Should We Proscribe Existential *There*?

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Textbook proscriptions of existential there *misrepresent its effect on information structure, overlook its structural necessity with "heavy" subjects, privilege dynamic verbs over stative verbs, privilege conciseness over author comment and emphasis, and overlook important differences between existential* there *and anticipatory* it. *Based on an examination of a 135,000-word corpus of scientific discourse, this paper suggests that in technical and scientific writing existential* there *is used to make explicit statements about existence or absence, to signal explicitly the introduction of a new topic, to alter information structure and emphasis, to facilitate nominalization, and to present negative statements positively.*

> Another way to make the subject of the sentence prominent is to reduce the number of grammatical expletives (sometimes called anticipating subjects or constructions): *it is, there is,* and *there are.* In most cases, these constructions serve only as grammatical placeholders and just waste space (Markel and Holmes, 1994, p. 161).

MOST TECHNICAL WRITING TEXTBOOKS CONTINUE to proscribe existential *there,* sometimes under such headings as:

> Avoid *There* Sentence Openers (Lannon, 1994, p. 266)
> Use *There Are* Sparingly (Riordan and Pauley, 1996, p. 85)
> Empty Sentence Openings (Reep, 1994, p. 157)
> Vague Pronouns and Slow Starts (Lay et al., 1995, p. 283)
> Focus on the "Real" Subject (Markel and Holmes, 1994, p. 160)

Yet this proscribed structure appears in respected scientific and technical texts.

For example, in just one paragraph of Stephen Hawking's *A Brief History of Time* (1988), there are four *there*-clauses:

> *Why should* there *be so many more quarks than antiquarks? Why are* there *not equal numbers of each?* It is certainly fortunate for us that the numbers are unequal because, if they had been the same, nearly all the quarks and antiquarks would have annihilated each other in the early universe and left a universe filled with radiation but hardly any matter. There *would then have been no galaxies, stars, or planets on which human life could have developed.* Luckily, grand unified theories may provide an explanation of why the universe should now contain more quarks than antiquarks, even if it started out with equal numbers of each. As we have seen, GUTs allow quarks to change into antielectrons at high energy. They also allow the reverse processes, antiquarks turning into electrons, and electrons and antielectrons turning into antiquarks and quarks. There *was a time in the very early universe when it was so hot that the particle energies would have been high enough for these transformations to take place.* But why should that lead to more quarks than antiquarks? The reason is that the laws of physics are not quite the same for particles and antiparticles (pp. 76–77).

Should technical writing teachers continue to proscribe this structure?

I have chosen to examine this question because existential *there* is mentioned in most technical writing textbooks, albeit briefly. More importantly, however, the fact that even excellent textbooks misrepresent how this structure functions in discourse suggests that a number of misconceptions are being perpetuated. Existential *there* is a complex and important structure in English that has been the subject of at least five book-length linguistic studies (Erdmann, 1976; Milsark, 1979; Breivik, 1983; Hannay, 1985; Lumsden, 1988). But it has received little scholarly attention in the literature concerning technical and scientific writing, except for Pettinari (1983), Huckin (1993), and a seminal article by Huckin and Pesante (1988) which concluded, after examining a 100,000-word corpus by good writers in a variety of genres, that there is little justification for handbooks having a prescriptive rule against the existential *there* (p. 387). While their corpus does include *Bell System Technical Journal,* six pages from *Econometrica,* and one complete article from *Biochemistry,* Huckin and Pesante do not focus specifically on the uses of existential *there* in technical and scientific writing. I want to extend their work by evaluating

the proscriptions in technical writing textbooks, and by suggesting new guidelines for using existential *there* in technical and scientific writing. These new guidelines are based on structures and functions observed in a 135,000-word corpus consisting of four chapters in scientific textbooks and 24 scientific articles (6 from each of the following journals: *The Canadian Journal of Chemical Engineering, Canadian Journal of Civil Engineering, The Canadian Mineralogist, Canadian Journal of Physics*).

I will first define existential-*there* clauses and review their special structural features. Next I will show what the proscriptions in some technical writing textbooks misrepresent or overlook. Then I will analyze existential-*there* clauses in five representative passages to show how they function in discourse. Finally I will suggest new guidelines for the use of existential *there* in technical and scientific discourse.

