

PUNCTUATION

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It is well known that written language is impoverished when it comes to representing prosody.¹ As a well-known introductory textbook puts it, "writing never really got around to providing a regular way of marking accent ..., and it has virtually disregarded rhythm and intonation" (Bolinger 1975:472). But to say that written language falls short in representing prosody is not to say that it fails to have prosody. As the same textbook remarks, "we monitor our writing sub-vocally, reading in an intonation, and the fact that the intonation is not actually shown and our reader is going to have to guess at it is as likely as not to escape our attention" (602).

Some who have reflected on their own personal experiences in reading and writing have concluded that written language involves what can be regarded as a mental image of sound, including prosody. Just as people can imagine what some familiar piece of music sounds like, readers and writers seem to be able to imagine how written language sounds. Eudora Welty (1983) put it this way: "Ever since I was first read to, then started reading to myself, there has never been a line read that I didn't hear. As my eyes followed the sentence, a voice was saying it silently to me. ... My own words, when I am at work on a story, I hear too as they go, in the same voice that I hear when I read in books. When I write and the sound of it comes back to my ears, then I act to make my changes. I have always trusted this voice."

Russell Long has made a similar observation, pointing out a relation between writing and reading aloud: "While some of my colleagues object to my use of the word hearing to describe the mental activity that goes on as we write, I am convinced that, at least metaphorically, it is the most accurate term to choose. As I write these sentences, even though my lips are not moving, I am quite conscious of the sound the words I am writing would make if they were read aloud" (Long:15).

This paper describes an initial attempt to explore the relationship between the "covert prosody" of writing and one device -- in fact the principal device -- that writers use in order to make it at least partially overt. That device is punctuation. Although punctuation certainly fails to represent the total range of prosodic phenomena a writer or reader may assign to a piece of written language, it does capture some major aspects of a writer's prosodic intent, to the extent that the quality and impact of a piece of writing may be greatly affected by the author's skill (or

lack of it) in punctuating. A skillful author uses punctuation as a resource to enhance the effectiveness of his or her writing, just as a skillful speaker manipulates pitch and hesitations to enhance the effectiveness of his or her speech.²

It is a common belief that the signaling of prosody is only one of the functions of punctuation, and perhaps not the primary one. Although certainly there are instances of punctuation that do not serve prosodic ends, I will defend the position here that those instances are departures from its main function, which is to tell us something about a writer's intentions with regard to the prosody of that inner voice.

Punctuation Units and Intonation Units

My own interest in this question has come especially from an interest in seeing how written language compares with spoken. In making such a comparison I have been struck by a relation between certain prosodic units already found to be present in spoken language and certain units of written language that are defined by punctuation. Before going any farther I need to say something more about this.

Spoken language exhibits important prosodic units of a kind that I have been calling "intonation units" (Chafe 1980, 1987a). These intonation units occur as spurts of vocalization that typically contain one or more intonation peaks, that end in any one of a variety of terminal pitch contours, and that usually but not always are separated from each other by pauses. Their grammatical form is variable, but the majority are single clauses. In the following illustration I have written each intonation unit on a separate line. The sequences of two and three dots indicate shorter and longer pauses respectively, and the commas and question marks show terminal pitch contours of different types. Person A is conversing with Person B about A's a new job, selling cars, and he begins by quoting some encouragement he received from a third person:

- A: ... He goes just give it a hundred ten percent,
 ... and .. and you'll do good.
 .. You have the personality,
 .. you've always s- se- sold cars,
 .. uh,
- B: .. Yeah.
- A: .. s-omething that you'll enjoy doing,
- B: ... They sell Dodge on this lot?
- A: .. No,
 .. just Chrysler Plymouth,
 .. some Dodge,
 .. we have used Dodge.
 .. but no new ones.

It is natural to wonder whether and in what way something comparable to these intonation units might be represented in writing, and the answer that immediately suggests itself is that writers show the boundaries of their privately heard intonation units with marks of punctuation. We can compare the intonation units illustrated just above with the following illustration of "punctuation units" (the stretches of language between two punctuation marks). The example is from Chapter 10 of Thoreau's Walden (1854). I have written each punctuation unit on a separate line:

Sometimes I rambled to pine groves,
 standing like temples,
 or like fleets at sea,
 full-rigged,
 with wavy boughs,
 and rippling with light,
 so soft and green and shady that the Druids would have
 forsaken their oaks to worship in them;

Although it would be useful to be able to equate punctuation units with intonation units, and thus to be able to compare directly their form and content, there are at least three reasons why such a direct equation is not always possible: (1) the fact that a particular writer may lack the skill to represent prosody accurately, (2) the fact that punctuation styles vary, and (3) the fact that punctuation is sometimes determined by factors other than prosody.

Lack of Skill in Punctuating. Evidently a writer's ability to use punctuation to mark the boundaries of something comparable to spoken intonation units is an acquired skill. This is one of the most obvious areas in which inexperienced writers do poorly. Writing teachers are familiar with examples like the following (taken from Danielewicz and Chafe 1985:220):

Lucy never was able to form whole, and completely new sentences whereas Helen was able to start conversations and express her ideas.

