/workingpapers/pdf/Fabian2.pdf>

Total number of authors:

1

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On the Relative Order of IP-adverbials

FABIAN BELJER

1 Introduction

Sentential adverbs are often assumed to be situated in front of the verb phrase in arbitrary order. In a recent monograph, however, Cinque (1999) claims that the relative order of sentential adverbs may, in principle, be universally fixed. In this paper I first give a brief presentation of Cinque's proposal. Then I present a pilot study of sentential adverbs in English and Swedish. This study is based on corpora, and it supports Cinque's proposal.

Ever since the idea of a universal grammar was first introduced, linguists around the world have been involved in the business of finding out what it is about grammar that is, or can be, universal. It is obvious that the languages of the world differ from each other to various extents. Linguists working within a generative, chomskyan framework claim, however, that if we succeed in abstracting away from the differences, we will be able to arrive at the general principles that are valid for all languages. In other words, each human child has an innate ability to learn a language. This ability, but not the input to which individual children in various language communities are exposed, is universal. Children raised in English and Swedish environments consequently develop different languages, although they are all equipped with the same universal grammar.

Universal grammar is perhaps best described as a collection of principles that govern to what extent individual languages are allowed to vary, i.e. even though the various grammars and the various syntactic structures of the languages of the world may seem to differ to an infinite extent, this is not the case, since universal grammar disqualifies certain grammars but accepts others. As is well known, English and Swedish differ from each other, both formally (e.g. *the woman* vs. *kvinna-n*, i.e. a separate word preceding the noun, vs. a definite suffix.) and functionally (e.g. *to play the drums* vs. **att spela trummorna*, i.e. the definite article has to be used in English, while it cannot be used in Swedish.), concerning the use of the definite article, but this variation is accepted, since it does not violate any principles or constraints of universal grammar. In other cases the two languages necessarily behave in exactly the same way, since other behaviours would imply violations of principles of universal grammar. One such principle rules out one of the interpretations of the following sentences, in both English and Swedish¹:

- (1) Mary thinks the girl saw herself.
- (2) Marie tror flickan såg sig själv.
Marie think-SING²-PRES girl-SING-DEF see-PAST REFL-SING-F
'Mary thinks the girl saw herself.'

In neither language is it possible for *Mary* or *Marie* to be co-referential with *herself/sig själv*. The same principle of universal grammar rules out the following English and Swedish

¹ Unless explicitly indicated all examples are mine.

² The following abbreviations are used: ACC (accusative case), ADJ (adjective), AUX (auxiliary), DEF (definite article), F (feminine), FUT (future tense), GEN (genitive), INDEF (indefinite article), INF (infinitive), M (masculine), NEG (negation), PART (modal particle), PASS (passive), PAST (past tense), PERF (perfective aspect), PL (plural), PRES (present tense), REFL (reflexive pronoun), SING (singular).

sentences:

- (3) *Herself dressed Mary.
- (4) *Sig klädde Marie.
REFL dress-PAST Marie
'Herself dressed Mary.'

The issue concerning what it is about grammar that is, or can be, universal is approached in different ways, not only by scholars working within competing frameworks, but also by individual generative linguists. Moreover, the answers proposed to the question of universality, and to other important questions, such as the question of phrase structure or the question of modularity, in the various stages of the development of the chomskyan framework have differed from each other quite considerably. This flux has, unfortunately, caused many linguists to abandon generative grammar altogether. The fact, however, that a comparatively new scientific theory develops through changes over time is natural and it can even be considered as a sign of health.

In the middle of the 1990s the Italian linguist Guglielmo Cinque, working within the minimalist framework (see e.g. Chomsky 1993, 1995), presented his ideas concerning what can best be termed 'a universal hierarchy of functional projections in the I-domain' (Cinque 1997, 1999³). The remains of this section consist of a simplified explanation of what is meant by "a universal hierarchy of functional projections in the I-domain".

In the monograph *Adverbs and Functional Heads* (Cinque 1999), Cinque presents an empirically based theory of the order of the constituents in what has been called the I-domain⁴. In the I-domain we find categories such as mood, modality, tense, negation, and aspect. In the world's languages, these categories are expressed in three ways, namely by means of suffixes on the main verb, auxiliaries, or sentential adverbs. Cinque's theoretical proposal is based on data from a huge selection of the languages of the world, and on thorough discussions of, for instance, different kinds of modality.

In fairly non-technical terms, the I-domain of a Swedish declarative main clause with SVO word order, including a finite auxiliary and a non-finite main verb, can be said to be the area between, but not including, the auxiliary and the main verb. Consider the following example:

- (5) Kalle har **fortfarande inte** målat huset.
Kalle AUX-PERF-PRES still NEG paint-PERF house-DEF
'Kalle has **still not** painted the house.'

