Adverbs Across Domains

Adverbs Across Domains

By

Amanda Payne

Adverbs Across Domains

By Amanda Payne

This book first published 2023

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

TABLE OF CONTENTS

LIST OF TABLES

PREFACE

Readers may come to this book for a variety of reasons, and from a variety of backgrounds. While introductory linguistics knowledge is assumed throughout, we attempt to keep the prerequisite knowledge fairly minimal. To that end, if you are simply curious about the nature of adverbs in grammar, the entire text is for you, since it will discuss adverbs from the point of view of many different perspectives, and, as the title indicates, in many different grammatical domains. If you are instead concerned with the appropriate theoretical representation for adverbs in syntax, Chapters 1-2 address this question at length. The rest of the book assumes the adverbial hierarchy proposed in Chapter 1, but many of the results are orthogonal to the particular theoretical representation, so if you want to read about adverb semantics (Chapter 3), prosody (Chapter 5), or a computational approach to adverb syntax (Chapter 7), you can go directly to these chapters without much confusion. Likewise, if your main interest is in adverb usage and variation over time, Chapter 6 addresses these topics both in combination with and separately from the adverb hierarchy posited in Chapter 1.

This text is an expanded version of a Ph.D. thesis, and as such, acknowledgement is due to everyone who provided support and feedback throughout the thesis-writing process and beyond. Thanks in particular to both faculty and students at the University of Delaware and Haverford College, whose judgments (both linguistic and otherwise) were essential to the creation of this book. Though the thesis was borne from the generative tradition, it is my hope that a broader range of researchers, working in any linguistic school of thought, will find utility in this book.

While no changes have been made to the core theoretical claims about adverb syntax and ordering, the book version has added additional chapters in the areas of sociolinguistics and prosody, which help create a fuller picture of adverb behavior across the grammar than was possible in a syntax-focused dissertation. What is remarkable about adverbs is that they are so consistently heterogenous—they aren't particularly well-behaved, no matter how you slice it. In that way, the same things that draw people to the study of language ought to draw people to the study of adverbs, since in both

cases, there are patterns to be found, but they are often hidden under a bit of grammatical mess.

CHAPTER 1

INTRODUCTION

Linguists are quick to note that although the concept of "word" is extremely common, there is no straightforward, universal definition for what constitutes a "word". The same thing might be said of an "adverb". One potential definition for an adverb (which itself is a subset of "adverbial"), is to be a single lexical item that modifies a verb, adjective, determiner phrase, clause, or another adverb. But even these terms (*lexical item, modification*) are theory dependent, language dependent, and even within a particular theory or language can contain exceptions. We see why, then, adverbs are often considered a very nebulous category, both syntactically and semantically.

Despite their elusive nature, adverbs are used as a metric for syntactic position in numerous publications. This is most likely because adverbs appear in many places throughout a sentence, and are associated with many different semantic properties. Although they are potentially useful as a diagnostic for other linguistic phenomena, in some ways building a theory using adverb position as one point of support feels like building a house on a very unstable foundation. This book provides a (partial) answer to the question: what do we really know about adverbs and their linguistic properties? Though the answer may be "not as much as we'd hope", awareness of the gaps in our knowledge is also valuable, and helps in building a sturdier foundation for other analyses.

Throughout this text, we will investigate many different properties of the entities generally referred to as adverbs. While the majority of examples come from English for expository reasons, the underlying assumption is that similar properties hold for adverbs in all languages (except when otherwise stated). The types of properties investigated will not be limited to adverbs' syntactic behavior, but will also include prosodic, morphological, semantic, and sociological factors. While adverbial phrases (multi-word expressions that behave similar to adverbs distributionally) have many things in common with adverbs proper, they are not included in our analyses.

This book does have a primary overarching goal, though, and that is to formalize the positions available to adverbs with respect to other adverbs. In service of that goal, parallels will be drawn to the adjectival domain, which has a great deal in common with the domain of adverbs. Of course, there has been a large amount of work done already with the goal of formalizing adverb position and location, presenting a great many insights about the grammar of adverbs. Some of this work will be discussed in further detail in the following section. Despite that significant body of work on adverbs, there is still not a consensus about the structure and distribution of adverbs cross-linguistically. As we will soon see, adverbs are quite flexible, and so their "base position" is difficult to pin down.

One issue, which is not unique to adverbs, is that many self-contained analyses of adverbs in a single language become untenable in the face of additional language data. As we compare different existing theories of adverb order, it will become clear that none of them are able to successfully account for everything. If it is possible to do so (and we will try our best!), a clear and precise account of the syntactic and semantic facts is required.

Crucially, the ordering of adverbs—even though it seems to be a syntactic question—relies on both the syntax and semantics. A semantic argument may be appropriate to explain why sentences like "Michael quickly luckily ate the sandwich" are strange, since *luckily* is a speaker-oriented adverb, so it should have higher scope than an event-related adverb like *quickly*, but similarly it must be a feature of the syntax that something like "How skillfully did Michael occasionally cut the lawn?" is ungrammatical in one language (Spanish) and grammatical in another (English).

Some formal ordering of adverb classes is necessary, since despite some irregularities, it is clear that adverbs *are* cross-linguistically ordered with respect to each other. However, though one option (famously employed by Cinque (1999)) is to encode these adverb classes as distinct projections in the syntax, it makes sense for adverbs to be syntactic adjuncts, since even though they have internal ordering restrictions, they are quite free within a sentence and allow for iterability (or "stacking"). The proposal advanced in this text is a combination of ordering *and* adjunction, which allows for freedom within a sentence but not with respect to other adverbs.

