Chunks and Dependencies: Bringing Processing Evidence to Bear on Syntax

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1 Introduction

At least some psycholinguists exploring how sentences are structured in linguistic behavior have concluded that the "performance structures" that emerge from experimental data differ from the syntactic structures hypothesized by linguists. For example, one measure of structure is the location and relative prominence of pauses when subjects read sentences aloud. Experiments have indicated that the syntactic prominence of boundaries is only a moderately good predictor of the prominence of pauses at those boundaries (Grosjean, Grosjean, & Lane [9]). Other experiments have looked at parsing by linguistically-naive subjects: when asked to group words together (Martin [12]), or to subdivide sentences at their natural joints [9]. Yet another set of experiments examined the probability of errors in performance, the highest probability of error representing the most significant boundaries. Levelt [11] investigated comprehension of spoken sentences mixed with noise, and Dommergues & Grosjean [5] looked at errors in recall of sentences heard previously. In all these studies, significant divergences were noted between standard syntactic structures and the structures derived from experimental data. Indeed, Grosjean, Grosjean & Lane [9] observe that structures obtained from pausing data and structures obtained from parsing data correlate better with each other ($r = 0.92$) than either do with linguistic structures ($r = 0.76$ for pausing, $r = 0.82$ for parsing).

Phonologists studying prosody have also remarked on the mismatch between prosodic structures and phrase structure. Chomsky's [3] example is frequently cited: *this is the cat that chased the rat that ate the cheese.*[1] More

[1]Though it is actually a rather curious example. Chomsky presents it as an exam-

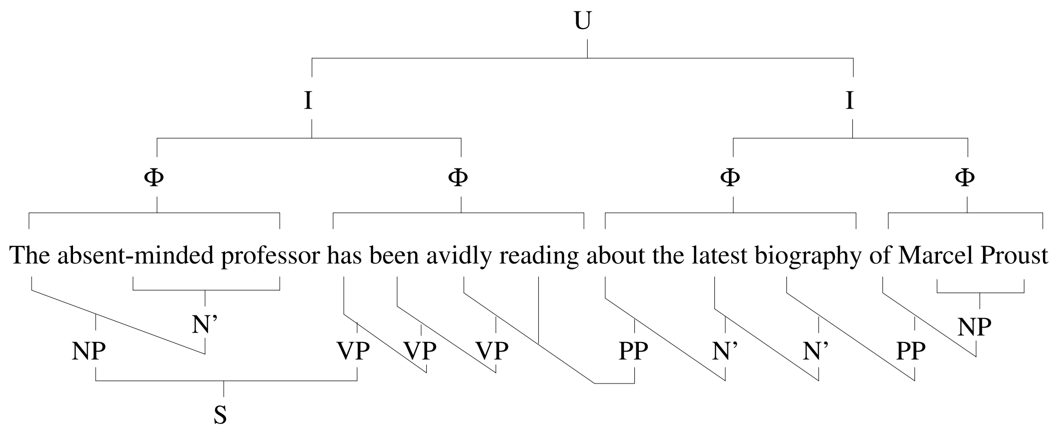

Figure 1: Selkirk's prosodic structure

systematic investigations into prosodic structure also conclude that prosodic structure differs from syntactic structure. Selkirk [13, 14, 15] argues for a hierarchy of prosodic units, including *phonological phrase*, *intonational phrase*, and *utterance*. (See figure 1.) They do not correspond to syntactic phrases. The most significant difference is that Selkirk's prosodic structures are not recursive. One consequence is that the sizes of prosodic units do not vary as much as the sizes of syntactic phrases. Phonological phrases (ϕ-phrases) comprise a few words; intonational phrases a few ϕ-phrases; and utterances a few intonational phrases. By contrast, because English is so heavily right-branching, the length of syntactic phrases depends less on their category than on how early they appear in the sentence.

Significantly, performance structures and prosodic structures appear to differ from phrase structure in similar ways. Gee & Grosjean [8], for example, present a model of performance structures based on Selkirk's phonological phrases. They argue that the ϕ-phrase model predicts performance structures better than their earlier models based on syntactic structure. In turn, Bachenko & Fitzpatrick [1] use a modification of Gee & Grosjean's model to predict intonation for speech synthesis.