In this sentence we have an auxiliary *har* 'has' and a main verb *målat* 'painted', and the material in between, that is *fortfarande inte* 'still not', is then in the I-domain⁵. The Swedish adverbs *fortfarande* and *inte* are thus IP-adverbs, or IP-adverbials, depending on whether we focus on their form or on their function. Cinque demonstrates that a hierarchy of adverbials in the IP, or I-domain, can actually be derived from a proposed hierarchy of functional projections. The reasoning goes like this: In agglutinating languages such as Turkish, in which all or most grammatical categories, such as mood, modality, tense, and aspect, are

³ It was not until 1999 that this work was published as a monograph. Before that, Cinque published a version very similar to the final version in *Working Papers in Linguistics, University of Venice*.

⁴ I is short for "Inflection".

⁵ *Kalle har* belongs to the C-domain and *målat huset* belongs to the V-domain. Note that the situation in English is somewhat different, since the finite auxiliary *has* in a sentence such as *Carl has still not painted the house* stays in the I-domain, i.e. Swedish is a V2-language, while English is not.

expressed and indicated by means of grammatical suffixes attached, one after the other, to the lexical verb, these suffixes have been shown to follow a specific universal order⁶.

By applying Baker's (1985) Mirror Principle to data from agglutinating languages, Cinque is able to predict the order of grammatically relevant linguistic material in languages such as English and Swedish in which these grammatical categories are typically not morphologically indicated/expressed. If the order of suffixes attached to the verb in an agglutinating language is Past Tense followed by Modality, Evidential Mood, Evaluative Mood and Speech Act Mood, the order in a non-agglutinating language will be the reverse, i.e. Speech Act Mood followed by Evaluative Mood, Evidential Mood, Epistemic Modality and Past Tense. All different kinds of mood, modality, tense, aspect, and voice occupy different structural positions in the I-domain.

These grammatical categories are only expressed by means of verbs in a minority of the cases, so we would not be able to observe the structural positions of these categories if it was not for the fact that each structural position in the I-domain is associated with a certain group of adverb phrases expressing the grammatical functions connected to the position or functional head to which they are associated. In addition to the universal hierarchy of functional projections Cinque is thus able to stipulate a universal hierarchy, or ordering, of IP-adverbials expressing mood, modality, tense, aspect, and voice.

Returning to the order of grammatical categories described above, which was based on the order of suffixes in agglutinating languages such as Turkish in combination with Baker's Mirror Principle (Speech Act Mood followed by Evaluative Mood, Evidential Mood, Epistemic Modality and Past Tense), we are now able to conclude that the order in which the different types of adverbial in the English and Swedish examples (6) and (7) are placed is less marked than any other orders imaginable :

- (6) She has **frankly** *Mood: Speech act*⁷ **unfortunately** *Mood: Evaluative* **reportedly** *Mood: Evidential* **probably** *Modality: Epistemic* **once** *Tense: Past* been a criminal.

'She has frankly, unfortunately, reportedly, probably, once been a criminal.'

- (7) Hon har **tyvärr** *Mood: Evaluative* **troligen** *Modality: Epistemic* **tidigare** *Tense: Past* varit brottsling.
She AUX-PERF-PRES unfortunately probably earlier be-PERF criminal

'She has honestly speaking, unfortunately, allegedly, probably, earlier been a criminal.'

The following four examples, taken from my English and Swedish corpora (see section 2 below) illustrate some further adverb combinations:

- (8) Den intelligente läsaren har **förstås redan** klurat ut det med hjälp av ovanstående exempel.
(PAROLE)

DEF intelligent-SING-M reader-DEF AUX-PERF-PRES of course already work-PERF out this with help of above example-PL

'The intelligent reader has **of course already** worked this out with the help of the examples above.'

⁶This universal suffix order is probably part of universal grammar. Why this precise order has become part of universal grammar remains to be explained. It is important, however, to consider the evolutionary processes that have determined the development of the human brain and its language faculty. I suppose that the universal order of grammatical suffixes developed the way it did for reasons related to cognitive phenomena more basic than the ability to use language. In other words, the fact that aspectual suffixes precede suffixes to do with mood and modality in agglutinating languages may be possible to explain by referring to basic cognitive principles, i.e. universal grammar has not developed independent of other innate aspects of the human brain.

⁷ Each adverb in examples (6) and (7) is followed by the name given by Cinque (1999) to the functional phrase to which it belongs. Technically, in Cinque's model, the adverbs occupy the specifier positions of these phrases.