Definition

There are two main types of *there* in English: adverbial (locative) *there* and existential *there*. These are illustrated in the following example:

(1) There are	many	electrons there.
EXISTENTIAL		ADVERBIAL

Whereas adverbial *there* always receives some stress in speech, existential *there* is always unstressed. Also, adverbial *there* is deictic (it refers to some specific place), whereas existential *there* is non-deictic. That some textbooks can even confuse these two types of *there* is illustrated by Collins (1991), who claims, absolutely incorrectly, that the *there* in "There is an anomaly in the test results" is an adverb and "a substitute for the adverb *in the test results*" (p. 219).

Proscriptions

In addition to the proscription that opens this article, we can consider the following guidelines in recent, highly respected textbooks:

1. "Save words, strengthen your statement, and improve your emphasis by not using *there is* and *there are* to begin your sentences—whenever your intended meaning allows" (Lannon, 1994, p. 266).
2. "These sentences have empty openings because the first words (*There is/ There are/ It is/ It was/ It might be*) offer the reader no information, and the reader must reach

the last half of the sentence to find the subject" (Reep, 1994, p. 157).

3. "To spot sentences that need to have their action moved to the verb, look for the following:
   Sentences that begin with *there are* or *it is* ..." (Anderson, 1995, p. 270).
4. "Writers often give away the power in their sentences by placing a vague pronoun in the place of the main subject or getting their sentences off to a slow start. When you edit, look for sentences that begin with *It, There,* and other pronouns to see if you could begin the sentences more directly and quickly" (Lay et al., 1995, p. 283).

There are five important problems with the above proscriptions:

1. They misrepresent how existential *there* affects information structure.
2. They overlook the fact that many of the existential-*there* clauses are structurally obligatory.
3. They privilege dynamic verbs over stative verbs.
4. They privilege conciseness over author comment and emphasis.
5. They overlook important differences between existential *there* and anticipatory *it*.

1. Information Structure

The proscriptions misrepresent the effect of delaying the notional (or "real") subject on what is called information structure—the distribution of "given" and "new" information in the sentence and the placement of emphasis. Rather than making the notional subject *less* prominent, existential *there* makes it *more* prominent. More than sixty-five years ago, Curme (1931) noted,

> When we desire to call especial attention to the subject, we often withhold it for a time, ... Where the subject is an emphatic noun or important group of words, *there* is much used at or near the beginning

> of the sentence as anticipatory subject, pointing forward to the following real subject, the emphatic noun or important group of words ... (Vol. 3, pp. 9–10).

More recent work on functional sentence perspective and functional grammar has made it a commonplace that the initial position in a sentence should be used for what is "repeated, more familiar to the reader, more psychologically accessible, less psychologically complex, less important," and that one should then "move toward information that is newer, less familiar, less psychologically accessible, and more complex and important" (Williams, 1988, p. 93). As Breivik (1981) says, "From the pragmatic point of view, *there*-sentences ... may be regarded as devices for presenting new information: *there* functions as a point of departure from which the utterance may be developed, by way of the semantically and communicatively weak item *is/are*, to the communicative core—the real subject" (p. 10).

Associated with the noun phrase (NP) in the position of new information is the presentative function of the *there*-clause noted by Huckin and Pesante (1988, p. 378). A presentative structure is "an entity which the speaker by means of the associated predication wishes to explicitly introduce into the world of discourse" (Hannay, 1985, p. 171). Also, Huckin and Pesante specifically point out that a *there*-clause can be used to introduce new information into a text *without* linking it to given information (1988, p. 381). Breivik (1981) suggests that the word *there* in the *there*-clause functions as a signal to the addressee that he must be prepared to direct his attention toward an item of new information (p. 15). This item of new information may become the topic for the next sentence or section of text. (Simply put, the "topic" is what a sentence or section of text is about.)

It is important to note, though, that since *there*-clauses are relatively rare—one in every 1300 words in my corpus and one in every 592 words in the Huckin and Pesante corpus (1988, p. 374), they are certainly not used to introduce every new topic. Rather, the *there*-clause may be used to direct a reader's attention to a new topic that is being emphasized for some reason. Sometimes existential-*there* clauses are used to mark a contrast or shift in topic. Pettinari (1983), in a study of surgical reports, found that *there*-clauses were used to introduce information that is peripheral to the procedure being discussed (p. 65).