If this had been spoken language, it is quite possible that there would have been an intonational break after the word "whole," a possibility that probably led the writer to introduce a comma at that point. But certainly it is even more likely that a speaker would have produced an intonation unit boundary after the word "sentences," and this writer failed to mark that break with punctuation. Inexperienced writers may often fail to be guided consistently by their inner voice.

Varying Styles of Punctuating. Even with professional writers, however, we find extensive variation in punctuation use. Much of this variation is associated with different punctuating

styles that are popular in different periods, while some of it can be attributed to the habits of individual authors.

During most of the nineteenth century, the fashion was to create punctuation units that were very much like the intonation units of speech. An example from Thoreau was given above. We might also look at Melville's description of the last moments of Ahab (Moby Dick, 1851):

The harpoon was darted;
 the stricken whale flew forward;
 with igniting velocity the line ran through the groove;
 -- ran foul.
 Ahab stooped to clear it;
 he did clear it;
 but the flying turn caught him round the neck,
 and voicelessly as Turkish mutes bowstring their victim,
 he was shot out of the boat,
 ere the crew knew he was gone.

But even when, by the turn of the century, writing had separated itself from such a close relation to speech, it continued to maintain clear analogies to spoken intonation units, however lengthened, elaborated, and interwoven they may have become. The following example is typical (Edith Wharton, The Age of Innocence, 1920):

Though there was already talk of the erection,
 in remote metropolitan distances "above the Forties,"
 of a new Opera House which should compete in costliness and
 splendor with those of the great European capitals,
 the world of fashion was still content to reassemble every
 winter in the shabby red and gold boxes of the sociable
 old Academy.

Here the second punctuation unit interrupts the long and complex unit made up of the first and third together, while the last punctuation unit, though uninterrupted, is longer and more complex than anything one would find in normal speech.

In the Hemingway style, however, the possibility of a relation between punctuation units and intonation units came to be deliberately ignored. The following example is taken from For Whom the Bell Tolls (1940):

Earlier in the evening he had taken the ax and gone outside of the cave and walked through the new snow to the edge of the clearing and cut down a small spruce tree.

For both physiological and cognitive reasons it would be impossible for a speaker under normal circumstances to produce a single intonation unit as long as this one.

Nonprosodic Uses of Punctuation. The third source of difficulty in equating punctuation units with intonation units is the fact that those who contribute to the establishment of written usage have developed a variety of rules for punctuating, not all of which are prosodically motivated. As a result, a piece of writing is likely to contain at least some punctuation marks that were inserted for reasons other than to guide the reader in following the prosodic intentions of the writer. Some may have been placed at grammatical boundaries that were not at the same time prosodic ones, and there may be others that were dictated by completely arbitrary conventions. The question of whether, or in what centuries, punctuation has been governed by "grammatical" or "rhetorical" considerations has been inconclusively debated for a long time. Deneau (1986) provides a useful summary of this literature. Unfortunately, no detailed history of English punctuation practices has yet been written.

Quirk, Greenbaum, Leech, and Svartvik's A Comprehensive Grammar of the English Language (1985:1611) takes the point of view that most punctuation is dictated by grammatical conventions and not by prosody:

Punctuation practice is governed primarily by grammatical considerations and is related to grammatical distinctions. Sometimes it is linked to intonation, stress, rhythm, pause, or any other of the prosodic features which convey distinctions in speech, but the link is neither simple nor systematic ... Punctuation marks tend, therefore, to be used according to fairly strict conventions and even in the peripheral areas where universal convention does not obtain, each individual publishing house imposes one for all materials that it puts forth in print.

It is not clear, however, whether this statement rests on systematic observation of punctuation practices, or whether it simply reflects a folk opinion. It is interesting that immediately following this passage the same authors remark:

There are two important qualifications to the foregoing generalizations. In the first place, there is, as we shall see, a great deal of flexibility possible in the use of the comma: in its presence or absence, or in its replacement by other marks. The comma in fact provides considerable opportunity for personal taste and for implying fine degrees of cohesion and separation. Secondly, the conventions as a whole are not followed as

rigorously in manuscript use (especially personal material, such as private letters), where there may be inconsistencies in their application that would not be permitted in most printed material.

That commas show more flexibility of use than other marks is interesting in view of the fact that Quirk et al. (1985:1613) found, in a varied 72,000 word sample from the "Brown corpus" (Francis and Kucera 1982), that fully 47 percent of the punctuation marks were commas. About half of the marks, then, belonged to this "flexible" category. Beyond that, 45 percent were periods. We will see presently that there is good reason to suppose that, in all but a few special cases, periods represent falling pitch. If, then, 92 percent of the punctuation marks in a representative body of written English are either overwhelmingly prosodic (the periods) or at least subject to "personal taste" (the commas), the statement that "punctuation practice is governed primarily by grammatical considerations" does not seem particularly well supported.