If psycholinguistic and prosodic evidence agree on common structures for

ple where syntactic boundaries and prosodic boundaries diverge: he assumes that major prosodic breaks ought to fall at the left brackets of noun phrases, rather than the left brackets of sentences. However, that seems an odd assumption, and Chomsky does not explain why he makes it.

sentences—on common data structures for sentence processing, in effect—but those structures differ from standard linguistic structures, then we face serious issues about the relationship of linguistic theory to language processing. If syntactic theory is not a model of the data structures of sentence processing, then what is it a model of?

In this paper, I would like to consider how we might modify standard approaches to phrase structure in order to account for the behavioral and prosodic evidence alluded to above. Fortunately, I believe the required modifications are modest. I will argue that we need only distinguish two types of syntactic relation previously considered homogenous, thereby permitting the definition of units I call *chunks*, which correspond much more closely to the units of prosodic structures and performance structures than do standard phrases.

At the same time, I hope that this work will be of interest for its methodology. For the most part, information flow between theoretical linguistics and the study of language processing has been one-way. Psycholinguists have often designed experiments to probe questions raised in theoretical linguistics, but rarely have the resulting data had any affect on linguistic theory. The one exception that occurs to me is the lexicalization of grammatical function changing operations in LFG, which was motivated at least in part by psycholinguists' disconfirmation of the so-called Derivational Theory of Complexity [2]. I offer this paper as another exception to the rule; and if nothing else, I hope that it encourages other linguists to think seriously about syntactic structures as partial models of linguistic behavior.

2 Chunks and Dependencies

I would like to approach chunks via some very practical considerations. It is generally accepted that prepositional phrase attachment cannot be adequately resolved without a good deal of semantic information. Consequently, the most explosive source of ambiguity in parsing, especially if we do not use semantic information, is the attachment of prepositional phrases and similar elements, including conjuncts and modifiers (cf. Church & Patil [4]). Since the semantic information necessary to resolve PP attachment in unrestricted text is not easily available, it makes sense to leave prepositional phrases unattached.[2] Figure 2 illustrates the resulting structure, using a

[2]For example, Don Hindle's parser Fidditch [10] "punts" nodes (leaves them unattached) when it cannot decide where they belong. Punted nodes occur very frequently.

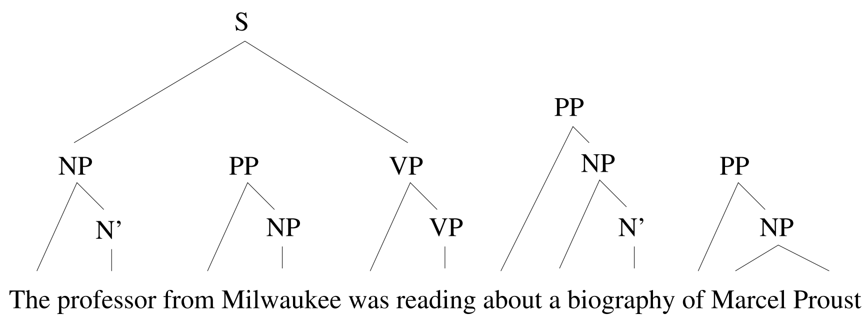

Figure 2: Chunks

slightly modified example from [13].

We can define *chunks* as the parse tree fragments that are left intact after we have unattached problematic elements. It is difficult to define precisely which elements are "problematic". They include not only modifiers and conjuncts, but some arguments as well (in fact, the ambiguity is often between attachment as a modifier and attachment as an argument). The smallest natural class that includes the important cases appears to be *post-head sisters*, including arguments, modifiers, and conjuncts.

When we unattach post-head sisters, S nodes become distinguished as the only nodes containing "floating" fragments. As noted by Emonds [7] and Williams [17], there is a prohibition in English against complements within pre-head elements, in every category except S. For example, **the proud of his son man* is bad because the pre-head element *proud* appears with a complement, *of his son*. S is obviously an exception, inasmuch as it is perfectly grammatical for prehead elements within S (e.g., the subject) to contain complements.