The remainder of this chapter gives an introduction to two prominent theories of adverb ordering, and will provide evidence that neither a purely

syntactic view nor a purely semantic view allows for a complete and accurate description of the facts of adverb distribution. Instead, this book will argue for an interdisciplinary view of the grammar, including a reduced syntactic adverb hierarchy (with five ordered classes). This hierarchy, in combination with several semantic, prosodic, morphological, syntactic, and sociolinguistic factors, can explain the ordering facts for multiple-adverb constructions in English. With a few modifications, it can also explain the facts in other languages. Furthermore, while theories of adverb ordering generally focus on examples with adverbs in the preverbal position (e.g., "Emily quickly read the book"), the hierarchy proposed in this text should apply to adverbs anywhere in a sentence. The basic idea is that adverbs are adjuncts, but that the operation of adjunction will only be permitted when the adverb hierarchy is obeyed. Within the minimal adverb hierarchy, each adverb class has consistent semantic properties, similar to the way that adjective classes are organized. Although adjective classes are not identical to adverb classes, the two grammatical categories have a great deal in common.

Background

A Syntactic Theory of Adverb Ordering

Perhaps the best-known study of adverb position is from Cinque's 1999 book. His view is that adverbs are encoded in the syntax as a detailed nesting of over 30 semantically based and strictly ordered functional projections above vP, with adverbs located in the specifier of each projection, as shown in (1) (Cinque 1999, 106). Each of these functional projections are assumed to be present in every sentence, even when they are unfilled. Note also that some adverbs, like *completely*, appear at two different positions in the hierarchy.

(1) [frankly $\text{Mood}_{\text{speechact}}$ [fortunately $\text{Mood}_{\text{evaluative}}$ [allegedly $\text{Mood}_{\text{evidential}}$ [probably $\text{Mod}_{\text{epistemic}}$ [once T_{Past} [then T_{Future} [perhaps $\text{Mod}_{\text{irrealis}}$ [necessarily $\text{Mod}_{\text{necessity}}$ [possibly $\text{Mod}_{\text{possibility}}$ [usually $\text{Asp}_{\text{habitual}}$ [again $\text{Asp}_{\text{repetitive(I)}}$ [often $\text{Asp}_{\text{frequentative(I)}}$ [intentionally $\text{Mod}_{\text{volitional}}$ [quickly $\text{Asp}_{\text{celerative(I)}}$ [already $\text{T}_{\text{Anterior}}$ [no longer $\text{Asp}_{\text{terminative}}$ [still $\text{Asp}_{\text{continuative}}$ [always $\text{Asp}_{\text{perfect(?)}}$ [just $\text{Asp}_{\text{retrospective}}$ [soon $\text{Asp}_{\text{proximative}}$ [briefly $\text{Asp}_{\text{durative}}$ [characteristically

Asp$_{generic/progressive}$ [almost Asp$_{prospective}$ [completely
Asp$_{SgCompletive(I)}$ [tutto(Italian) Asp$_{Pl\ Completive}$ [well Voice
[fast/early Asp$_{celerative(II)}$ [again Asp$_{repetitive(II)}$ [often
Asp$_{frequentative(II)}$ [completely Asp$_{SgCompletive(II)}$
]]]]]]]]]]]]]]]]]]]]]]]]]]]]

This ordering of functional projections is also stated by Cinque to be the same as the ordering for verbal affixes in languages with extensive verbal morphology. In this way, the cascading adverb classes are connected to a symmetric cascade of verbal affixes. Cinque's detailed analysis is useful for explaining the basic word order facts of multiple-adverb constructions that are allowed in many languages. It has been highly influential in syntax, and many analyses have built upon Cinque's assumptions. However, the analysis has also been criticized for the uneconomical way in which it encodes an ordering that might instead be enforced by semantic constraints (Ernst 2002). It has also been claimed (Ernst 2002; Bobaljik 1999) that several attested adverb positions which are not predicted by Cinque's ordered system are possible, as examples like (2) show.

(2) George will have probably read the book.

In Cinque's hierarchy, *probably* is an epistemic modal, and has only one base-generated position, which is higher than the auxiliaries and sentence subject. This means that both *will* and *have* must raise over *probably* to produce the surface word order in (2). Cinque states that (2) should be ungrammatical, since the movement of *have* crossing the trace of *will* or moving into its former position is a violation of the Head Movement Constraint. He does further note that if (2) is grammatical for some speakers (and indeed, it is grammatical for many) then perhaps this is due to *probably* being a focusing adverb, and thus directly attached to *read*. However, while it is certainly true that adverbs can directly modify other constituents, Cinque does not elaborate on this explanation or give a metric for exactly when being a focusing adverb is possible and when it is not.

The analysis of Cinque is primarily focused on adverbs in the preverbal position, as mentioned earlier, but he does introduce the three canonical positions for adverbs in English, which are the sentence **initial** position, as in (3), the **preverbal** position (4), and the sentence **final** position (5).

(3) Apparently Cayla wrote a letter.

(4) Cayla apparently wrote a letter.
(5) Cayla wrote a letter quickly.

Note that although individual adverbs are relatively free to appear in all these sentence positions, there are some restrictions. Adverbs like *apparently* which are high in Cinque's hierarchy cannot appear in the sentence final position, as in (6), without comma intonation. These "high" adverbs are sometimes called sentence-level adverbs, because they modify a sentence rather than a verb phrase or smaller constituent.

(6) *Cayla wrote a letter apparently.
(7) Cayla wrote a letter, apparently.