The second qualification in the above quote is also worth pondering. If "manuscript use" such as private letter writing shows a less consistent adherence to grammatical punctuating conventions, does this mean that writers who are not the victims of copy-editing are able to be guided more consistently by prosody? It is too bad to imply that writers who use prosody-based punctuation are exhibiting a sloppiness "that would not be permitted in most printed material." It would seem that the question should not be put in terms of sloppiness versus care, but in terms of the extent to which writers are guided by their inner voices -- by auditory imagery -- versus the extent to which they are guided by imposed rules.

As mentioned above and demonstrated below, periods are typically associated with an auditory image of falling pitch. That image is in turn typically associated with the end of a sentence. It follows that in many cases there may be no point in asking whether some instance of punctuation is determined by prosody or by grammar. So long as prosody and grammar coincide, the only proper answer is "by both."

Question marks, on the other hand, provide a good example of punctuation that is at least ambiguous with respect to prosody. Functionally there are two major types of questions: "yes-no" questions and "question-word" questions. Yes-no questions generally exhibit a final rising pitch; question-word questions a falling pitch. (For a fuller discussion, including cases where these pitches are reversed, see Chafe 1970:309-345.) That both of the following examples are written with a question mark, in spite of the fact that (a) ends with a rising pitch and (b) with a falling one, does show that function can override prosody in some cases:

- (a) Did you buy some artichokes?
- (b) What did you buy?

An especially clear example of conflict between grammar and prosody is a negative one: the dictate that a comma must not be used between a subject and a predicate. Quirk et al. (1985:1619) discuss the following example:

The man over there in the corner, is obviously drunk.

They mention that in speech this sentence "might have a tone unit break where the unacceptable comma has been inserted and we are sometimes tempted to match this with a comma in writing, an error particularly likely to arise with lengthy subjects ... The rule, however, is clear enough and is strictly observed in print."

Its observance in print, however, is something new. We find Melville, for example, frequently writing sentences like:

But this august dignity I treat of, is not the dignity of
kings and robes,

Only the most unprejudiced of men like Stubb, nowadays partake
of cooked whales;

And indeed in current advertisements, apparently less subject to such rules, we find similar examples:

Two cups of Quaker 100% Natural Cereal mixed with a little of
this and a little of that, make the best cookies you've
tasted in years.

Or in a student paper:

Those who are in disagreement, hold that babbling is essential
to language development.

Or in a department memo:

Not asking me, will give me time to post things as they come.

Or in a fortune cookie:

Those who place all their hopes in money, usually get short
changed.³

Evidently unconstrained writers still have an inclination to place a comma after a long or heavy subject, thus marking a natural intonation break. Older writers like Melville did this without hesitation, and it is apparently only the fear of rules, or of copy editors, that keeps modern writers from doing the same.

The discussion that follows will try to throw a little more light on the role punctuation plays in making overt the covert prosody of written language. It grapples with the question, "To what extent, and in what ways, does punctuation function to signal the prosody of that inner voice?" It would be much easier to answer this question if there were some direct and independent way of knowing what the covert prosody of a piece of writing was -- the prosody intended by the author, and that assigned by a reader. We could then simply compare those prosodies with the punctuation, documenting the places where it coincides and where it does not. Unfortunately, there is no such direct, independent manifestation of the inner voice, and we will have to approach it in more indirect ways.

Reading Aloud

It may be remembered that Russell Long equated the prosody that is "heard" in one's auditory imagery with the prosody that would be present if a piece of writing were read aloud: "As I write these sentences, even though my lips are not moving, I am quite conscious of the sound the words I am writing would make if they were read aloud."

If the auditory imagery we are concerned with could always be made overt by reading aloud, we would have a simple and direct way to submit it to public view. To capture the prosodic intentions of writers, we could ask them to read their own works aloud (whenever that was possible). To capture the auditory imagery of readers, we could ask them to read aloud the works of others. The reasoning would be as follows. Reading aloud converts written language into spoken language, spoken language necessarily has a prosody, and from that prosody we can see (or, better, hear) the prosody that is hidden in the writing. If we are interested in the relation between prosody and punctuation, we can then go on to compare the read-aloud prosody with the written punctuation to see where the two do or do not coincide.

But of course things are not that simple. Reading aloud, when it is examined in any detail, turns out to be a highly peculiar activity. It is neither spoken language nor written language, but both and neither at the same time. Although it is spoken language in the sense that it is, quite literally, spoken, there are very few people whose oral reading would be mistaken for speech. A tape-recording of someone reading aloud will almost always be recognizable as such, for two reasons. First of all, the form of the language itself -- its lexical, grammatical, and rhetorical properties -- will be of a written rather than a spoken nature. We know written language when we hear it. Second, the prosody used by oral readers -- the intonation, hesitations, even the voice quality -- will be different from that used by a speaker. People simply do not read aloud the way they talk.