Thus a consequence of the Emonds/Williams constraint is that each clause consists of a sequence of chunks, with no nesting of chunks within chunks. Another constraint, the well-known prohibition against center-embedding, prevents multiple nesting of clauses. Unbounded clausal embedding occurs only at the beginning or end of matrix clauses, never in the middle. A single clause may be embedded at an interior position, but only one. Hence if we unattach clauses, an utterance consists of a sequence of simplex clauses, with no nesting of clauses within clauses (ignoring singly-center-embedded clauses for the moment). The resulting picture is remarkably similar to Selkirk's prosodic structures: utterances are sequences of

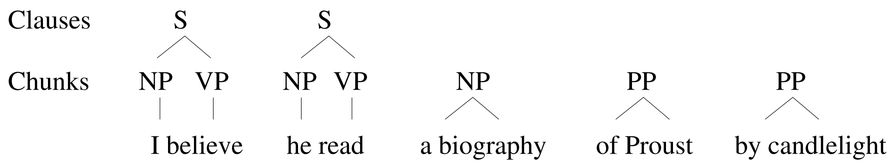

Figure 3: Strata

simplex clauses, clauses are sequences of chunks, and chunks are sequences of words (see figure 3). Singly center embedded clauses complicate the picture somewhat, in that we must introduce a layer between clauses and chunks for them, but we still have a small, fixed number of layers, each with a distinctive character.

Chunks are justified not only as a practical expedient in the face of shortcomings of current lexical resources. First of all, the Emonds/Williams constraint—which to now has been an unexplained, and rather odd, descriptive generalization—follows as a direct consequence of stratal phrase structure. Examples like

> *a proud to be an American man

are ill-formed because they involve proper nesting of the chunk *to be an American* within the chunk *a proud man*. The intended phrase structure cannot even be represented without adding another stratum.[3]

Further, there are possible computational advantages to building chunks before doing attachment, even when the semantic information for disambiguating attachments is available. If ambiguities in the placement of chunk boundaries can be reliably resolved without factoring in attachment issues (as I believe they can), then we can deal with the two questions separately, simplifying the parsing task considerably.

An additional benefit of the stratal representation is that we can use computationally cheap finite-state techniques to build it. We can use a finite-state recognizer to build each stratum from the previous one: one recognizer

[3]The interpretability of such examples may seem problematic if the intended phrase structure cannot even be represented. However, we may assume either that the stratal discipline may be relaxed, at the cost of easy parsability, or that an ill-formed phrase structure is used to get an interpretation, e.g.:

> [$_{NP}$ a proud] [$_{PP}$ of his son] [$_{NP}$ man]

where the first NP lacks a head, and the second is construed as appositive to the first.

builds chunks from words, another one builds clauses from chunks, and another collects the clauses into an utterance. Ejerhed [6] pursues just such an approach. She also explores stochastic techniques for building clauses from chunks.

Further, there are certain parsing preferences in English that are characteristic of finite-state recognition by stratum. In finite-state recognition, ambiguities arise concerning when a pattern has been matched; the usual rule is to choose the longest match. A similar parsing preference appears to be operative in English. Consider:

a. John sold old folks homes
b. the emergency crews really hate is family violence

In the preferred reading of (a), John is a seller of old folks homes; in the dispreferred reading, he sold homes to old folks. A plausible account is that the parser chooses the longest match when seeking a chunk starting with *old*—the longest match is *old folks homes*, not *old folks*. Similarly, (b) involves competition between the chunks *the emergency* and *the emergency crews*. Plausibly, the preference for the longer chunk leads to the garden path effect in this sentence.

Such constructed examples do not tell us very much about whether English possesses a general longest-match preference. To address the general question, I constructed two stochastic parsers. One simply used lexical frequency information for part-of-speech assignment to compute probabilities of phrases, and the other used a stochastic analog of the longest-match rule, based on the same frequency information. The longest-match model performed significantly better on natural text, both in the number of sentences incorrectly parsed, and in the degree to which it considered the correct parses to be most probable. This result, though hardly definitive, suggests that there is a tendency in English to choose longest chunk candidates, which implies in turn that a chunk stratum indeed exists.

