

## Using Sentence Combining in Technical Writing Classes

M. Rosner and T. Paul  
Iowa State University

Technical writing students have trouble learning technical style. And it's no wonder. As a discipline, we cannot fully agree on a definition of the term, and our textbooks' abstractions about what we do agree do little to help students who have not written since freshman composition. They cannot learn to write by following a series of abstractions, no matter how common-sensical they may seem. Students can, however, learn with writing practice. Sentence-combining exercises can give them this practice.

Unfortunately, few teachers use sentence combining in technical writing classes. First, they find that available sentence-combining exercises, those found in freshman texts, are inappropriate for their advanced students who want to write about their expertise, not about hamburgers or the Cincinnati Reds. Second, they fear that sentence combining will simply teach students to write longer (not better) sentences. Our own experience with asking juniors and seniors to combine kernels of specialized (i.e., technical) information, however, indicates that the process can be helpful in several ways: it gives students regular writing practice; it can teach the logic of sentence structure, sentence editing, and punctuation; paragraph development and organization; and rhetorical stance. If technical writing students learn as well as the freshman practitioners of sentence-combining, we can hope for significant and long-range increases in their writing quality.

What follows describes typical sentence, paragraph, and discourse level sentence-combining exercises using material appropriate for technical writers. All examples deal with agronomy, but we believe that these kinds of exercises can teach effective technical prose to writers in other disciplines as well. We realize the inventing, editing, and organizing skills taught through sentence combining can be taught by other means. Nevertheless, we urge technical writing teachers to consider this procedure which has worked with freshmen so well.

### SENTENCES

Used regularly throughout the term, sentence-level exercises can demonstrate at least four important things: how parts of the sentence work together, how a message can be expressed in different structures, how structure and meaning are related, and how material is often (but not always) better focussed when it is in a single sentence rather than in several overlapping ones. Our exercises are based on those found in The Writer's Options,<sup>1</sup> but contain specialized information. Like that text, during the quarter we explain a series of syntactic structures--coordination, for instance--and show when it can be used effectively (to indicate items of equal importance, as lists) and how it is punctuated (commas vs. semi-colons). Our students then work through an exercise that requires them to combine sets of sentences in imitation of the structure and to share their combinations. An excerpt follows:

Combine the information in each of the following sets of sentences by using a coordinate structure.

1. The major corn endosperm mutants can be divided into three classes.  
One class consists of corn mutants now in use.  
Potentially useful corn mutants are members of a second class.  
Another class consists of corn mutants that have no know use.
2. Some potatoes are not grown commercially.  
These are the Abnaki, Bellisle, and Cascade.  
The Hudson and the Snowchip also fall into this category.

Students may also be asked to evaluate how effectively a writer has used the structure; i.e., whether it reinforces sentence content. Another typical exercise on coordination:

What items are coordinated in the following sentences. (Find the coordinating word.) Are they similar enough to deserve coordination?

1. The tall fescue clone, designated 80-1, had yellow-green leaf color and had been selected for resistance to *Puccinia coronata* and *Helminthosporium* spp.
2. Although a highly resistant fescue line served as maternal parent, a high percentage of C1 progenies...was susceptible to disease and therefore, susceptible plants failed to survive the winter.

Finally, they create original sentences incorporating the structure. With these short, regular exercises, students learn to analyze sentences carefully, to consider the relationship between form and meaning, and to practice sentence variety, modification, and punctuation. And because they share "answers" to the various writing problems, they become more aware of the possibilities of writing.

In spite of sentence-combining's apparent emphasis on sentence length, we all know that long sentences are not necessarily good sentences. A series of decombining exercises can help students see why a particular structure is unfocused and how it can be improved. These exercises ask them, first, to break up a sentence into smaller pieces of information and to decide which of the pieces are most important, which less important, which unimportant. They then eliminate repetition, revise for mechanics, and choose structures that are clearer (and usually shorter) than the original:

The following sentence is not as clear as it could be. Break it into smaller sentences, decide what you want to empahsize, and organize your material into one or more sentences.