In 1986 I asked two different groups of people to take home with them six brief written passages and read them into a tape-recorder. One of the groups consisted of 20 college students, the other of 8 individuals, mostly in their mid-60's, enrolled in an adult education course. Since the results obtained from the two groups were comparable, I will refer here only to the college student data. The passages were intended to be diverse in style and punctuation, and included excerpts from an automobile advertisement in Time, from Thoreau's Walden, from James's The Turn of the Screw, from a news report in the San Francisco Chronicle, from Hemingway's For Whom the Bell Tolls, and from an article in the American Anthropologist. The mean length of these excerpts was 227 words.

These tape-recordings were transcribed like any other samples of spoken language, special attention being given to the boundaries of intonation units. A distinction was made between terminal pitch contours showing falling pitch, as at the end of a sentence, and any other, non-falling terminal pitch contours. Contours of the falling-pitch type were transcribed with a period, those of the non-falling pitch type with a comma.

The intonation units of ordinary spoken language show a relatively constant length in terms of the number of words they contain. This length varies from language to language depending on the language's morphological type, since some languages pack more information into a word than others. In English the mean length of an intonation unit is between 5 and 6 words. It is interesting, then, that the mean length of the intonation units produced by the college students in oral reading was 5.7 words, well within the typical range of ordinary spoken language. This figure can be compared with the length of the punctuation units in the excerpts these people were reading from, where the mean was 8.9 words. The oral readers obviously introduced many more prosodic boundaries than were signaled by the punctuation in the passages before them. Evidently they went beyond the punctuation in order to make what they were saying coincide with the norm for spoken language. From this evidence it would seem that all spoken language, including oral reading, adheres to a strong constraint on intonation unit length. If a written passage fails in its punctuation to allow for that constraint, oral readers will introduce their own prosodic boundaries in order to bring their reading into line with what seem to be the unavoidable requirements of speaking.

There were real differences between the six passages in the extent to which their punctuation reflected this spoken language constraint. (The passages were chosen with such differences in mind.) Table 1 shows, in the lefthand column, the mean number of words per punctuation unit for each of the six passages, increasing from a low of 5.4 words for the advertisement in Time to a high of 13.3 words for the article in the American Anthropologist. The

righthand column shows the mean number of words per intonation unit in the orally read versions of these passages. The range here was much smaller: from 4.5 to 6.6 words, a range that might be found in spoken language. The reading aloud was closest to the punctuation in the advertisement, with 4.5 words per intonation unit reflecting the 5.4 words per punctuation unit of the original. It diverged farthest from the punctuation in the academic article, with 5.7 words per intonation unit reflecting the 13.3 words per punctuation unit of the original.

	Mean Words per Punctuation Unit in Original Passage	Mean Words per Intonation Unit in Read-Aloud Versions
Advertisement	5.4	4.5
Thoreau	6.9	5.2
James	9.6	6.5
Newspaper	11.9	6.2
Hemingway	12.1	6.6
Academic	13.3	5.7
Overall	8.9	5.7

Table 1. Comparison of Lengths of Punctuation and Intonation Units

Since speaking of any kind evidently imposes a strong constraint on intonation unit length, we have here a measure of the degree to which the punctuation of a particular piece of writing accords with the prosody of spoken language. Thus, we can say that the automobile advertisement as well as the Thoreau passage were quite spokenlike in this respect, whereas the academic article was especially unspokenlike in its punctuation.

The oral readers obviously introduced many prosodic boundaries that were not signaled by punctuation marks in the writing. Of the total number of prosodic boundaries in the oral readings, about 60 percent reflected punctuation marks in the written passages, while 40 percent did not. 91 percent of the added boundaries were non-falling pitches and only 9 percent falling. Thus, when these oral readers added prosodic boundaries over and above those indicated by the punctuation, they nearly always added boundaries that were not of the sentence-final type.

The punctuation marks that the written passages did contain were almost always read as prosodic boundaries. In only 6 percent of the possible cases was a punctuation mark not read aloud as a boundary. Furthermore, in most cases the kind of punctuation determined the kind of prosody. That was especially true of periods, which constituted 37 percent of the punctuation marks in the written passages. 94 percent of these periods were read aloud as falling pitches. More common than periods were commas, constituting 52 percent of the punctuation marks in these passages.

Commas were not quite as strong a determinant of a particular read-aloud intonation: 66 percent were read as non-falling pitches, while 25 percent were read as falling. These proportions were, however, skewed by the Thoreau passage, where 44 percent of the commas were read as if they were periods. (The passage itself contained only two periods.) If we leave the Thoreau passage out of account and look only at the 5 other passages, 72 percent of the commas were read as non-falling pitches and 16 percent as falling. To summarize, periods were almost always read aloud as falling pitches, while commas were usually read aloud as non-falling pitches, though the proportions in the latter case were not quite as overwhelming.