Now whatever the advantages of stratal phrase structure, essential information has clearly been lost by "unattaching" chunks. Fortunately, we can re-introduce the deleted information, without losing the phrase boundaries we require to account for processing facts, by including the severed attachments as a relation *distinct from* immediate constituency. Since post-head sisters are canonically licensed by θ-role assignment, it is natural to reintroduce the severed attachments as relations between post-head sisters and their *governors*, rather than their immediate dominators. Such a move would

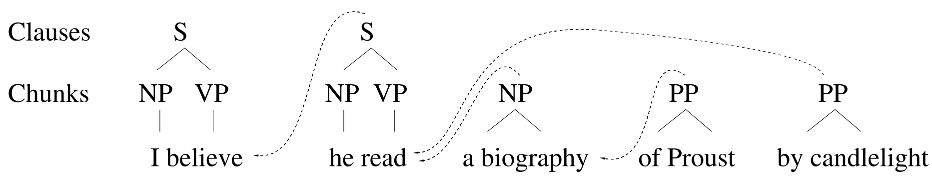

Figure 4: Dependencies

lead us to what is essentially a mixed immediate-constituency/dependency structure, in which dependency relations contribute to semantic interpretation and syntactic constraints involving binding and movement, but immediate-constituency boundaries are reflected in prosodic and various behavioral measures. (See figure 4.)

3 Accounting for the Experimental Data

3.1 A Model

In the remainder of the paper, I would like to consider whether the stratal model also accords with the psycholinguistic and prosodic evidence that is difficult for standard phrase structure analyses. In particular, I would like to consider whether the phrasal boundaries in the stratal model correspond to boundaries in the empirical data. In the psycholinguistic data that I discuss below, the experimental measures assign real numbers to each boundary between two adjacent words, representing the strength or prominence of that boundary. To gauge how well the theoretical boundaries correspond to the empirical boundaries, we must assign strengths to theoretical boundaries. I adopt the following general rules assigning strength to theoretical boundaries:

1. Chunk boundaries are strong
2. Clause boundaries are stronger than chunk boundaries
3. Dependencies between adjacent chunks can weaken the boundary between them

As they stand, these are more guiding principles than rules. I will try to make them more explicit, beginning with (3).

I propose two types of weakening. "Phonological" weakening occurs between two adjacent phrases if: (1) one of them consists of a single function word, and (2) they are syntactically related in one of the following ways:

verb – object	have seen – it
verb – particle	give – up
wh-pronoun – aux	who – does
aux – subject	does – the president
subject – verb	he – left

It would be nice to be able to give a syntactic definition of *dependency* that covers exactly these relations, but I will be content to list them for the time being.

The second type of weakening, syntactic weakening, is occasioned when the adjacent phrases participate in one of the following syntactic relations:

subject – verb
verb – any dependent
noun – of-NP
noun – restrictive relative

I would like to emphasize that either type of weakening occurs only between *adjacent* phrases. For example, if a PP chunk intervenes between subject and verb chunks, there is no weakening:

[the professor] – [was reading]	weak
[the professor] [from Milwaukee] – [was reading]	not weak

The only exception is that two phrases separated only by a phonologically weak phrase are considered adjacent. For example, in the following, the boundary between *up* and *his car* is weakened because *his car* is dependent on, and "adjacent enough" to, the verb *fix*.

[fix] [up] – [his car]	weak

Next we must quantify boundary strength. For convenience, I assign the following values to boundaries, though all that really matters is the relative values. (The first column gives the symbol I will use to annotate boundaries.)

<table>
<tr><td>||</td><td>3</td><td>Clause</td></tr>
<tr><td>|</td><td>2</td><td>Chunk, weak relative clause</td></tr>
<tr><td>;</td><td>1</td><td>Syntactically weak boundary</td></tr>
<tr><td>,</td><td>0</td><td>Phonologically weak boundary</td></tr>
<tr><td></td><td>0</td><td>No phrase boundary</td></tr>
<tr><td>–</td><td>2</td><td>Break: interjections, false starts</td></tr>
</table>

Distinguishing weak relative clause boundaries from other weak clause boundaries (such as complement clauses) seems to give a better fit to the data. Also, for completeness' sake, I have included a type of boundary I did not previously mention: in the prosodic data, syntactic discontinuities like interjections and false starts are common, so I have included a special phrase boundary for them.