- (9) Akademien kan **ju möjligen** utesluta mig på grund av vad jag här sagt. (PAROLE)
Academy-DEF can PART possibly expel-INF I-ACK on ground of what I here say-PERF
'The Academy may **very well possibly** expel me for saying what I have here said.'
- (10) Canon has **reportedly already** expressed an interest in buying the hardware business, but says it won't make any decisions until the end of May. (BDCSX 148⁸)
- (11) We have **probably often** been guilty of viewing censorship as something that must be imposed from time to time. (BDEB9 341)

I am generally interested in evaluating Cinque's (1999) proposed universal hierarchy and its theoretical explanations and implications. In this paper I compare the proposed hierarchy of adverb phrases to actual English and Swedish corpus data. When doing this, it is crucial to be aware that there exist systematically explicable types of exceptions to Cinque's adverb hierarchy. The three exception types that have been most relevant in my work so far are:

1. Cases where one adverb clearly modifies another one directly, where no material can intervene between the two adverbs (e.g. *He had already then lost all his money*).
2. Cases where adverb phrases are used parenthetically, with the typical intonation of parenthetical insertions (e.g. *He has probably, already, unfortunately, left town*).
3. Cases where one and the same adverb phrase can be generated or merged in two different positions in the clause, with one position to the left and the other to the right of another adverb phrase, as illustrated by examples (i) to (iv):
 - (i) John has answered their questions **cleverly**. (manner reading)
 - (ii) John **cleverly** has answered their questions. (subject oriented reading)
 - (iii) John has **cleverly** answered their questions. (ambiguous)
 - (iv) John has been **cleverly** answering their questions **cleverly**. (subject oriented reading in the first case and manner reading in the second one)

Although Cinque's work is perhaps the most empirically profound presented so far within the minimalist framework, there is still a need for linguists around the world to investigate their own languages in order to justify or falsify Cinque's claims and hypotheses. I intend to take part in this enterprise. To quote Cinque:

There is no need to emphasize the incomplete and provisional character of most of the conclusions reached in this study. Many specific claims will have to be modified; others rejected. Yet, should the hierarchies of AdvPs and of functional heads indeed prove to match systematically, we will have gained new insight into the structure of UG [Universal Grammar]. (Cinque 1999: 141)

I will now proceed to present my pilot study of the relative order of English and Swedish adverbs in the I-domain. Section 2 consists of a presentation of the material used for the analysis. Section 3 contains a presentation of the results of the study, including my analysis of the data. Section 4 is a short conclusion.

⁸ This index refers to the exact place in the British National Corpus from which the example is taken. Note, however, that unfortunately there exist no such indexes for Parole.

2 Material

I have investigated Swedish material from Parole (<http://spraakdata.gu.se/lb/parole/>) and from the written part of The British National Corpus (BNC) (<http://info.ox.ac.uk/bnc/index.html>). The two corpora are comparable, since they both consist of written texts from various genres, but the English one is larger (approximately 89.5 million words) than the Swedish one (approximately 18.5 million words). From Parole I retrieved sentences in which two adverbs (and nothing more) occur between a finite auxiliary and a non-finite main verb⁹. These sentences were analysed in order to discard irrelevant examples¹⁰. The remaining adverbs occurring in this context were translated into English, and together with the prototypical adverbs mentioned in Cinque (1997) they constitute a list of adverbs that was used when I searched the BNC¹¹. The search string used for the search in BNC was of the following kind: “have/has + 2 adverbs from the disjunction of the adverb list just mentioned + a past participle”¹². When searching for adverb pairs within these syntactic frames, I was able to retrieve a total of approximately 3000 relevant instances from each corpus in which two adverbs co-occurred in the I-domain. These examples have then been linguistically and statistically analysed, and some of the results of these analyses are presented in section 3 below.

3 Results and Analysis

The most natural reaction to the adverb hierarchy proposed by Cinque (1997 & 1999) is probably scepticism. People tend to claim that there are no rules governing the ordering of adverbs in the IP, except for those related to the scope of various elements. As will soon be made apparent, I would like to argue that the ordering of adverbs (and other constituents) in the IP is far from arbitrary. By analysing the English and Swedish material statistically, I have established a first approximation of the relative order of adverbs occurring between the above-mentioned auxiliaries and main verbs in the two languages, that is, an approximation of the relative order of English and Swedish IP-adverbials and other adverbials occurring in the above-mentioned I-domain. The tables above are to be interpreted as follows: A number of adverbs of various kinds have been tentatively ordered. They are listed on the vertical axis, and the same adverbs are listed in the same order on the horizontal axis. An adverb on the vertical axis is supposed to be interpreted as the first adverb in a possible sequence of two adverbs occurring in the syntactic frames described in the previous section, and an adverb on the horizontal axis is consequently supposed to be interpreted as the second adverb in such a possible sequence. Every instance of each adverb order has been counted, and a figure is entered for the relevant order in each case. If there is a universal order of adverbs that corresponds to the tentative order, we will find that all figures indicating instances in the corpora will be to above, or to the right of, the black diagonal.