Although periods and commas together constituted 89 percent of the punctuation marks in the original passages, it is of some interest to see how other punctuation marks were read aloud. There were some that were usually read aloud as falling pitches. For example, semicolons were read as falling pitches 89 percent of the time. Colons, of which there were only two examples, were read as falling pitches 95 percent of the time. The one question mark was read as a falling pitch 90 percent of the time. This question mark occurred at the end of a question-word question ("How was this ... accomplished ...?"), where a falling pitch is normal. The only marks beside commas that were usually read aloud as non-falling pitches were parentheses. The three open parentheses were preceded by non-falling pitches in oral reading 80 percent of the time, and the one close parenthesis that was not immediately followed by a comma was read aloud as a non-falling pitch 95 percent of the time. The four dashes, all of which occurred in the Henry James selection, were prosodically ambiguous. When the dash could be interpreted as the end of a sentence (regardless of the following context), it was usually read as a falling pitch. When, on the other hand, it functioned to set off a parenthetical remark ("She wished, of course -- small blame to her! -- to sink the whole subject;") it was usually read as a non-falling pitch. Thus the dash, like the question mark, apparently has no consistent pitch interpretation, but receives such an interpretation from its context.

Repunctuating

We can by no means be certain that reading aloud captures completely the auditory imagery that is in a writer's or reader's mind during the silent processing of written language. Reading aloud is useful in showing that there is a correspondence between punctuation marks and their prosodic interpretation. Not only do oral readers interpret punctuation marks as signals of prosodic boundaries, they also interpret specific marks as signals of specific kinds of boundaries. But what of the many boundaries oral readers introduce that are not signaled by any punctuation? Are such boundaries also present for silent readers, or are they introduced only because of the requirements of spoken language production? If

spoken language is locked into a format in which intonation units contain about 5 or 6 words, that accounts for the 40 percent of the read-aloud prosodic boundaries that were not triggered by any punctuation. But why should the auditory imagery that accompanies silent writing or reading be subject to the same spoken-language constraint? Why should either writers or readers be locked into the same 5 or 6 word format?

Writers have the leisure to construct longer units and, since they can peruse a segment of language repeatedly, they are not subject to the same short-term memory limitations as speakers. Time is less pressing for writers than for speakers. But what of silent readers? The relation between reading and listening is a curious one. Of necessity we can listen only as fast as we are spoken to. In listening to a speaker whose pace is too slow, our minds may try to leap ahead, but if we are really listening we have no choice but to follow the tempo of what is being presented to us. In reading, on the other hand, we are free of any tempo constraint that might be imposed by the producer of the language. We can follow whatever pace is comfortable, speeding up and slowing down as we wish. There is nothing to prevent us from exceeding the approximately 180-words-per-minute pace that governs speaking, and therefore listening. If readers of written language are able to assimilate chunks of language that are larger than speakers of spoken language are able to produce, then the 5 or 6 word ceiling of spoken language need not be a restriction that applies to silent auditory imagery. To find out more about this, we need to look at written language prosody in ways that are free of the constraints inevitably placed on spoken language production.

One possible way is to ask people to provide their own punctuation for written passages from which the original punctuation has been removed. To the extent that these "repunctuators" are guided by their auditory imagery, their punctuation may give us some idea of what that imagery is. As with any assignment of punctuation, the disturbing factors listed earlier may be present. People may be more or less skilled in using punctuation to represent their prosodic imagery. They may be influenced by current fashions in punctuating. And they may also be influenced by non-prosodic rules of punctuating. For these reasons we cannot take repunctuation as an unambiguous indicator of prosodic imagery. In spite of these reservations it does appear that repunctuation may give us some useful insights into that imagery.

At the same time that I collected the first set of oral readings discussed above, I also asked 20 other students to repunctuate the same passages. I gave them doctored versions which lacked all punctuation, and asked them to insert punctuation as they thought appropriate.

So far as the length of the resulting punctuation units is concerned, there was a closer correspondence between the repunctuators and the original authors than there was between the oral readers and the original authors. It will be recalled that the mean length of intonation units in reading aloud was 5.7 words, as compared with 8.9 words in the punctuation units of the original passages. The mean length of the punctuation units created by the repunctuators was 9.4 words. In other words the punctuation units tended to be even somewhat longer than those of the originals, but closer in length to the originals than were the intonation units of the oral readers.

More interesting is the fact that the introduced punctuation units showed no ceiling effect of the type that kept the oral readers from producing intonation units that averaged between 5 and 6 words in length. Table 2 shows how, in general, as the punctuation units of the originals increased in length, from the automobile advertisement at one extreme to the academic article at the other, the punctuation units of the repunctuators also increased in length. In the advertisement and the James, the introduced punctuation units were almost identical in length to those of the original. They differed by about one word in the Hemingway and the newspaper article. The difference was somewhat greater in the case of the academic article and especially the Thoreau.

	Mean Words per Punctuation Unit in Original Passage	Mean Words per Punctuation Unit in Repunctuated Passage
Advertisement	5.4	5.6
Thoreau	6.9	10.0
James	9.6	9.7
Hemingway	11.9	11.2
Newspaper	12.1	13.2
Academic	13.3	11.1
Overall	8.9	9.4

Table 2. Comparison of Original and Repunctuated Units

To what extent did this punctuation agree with that of the original authors? 80 percent of the punctuation marks corresponded to some kind of punctuation in the original passages. These figures can be compared with those for reading aloud, where 60 percent of the prosodic boundaries reflected original punctuation.