Finally, we require a measure of the correspondence between theoretical and empirical boundaries. As mentioned, I am only concerned with the relative strength of theoretical boundaries. Thus I consider the theoretical assignments to be borne out by the data if, for every substring s of a sentence, the boundary that has the highest theoretical strength in s also has the highest empirical value. Define the *domain* of a boundary b to be the longest substring in which it is the (unique) theoretical maximum. Then we require that each boundary be an empirical maximum in its domain.

These definitions are perhaps more meaningful with an example. Consider the sentence *children who attend regularly appreciate lessons greatly.*

children | who , attend ; regularly || appreciate ; lessons | greatly

The boundaries on either side of the relative clause are clause boundaries; every other boundary is a chunk boundary. The clause boundary between *children* and *who* is weakened because it involves a head noun and restrictive relative that are adjacent. The chunk boundary between *who* and *attend* is phonologically weak because *who* is a pronoun. The chunk boundaries after *attend* and *appreciate* are syntactically weak because they involve a verb and its dependent. The remaining boundaries are not weakened. The domains are as follows:

```
children who attend regularly appreciate lessons greatly
        2   0      1         3          1       2
           --------|--
     ---|-------------                ----------|---
     ------------------------|----------------------
       110  30    40        180        50      120
```

The top line shows theoretical strengths. The bars show domains of boundaries. The bottom line gives the data from one of the psycholinguistic experiments to be discussed below. In this example, theoretical and empirical relative strengths correspond exactly. For example, the domain of the first boundary includes the second and third boundaries, and the empirical strength of the first boundary (110) is greater than that of the second and third boundaries (30 and 40, respectively). Again, the fourth boundary subsumes all others in its domain, and its empirical strength (180) is also maximal in the sentence. The remaining boundaries likewise have maximal empirical values within their domains (the second and fifth boundaries trivially so, inasmuch as they are the sole boundaries in their respective domains).

3.2 Performance Structures

We can consider now how well theoretical boundary strengths correspond to empirical strengths. There are a number of relevant psycholinguistic experiments, as discussed in the introduction. Unfortunately, they report mostly summary statistics, with very little data on single sentences. I have been able to glean data on two sentences from Martin [12], one sentence from the parsing experiment of Grosjean, Grosjean, & Lane [9], and fourteen sentences from the pausing experiment of Grosjean, Grosjean, & Lane (also discussed in Gee & Grosjean [8]).

Martin [12] reports on a naive-parsing experiment, in which subjects were asked to divide sentences into any number of disjoint groups of words, each group containing any number of words. Data was reported on two sentence types. The data was not broken down by sentence, though the sentences in a type were syntactically identical, differing only in lexical items; I present the data on the entire type as if it were data for a single sentence. The measure of boundary strength was based on how often words were grouped together, across subjects and sentences within a type. The derivation of the numbers is not difficult, but somewhat involved, so I refer the reader to the original paper for the details.[4] These are the results obtained for the two types:

[4] Readers who do refer to [12] should note that I have used his "maximum method," and I have converted his similarities into distances by subtracting each value from the maximum value (255, for Frame A; 220, for Frame B).

```
Parents ; were assisting ; the advanced teenage pupils
        2     0          2    0        0       0
--------|-----------
            -------------|----------------------------
       135   25          176   60      52      27
```

```
Children | who , attend ; regularly || appreciate ; lessons | greatly
         2     0        1           3             1         2
            ------------|-----
---------|--------------------             -----------------|--------
------------------------------------|--------------------------------
         110   30       40          180            50        120
```

For these two examples, the theoretical strengths correspond exactly to the empirical strengths.

Grosjean, Grosjean, & Lane [9] report on two experiments. In one experiment, they asked subjects to bisect sentences at the most natural break, then bisect the fragments likewise until they were left with single words. In this way, each subject produced a binary parse tree for each sentence. For an individual parse, the strength assigned to a boundary was the size of (i.e., number of nonterminal nodes in) the smallest subtree that includes both words adjacent to the boundary. The final value for boundary strength was obtained by averaging across subjects the values for individual parses.