⁹ The search strings used were of the following kind: “finite auxiliary + adverb + adverb + main verb”, and the syntactic environments investigated so far are “*har* ‘have’ + adverb + adverb + (verbal) past participle”, “*kan* ‘can/may/might’ + adverb + adverb + infinitive”, “*kunde* ‘could/was able to’ + adverb + adverb + infinitive”, “*ska* ‘will’ + adverb + adverb + infinitive”, “*skulle* + adverb + adverb + infinitive”, “*blir* + adverb + adverb + past participle”, “*blev* + adverb + adverb + past participle”.

¹⁰ For instance, obvious cases belonging to the three exception types mentioned on page 4 above were discarded.

¹¹ I would like to thank Mats Eeg-Olofsson for helping me with the searches in the BNC.

¹² The next step will be to add more auxiliary-main verb environments to the study.

	therefore	hitherto	also	unfortunately	apparently/obviously	probably	perhaps	possibly	yet	often	already	still	never	just	long	almost	completely
therefore			1														
hitherto										1							
also				3		1	1		4	2	1	3	14	3			1
unfortunately										1							
apparently/obviously										2		5	1				
probably			3						1			17	6				1
perhaps										2		1					
possibly																	
yet																	
often																	
already																	1
still													2				
never		1							21					1			4
just													6				
long			1														
almost																	7
completely																	

Table 1. The relative order of a selection of English adverbs in the BNC

	ju/väl/nog	då	dock	alltså	hittills	tyvärr	förstås	tydligt	förmodligen	nu	egentligen	naturligtvis	kanske	givetvis	redan	ändå	ännu	alltid	heller	aldrig	inte	ens	
ju/väl/nog		3		4	1				1	7	4	33	14	1	58	95	518						
då														2	1	5	5	22					
dock				3		1	1				1	6		6		16	138						
alltså					1							3	2					55					
hittills												1				4	4	73					
tyvärr																		2	29				
förstås														2	1	1	1	19					
tydligt																		1	13				
förmodligen													1			1	4	9					
nu			3									1		1				8					
egentligen																1	13	11					
naturligtvis																2	6	60					
kanske		1												1	1	2	3	29					
givetvis																							14
redan																							
ändå										1								6	47				
ännu																		3	378				
alltid		1																					
heller																			20	100			
aldrig																		1					7
inte																1	134						119
Ens																							

Table 2. The relative order of a selection of Swedish adverbs in PAROLE¹³

¹³ [ju, väl, nog modal particles, lack English translational equivalents] [då ‘then’, polyfunctional] [dock ‘though’, ‘however’] [alltså ‘thus’, ‘consequently’] [hittills ‘hitherto’] [tyvärr ‘unfortunately’]

Table 1 thus illustrates, for instance, that the adverb combination *perhaps already* occurs three times in the material, and that the combination *probably just* occurs seven times, while their mirror images *already perhaps* and *just probably* never occur. As pointed out above, if the relative order of adverbs were arbitrary no patterns would be expected, regardless of how the adverbs were ordered in the tables. If, on the other hand, the tentative ordering of the adverbs in the tables corresponds to a fixed relative order of adverbs, only squares above the diagonals would be expected to be filled. In Tables 1 and 2, considerably more squares above the diagonal than below it are filled.

There are, however, five filled squares below the diagonal in Table 1, and seven filled squares in Table 2, which indicates that there exist apparent counter-examples to the proposed adverb order. In the cases where both a certain adverb order and its mirror image occur in the material, this is indicated by means of shading of the squares in question. When only the unexpected order occurs, this is indicated by the use of a frame around the square in question. In the next sub-section I will claim that most of these apparent counter-examples can be disregarded.

It is also the case that many adverbs do not co-occur at all in the given syntactic contexts. In some cases this is unproblematic, since certain adverbs simply never co-occur, but in other cases the fact that there are no co-occurrences of certain adverbs rather indicates that a larger corpus is needed if that collocation is to be found.

3.1 An account of apparent counter-examples

As already mentioned, my two corpora include apparent counter-examples which I must be able to account for if I want to argue that the proposed relative orders of IP-adverbials reflect the actual state of affairs. I claim that these apparent counter-examples are no true counter-examples, and that most of them can be referred to the following exception categories:

- (i) Context-referential adverbs (3.1.1)
- (ii) Negative polarity items and negation (3.1.2)
- (iii) Polyfunctional elements (3.1.3)
- (iv) Prosody and phonology (3.1.4)

These exception categories are discussed in the sub-sections below.