2. *Structural Necessity*

The proscriptions overlook the fact that many *there*-clauses are structurally obligatory and therefore cannot be avoided. First, as Huddleston points out, the "bare" or "ontological" *there*-clause, which expresses existence, has no counterpart without *there* (Huddleston, 1984, p. 468):

(2) There are two Vancouvers.

(3) *Two Vancouvers are.

(4) Two Vancouvers exist.

In other words, in order to state the existence of something explicitly, the writer has only two options, the existential *there* or the verb *exist*, as in sentences (2) and (4) above. If *two Vancouvers* were "given" information, and we wanted the emphasis to fall on *exist*, then we would choose (4). However, it is difficult to imagine how this situation would arise, because if we already knew that there are two Vancouvers, why would we want to note that they "exist"? If *two Vancouvers* is "new" information, then we must choose (2). In other words, if the meaning of "existence" is to be conveyed explicitly, then it is difficult to avoid existential *there*. It is important to remember, at the same time, that instead of talking explicitly about existence, we can imply existence simply by introducing an NP into a discourse, as in (5):

(5) The two Vancouvers—one in British Columbia, and one in Washington—often confuse travellers.

Since science is often concerned with what does and what does not exist, as in the excerpt from Hawking quoted at the beginning, we can expect existential-*there* clauses to perform the function of explicitly stating the existence of something somewhat more frequently than in other kinds of discourse.

The second reason why some existential-*there* clauses are obligatory is the principle of end-weight, which states that English does not tolerate a long subject with a short predicate (Quirk et al., 1985, p. 1398). This explains why we have sentence (6) in the corpus instead of sentence (7):

(6) There is, of course, no obvious reason why petrographers should favor the use of triangles and hence only three main variables for classification (Blatt et al., 1980, p. 372).

(7) *[Of course, no obvious reason why petrographers should favor the use of triangles and hence only three main variables for classification] exists.

The existential *there* in sentence (6), then, is used to avoid a long subject and a short predicate.

3. *Action Verbs vs.* **Be** *and Other Statives*

Anderson's (1995) proscription of existential *there* is veiled as a means of moving action to the verb. The explicit or implicit claim that *be* and other stative verbs are undesirable is present in most technical writing textbooks. While it may be appropriate for general composition handbooks to privilege dynamic verbs over statives, it is not necessarily appropriate in guidelines for scientific writing. As Halliday (1993) has pointed out, the structure of scientific knowledge is such that "while the argument has to be dynamic (hence the flow of the text), the edifice that is constructed by it is a static one—or let us say that it embodies a synoptic rather than a dynamic representation of reality" (p. 131). In other words, according to Halliday, even though scientists recognize that the world is dynamic, when they write about it, they try to hold it "still".

4. *Conciseness vs. Author Comment and Emphasis*

Most proscriptions of existential *there* privilege conciseness over author comment and emphasis; and they claim that the structure squanders words. Although the existential *there* does not function as author comment, per se, it is often associated with author comment, as in sentence (8):

(8) There are, however, several interesting features of our results, apparently related to the restricted geometry of our cell, which we will now discuss (Liu and de Bruyn, 1992, p. 692).

Furthermore, the number of words the structure can "squander" is of necessity very small, for like the passive and anticipatory *it*, existential *there* can add only one or two words.

5. *Existential* **There** *and Anticipatory* **It**

All of the proscriptions I have cited make the mistake of grouping existential *there* together with anticipatory *it*. Indeed, both structures do allow

the notional subject to move from the canonical position at the beginning of the sentence (subject-verb-object), but there the structural and functional resemblance ends. As Rodman (1991) points out, the moved notional subject in anticipatory-*it* clauses is either a *that*-clause or an infinitive phrase; in an existential-*there* clause the moved notional subject is a simple noun phrase. Rodman (1991) also notes that anticipatory-*it* clauses tend to function primarily as devices for making author comment. Many of these comments are evidential; they evaluate, they mark speaker response, they mark validity. For example, in (9) the anticipatory-*it* clause (*It is well known* + THAT CLAUSE) allows the authors to make an evidential comment about reliability of a statement (the THAT CLAUSE):

> (9) It is well known that wave boundary layers are thin when compared with the thickness of steady flow boundary layers (Quick et al., p. 204).