Grosjean, Grosjean, & Lane only give parsing data for one sentence, noting that the remaining data was highly correlated with the pausing data, which they give in full. This was the parsing example:

```
our disappointed woman ; lost ; her optimism || since , the
prospects ; were , too limited
```

```
our  dis  wom  lst  her  opt  snc  the  prs  wer  too  lim
   0    0    1    1    0    3    0    0    1    0    0
-------------|-  -|-------     ------------|--------------
----------------------------|-----------------------------
  1.5  1.2  5.5  2.0  1.0  9.1  2.2  1.0  4.0  1.8  1.0
```

Again, the correspondence between theory and data is exact.

The pausing experiment was conducted by having subjects read 14 sentences at 5 different reading rates. The strength of a boundary was taken to be the mean pause duration at that boundary, across all reading rates and all subjects. (The values are normalized so that the sum for each sentence is 100.) Of the 14 sentences, 11 show the predicted relative strengths. Each of the remaining 3 sentences has one *inversion*, that is, a domain in which the theoretical maximum is not the empirical maximum. (In the 14 sentences, there are 55 non-trivial domains, i.e., opportunities for inversions.) All three inversions occur at the ends of sentences, when the final noun phrase contains a multisyllabic modifier. The pauses around the modifier are longer than predicted. Plausibly, there is a single sentence-final lengthening effect, not captured in our model, that accounts for all three discrepancies.

Here are a few examples, including one of the inversions (marked by an asterisk):

```
5.  When , the new laywer ; called , up ; Reynolds || the plan
    ; was discussed ; thoroughly

   0  0  0  1  0  1  3  0  1  0  1
  -------------------|-------------
              ----|-         ----|-
  ----------|---       ----|----
   5  0  2 20  3  5 30  3 10  1 21

6. closing ; his client's book || the young expert ; wondered ;
   about this extraordinary story

   1  0  0  3  0  0  1  1  0  0  0
  ----------|----------------------
  -|------    -------|  |----------
                        *
   6  5  6 26  2  4 15  8  9 11  8

7. John ; asked ; the strange young man | to be quick | on the
   task

   1  1  0  0  0  2  0  0  2  0  0
  ----------------|-------
     -|---------    -------|------
  10 17  3  8  5 25  5  3 19  5  0
```

I include the complete set of sentences as Appendix A.

3.3 Prosody

The data I have on prosody was kindly provided by Julia Hirschberg of AT&T Bell Laboratories. It consists of 127 spoken sentences from DARPA's ATIS task. Julia Hirschberg hand-marked three degrees of prosodic boundary: strong (%%), weak (%), and no boundary.

Even a casual glance at the data reveals that there is at least one prominent effect not included in my model: the data is rife with what appear to be hesitation pauses, as opposed to the prosodic boundaries that occur even in perfectly fluent speech. For example:

> the morning % of %% april % twenty fifth

My approach to this problem has been to define which boundaries I consider to be hesitation pauses, and which I consider my model to be responsible for. Boundaries that appear immediately following a preposition, conjunction, or infinitival *to*, I consider to be hesitation pauses, as well as boundaries among the pre-modifiers of N, e.g.:

> on april % twenty fifth %
> what % does % f y % q %% h k % stand for %
> flight % four fifty nine

All other boundaries I treat as genuine prosodic boundaries.