3.1.1 Context-referential adverbs

To this category I refer cases involving adverbs that would generally, but not always, precede all proper IP-adverbs, and that could never be argued to be part of Cinque's hierarchy of adverbs in the IP. The reason these adverbs cannot be part of the hierarchy is that they have nothing to do with mood, modality, aspect, tense, or voice. The typical function of these adverbs is to connect the proposition in question to something in the immediately preceding linguistic context, i.e. they are adverbs used to structure discourse. To this category I would thus refer the apparent counter-examples involving the English adverb *also* and the Swedish adverb *alltså* 'consequently'. There is one instance of the adverb combination *probably also*:

[*förstås* 'of course'] [*tydligen* 'obviously'] [*förmodligen* 'probably'] [*nu* 'now'] [*egentligen* 'actually'] [*naturligtvis* 'naturally', 'of course'] [*kanske* 'perhaps'] [*givetvis* 'of course'] [*redan* 'already'] [*ändå* 'still', used as a concessive conjunct (Quirk et. al 1985: 634-647)] [*ännu* 'still' in its temporal use] [*alltid* 'always'] [*heller* 'either', used as a negative polarity item (c.f. e.g. Horn & Kato 2000)] [*aldrig* 'never'] [*inte* 'not'] [*ens* 'even', used as a negative polarity item].

- (12) The widespread use of pesticides, notably insecticides, in modern [sic!] farming has **probably also** affected the food supply available to birds as well as sometimes causing widespread deaths among them. (BDB31 0433)

This ordering of the two adverbs is not at all odd, since *probably* must, for semantic reasons, have *also* in its scope¹⁴, and since *also* is an adverb that cannot part of the hierarchy, this is not an actual counter-example to the hierarchy proposed by Cinque. Since *also* is not part of the actual hierarchy, the fact that there is one instance of *long also* in my English material is not problematic either. The example is as follows:

- (13) Firstly, because self-employed pensions have **long also** been called personal pensions -- or, to use the former technical jargon, Section 226 policies. (BDCMK 1033)

It should be noted in connection to *long also* that the less marked order *also long* is three times more common in my corpus. Example (14) illustrates one instance of the order *also long* from my corpus:

- (14) It has **also long** been recognized that the same distinction occurs in attributive adjectives (see, for instance, Jespersen, 1924). (BDHPY 861)

In my Swedish corpus there are three instances of the adverb combination *nu alltså* ‘now consequently’, for instance example (15) below:

- (15) Kommunen kan **nu alltså** glädja sig åt ännu mer återbäring från den europeiska unionen. (PAROLE)
Municipality-DEF can now consequently rejoice-INF REFL at even more refunding from European union-DEF
‘The municipality can consequently now be rejoiced at still more refunding from the European Union.’

This apparent counter-example can be explained by saying that *alltså* is an adverb that refers back to the immediately preceding linguistic context, and which cannot thus be part of the hierarchy. Another aspect relevant to the ordering *nu alltså* is that the adverb *nu* is a phonologically light linguistic item, while *alltså* is somewhat heavier (see 3.1.4 below). The last apparent counter-example discussed in this sub-section is *ändå nu* ‘still now’. My intuitions concerning this adverb combination is not particularly strong. Whether *ändå nu* is more natural than its mirror image *nu ändå* remains to be revealed. What is certain is, however, that neither of the two orders constitutes a problem, since *ändå* ‘still’ is an adverb (a concessive conjunct in Quirk et. al’s terms) that refers to something in the preceding context.

3.1.2 Negative Polarity Items and Negation

As illustrated in Table 1, there are apparent counter-examples in the English material involving the adverb *yet*, and Table 2 indicates that there are several apparent counter-examples in the Swedish corpus involving the adverbs *ännu* (‘still’ or ‘yet’) and *heller*

¹⁴ It is also important to note here that Quirk et. al (1985: 86) consider *also*, *only*, and *even* to be ‘focusing subjuncts’ since “they have the peculiarity of extending the application of their meaning to units of varying size and position”, once again indicating that the ordering between *also* and other elements is semantically crucial, and that *also* cannot be part of Cinque’s hierarchy. Focusing adverbs can, as mentioned elsewhere, obviously never be part of the hierarchy, since they are positioned right before the part of the sentence they are focusing.

(‘either’)¹⁵. I will now argue that *yet*, *ännu*, and *heller* typically function as what is called ‘negative polarity items’. Negative polarity items can be realised by many different linguistic entities, i.e. they are formally non-homogenous, but they only appear (felicitously) in negative contexts, i.e. they are distributionally homogeneous (see Horn & Kato 2000, van der Wouden 1997). Consider the following sentences from the BNC:

- (16) This clause has **never yet** been activated. (BDA1F 154)
- (17) Do you know, I have **never yet** found anything which closely resembled what we discovered in his mouth. (BDHU0 2358)

As the examples indicate, *yet* is an item that typically has its position after the negation *not* or some other negative form such as *no*, *nobody*, *nothing*, and *never*. In Quirk et. al’s terminology *yet* is a ‘non-assertive form’ occurring in non-assertive contexts, i.e. in negative statements and *yes-no* questions (Quirk et. al 1985: 83-85). We would consequently not expect the sentence in (18) to appear, since the assertive/positive context is incompatible with the use of the non-assertive form *yet*:

- (18) *This clause has **yet** been activated.¹⁶

The prototypical Swedish counterpart of *yet* is *ännu*. There are 378 instances of *ännu inte* [yet NEG ‘not yet’], and one instance of *inte ännu* [NEG yet ‘not yet’] in my corpus:

- (19) Samsyn om försvaret har **inte ännu** uppnåtts, men enigheten om säkerhetspolitiken ökar i vart fall förutsättningarna inför det slutgiltiga försvarsbeslutet 1996. (PAROLE)
Consensus about defence-DEF has NEG yet reach-PERF-PASS but unity-DEF about security-policy-DEF increase-PRES in either case condition-PL-DEF before DEF final-DEF defence-decision-DEF 1996
‘Consensus concerning the defence has **not yet** been reached, but, at least, the unity concerning the state security policy improves the conditions regarding the final military defence decision of 1996.’

Using the marked order *inte ännu* (NEG yet ‘not yet’) instead of *ännu inte* [yet NEG ‘not yet’] implies a contrast, i.e. there is something that has not yet happened, but will happen rather soon. The unmarked order carries no such implications. According to Teleman et. al (1999), the adverb *ännu* ‘yet’ may occur on either side of the negation *inte* ‘not’, but Teleman et. al (1999) discuss only cases where *ännu* precedes *inte* (20), or cases, such as (21), where the main verb plus its complementation occurs between *inte* and *ännu*:

- (20) De har **ännu inte** köpt bil.
They AUX-PERF-PRES yet NEG buy-PERF car
‘They have **not yet** bought a car.’
- (21) De har **inte** köpt bilen **ännu**.
They AUX-PERF-PRES NEG buy-PERF car-DEF yet.
‘They have **not** bought the car **yet**.’

Teleman et. al (1999) also state that *ännu* is a negative polarity item only when it occurs in connection with verbs in the perfect tense. Consequently, *ännu* is not a negative polarity item

¹⁵ If I would have chosen to place *yet* between *never* and *just*, there would have been no counter-examples involving the item *yet*. As will soon be apparent, this is of no particular relevance to this investigation, since *yet* is not part of Cinque’s hierarchy.

¹⁶ Note, however, that the following sentence is perfectly normal: *This clause has yet to be activated*. I will not elaborate on this fact here, but I find it safe to assume that the negative semantics of the sentence is of importance.

in example (22), since this sentence is in the present tense. In these cases *ännu* is glossed ‘still’¹⁷:

- (22) De kör **ännu** sin gamla Volvo.
They drive-PRES still their old-DEF Volvo
 ‘They **still** drive their old Volvo.’

There is also one occurrence in my material of *aldrig heller* ‘never either’. The adverb *heller* ‘either’ is a typical negative polarity item, which, just like its English counterpart *either*, has its typical position in the VP. When it is placed in the IP it usually precedes the negation (*heller aldrig* ‘either never’ occurs 20 times), but, as mentioned, the following order occur once:

- (23) Någon nåd har han aldrig begärt och han **har aldrig heller visat** någon ånger. (PAROLE)
Some mercy AUX-PERF-PRES he never request-PERF and he AUX-PERF-PRES never either show-PERF some remorse.
 ‘He has never asked for mercy, and he has **never** shown remorse **either**.’

The marked word order is here used as a rhetorical device. The negative element *aldrig* ‘never’ precedes *heller* ‘either’ because *aldrig* occurs in the preceding clause too. Concerning the case of *inte* ‘not’ and *heller* ‘either’, Teleman et. al (1999) mention that the two adverbs can occur in either order, and this is probably true of *aldrig* and *heller* too. The important thing to note, though, is that negative polarity items do not belong in Cinque’s hierarchy. Naturally, they must relate to the hierarchy in some way, as do other negative forms, and this relation is definitely worth investigating, but such an investigation is beyond the scope and purpose of this paper.

Apart from the cases discussed above there are two more apparent counter-examples in the English material in which the negative element *never* is involved, namely *never hitherto* (24) and *just never* (25). I have placed *hitherto* very high in the hierarchy, suggesting that it would definitely precede *never*. The fact that *never* here precedes *hitherto* can perhaps be explained by appealing to the notion of constituent negation, i.e. *never* and *hitherto* actually belong to the same adverb phrase.