These clauses also function to manage discourse by forecasting, by summarizing, or by directing readers to salient points in an argument (pp. 24–25). As we saw above, the main discourse function of existential *there* is to introduce a new discourse topic. (Lay et al (1995) compound the problem of not distinguishing these two structures by also failing to distinguish between anticipatory *it* and referential *it* with a vague antecedent, as in "It's an imperfect system ...." and by calling existential *there* "vague pronoun reference" (p. 284).)

Analysis of Passages

Perhaps the most critical weakness of the proscriptions is that by considering sentences in isolation, they ignore how the sentences function in a discourse. In the next section we will consider how five *there*-sentences in the corpus function in discourse.

Passage 1:

> One result of adsorption is that the particles become charged and thus repel each other because they all have the same charge. The force of repulsion is a function of the size of the charge and the distance of separation. For any given size of charge the repelling force increases as the particles come closer together. This effect does not extend beyond the counterion region since the charge is neutralized by the excess of oppositely charged ions in this region, as shown in Figure 8–5.

> ***There* are also cohesive forces (often called van der Walls' forces) between the particles that tend to attract the particles to each other so that they may form larger aggregates.** This cohesive force is similar to gravity, in that it increases as the mass increases and as the distance of separation decreases. For two charged particles to be able to combine to form a larger particle or aggregate, the cohesive force must be greater than the repelling force owing to like charges as the particles come close together (Berry et al., 1983, p. 127).

Passage 1 illustrates the presentative function of *there*-clauses rather clearly. *Cohesive forces* ... is in the position of new information. The *there are* signals that the NP (*cohesive forces* ...) is being introduced explicitly into the discourse. The parenthetic naming of the forces (*often called van der Waals' forces*) is a second signal that *cohesive forces* is a new item in the discourse, for it would only be appropriate to name them when they are first introduced.

This *there*-clause is the topic sentence of a paragraph that discusses the cohesive forces. (In fact, of the 103 *there*-clauses in my corpus, 28 are first sentences in paragraphs, and 12 are final sentences.) Since the first paragraph in the passage is concerned with forces that repel the particles, the *there*-sentence also signals a shift in topic, and this shift is emphasized by *also*, which Taglicht (1984) calls an "additive focusing adverb" (p. 2). As one might guess from the generally low information density of this passage, it is part of a textbook chapter, not a scientific article.

Passage 2:

> NATURE OF GRAIN-SIZE DISTRIBUTIONS
>
> ***There* are four main reasons for grain-size analysis.** (a) The grain size is a basic descriptive measure of the sediment; therefore some attempt at precision in recording the size is justified. (b) Grain-size distributions may be characteristic ... (Blatt et al., 1980, p. 68).

In passage 2 the *there*-clause again performs a presentative function, this time introducing the NP—*four main reasons for grain-size analysis*—into the discourse. More importantly, though, the cardinal *four* also allows this clause to function as an organization cue or schema, a function Rude (1991) also acknowledges (p. 229).

This clause is again a topic sentence, this time of a paragraph that lists the four reasons. It is also the opening sentence of a textbook section con-

cerned with grain size. (Of the 28 topic sentences in my corpus, 11 (or roughly 40%) are also the opening sentences of sections of discourse that are important enough to be marked with a heading.) Of course, it makes sense for this to be the case because at the beginning of a section there often is no "given" information within the text to begin with.

Passage 3:

> The experimental measurements of the wave velocity field near the boundary necessary to produce onset of sediment motion are presented in Figs. 3a-3c. On these same graphs are plots of non-viscous linear and second-order wave theory predictions calculated from the known wave period, height, and water depth. **Even very close to the sediment bed it can be seen that *there* is reasonably good agreement between measured and calculated velocities, especially with a second-order theory.**
>
> It is well known that wave boundary layers are thin when compared with the thickness of steady flow boundary layers (Quick et al., 1987, p. 204).

In passage 3 the *there*-clause is a subordinate noun clause which in turn is the object within an evidential anticipatory-*it* clause. In other words, *reasonably good agreement* .... is delayed twice, and thus gains twice the emphasis. This time the *there*-clause functions not to introduce a new topic that is developed in subsequent sentences, but to emphasize an NP to which the reader's attention is being directed. Part of the interpretation of results in the Results section of an article, it is in one of the 12 paragraph-final *there*-sentences in my corpus. This passage is very rich in emphatic author comment: *even*, the anticipatory *it* clause, and *especially*.