Here are a few sentences from the data set. I have mapped strong boundaries to 2, weak boundaries to 1, and no boundary to 0. Hesitation pauses I have deleted (mapped to 0).

```
yes -- i , would like ; some information / on the flights / on april
twenty second -- evening flights / from dallas / to denver / leaving ;
around five p m

 2 0 0 1 0 2 0 0 2 0 0 0 2 0 2 0 2 0 2 1 0 0 0
   ----|--                             |------
 |--------   ----|------   --|--   --|--------
   --------|----   ------|--   --|--
 2 0 0 0 0 2 0 0 1 0 0 0 2 0 2 0 2 0 2 0 0 0 0
```

```
what type ; of ground transportation / is available / from airport /
in denver / to boulder / at three p m / on the twenty third

 0 1 0 0 2 0 2 0 2 0 2 0 2 0 0 0 2 0 0 0
 --|----   --|--   --|--   ------|------
 --------|--   --|--   --|------
 0 0 0 0 0 0 2 0 0 0 2 0 2 0 0 0 1 0 0 0
```

```
show , me ; the nonstop flights / on american airlines / from denver /
to san francisco / leaving ; after one p m / on april twenty third

 0 1 0 0 2 0 0 2 0 2 0 0 2 1 0 0 0 2 0 0 0
 --|----   ----|--         |------
 --------|----   --|----   --------|------
                     ----|--------
 0 0 0 0 2 0 0 2 0 2 0 0 2 2 0 0 0 2 0 0 0
```

There are no inversions in this sample—that is, there are no cases in which a boundary is empirically *weaker* than some other boundary in its domain—but there are some cases in which a boundary is empirically *no stronger* than some other boundary in its domain. We can distinguish two types of cases: *deletions*, in which a theoretical boundary is ignored (empirical value 0), and *conflations*, in which boundaries of differing theoretical strength are assigned the same empirical value. Given that in this data set we have fewer empirical distinctions than theoretical distinctions, conflations are unavoidable in certain situations, though they do occur even where they are avoidable. We could introduce more empirical distinctions by collecting data from more speakers, and considering the probability of producing strong or weak boundaries. I expect that we would eliminate both deletions and conflations if we did so, though I do not have the data to verify it.

In the complete data set, there are 12 inversions (out of 127 sentences, containing 363 non-trivial domains). There are also 8 cases where an empirical boundary does not correspond to a theoretical boundary. Such cases do not (necessarily) constitute inversions, but given that there are so few empirical distinctions, it seems they should be considered discrepancies. Of the 20 inversions and unpredicted boundaries, 7 appear to be attributable to effects not included in the model, 6 appear to be noise in the data, and it is unclear how to categorize the remaining 3 cases.

The following are examples of cases I considered noise in the data:

a. do all fares %% include a meal % on this flight
b. how do i make % reservations __ on this flight
c. the m eighty aircraft %% flying % out of san %% francisco __ to atlanta

For example, I feel it would be more natural to speak (a) with a stronger break after *meal* than after *fares*; and that is what the model also predicts.

Here are examples that I classified as probable model error:

a. explain % base b %% and q
b. give me information __ on all classes %% of united airlines flights

For example, in (b), the model weakens the boundary before an *of* complement to N, but not before an *on* complement. That is probably not the correct distinction.

4 Conclusion

To summarize, I have tried to motivate a chunks-and-dependencies model of phrase structure, by appealing to a much wider range of evidence than is usually considered in discussions of phrase structure. The model corresponds well to performance structure data; it corresponds well to prosodic data; it has computational advantages as a data structure for parsing; it gives an account of longest-match parsing preferences; and it gives a natural account for the hitherto inexplicable Emonds/Williams constraint.

I hope also that this work provides an illustration of how processing evidence can be brought to bear on syntactic questions. I have tried to take seriously the idea that linguistic theory (specifically, phrase structure) provides at least a partial model of linguistic behavior. To do that, one must make some concrete assumptions about the behavior in question, assumptions that may have little to do with syntax. But I believe it is unavoidable. In particular, we cannot avoid it by appealing to introspection. Despite all the rhetoric about "psychological reality," introspection does not provide a secret window onto the structures and processes constituting the human language faculty. Introspection itself is a collection of linguistic behaviors—paraphrasing, making grammaticality judgments, etc.—that are still poorly understood. To see the structures of linguistic interest through them, we must understand how they distort our view of those structures, much as we must be able to undo the effects of hesitation pauses to see the prosodic structures of linguistic interest.

A The Pausing Data from Grosjean, Grosjean, & Lane

The following are the fourteen sentences from Grosjean, Grosjean, & Lane. Note that the data is actually pieced together from Grosjean, Grosjean, & Lane and Gee & Grosjean [8]. They sometimes disagree about the precise values, though fortunately they always agree on relative values.