- (24) Parliamentary sovereignty was felt to be compatible with the rule of law primarily because 'the commands of Parliament... can be uttered only through the combined actions of its three constituent parts' and that, 'unlike a sovereign monarch who is not only a legislator but a ruler, that is, head of the executive government, has **never hitherto** been able to use the powers of the government as a means of interfering with the regular course of law'. (BDEAJ 1185)
- (25) I've **just never** known a woman priest... but with someone as good as her, one gradually gets over the prejudice. (BDAT9 115)

The occurrence of the collocation *just never* can be explained by the fact that *just* is polyfunctional. It has a number of different functions, one of which is the one present here, where *just* is not related to time, but can be paraphrased as ‘simply’. All in all, the correct way of relating the different negation positions to the adverb hierarchy is not yet known.

¹⁷ The fact that *ännu* is glossed ‘still’ here, together with the fact that the default order in English is that *still* precedes *not*, while *yet* follows *not*, indicates that the behaviour of *ännu*, *yet*, and *still* is much more complex than this tentative discussion has shown.

3.1.3 Polyfunctional items

As mentioned in the introduction, there are some systematically explicable types of exceptions to Cinque's (1999) hierarchy that must be paid attention to when the hierarchy is evaluated. One such explicable type of exception is that the same linguistic form, in this case an adverb, can have more than one function, and thus occupy different positions in the in the clause. The Swedish adverb *då* 'then' is such a polyfunctional item. Usually, when *då* occurs in the specific linguistic context discussed here, it is used as a modal particle, thus occupying a position very high in the hierarchy. When *då* is used in its original, temporal sense, it occupies a position further down in the structure. This means then that the order in example (26) is not as surprising as the hierarchy in Table 2 indicates:

- (26) Förhoppningsvis kommer uppmaningen från Publicistklubbens ordförande Bertil Torekull att journalister ska ägna sig åt uppsökande journalistik inte att klinga ohörd. Vi kan **kanske då** få en belysning av vårt säkerhetspolitiska läge med utgångspunkt i Sture Höglunds yttrande om hot och om detta kan sättas i samband med ubåtskränkningar, avslöjat spionage mot vårt försvar eller den ansamling vi fått av kända och okända terrorister. (PAROLE)
Hopefully come-FUT appeal-DEF from Publicist-club-DEF-GEN chairman Bertil Torekull that journalist-PL AUX-FUT devote-INF REFL to visiting journalism NEG INFM sound-INF unheard. We can perhaps then get-INF INDEF illustration of our security-policy-ADJ situation with starting-point in Sture Höglund-GEN remark about threat and whether this can place-PASS in connection with submarine-violation-PL, exposed espionage against our defence or DEF accumulation we get-PERF from known and unknown terrorist-PL
 'Hopefully, the appeal from the chairman of Publicistklubben, Bertil Torekull, that journalists should devote themselves to visiting journalism will not be unnoticed. We might **perhaps then** get an illustration of our status regarding security policy, with Sture Höglund's remark about threats as its starting-point, and whether this can be connected to submarine violations, revealed espionage against our defence or the present accumulation of known and unknown terrorists' [The non-fluent nature of the English translation only reflects the Swedish original.]

It should also be noted in connection to this example that the adverb *kanske* 'perhaps' is a very special adverb in Swedish since it has developed from the two verbs *kan* 'may' and *ske* 'happen'. This etymology has been presented as one explanation why *kanske*, although it is neither a finite verb nor a focusing adverb, and in spite of the V2 constraint, may occupy the second position in a Swedish declarative main clause. It is possible that the fact that *kanske* is commonly associated with positions very high in the structure is a second reason why the order *kanske då* in (26) is as acceptable as its mirror image *då kanske*¹⁸.

3.1.4 Prosody and Phonology

In my Swedish material one apparent counter-example is, as mentioned above, the collocation *nu alltså* 'now thus' (example (15) is repeated here as example (27)):

- (27) Kommunen kan **nu alltså** glädja sig åt ännu mer återbäring från den europeiska unionen. (PAROLE)
Municipality-DEF can now consequently rejoice-INF REFL at even more refunding from European union-DEF
 'The municipality can **consequently now** be rejoiced at still more refunding from the European Union.'

¹⁸ In technical terms, it is in fact not clear whether *kanske* 'perhaps' should be argued to occupy the specifier position of the Epistemic Modality Phrase (in which case *kanske* would precede the temporal *då* 'then') or the specifier position of the Possibility Modality Phrase (in which case *kanske* would follow the temporal *då*).

I mentioned above that this apparent counter-example might be explained by reference to phonology or prosody. Normally, an adverb such as *alltså* ‘consequently’, which refers to the preceding linguistic context, should come before a temporal adverb such as *nu* ‘now’. I would suggest that the adverb order in example (27) can be partly accounted for by appealing to what is often referred to as PF phenomena. PF is short for Phonological Form, and within the generative, modular approach to language a PF phenomena is something that takes place outside the syntactic component, in another module, namely PF. The consequence of this is that some counter-examples to, for instance, a proposed hierarchy of adverbs can be referred to as PF phenomena, i.e. to something outside the syntax and outside UG, with the result that these counter-examples are only apparent counter-examples. The theoretical possibility to refer exceptions and apparent counter-examples to the category of PF phenomena must, however, be used with caution.