Passage 3 also shows how *there*-clauses are particularly useful for focussing on nominalizations (nouns that are derived from verbs and adjectives). Many technical writing books advocate using verbs rather than nominalizations, and in this case, they would advise the writer to rephrase the *there*-clause as follows: "... that the measured and calculated velocities agree reasonably well, especially ...." However, as Halliday (1993) has pointed out, in scientific writing nominalizations are very important as means of allowing the scientist to talk about processes as "things." "Where the everyday 'mother tongue' of commonsense knowledge construes reality as a bal-

anced tension between things and processes, the elaborated register of scientific knowledge reconstrues it as an edifice of things" (p. 15). Furthermore, since the verb *agree* is stative, rather than dynamic, the admonition to use the verb in order to focus on the action hardly applies.

Passage 4:

> An important fact to note is that despite the close correspondence of the beta terms for As for the two data-sets, the quantitative statistical tests indicate that the two populations (natural and synthetic) are statistically distinct. ***There* is no a priori reason for As to differ between natural and synthetic tetrahedrite, and in fact, there may be no difference.** Whereas the data for natural As-bearing tetrahedrite are scattered randomly between zero and four atoms of As, the As-tetrahedrite synthesized is found in groups along the As-Sb composition line (Fig. 2). The difference in the distribution of data, randomly dispersed *versus* tightly clustered, is probably what is reflected in the statistical test, which would then mask any other possible differences. This illustrates the principle of *caveat lector*, the need to carefully examine data prior to accepting a numerical result from a "canned" statistical computer-package (Johnson et al., pp. 241–2).

The two *there*-clauses in passage 4, each a main clause, come within the final paragraph of a Discussion section, and the final paragraph of an article. This paragraph is strongly marked with author comment (*an important fact to note*) and the sentence with the *there*-clauses is a very important turning point in the paragraph's argument; it stresses the main conclusion that there may indeed be no difference between the data for natural and synthetic tetrahedrite. The most emphatic point in this sentence is *no difference*. The grammatical parallelism within the sentence and the author comment (*in fact*) also add to the prominence of the sentence.

The important structural characteristic of these *there*-clauses is that in each clause the determiner within the NP is *no*. (In my corpus there were 19 *there*-clauses with this NP structure (18%)). Although it may at first seem somewhat counter-intuitive to speak of existentials that attest to the absence of something, it is important to remember that the absence of something (zero) is very important in science. In other words, negation can have as much significance as a positive assertion. Since I found no cases of syntacti-

cally negative *there*-clauses (*There aren't any* ...) in my corpus, it seems that a syntactically positive clause with *no* as the determiner is favoured over the negative verb phrase.

Passage 5:

> WAVE AND CURRENT INTERACTION
>
> **When considering the interaction of waves and current, there are two distinctly different types of interaction that need to be clearly distinguished.** The first type of interaction concerns the modification of surface waves when they travel from a region of zero current into a region where currents exist. Longuet-Higgis and Steward (1960) have analysed this situation using .... The second type ... (Quick et al., p.197).

Passage 5, the opening sentence of a section within the Introduction of an article, illustrates all three discourse functions. First of all, it has a strong presentative function, for it introduces *two distinctly different types of interaction* to the discourse. Second, the cardinal *two* correlates with its function as an organization cue. Third, the structure is emphatic (if redundant) as a consequence of the *distinctly* and perhaps the entire relative clause *that need to be clearly distinguished.*

Guidelines

Should existential *there* be proscribed in technical and scientific writing? The evidence presented here shows clearly that it should not be proscribed universally, but that the appropriateness of its use should be determined by syntactic, semantic, and pragmatic factors. Syntactic factors to consider include whether or not the principle of end weight applies, whether or not it might be desirable to nominalize a particular verb, whether or not it might be desirable to phrase a negative statement "positively," and whether or not it is preferable to use the verb "exist." The important semantic factor is whether or not it is necessary to make an explicit statement of existence. And the most important pragmatic factor is whether or not the introduction of a new topic or a shift in topic should be signalled explicitly. Additional, related factors are the introduction of organization cues and the placement of emphasis within the sentence.

Rather than proscribing the structure, we should suggest that existential *there* be used to achieve the following:

1. to make an explicit statement about the existence or absence (with *no*) of a noun, whether that noun refers to a "thing" or to an abstraction, usually framed as a nominalization.
2. to signal explicitly the introduction of a new topic. Often such a signal is useful for marking important shifts in topic or argument. If the determiner in the NP is a cardinal, the clause can be used to provide an organization cue or a schema for subsequent text.
3. to alter information structure and emphasis within a sentence so as to improve the cohesion of a text.
4. to allow verbs to be nominalized without having to provide an additional verb as a predicate for the nominalization.
5. to allow negative statements to be presented "positively" (without using a negative verb phrase).