Inversions are marked by asterisks.

1. the expert || who , couldn't see ; what , to criticize || sat , back | in despair

```
0  3  0  0  1  0  0  3  0  2  0
     ----------------|---------
---|---------------
     -------|------    ----|---
3 14  2  4 11  7  3 41  5  7  3  (GGL)
3 19  3  5  9  7  4 29  5 14  2  (G&G)
```

2. since , she , was indecisive | that day || her friend ; asked , her ; to wait

```
  0  0  0  2  0  3  0  1  0  1  0
 ----------------|---------------
                         ----|---
 ----------|---    ----|---
  7  1  8 18  1 44  2 10  4  4  1  (GGL)
 11  2 13 13  2 34  2 12  2  9  6  (G&G)
```

3. after the cold winter ; of that year | most people ; were , totally fed-up

```
 0  0  0  1  0  0  2  0  1  0  0
-------------------|------------
----------|------    ----|------
 7  1  5 12  1  5 38  5  9  5 12  (GGL)
 5  5  5 14  3  5 32  5 10  5 11  (G&G)
                         *
```

4. our disappointed woman ; lost ; her optimism || since , the prospects ; were , too limited.

```
0  0  1  1  0  3  0  0  1  0  0
---------------|---------------
------| -|---    -------|------
5  6 24  8  4 28  5  1 15  3  1   (both)
```

5. When , the new laywer ; called , up ; Reynolds || the plan ; was discussed ; thoroughly

```
 0  0  0  1  0  1  3  0  1  0  1
-------------------|-------------
            ----|-         ----|-
----------|---       ----|----
 5  0  2 20  3  5 30  3 10  1 21  (G&G)
```

6. closing ; his client's book || the young expert ; wondered ; about this extraordinary story

```
 1  0  0  3  0  0  1  1  0  0  0
----------|----------------------
-|------    -------|  |----------
                      *
 6  5  6 26  2  4 15  8  9 11  8   (both)
```

7. John ; asked ; the strange young man | to be quick | on the task

```
   1  1  0  0  0  2  0  0  2  0  0
  ----------------|-------
     -|---------    -------|------
  10 17  3  8  5 25  5  3 19  5  0  (both)
```

8. By making ; his plan ; known || he , brought , out ; the objections ; of everyone

```
   0  1  0  1  3  0  0  1  0  1  0
   ------------|-----------------
        ----|-            ---|---
   ---|---       -------|---
   0 11  2  5 38  0  4 19  2 16  3    (both)
```

9. In addition ; to his files | the lawyer ; brought ; the office's best adding-machine

```
   0  1  0  0  2  0  1  1  0  0  0
  -------------|------------------
  ----|-------   ----|  |----------
   2 10  3  3 33  1  8 17  0 10 13
```

10. That , a solution ; couldn't be found || seemed , quite clear | to them

```
   0  0  1  0  0  3  0  0  2  0
  ----------------|-------------
  -------|-------   -------|----
   5  5 15  7  3 30  9  6 17  3
```

11. the agent ; consulted ; the agency's book || in which | they , offered ; numerous tours

```
 0  1  1  0  0  3  0  2  0  1  0
---------------|---------------
                 ----|---------
---|  |------          ----|---
 1 18 11  2  5 25  2 13  3 10 10  (both)
```

12. That , the matter ; was dealt , with | so fast || was , a shock | to him

```
 0  0  1  0  0  2  0  3  0  0  2  0
----------------------|-------------
----------------|----
-------|-------         -------|----
 7  2 13  2  2 18  5 28  5  3 13  2  (G&G)
```

13. Not quite all ; of the recent files | were examined | that day

```
  0  0  1  0  0  0  2  0  2  0
--------------------|---
--------|----------   ----|----
 11 10 17  4  3  9 23  7 10  6
```

14. She , discussed ; the pros ; and cons || to get , over ; her surprisingly apprehensive feelings

```
 0  1  0  1  0  3  0  0  1  0  0  0
----------------|-------------------
      ----|----
----|----         -------|----------
 4 15  1  8  1 25  1  5  8  6 16 10
                         *
```

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