However, while the repunctuators tended more than the oral readers to punctuate in just those places where the authors had punctuated, there was less agreement with respect to specific kinds of punctuation. 66 percent of the original periods were mirrored by periods in the repunctuated versions, as compared with the

falling pitches used in reading periods by 94 percent of the oral readers. 54 percent of the original commas were mirrored by commas in the repunctuated versions, as compared with the non-falling pitches used in reading commas by 66 percent of the oral readers. The oral readers, of course, saw the authors' punctuation marks, while the repunctuators did not. Furthermore, the repunctuators were free to use marks other than periods and commas, whereas the oral readers were transcribed as having only falling or non-falling pitch contours. This freedom to use other punctuation marks contributed to the distance between the originals and the repunctuated versions. For example, 17 percent of the original periods were repunctuated as neither periods nor commas.

If oral reading can suggest the degree to which the punctuation of a particular piece of writing is spokenlike, repunctuating, by showing us the punctuation that a consensus of readers would assign to a piece of writing, can suggest the degree to which a piece of writing captures the auditory imagery of ordinary readers. In that light we can say that the automobile advertisement and the James captured the readers' auditory imagery very well. The greatest discrepancy, perhaps surprisingly, was with Thoreau, who used much shorter punctuation units than the repunctuators did.

Why Are Punctuation Units Longer Than Intonation Units?

One finding that is clear from a comparison of Tables 1 and 2 is that, for a given piece of writing, the mean length of punctuation units is always greater than the mean length of the intonation units produced by oral readers. This is true whether the punctuation units were those produced by the original authors, or whether they were those produced by the repunctuators. The difference between the punctuation and intonation units is greater for some pieces of writing than for others, but the difference is always there. Why should there be this consistent difference?

Two possibilities suggest themselves. One is that both writers and silent readers are able to process larger chunks of information at a time. For writers, their freedom from a speaker's need to create language on the run may provide the leisure to create punctuation units that exceed the length of what a speaker is capable of. For silent readers, unconstrained by the necessity to follow the pace set by a speaker, it may be possible to assimilate more information in a single gulp of comprehension (assuming that comprehension also takes place as a series of brief acts).

An alternative possibility is that written language signals prosodic boundaries in other ways, in addition to punctuation. Perhaps a writer's or reader's prosodic interpretation of a piece of writing is not dependent on punctuation alone. More specifically, perhaps learning to deal with written language involves

learning to give prosodic interpretations to specific syntactic patterns, even when punctuation is not involved.

There may be no point in trying to choose between these two alternatives, for it is likely that both are correct. It is likely that the syntax of written language does provide clues to prosodic boundaries, but also that these boundaries can be, and often are, extended beyond what would be natural in spoken language. It is likely in addition that both writers and readers have flexibility, creating syntax and interpreting syntax prosodically in ways they find most comfortable under their own individual conditions of expression and understanding. A writer's omission of punctuation maximizes such flexibility. Instead of locking the reader into a single prosodic interpretation, a writer may leave possibilities open.

To make this more concrete, it is instructive to look at cases where the original authors and the repunctuators inserted approximately the same number of punctuation marks, but where the oral readers inserted more. Such was true of the selection from James, where the mean number of words per punctuation unit in the original was 9.6 and for the repunctuators 9.7, but the mean number of words per intonation unit for the oral readers was 6.5.

James wrote, for example:

We were to keep our heads if we should keep nothing else--

16 of the repunctuators agreed with James in preserving this sequence as an unpunctuated unit, only 4 of them inserting a comma after "heads." Among the oral readers, on the other hand, 17 of them inserted a non-falling intonational break after "heads," only 3 of them pronouncing the entire sequence as a single intonation unit. Most of the oral readers thus quite characteristically divided these 12 words into two 6-word intonation units.

Why did James write all this as a single unit, and why did the repunctuators agree with him? In spoken language there is a constraint that limits the amount of information in a single intonation unit to one "new" idea -- new in the sense that it is being newly activated for the hearer (Chafe 1987a). Such information contrasts with that which is "given," or already activated. There is, however, a gray area of information that is inferrable from the context. Rather than being completely new, such information can be regarded as in some way already "accessible."

The first clause of the above example, "we were to keep our heads," expresses information that is accessible from the immediately preceding clause:

we were of a common mind about the duty of resistance to extravagant fancies.

"Keeping our heads" is essentially a paraphrase of "resisting extravagant fancies." In this context, the sequence "we were to keep our heads if we should keep nothing else" does not really express two new ideas but one, the idea contained in the second clause. Beginning with the accessible idea "we were to keep our heads," it adds the new idea "if we were to keep nothing else." That new idea itself, furthermore, does not carry forward the development of ideas in the narrative, but serves only as a reinforcement of the preceding idea.