With the addition of comma intonation, almost any adverb position (or any linguistic content in general) is acceptable, as seen in (7). I will therefore assume, as most do, that such adverbs introduced by comma intonation are parentheticals and are therefore outside the main constituent structure of the sentence. Of course, it is worth noting that while this intonation is easily detectible in written language (via a comma, parentheses, or dash), it is a bit more difficult to distinguish the pause that is characteristic of comma intonation in spoken language. We return to this issue in Chapter 5.

Positional restrictions can be used to disambiguate between different interpretations of a single adverb. For instance, the adverb *cleverly* in (8) is ambiguous between a manner interpretation (meaning that the questions were answered in a clever manner), or a subject-oriented interpretation (meaning that it was clever for the subject of the sentence, *John*, to answer the questions). However, the adverb in (9) is restricted to the lower, manner interpretation, and the adverb in (10ab) is restricted to the higher, subject-oriented interpretation.

(8) John has cleverly answered their questions.
(9) John has answered their questions cleverly.
(10a) Cleverly John has answered their questions.
(10b) John cleverly has answered their questions.

Cinque also notes that it is possible to force a manner reading by adding a second auxiliary, as in (11), though he also claims that this manner reading is categorically different from the reading in (9). Judgments on whether that is the case are quite variable, but several speakers disagree with the claim that (11) forces a strict manner reading at all.

(11) John has been cleverly answering their questions.

Cinque's evidence for the claim that there are two distinct manner readings is twofold: first, he notes that there must be two distinct manner readings because both manner positions can be filled simultaneously, as in (12). The first instance is subject-oriented, and the second is a "pure manner" reading. But note that there is no syntactic restriction on stacking adverbs with identical readings: *Cleverly John cleverly has answered their questions* is equally as "good" as (12), even though both *cleverly*s must have a subject-oriented reading.

(12) John has cleverly answered the questions cleverly/stupidly.

Secondly, Cinque notes that the preverbal manner position can't satisfy verbal subcategorization requirements, as in (14).

(13)   Kaashvi has worded the letter carefully.
(14) ?Kaashvi has carefully worded the letter.

As it turns out, (14) is actually acceptable for some speakers. However, supposing that Cinque's points of evidence are accurate, the meaning difference between the two proposed manner readings is not clear. Even if we assume that there are two distinct positions, they might not correspond to two distinct interpretations. Thomas Ernst, a main proponent of the semantic view described in the following subsection, provides another explanation for the apparent positional distinction in (13-14). Ernst notes that from a discourse perspective, the preverbal position requires backgrounding, but when a verb makes no useful contribution without an adverb, the adverb must be foregrounded—and thus it cannot appear preverbally. For instance, in (14), *worded* is providing no real new information without *carefully*, and therefore *carefully* must instead appear in the more prominent foregrounded final position of (13). For speakers who accept (14), the adverb appears with more prosodic prominence than the preverbal position is normally claimed to have (see Chapter 5 for more on this).

In any case, it is true that most manner adverbs (like *slowly, carefully*, etc.) can appear in preverbal position or final position. The exception in English is manner adverbs that do not end in the canonical adverb suffix *-ly*.

(15) Danny scrubbed the pot (hard/well/fast).

(16) Danny (*hard/*well/*fast) scrubbed the pot.

A similar contrast between morphologically derived adverbs and simplex adverbs also exists in other languages (e.g. Spanish non -*mente* adverbs like *rápido*, *bien*, *solo*). This contrast might be derivable from the fact that many non -*ly* adverbs are identical to their adjectival counterparts (*slow, fast, hard*), as will be discussed further in later chapters. In some way, these non -*ly* adverbs are lexically marked as distinct, which means that they can't appear in the backgrounded preverbal position and must appear postverbally, with additional prosodic emphasis. In the terms of Cardinaletti and Starke (1996), such adverbs are "morphologically deficient". Ernst (2003) proposes that these non -*ly* adverbs are lexically marked as "Lite" adverbs, which forces them to the right of the verb. In this case, Lite adverbs are shorter (i.e. lighter) than others, but the distinction refers not only to the length of the word, but correlates with additional factors as well, like the degree of prosodic stress placed on the word (which is stronger for Lite adverbs). Note that this is a lexical contrast and not a syntactic one. Consequently, an adverb like *hard* has a lexically marked feature which forces it to appear sentence-finally, ruling out (16). Since only "low" adverbs, like some manner and frequency adverbs, can appear post-verbally, the sentence-final position is roughly isomorphic to the lowest preverbal positions.

A Semantic Theory of Adverb Ordering

If Cinque's purely syntactic theory is too restrictive, an alternative is to treat adverbs as adjuncts rather than as syntactically ordered projections. Then adverbs are unrestricted by the syntax, but have certain semantic constraints which must be satisfied instead. Following these semantic constraints will then result in an ordering. Some of the most influential work in this vein comes from Jackendoff (1972) and Ernst (2002; 2003). Though the distributional analyses they espouse are partially syntactic, many of the core arguments given in their line of research are semantic ones.

Jackendoff points out that early generative grammarians treated adverbs as a collection of unrelated elements, with no common underlying property in either syntax or semantics. Contrary to this hodgepodge approach, he assumes that all adverbs have (roughly) the same syntax, and that previously used syntactic classes like "MannerAdv" can be restated as semantic properties on the general category "Adverb" instead.

As a simple metric for distinguishing classes of adverbs, Jackendoff considers which combination of the three basic sentence positions (initial, preverbal, or final) an adverb can appear in. One class of adverbs is completely free, and can appear in all three positions. This set includes adverbs like *quickly, slowly, sadly, frequently, often*, and *soon*. In terms of semantic type, we see a variety of at least both manner and frequency adverbs in this class, as well as some adverbs with -*ly* endings and some without.