1. Considering only fresh vegetable use since 1970, the most important development is that the pattern of declining use has been checked, and there has been a slight upward movement each year since 1973.

- This generalization will concern the use of fresh vegetables since 1970.
- The use of fresh vegetables is no longer declining.
- The use of fresh vegetables has slightly increased each year since 1973.

Possible revision: Since 1970, the use of fresh vegetables has stopped declining; in fact, since 1973, it has slightly increased each year.

Students notice that the revision has reduced the 33-word original to 20 words. Early in the term at least, we have to point out that it also eliminates the dangling modifier and tightens the coordination.

#### PARAGRAPHS

As the sentence-level exercises demonstrate, sentence combining shows a writer how to make a point and how to subordinate material to it. Paragraphs function similarly. Given a list of kernel sentences, students can choose a focus for a paragraph, select appropriate details to maintain that focus, and combine those details to edit and to emphasize. An alternative is the more directed assignment below:

Use the details from the list below to construct a well-organized paragraph that describes how the Moduleponics system operates. You may have to change the order of the details.

1. Moduleponics is a system based on hydroponics.
2. Hydroponics is a system that grows plants in water, not in soil.
3. Air is pumped into the reservoir.
4. The growing tube is filled with plastic gravel.
5. The second pipe is parallel to the growing tube.
6. The growing tube is 18 inches off the ground.
7. The air forces the nutrients into the growing chamber.
8. The second pipe is fed by an air supply line.
9. A second pipe is below the growing tube.
10. Moduleponics consists of a growing tube.
11. The nutrients feed the plants.
12. The second pipe is a reservoir for the nutrient solution.
13. Hydroponics can be very expensive.

#### POSSIBLE PARAGRAPH:

Moduleponics is a system based on hydroponics, which grows plants in water, not in soil. Moduleponics consists of a growing tube filled with plastic gravel. It is 18 inches off the ground. A second pipe, below it, is parallel to it. The pipe, a reservoir for the nutrient solution, is fed by an air supply line. The air is pumped into the reservoir, forcing the nutrients into the growing chamber. These nutrients feed the plants.

This exercise will help students recognize what belongs in a paragraph (most of them easily eliminate point 13) and consider order. Exchanging paragraphs, they learn how different structures can present the same data, and how structure affects emphasis and meaning. For those who need help organizing material within the paragraph once they've decided it belongs, the Christensen system of analysis,<sup>2</sup> which--like sentence-combining--relates structure and meaning, can teach paragraph organization and development. Students who revise according to the Christensen model can create paragraphs like the one below, one that is more effective than the earlier version because items that are equally important are phrased similarly:

Like hydroponics, moduleponics is a system that grows plants in water, not in soil. This system consists of three parts. First is a growing tube 18 inches off the ground. It is filled with gravel. Second, parallel to and below the growing tube, is a pipe. It is a reservoir for the nutrient solution. Third is an air supply line which pumps air into the reservoir, forcing the nutrients into the growing chamber. These nutrients feed the plants.

Finally, sentence-combining can give students practice in translating information for different, already-defined audiences. This cannot, of course, replace work in audience analysis, but it can give them the opportunity to gain skills in adaptation of tone, data, vocabulary, even sentence structure, once the reader has been defined:

Below you will find a series of details. Study them. Then choose the details that would be appropriate for the reader of Wallace's Farmer, aimed at practicing midwest farmers. Translate those details into the language they will understand.

Abnaki is a round-white potato which is not widely produced commercially.

Bellisle and Snowchip are two other round-white types.

Bellisle and Snowchip are also not widely produced for the commercially market.

Nampa and Targhee are long russet types.

Nampa and Targhee are not widely produced for commercial purposes.

Butte is another russet potato.

Butte was released in 1977.

Butte has not had widespread commercial testing.

Butte's commercial market potential is not known.

Bison is a red skin variety.

Bison has performed well in several studies.

Bison might be the most promising potato for commercial use.

#### POSSIBLE REVISION:

Uncertain about what potato crop to plant this year? Don't grow Bellisle, Abnaki, Snowchip, Nampa or Targhee. They won't sell. Butte is chancy. It hasn't proven itself. Bison, a red skin, is your best bet.