The modal particles *ju*, *nog*, *väl* and *då* are supposed to always be the first adverbial elements in the Swedish IP (see e.g. Teleman et. al 1999 vol. 4: 90-95). The main reason for this is that they are phonologically non-prominent, i.e. the fact that the modal particles are unstressed and light makes it phonologically and prosodically natural for them to occur before all other adverbs, and before all other possible elements in the I-domain. The fact that these particles are modal elements also suggests that they should be high in the structure, as are other modal adverbs. The fact that *ju* is preceded by the adverb *alltid* ‘always’ once in my material is thus very peculiar:

- (28) I dag är Barbro Sandin 69 och bor sedan ett halvår i Lerum . - Jag **har alltid ju** längtat söderut, säger hon och menar alltså inte Provence utan Lerum och Göteborg . (PAROLE)
In day be-PRES Barbro Sandin 69 and live-PRES since one half-year in Lerum I AUX-PERF-PRES always PART long-PERF southwards say-PRES she and mean-PRES thus NEG Provence but Lerum and Gothenburg
 ‘Today Barbro Sandin is 69 years old, and for half a year she has lived in Lerum. –I have **always** longed to go south, she says, and she does thus not mean Provence, but Lerum and Gothenburg.’
 [Note that the particle *ju* has no English counter-part]

When this collocation was first encountered, the first reaction was that the person who produced this adverb order could not possibly be a native speaker of Swedish. Interestingly enough, when considering the linguistic context in which the sentence occurred closely, it is revealed that the person responsible for the utterance is likely to be a native Swede. This means that the adverb combination *ju alltid* ‘PART always’ is the only collocation, constituting an apparent counter-example in Tables 1 and 2, which I cannot yet account for. Note, however, that particles are not thought of as being part of Cinque’s hierarchy, and consequently, example (28) is not as alarming as it could have been.

3.2 Typical IP-adverbs

As has now been demonstrated in section 3.1 all apparent counter-examples noted in Tables 1 and 2, except one, can be accounted for, and can thus be disregarded. Moreover, Tables 3 and 4 below show that if only those adverbs that would be claimed by Cinque to be part of his hierarchy are considered, there are no counter-examples at all in the two corpora:

	unfortunately	apparently/obviously	Probably	then	perhaps	often	already	Just	long	almost	completely
unfortunately							1				
apparently/obviously							2	1			
probably						1		6			1
Then											1
perhaps							2				
Often											
already										1	
Just											
Long											
almost											7
completely											

Table 3. The relative order of some typical English IP-adverbs

	sannerligen	tyvärr	förstås	förmodligen	nu	framöver	kanske	givetvis	möjligen	åter	redan	fortfarande	alltid	just	nästan
sannerligen															
tyvärr															
förstås											2		1		
förmodligen											1		1		
Nu							1		1	1					1
framöver															
kanske										1	1		2		
givetvis															
möjligen															
Åter															
redan															
fortfarande															
Alltid															
Just															
nästan															

Table 4. The relative order of some typical Swedish IP-adverbs

As Table 3 and Table 4 illustrate, if only those adverbs that are primarily relevant when evaluating Cinque's proposed hierarchy are considered, there are no counter-examples in my material. Note however, that the collocations were not numerous.

4 Conclusions

In this paper I have presented a corpus-based pilot study of the relative order of adverbs occurring in the I-domain in English and Swedish. The purpose of this study was to statistically evaluate a claim made by Cinque (1999) that there are strong indications that there exists a universal hierarchy of functional projections in the I-domain, and a universal hierarchy of adverbs occupying the specifier positions of these functional phrases. By using English material from BNC and Swedish material from Parole I was able to demonstrate that there are patterns in both languages concerning the order in which adverbs in the I-domain are positioned. I was also able to account for practically every apparent counter-example by showing why they could be referred to certain exception categories and thus be disregarded. I was also able to show that if only adverbs that would be claimed by Cinque to be part of his hierarchy were considered, there were no counter-examples at all in my material. I do not claim that any of the results presented in this paper give strong support for Cinque's hierarchy. As has been noted, I do not yet have enough relevant data on which to base my theoretical claims. What I can say, however, is that the hierarchies that I arrived at by the use of my two corpora seem to match the hierarchy presented in Cinque (1999). It is also the case that since no actual counter-examples were found, what has been presented in this paper clearly indicates that we cannot disregard Cinque's idea of a hierarchy of adverbs, although we do not yet know the true nature of the hierarchy or the ultimate way of accounting for it, technically and theoretically. However, these issues will be further explored.

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