Another set of adverbs can appear initially and preverbally, but not sentence-finally. Jackendoff claims these include adverbs like *evidently, probably, certainly, unfortunately* and *apparently*, which are speaker-oriented or subject-oriented adverbs.

A third class of adverbs is the set that can appear preverbally and finally, but not sentence-initially. Per Jackendoff, these include adverbs like *easily, completely, totally, handily, badly*, and *purposefully,* which are some of the manner adverbs. Jackendoff notes that many of these adverbs do not have an equivalent adjectival paraphrase; compare *Jane did the job completely* to ?*Jane did the job in a complete way*. However, some of them do have adjectival paraphrases, like *badly* and *purposefully*.

Because the preverbal position is the most unmarked, there are no adverbs that can appear initially and finally but not preverbally. However, there are adverbs claimed to only appear sentence finally, as mentioned earlier. These are adverbs like *hard, fast, more, less, early, home*, *well, terribly, slow*, and *indoors*, most of which are non -*ly* adverbs.

There are also some adverbs which are are claimed to only appear preverbally. This final class includes words like *truly, simply, hardly, scarcely* and *virtually*. Adverbs in this set also do not typically have corresponding adjectival paraphrases.

Although it is possible to partition adverbs by their sentential distribution, doing so doesn't appear to map clearly on to any type of semantic classification, though there are some tendencies, as described above. Instead of position-based classes, then, Jackendoff proposes groupings of adverbs based on their semantics. The first such group is the speaker-oriented adverbs, which he denotes with the semantic structure ADJ(SPEAKER, f(NP^1, . . . NP^n)), where ADJ is the semantic content of the adjectival counterpart of the adverb, and f(NP^1, . . . NP^n) represents the relation between the verb and

its subcategorized NP arguments. This semantics is available only to adverbs in initial and preverbal position. For example, the speaker-oriented adverb *unfortunately* would have the structure *unfortunate*(SPEAKER, f(NP^1, . . . NP^n)), meaning that the speaker views the proposition expressed by the sentence to be unfortunate.

The second semantic grouping is the subject-oriented adverb, which also is available to adverbs in initial and preverbal position. The denotation for this interpretation is ADJ (NP^i, f(NP^1, . . . NP^n)), where ($1 \leq i \leq n$). For instance, the subject-oriented adverb *quickly* has the denotation *quick*(NP^i, f(NP^1, . . . NP^n)), meaning that the sentence subject NP^i has been quick in doing whatever event is described by the sentence.

The third semantic group consists of adverbs of manner, degree, or time. These adverbs are all denoted by [f, ADV](NP^1, . . . NP^n), which is meant to indicate that the adverb interpretation is attached as an additional specification on the function, without changing the method of incorporation of the arguments. This denotation is available in preverbal and final position. For example, in its manner reading, *quickly* is denoted by [f, QUICKLY](NP^1, . . . NP^n), meaning that the event in the sentence happened quickly, but not that any of the participants themselves were necessarily "quick".

Jackendoff suggests that there is also a fourth semantic grouping, for those adverbs that appear only in preverbal position. He makes no suggestion for a semantic denotation for this class, only that it is distinct from the other groups and is restricted to this single position.

Ernst builds on Jackendoff's work by proposing a broader semantic distinction, one between adverbs that can right-adjoin at the clausal level (i.e. adverbs that can appear in final position with high scope) and adverbs that cannot. A possible semantic split he considers along these lines would be predicational adverbs (which cannot right-adjoin clausally) vs. functional adverbs (which can).

Functional adverbs focus on things like frequency (e.g. *occasionally*), duration (*briefly*), and aspect (*already*).

Predicational adverbs are claimed to have the following cluster of properties in English:

1. They come from open classes
2. They end in -*ly*
3. They take a proposition, fact, or event as an argument
4. They tend to show a clausal/manner pattern of homonymous readings

This pattern of homonymous readings mentioned in point 4 is illustrated for the predicational adverb *frankly* in (17-18) below.

(17) Frankly they won't speak to her. (clausal reading)

(18) They won't speak to her frankly. (only manner reading)

However, this pattern of readings doesn't apply to every predicational adverb, since modal adverbs like *probably* cannot take a manner reading or appear sentence-finally, and manner-only adverbs (like *loudly*) cannot take a clausal reading or appear sentence-initially. Therefore, in addition to other issues, the predicational vs functional divide does not accurately partition the function and distribution of English adverbs.

Ernst then considers many other potential distinguishing semantic characteristics, including open vs. closed class, quantitative vs. qualitative, and gradable vs. nongradable. However, he rejects each of these in turn, as none is sufficient to partition adverbs into two distinct classes. Ultimately, he decides instead on partitioning based on a notion of "subjectivity", stating that the adverbs that cannot right-adjoin to functional projections are exactly those "gradable adverbs on whose scale the members of its comparison class may be reranked according to the speaker's judgment of the context" (Ernst 2003, 12), which turn out to be speaker-oriented adverbs, agent-oriented adverbs, and manner adverbs. For instance, the manner adverb *well* can provide a scale of wellness where different members could be ranked. So, in the sentence *Caitlin dances well*, you can imagine that Caitlin's dancing ability would be ranked differently depending on if the relevant context is a children's dance class or a professional competition. Ernst states that this lexical semantic property of subjectivity is an accurate predictor for the right-adjunction of adverbs to functional projections, since non-subjective adverbs like frequency, duration, aspectual, and mental-attitude adverbs are exactly those which can right-adjoin to a clause. However, it is not clear that the level of subjectivity of various adverbs is easily defined in a binary way, as discussed further in Chapter 4. For instance, the speaker-oriented adverb *evidently* might be context dependent, but so might the frequency adverb *often*, even though these are predicted to appear in different classes.