This conscious attention to the reader is something all of our technical writing students have to learn. Practicing these transformations, even in these artificial contexts, can help them develop the writing skills they need.

#### TECHNICAL FORMS

Sentence-combining exercises can also give students experience manipulating the unique forms of technical writing. This section describes assignments with proposals, progress reports, and sections of the technical report.

A proposal offers a service to the reader. Students, however, frequently have difficulty adopting a successful service attitude. In trying to be honest, they tend to concentrate on what they cannot do; at times, they raise such serious objections that they call into question the entire proposal. Discussions of responses to exercises like the following, which reinforce editing and organizing skills encouraged by the earlier sentence-level material, can show them how to acknowledge unfavorable information tactfully.

Reorganize the following set of sentences into the opening of a proposal. Although you should include all relevant data, be sure to emphasize only selling points.

1. This is a preliminary study.
2. The results will necessarily be tentative.
3. Further tests will be required.
4. This study covers only a period of two weeks.
5. This study deals with only one kind of corn.
6. This corn is Shrunken-2.
7. Shrunken-2 has a high sugar content.
8. Shrunken-2 has low water-soluble polysaccharide (WSP) content.
9. No exact data on germination rates of Shrunken-2 exist.
10. It may have problems in poor germination.
11. These problems may occur in laboratory tests.
12. Shrunken-2 is popular among home and market growers.

These details can, of course, be organized in different ways; the advantages of the versions students offer should be discussed. One possible statement, for instance, follows:

Although Shrunken-2 is popular among home and market growers, no exact data on its germination rates exist. This preliminary study will examine germination rates of this corn hybrid in laboratory tests over two weeks. Since Shrunken-2, which is high in sugar and low in water-soluble polysaccharide (WSP), may not germinate well under laboratory conditions, the results of the study will necessarily be tentative. Further tests will be required.

This revision has several virtues. The writer begins by explaining the need for the study. She then plays down potential weaknesses in the project: the fact that the data will be collected over a short period is presented neutrally; the possible difficulty with germination rates is subordinated; negative words like "problems in poor germination" are eliminated. Exercises like this teach

students--through analyses and comparisons of their own controlled writings--various ways to minimize both familiar and negative information. The information about the sugar and WSP content, the distinguishing features of the hybrid, can also lead to a discussion of intended audience: how can the writer develop the proposal for the audience she has defined implicitly.

Similar assignments can demonstrate ways of organizing material in larger contexts. Kernel sentences like the following from a progress report can be provided.

Study the following. Decide what information you want to emphasize and then organize it into a short progress report. Add any additional information you consider essential. Be prepared to defend your choice of organizational pattern and additions.

1. This is the first progress report.
2. It covers the period from January 1 to March 15.
3. It reports on the evaluation of the effect of vestigial glume character on tassel length and on pollen production.
4. Wisconsin sweet corn inbreeds were the plants studied.
5. Twenty sets were planted.
6. Twenty sets of normal corn were also planted.
7. Tassels were bagged and sealed for pollen.
8. Pollen volume was measured.
9. Glume length was measured.
10. Pollen ranged from .65 to 15.95 ml./tassel for Vg inbreeds.
11. Pollen averaged 2.99 ml. for the Vg inbreeds.
12. Pollen averaged 20 ml. for normal corn plants.
13. Tassel glume length ranged from .65 to 5.20 ml. for Vg inbreeds.
14. Tassel glume length averaged 3.76 fro the Vg inbreeds.
15. Tassel glume length averaged 11.93 for normal plants.
16. Neither the pollen volume nor glume length varied significantly in the normal plants.

Most students recognize that the first four sentences, along with missing information about the authorization of the proposal, can comprise a transitional introduction. But the rest of the material, the "Work Completed," can be organized in several ways. Unfortunately, many inexperienced writers are unaware of the possibilities; sharing the results of the exercise can make them more aware. The writer who wishes to emphasize the products measured should recognize this pattern:

Preparation: Twenty sets of Wisconsin sweet corn inbreeds were planted; tassels were bagged and sealed for pollen. Twenty sets of normal corn were treated similarly.