The point is that, whereas this example may appear superficially to convey two clauses worth of new information, and thus to be too much to process in a single gulp of comprehension, in fact the first clause conveys information that is already accessible from the immediately preceding context, while the second clause conveys new information that does nothing more than to emphasize what preceded. A reader's cognitive capacities are not, then, severely taxed by the need to interpret this sequence as a single unit. Furthermore, if a reader did need to interpret it in two separate acts of comprehension, the word "if" can be almost as good a signal for a break as a comma would be. By not using a comma after "heads" James showed his understanding of the light cognitive load exacted by this sequence in the context given. But in addition the clause structure, clearly signaled by the word "if," makes it easy for the reader to direct either one or two focuses of attention on these words, whichever seems most comfortable.

Close versus Open Punctuating

If punctuation serves to make a writer's prosodic intentions explicit, but if at the same time there are other cues which, in the absence of punctuation, enable readers to assign their own prosody, then writers can enjoy a certain amount of freedom in this respect. While few of them are likely to deviate from using periods at the ends of declarative sentences, in the use of commas they may be entirely explicit, or they may leave prosody in part to the imagination.

Such flexibility opens the doors to fashion. Where choices can be governed by taste rather than inevitable rules, the tastes will vary with the times and the creativity of individuals. The continuum of possibilities in the use of commas has come to be identified in terms of "close" or "open" punctuating. At the present time it is fashionable to prefer a relatively open style. As stated in The Chicago Manual of Style (1982:132):

The tendency to use all the punctuation that the grammatical structure of the material suggests is referred to

as close punctuation. It is a practice that was more common in the past, and though it may be helpful when the writing is elaborate, it can, when misused, produce an uninviting choppiness. There is a tendency today, on the other hand, to punctuate only when necessary to prevent misreading. Most contemporary writers and editors lean toward this open style of punctuation yet preserve a measure of subjectivity and discretion.

We have seen that the close punctuating favored in the past was more in accord with the prosody of speech. Probably this fact was related to the widespread habit of reading aloud, as described, for example, by Walter Ong (1982:115-116):

The famous McGuffey's Readers, published in the United States in some 120 million copies between 1836 and 1920, were designed as remedial readers to improve not the reading for comprehension which we idealize today, but oral, declamatory reading. The McGuffey's specialized in passages from "sound-conscious" literature concerned with great heroes ("heavy" oral characters). They provided endless oral pronunciation and breathing drills.

The constraints on information flow that are responsible for the intonation units of spoken language were, then, during the nineteenth and early twentieth centuries, applied as well to the punctuation of written language. The trend toward open punctuation seems to have gained momentum at the same time that the popularity of oral reading declined. As is customary when rules are legislated, this change was validated with appeals to logic (one should not "separate inseparables"), or aesthetics (one should avoid "uninviting choppiness"), or the ease with which a rule can be stated ("the rule is clear enough"). But in the end all such appeals simply rationalize the results of a decline in the habit of reading aloud, the most powerful of the ties between writing and speaking.

An exaggerated form of open punctuating became a trademark of certain 20th century writers, among whom in America were Hemingway and Agee. The following passage from A Death in the Family (published posthumously in 1957) provides an example:

He has been dead all night while I was asleep and now it is morning and I am awake but he is still dead and he will stay right on being dead all afternoon and all night and all tomorrow while I am asleep again and wake up again and go to sleep again and he can't come back home again ever any more but I will see him once more before he is taken away.

When this passage was given to the older group of oral readers, they divided it into as many as 16 intonation units. In the following version the square brackets show the percentage of oral readers who introduced a break at that point:

He has been dead all night, [100%]
 while I was asleep, [100%]
 and now it is morning, [88%]
 and I am awake, [100%]
 but he is still dead, [100%]
 and he will stay right on being dead, [75%]
 all afternoon, [88%]
 and all night, [88%]
 and all tomorrow, [75%]
 while I am asleep again, [100%]
 and wake up again, [100%]
 and go to sleep again, [100%]
 and he can't come back home again, [63%]
 ever any more. [100%]
 But I will see him once more, [88%]
 before he is taken away. [100%]

Most or all segmented the passage before a conjunction -- before "and," "but," "while," and "before" -- thus helping to confirm the notion that conjunctions signal prosodic breaks when punctuation is absent. More than half also introduced a prosodic boundary at a potential sentence closure -- a place where a sentence could have ended but did not -- even when no conjunction followed: "and he will stay right on being dead, all afternoon" and "and he can't come back home again, ever any more."

The repunctuators were, as usual, much less liberal than the oral readers in segmenting this passage. The following version shows a break wherever at least half of the repunctuators introduced one:

He has been dead all night while I was asleep and now it
 is morning and I am awake but he is still dead,
 [50%]
 and he will stay right on being dead all afternoon and all
 night and all tomorrow while I am asleep again, [63%]
 and wake up again, [63%]
 and go to sleep again, [50%]
 and he can't come back home again ever any more. [100%]
 But I will see him once more before he is taken away. [100%]

The breaks were always triggered by the presence of a conjunction, but not every conjunction had this effect.