Regardless of the difficulty of producing a fully predictive semantic account, many authors have pointed out issues with a purely syntactic analysis. One such example comes from Engels (2012), who claims that because adverbs' positions are restricted relative to each other, as in (19-20)[1], but not independently (they can appear pre- or post-auxiliary, for instance, as in (21-22)), there must be additional semantic factors that control adverb distribution, thus arguing against a purely syntactic Cinque-style account.

(19) She probably has wisely returned the money.
(20) *She wisely has probably returned the money.

(21) She (probably/wisely) has returned the money.
(22) She has (probably/wisely) returned the money.

Bruening (2010), following Baker (1991), suggests that the adverb position in (21) and (22) is not necessarily due to adverb movement or the availability of multiple adverb positions, but rather from an optional raising of the auxiliary *has*. Looking at the position of adverbs and auxiliaries with respect to negation, as in (23), indicates that since negation is presumed to initially be located above auxiliaries, it must be that the auxiliary *has* is raised.

(23) She has probably not returned the money

Therefore we needn't necessarily assume different base positions for the adverbs in the preverbal zone, regardless of their distribution among auxiliaries. However, the raising of *has* doesn't preclude the possibility of multiple adverb positions, it simply means that multiple adverb positions are not the only plausible analysis.

While the above data indicate that a Cinque-style syntactic model is not a perfect account, it might still be that the syntactic ranking of adverbs proposed by Cinque could be restated instead as a semantic adverb hierarchy which somehow restricts adverbs' positions. Ernst does something similar

---

[1] Judgments on these sentences' acceptability, as well as adverb ordering judgments in general, are quite variable from speaker to speaker, an issue which is returned to in Chapter 2. However, the judgments in (19)-(22) are given multiple times in the literature, in Ernst (2002); Cinque (1999); Engels (2012) among others. Whether or not (20) is acceptable is not as important as the intuition that it is less acceptable than (19).

to this, though much less fine-grained, as he presumes that different semantic classes of adverbs (evaluative, epistemic, frequency, etc.) select for different types of arguments (facts, propositions, events, etc.). In this model, when an adverb modifies an argument that it does not select for, there is a scope mismatch, and therefore ungrammaticality. This accounts for the ungrammaticality of (20), for instance, since *wisely* is a subject-oriented adverb, selecting for an event, but *probably* is a speaker-oriented epistemic modal, selecting for a proposition. Because *probably* is lower in the clause, but is already making use of the speaker's opinion (requiring a high attachment), *wisely*, which is not referring to the speaker but only to the subject, is unable to attach higher than *probably*.

In addition to the purely semantic machinery of this approach, though, some syntactic machinery is still needed. While adverbs do seem to have a universal relative ordering which could potentially be explained via either syntax or semantics, there are additional syntactic constraints on adverbs which seem to require a syntactic encoding of adverb type (like wh-movement, as illustrated in Chapter 2). So, while they may be accurate for explaining adverb order in declarative sentences, semantic classes can only be one piece of the puzzle.

Proposing a New Hierarchy

In addition to the proposals detailed above, many other classes or groupings for adverbs have been posited. However, though all of them have some inaccuracy or another, and Cinque's hierarchy at face-value is too strict or too fine-grained for English adverbs, there are still some crucial orderings which need to be stated. That is, at minimum, we can be sure that there *are* adverb ordering preferences, if not outright ordering restrictions. To account for these orderings, I propose a minimal adverb hierarchy, consisting of only the classes of adverbs shown in Figure 1-1. These classes are based on commonly cited semantic categories, which, it turns out, also pattern together syntactically.

Evaluative speaker-oriented adverbs include words that describe a speaker's evaluation of a proposition, like *apparently* and *frankly*. Epistemic adverbs are adverbs that express epistemic modality, like *probably* and *perhaps*. Tense & Aspectual adverbs are adverbs that make reference to or encode temporal or aspectual information, like *already*, *no longer*, *still*, *almost* and *once*. Many of these adverbs are non-*ly* adverbs and have additional semantic restrictions. Frequency & Degree adverbs are adverbs which

describe either the frequency of an event or the degree to which a constituent applies; these adverbs include *always*, *never*, *rarely*, *actually*, *really* and *very*. Manner adverbs, both high and low, include adverbs that describe the manner in which an event is performed. These include adverbs like *neatly* and *quickly*.
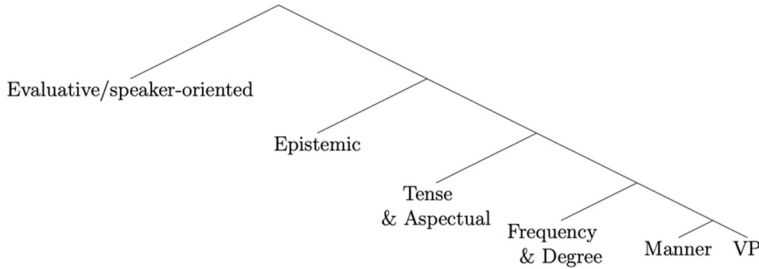

Figure 1-1: Minimal adverb hierarchy

Why just these classifications, rather than all of the ones used by Cinque? Apart from the fact that they match native speaker judgements more closely (as will be shown in the following chapter), and that having fewer classes is preferable to having more classes, certain processes involving adverbs seem to be sensitive to partitions in the above hierarchy. These processes include wh-questions (see Chapter 2), focus constructions, and conjunction (Chapter 3).