Measurement:

Pollen For Vg inbreeds, pollen ranged from .65 to 15.95

ml./tassel. It averaged 2.99 ml. For normal corn plants, pollen averaged 20 ml.

Tassel Glume Length for Vg inbreeds, tassel glume length ranged from .65 to 5.20 ml. It averaged 3.76 ml. For normal corn plants, length averaged 11.93.

The writer who wants to emphasize differences between the inbreed and the normal corn plants should consider this variation:

Preparation: Same

Measurement:

Vg Inbreeds Pollen ranged from .65 ml. to 15.95 ml./tassel. It averaged 2.99 ml. Tassel glume length ranged from .65 to 5.20 ml. It averaged 3.76 ml.

Normal Corn Very little variation. Pollen averaged 20 ml. Tassel glume length averaged 11.93 ml.

And so on. Whatever the choice, discussions of the options help students to recognize relationships between material and organization, and to practice those relationships in these exercises and their own writing.

Other students have difficulty distinguishing elements of the technical report. Since the descriptive abstract and conclusion, for example, often contain some of the same material, inexperienced technical writers tend to repeat the information verbatim. Exercises that focus on material likely to be repeated can help them practice tailoring information, choosing and arranging details according to various formal requirements. Sentences like the following can be furnished:

1. This document reports the measure of pH levels of soil growing corn seedlings.
2. This document reports the measure of phosphate levels of soil growing corn seedlings.
3. The corn seedlings were grown for eleven days.
4. The corn seedlings were grown in two plots, Plot M and Plot R.
5. Both plots were fertilized with monocalcium phosphate.
6. Plot R was treated with nitrous oxide.
7. Rhizocylinder solutions were obtained from both plots.
8. The solutions were obtained by centrifugal filtrations.
9. The solutions were analyzed for pH.
10. The solutions were analyzed for phosphate.
11. The pH levels of both plots measured 4.6.
12. The phosphate level of Plot R was less than the level of Plot M.
13. Nitrous oxide increased corn root growth.
14. Corn roots absorb phosphates.

The descriptive abstract is little more than a list of topics covered in the report, and students who write an abstract have to practice discretion: what must they include? what can they exclude? Since the abstract should be brief, they have to edit carefully. Since it should be coherent, they need to work on paragraphing, a most troublesome requirement for them here. After some practice, they can write abstracts like this:

This report identifies pH levels and phosphate levels of soil growing corn seedlings for eleven days. The soil was fertilized by monocalcium phosphate, but one plot was also treated with nitrous oxide. This report discusses reasons for the decreased phosphate levels in the oxidized plot.

A conclusion drawn from the same kernel sentences can force students to recognize differences between it and the abstract. The following combination presents the investigative results specifically and in diminishing order of importance.

This report on the pH and phosphate levels of soils growing corn seedlings reveals the following:

1. The phosphate levels of the soil treated by nitrous oxide was less than the level of the untreated plot.
2. Nitrous oxide increased corn seedlings' root growth. These roots rapidly absorb phosphate.
3. The pH levels of both plots were 4.6.

Again, this is not the only possible order of information (since order depends on audience) or organization of a conclusion; students can increase their available writing options by sharing and comparing their own variations.

Exercises like these demonstrate that sentence combining can work effectively within a technical writing course. Using the language and structures of the technical disciplines, we can create material that will speak to our students' interests. More important, because it demonstrates and inculcates principles of analysis and revision, sentence combining can show our students how to become writers who communicate intended meanings to intended readers-- in a "technical style" they have defined (and refined) through use.

#### NOTES

<sup>1</sup>Donald Daiker, Andrew Kerek, Max Morenberg, The Writer's Options (New York, Harper and Row, 1979).

<sup>2</sup>Francis Christensen and Bonniejean Christensen, A New Rhetoric (New York, Harper and Row, 1976), 142-164. An additional benefit of this system is that it lets students see where to expand points: a paragraph with a series of only level 2 details, for instance, might suggest superficiality and invite further development.