The oral readers showed what a close punctuator might have done with this passage, and the repunctuators what an open punctu-

ator might have done. Agee's own version, however, was more extreme. It has been thought that writing without commas reproduces somehow a narrator's "stream of consciousness," but that notion is ironic if it is correct to view intonation units as the verbal representations of focuses of consciousness (Chafe 1980). Consciousness probably flows in spurts rather than in a steady stream, and commas help to capture this spurt-like quality.

Suppressing commas has two other effects. First, it forces the reader to rely wholly on syntax for prosodic divisions. Through a liberal use of "and" (as in the Agee example) it can make that task an easy one, for "and" alone may be almost as good a marker of an intonational boundary as a comma. Second, through its deviation from accustomed usage it calls attention to the language itself. Other writers may use punctuation to increase the transparency of their language. By signaling the boundaries of normal processing units, they relieve readers of the necessity of creating those boundaries for themselves, and thus allow the ideas behind the language to show through without interposing the language as something else to pay attention to. Agee forces his readers to create their own processing units, and in so doing makes his language a separate object of attention. Reading his sentence makes one as aware of the sentence itself as of the ideas behind it. This tactic, of course, can have its own aesthetic value -- in this case, perhaps, suggesting a breathless tumbling out of the writer's thoughts.⁴

Conclusion

I began by pointing to introspective evidence that both writers and readers experience auditory imagery of intonations, accents, and hesitations in written language. I suggested that some aspects of this "written language prosody" -- in particular the boundaries of imaged intonation units as well as the terminal contours of these units -- are made partially overt through punctuation. If one is to study the degree to which punctuation succeeds in performing this function, one would like to discover some independent ways of uncovering written language prosody. I explored two such ways: asking people to read passages aloud and asking them to repunctuate (insert punctuation marks in passages from which punctuation has been removed). Each of these devices can provide some insights, but each also has its limitations.

People who read aloud nearly always produce intonation units whose length lies within the normal range for ordinary spoken language. The degree to which their segmentations match the punctuation units of a piece of writing provides an index of the degree to which that writing is prosodically spokenlike. Oral reading is also useful in showing how different punctuation marks are prosodically interpreted; for example, periods are almost

always interpreted as falling pitches, and commas are usually interpreted as non-falling pitches.

There is no reason to believe that either writers or readers are governed by exactly the same temporal processing constraints that are responsible for the relatively brief intonation units of spoken language. One way of obtaining information on constraints that are more specific to written language may be repunctuation. On the whole, repunctuators come closer than oral readers to matching the punctuation of the original authors, at least so far as the location of punctuation is concerned. They may, at the same time, provide a way of measuring the degree to which a piece of writing captures the auditory imagery that is "heard" by ordinary readers.

I raised the question of why punctuation units, whether of the original authors or of repunctuators, are consistently longer than the intonation units produced by oral readers. I suggested both that (1) writers and (silent) readers are able to process larger chunks of information at a time, and (2) written language provides syntactic as well as punctuational clues to prosodic boundaries. I discussed an example from James that suggested how an author might be sensitive to the cognitive "accessibility" of a considerable amount of information packed into a single punctuation unit. The same example also suggested how, in the absence of punctuation, the presence of a conjunction might provide a reader with a clue to a prosodic boundary if the reader's cognitive load required such a boundary.

The distinction between "close" and "open" punctuation was discussed in this light. The effects of open punctuation were seen as (1) forcing a reader to rely on syntax alone for prosodic segmentation, and (2) calling the reader's attention to the language itself, removing some of its "transparency." A passage from Agee was discussed as an extreme example of open punctuation.

In spite of occasional deviations from the prosody of the inner voice, whether prescribed by grammatical convention or the result of current fashion, the most broadly applicable finding of this study is that most writing most of the time does use punctuation in a way that respects the prosody of written language. Reading aloud and repunctuating are limited ways of making that prosody reveal itself. In the end, however, the most satisfying guidance comes from listening to the inner voice itself, an exercise I strongly recommend to those who write.

NOTES

¹ A longer version of this paper is available as Chafe 1987b.

² It is possible that fast reading or skimming tends to degrade the prosody of written language, which evidently comes closest to the prosody of speech when the reader maintains a tempo close to that of speech. I suspect, however, that most writers would be pleased if their readers would read slowly enough to experience the prosody that was intended.

³ For the last four examples I am indebted to Sandra Thompson.

⁴ Deborah Tannen has brought to my attention a curiosity that is quoted in Walker (1985). Lavery (1923) believed that close punctuating was feminine: "... instead of a rugged and bold reliance on words to convey meaning, which would be the masculine way of doing things, the habit has grown up of dressing up a sentence with the lace and ruffles of punctuation." One wonders whether the extremes of open punctuation found in Hemingway and his followers have anything to do with this belief.

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