Methodology

In order to determine the true nature of adverb behavior in English, most claims in this book utilize crowd-sourced data from English speaker populations, rather than relying on one author's judgments alone. Although there have been studies showing that most grammaticality judgments in syntax papers and texts are replicated when judged by larger groups (Sprouse and Almeida 2012), thus it may seem unnecessary, adverb judgments are much less binary than many other English grammaticality judgments. Several examples require relative judgments rather than absolute judgments, since sentences with multiple consecutive adverbs are relatively infrequent in natural speech, and speakers tend to judge them as less than perfect, regardless of the particular adverbs involved or the order that they are in. Thus a larger sample size than n=1 can help to provide the finer-grained data needed for claims about adverb placement.

Platform

Unless otherwise noted, all acceptability/grammaticality judgment tasks described in this book recruited participants on either Amazon Mechanical Turk or Prolific. Mechanical Turk has been used in many other linguistic tasks with good results, and it is very efficient. Both platforms allow researchers to restrict their subject pool to certain populations; in the experiments here, subjects were restricted to those with an IP address in the United States. Later experiments were done on Prolific rather than Mechanical Turk, not due to the quality of the subject pool, which was quite similar on both platforms (in my experience), but rather because Prolific allows subjects to be paid a minimum hourly wage for their time spent on the task, rather than encouraging task completion as fast as possible. [2] Subjects were paid approximately $10/hour for their time. All surveys described in this book had a minimum of 40 participants, though several had larger sample sizes. Other than location and language, subjects were not screened for any other qualities.

Survey Design

Each acceptability judgment task included an equal number of grammatical and ungrammatical filler sentences, and sentences were presented in a randomized order. Some experiments also included an attention check question to ensure that subjects were actually reading every test item. Ratings were from 1-7 and were selected by choosing the corresponding radio button from a horizontal list. Fill-in-the-blank elicitation items were also presented in a random order, and subjects were asked to give the response that sounded most natural to them, regardless of whether they think it is "textbook English" or not. Each survey asked for demographic information only after the judgments were submitted, and all demographic information was provided via text box. Subjects who did not list English as one of their native languages were excluded from the study (though they were still paid), and there was also an additional text box for any questions or issues about each survey.

---

[2] As a former Mechanical Turk "worker", I can attest to the fact that speed is generally prioritized over accuracy.

Data Analysis

Because most of the experiments were performed with the intention of quantifying the single metric of acceptability (or grammaticality), typically between two contrasting forms, the majority of tests for statistical significance were simple t-tests. Raw scores have been provided rather than standardized scores. Though more sophisticated statistical analyses are certainly possible, they would be outside the scope of this text, which cites primarily non-experimental work containing judgments from small numbers of language consultants.

Roadmap

The rest of this book is focused on illustrating the wide range of properties and processes adverbs participate in, across various areas of the grammar. While the minimal adverb hierarchy is assumed throughout, there are still many other factors which have impacts on adverb behavior. Chapter 2 explores the syntax of adverbs, starting with a data-based justification for the minimal adverb hierarchy over other hierarchies. It then discusses how the classes in the adverb hierarchy behave with respect to wh-questions, contrastive focus, and sentence position. Chapter 3 describes the semantic constraints on adverb combinations, as well as general semantic properties for each of the classes in the proposed minimal adverb hierarchy. Chapter 4 compares adverbs to their adjectival counterparts, particularly with regard to the conceptual underpinnings of their hierarchical organization, and argues that adverbs behave as a distinct lexical category. Chapter 5 discusses the prosodic requirements for adverbs in various circumstances and clause types, and how their prosody depends on both syntax and semantics, as well as speaker age. This leads in to Chapter 6, which discusses sociolinguistic variation of adverb use, including the usage patterns of non -*ly* adverb forms like "quick" and "serious". It also briefly discusses some common prescriptive claims about various adverbs in English. Chapter 7 proposes one potential formal model for synthesizing the various constraints on adverb position, based on minimalist grammars with adjunction. We also describe the schema used for adverb organization in a few large online language databases and corpora. Chapter 8 concludes with some still open questions about adverb behavior, as well as recommendations for language teaching with respect to adverb placement.

CHAPTER 2

ADVERB SYNTAX

By far the biggest question for adverb syntax throughout this book is that of the appropriate way to deal with adverb ordering restrictions (or preferences). However, there are other big syntactic questions too: how do adverbs behave with respect to movement? Can adverbs be conjoined, elided, or focused? Are adverbs selected? Are they arguments or adjuncts? We begin this chapter by addressing the question of ordering, and use this ordering as we consider the restrictions imposed by other syntactic environments.

Evidence for a Reduced Hierarchy

The minimal hierarchy proposed in the previous chapter is repeated in (1) below:

(1) Evaluative/speaker-oriented (e.g. *apparently*) > Epistemic (e.g. *probably*, *perhaps*) > Tense (e.g. *once*) & Aspectual (e.g. *already*, *no longer*, *still*, *almost*) > Frequency (*always*, *never*, *rarely*) & Degree (e.g. *actually*, *really*, *very*) > Manner (*neatly*, *quickly*)

Evidence for this hierarchy comes from both corpus data and experimentally collected native speaker judgments. Though the minimal hierarchy is obviously different from what Cinque proposes in his book, Cinque does provide an excellent benchmark for the supposedly universal adverb ordering framework. However, given the basic schema he presents (shown in (1) in Chapter 1), there are some ordering combinations which do not sound completely natural which are still predicted to be allowed, and perhaps more difficult to explain, there are also combinations predicted to be unacceptable which seem to be allowed. For example, *Hannah **briefly intentionally** misled everyone* is generally accepted, even though *briefly* is lower in Cinque's hierarchy than *intentionally*, and therefore should come after it in a sentence. (While Cinque does not discuss manner adverbs in

depth, he assumes that they are located in the specifier of VoiceP, as indicated by the position of *well* in in his hierarchy).

One common-sense approach for gathering data on the usage of adverb combinations in English is to see which adverbs have actually been produced together in a corpus. Unfortunately, combinations of multiple adverbs are relatively rare in natural speech, especially with more than two adverbs in a single sentence. Nevertheless, even with this limited set of examples, a look at the Corpus of Contemporary American English, henceforth COCA (Davies 2008), reveals that the adverb data are messier than a purely straightforward Cinque-style analysis would predict. Some expected adverb orderings (like *frankly fortunately*) are never found, while some unexpected orderings are (see Table 2-1). Since the overall counts of sentences with multiple adverbs are relatively low, it is not surprising that some grammatical orders do not appear in a corpus (although it may also be that they are ruled out based on semantic factors; see Chapter 3 for more on this point). The appearance of unexpected orders is in need of some explanation, though, and while Cinque does provide several potential explanations for apparent counterexamples to the hierarchy, even taking these into account, some attested instances of unexpected orderings remain.

One potential source for unexpected orderings comes in the form of "comma intonation", also known as appositions or parentheticals. An example is shown in (2), which, if read without a comma intonation, is indeed less acceptable. In written text these sentences typically contain commas, dashes, or parentheses to mark the pausation.

(2) Sophie always, frankly, overcooks the tortillas.

The COCA counterexamples listed in Table 2-1, however, do not appear to be of this type. Another possible source for adverb ordering counterexamples in a surface string is in the case of syntactic movement, such as in focus constructions or wh-questions. Movement seems to follow a different set of rules for adverb ordering, as discussed in more detail later in this chapter. For instance, (3) is grammatical, though (4) is less so, suggesting that the movement of a lower adverb over a higher one can result in an unexpected surface ordering.

(3) How **quickly** does Nick **usually** build a new chair?
(4) *Nick **quickly usually** builds a new chair.

None of the counterexamples from the corpus appear to be of this type, though. They are all declarative constructions—though it is possible there are cases of focus which were not indicated in the text by any particular emphasis.

Finally, and perhaps most difficult to diagnose, counterexamples can also come from cases of a lower adverb directly modifying a higher one, rather than modifying a larger constituent like a verb phrase. In such cases, no intervening material is allowed between the two adverbs, and the semantic interpretation is different from a non-modification case. It has been claimed that focus-sensitive adverbs (like *only*) can directly attach to their associated focused element (Rooth 1985), which is likely the reason for most adverbial modification. An example of this type of modification is shown in (5).

(5) Keith only rarely smuggled food into the camp.

In this case, *only* could theoretically modify the whole event ("It was only smuggling food into the camp rarely that Keith did, he didn't do anything else") or just the adverb *rarely* ("It was only on rare occasions that Keith smuggled food into the camp"). The former is semantically possible, but the latter reading is more likely, especially devoid of any other context.

Keeping all these factors in mind, then, COCA contains the preverbal adverb sequences in Table 2-1 which are "out-of-order" per Cinque's hierarchy. None of them look to be obvious examples of comma intonation, adverb movement, or direct modification, so their appearance is unexpected if we assume Cinque's hierarchy is correct.

Ordered Adverb Pair	Example
probably allegedly	But, I mean, 20-month-old children stick everything in their mouths as they go around the house. That's the phase and the stage that they're in. And this child **probably allegedly** saw some [meth] lying around and stuck it in his mouth.
once allegedly	WITHOUT FIRST CONSULTING ME, Deck sneaks his phone from the office and takes it to Butch, then together they take it to an acquaintance who **once allegedly** worked for some branch of the military.
just allegedly	didn't understand why she was thinking like that when the- when our kids had **just allegedly** got carjacked.

once probably	The soffit had always been bricked in and had **once probably** been decorated with polychrome marble, long since disappeared.
already probably	You've **already probably** got the once-in-a-lifetime jitters every bride endures.
no longer probably	[They are] building up this crisis over an Agriculture Ministry building, where the documents **no longer probably** exist.
still probably	We **still probably** need that charismatic leader to come along.
always probably	I think he's **always probably** had a love of the outdoors.
soon probably	In fact, she really didn't know anything about it, which we will **soon probably** know more about.
already once	Roberts landed a spot at Calvert Hall College High School, a Baltimore boys' school that had **already once** refused him.
always then	I think the defense always wants to separate the two out because they can **always then** use the empty chair and say it was the other guy.
already perhaps	So if you think of the economy as **already perhaps** moving into a recession, then add to that the effect of these oil price increases, and the effect on consumer confidence, sure, it can well have the effect of giving us a mild recession.
still perhaps	Pascual opened his mouth to say he was sorry, to say it while Aranead could **still perhaps** hear.
always perhaps	Though, of course, we'll **always perhaps** try to send some embedded reporters, like we had during the war.
always usually	And we **always usually** watch the weather channel but today we didn't watch it.
already quickly	Senators had **already quickly** confirmed two other nominations.
almost still	In complex designs it **almost still** is impossible to predict all the possible interactions of even well-known physical laws.
almost just	This set had **almost just** killed you.

Table 0-1: Unexpected orderings found in the Corpus of Contemporary American English (COCA)

Where corpus data is ambiguous or insufficient, native speaker judgments of various constructed sentences can help to fill in the gaps. Although it has been shown that native speaker judgments are generally as reliable as experimental or larger-scale judgments (Sprouse and Almeida 2012), sentences with multiple adverbs, especially consecutive adverbs, are often judged to be marginal. Comparing marginal sentences to other marginal sentences can still reveal useful information about the grammar, but the fact is that different theories of adverb ordering typically rely on different speaker judgments. In fact, Cinque's work on adverb ordering is criticized not for its theoretical foundation (that is, his idea of comparing verbal morphology ordering to adverb ordering is rarely questioned), but for its failure to align with researchers' own native speaker intuitions instead. For instance, the ordering between the two antonymic adverbials *no longer > still* is included in Cinque's hierarchy because he finds the stated order to be more grammatical than the inverse. But in a review of Cinque's work, Manninen questions such a judgment, wondering why the two cannot be collapsed into a single category, since the two adverbs seem to have paralleling opposite semantics (Manninen 2005). This type of ordering seems analogous to proposing that a strict ordering exists between *happily* and *sadly* (which Cinque does not posit), or *always* and *never* (which he does). Since the minimal adverb hierarchy proposed here also relies on disagreement with previously published judgments of others, and since there is not yet a clear universal consensus for which orderings are indeed grammatical (or even which orderings are better than others) in English, it seems prudent to corroborate my own judgments with additional data.

Using online survey platforms, it is possible to sample a large number of native speakers to get their judgments about the acceptability of various adverb ordering combinations. Amazon Mechanical Turk is one automated way to collect survey data remotely, which has been shown to be equally rigorous as laboratory data (Sprouse 2011; Gibson, Piantadosi, and Fedorenko 2011) and also allows for a more diverse participant sample than testing local college students (Erlewine and Kotek 2015). So, using the unexpected pairs from COCA as a starting point, along with their counterparts in the Cinque-expected order, we can obtain acceptability judgments for these adverb pairs to determine if the corpus examples were outliers or truly indicative of speakers' adverb grammar.

Results for this judgment collection are shown in Table 2-2, where the unexpected orderings found in COCA are listed above their Cinque-expected counterparts. Participants were restricted to those with IP

addresses in the United States, and all reported English as their native language. 40 subjects were recruited to participate in the rating study. Each rated basic Subject ADV ADV Verb Object sentences (e.g. "Kim ADV ADV eats dinner") on a 1-7 acceptability scale. This Likert scale is commonly used for linguistic judgments, and it has been shown to be equally as informative as magnitude estimation tasks (Weskott and Fanselow 2011). The sample sentences were constructed so that the most obvious reading would be an [Adv[Adv VP]] interpretation and not an [[Adv Adv]VP] one, but it is possible that some subjects may have interpreted some adverbs as direct adverb modifiers regardless. The exact test items used are listed in the Appendix. All test items were required, so each subject rated every sentence.

Order	Score (1-7)	St. Dev.
probably allegedly	2.88	1.20
allegedly probably	3.19	1.36
once allegedly	4.14	1.62
allegedly once	**4.81** (p=.005)	1.78
just allegedly	5.14	1.53
allegedly just	5.57	1.16
once probably	4.19	1.57
probably once	**5.00** (p=.035)	1.58
already probably	3.71	1.59
probably already	**5.29** (p=.001)	1.52
no longer probably	3.19	1.63
probably no longer	**5.48** (p=.001)	1.50
still probably	5.00	1.61
probably still	**5.81** (p=.05)	1.44
always probably	3.14	1.74
probably always	**4.76** (p=.01)	1.70
soon probably	4.01	1.84
probably soon	**4.67** (p=.05)	1.74
already once	**4.04** (p=.01)	1.77
once already	3.02	1.48
always then	2.46	1.29
then always	**3.35** (p=.01)	1.77
already perhaps	3.38	1.56
perhaps already	**4.48** (p=.001)	1.50
still perhaps	3.67	1.80
perhaps still	**5.19** (p=.001)	1.54

always perhaps	2.95	1.40
perhaps always	3.43 (p=.05)	1.75
always usually	2.67	1.53
usually always	**4.33** (p=.001)	2.06
already quickly	**3.77** (p=.01)	1.40
quickly already	2.95	1.28
almost still	3.38	1.66
still almost	3.67	1.62
almost just	4.38	1.69
just almost	4.00	1.84

Table 0-2: Acceptability scores for base adverb pairs

For a benchmark, grammatical fillers (e.g. "John carefully did his homework") had an average rating of 6.66, and ungrammatical fillers (e.g. "Max his do homework") had an average rating of 1.22. All of the test sentences with two adverbs had average ratings that fell between 2.46 and 5.81, indicating that no matter their order, two consecutive adverbs in the preverbal position are somewhat degraded. However, none of them were as unacceptable as the ungrammatical filler items with elements like tense or number mismatches. This is not surprising, but it makes apparent the reason for the difficulty in obtaining definitive judgments on multiple adverbs in the literature—the judgments are generally unclear, hovering somewhere between fully acceptable and fully unacceptable [3]. Even in non-AMT settings, speakers typically prefer a sentence with fewer adverbs to a sentence with more adverbs. When we talk about acceptability of adverb orderings, then, we do so in a strictly comparative sense: which orders are significantly more acceptable than others, on average? I do not intend to make a claim about the nature of grammaticality in general, or to propose an arbitrary acceptability cutoff like 4/7, so all adverb acceptability rankings should be considered only with respect to each other.

As for how the predictions of Cinque's hierarchy fared: on average the rating for all multi-adverb test sentences that followed his ordering was 4.39, while the average rating for all test sentences that did not obey the Cinque hierarchy was 3.67. The average expected order rating *is* significantly higher

---

[3] Readers of this book may also disagree with one or more of the judgments presented throughout. All of the English language judgments I use, if not tested on AMT, have been checked with at least three other native speakers–but I know from experience that in many cases, readers will still disagree with some data. This speaks to the importance of validating judgments in a corpus or in a more methodical way.