Generally in our discussions of style, we should be less absolute about the condemnation of an extra word or two in a sentence and less adamant that "action" verbs are better than *be* or other statives. And we should certainly stop perpetuating the error that it is the grammatical "subject" that is the most important part of the sentence.

References

Anderson, P. V. (1995). *Technical writing: A reader-centred approach.* 3rd ed. Fort Worth, TX: Harcourt Brace.

Berry, L. G., Mason, B. & Dietrich, R.V. (1983). The physical properties of minerals. In L. G. Berry, B. Mason, and R. V. Dietrich (Eds.), *Mineralogy: Concepts descriptions determinations,* (pp. 136–163). 2nd ed. New York: W. H. Freeman.

Blatt, H., Middleton, G., & Murray, R. (1980). Classification of sandstones. In H. Blatt, G. Middleton, and R. Murray, (Eds.),*Origin of sedimentary rocks.* (pp. 369–379). 2nd ed. New York: Prentice-Hall.

_____. (1980). Sedimentary textures. In H. Blatt, G. Middleton, and R. Murray, *(Eds.), Origin of sedimentary rocks* (pp. 43–89). 2nd ed. New York: Prentice-Hall.

Breivik, L. E. (1981). On the interpretation of existential *there. Language, 57,* 1–25.

_____. (1983). *Existential there: A synchronic and diachronic study.* (Studia Anglistica Norvegica 2). Bergen: University of Bergen.

Collins, E. C. (1991). *The basics of technical writing and speaking.* Scarborough, ON: Prentice-Hall Canada.

Curme, G. O. (1931). *Syntax.* Vol.3 Boston: D.C. Heath.

Erdmann, P. (1976). *THERE sentences in English: A relational study based on a corpus of written texts.* Munich: Tuduv.

Halliday, M. A. K. (1993). General orientation. In M.A.K. Halliday and J. R. Martin (Eds.), *Writing science: Literacy and discursive power* (pp. 2–21). Pittsburgh, PA: University of Pittsburgh.

_____. (1993). The analysis of scientific texts in English and Chinese. In M. A. K. Halliday and J. R. Martin (Eds.), *Writing science: Literacy and discursive power* (pp. 124–132). Pittsburgh, PA: University of Pittsburgh.

Hannay, M. (1985). *English existentials in functional grammar.* Dordrecht: Foris.

Hawking, S. W. (1988). *A brief history of time: From the big bang to black holes.* New York: Bantam.

Huckin, T. N. (1993). Stylistic prescriptivism vs. expert practice. *Technostyle, 11(2),* 1–17.

Huckin, T. N., & Pesante, L. H. (1988). Existential There. *Written Communication, 5,* 368–391.

Huddleston, R. (1984). *Introduction to the grammar of English.* Cambridge: Cambridge University Press.

Johnson, N. E., Craig, J.R., & Rimstidt, J.D. (1987). Effect of substitutions on the cell dimension of tetrahedrite. *The Canadian Mineralogist, 25,* 237–244.

Lannon, J. M. (1994). *Technical writing.* 6th Ed. New York: Harper Collins.

Lay, M. M., Wahlstrom, B. J., et al. (1995). *Technical communication.* Chicago: Irwin.

Liu, M., & de Bruyn, J. R. (1992). Travelling-wave convection in a narrow rectangular cell. *Canadian Journal of Physics, 70,* 689–695.

Lumsden, M. (1988). *Existential sentences: Their structure and meaning.* London: Croom Helm.

Markel, M. & Holmes, H. (1994). *Technical writing: Situations and strategies.* Scarborough, ON: Nelson Canada.

Milsark, G. L. (1979). *Existential sentences in English.* New York: Garland.

Pettinari, C. (1983). The function of a grammatical alternation in fourteen surgical reports. *Applied Linguistics, 4,* 55–75.

Quick, M. C., Kingston, K., & Lei, S. (1987). Onset of sediment motion under waves and currents. *Canadian Journal of Civil Engineering, 14,* 196–206.

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English language.* London: Longman.

Reep, D. C. (1994). *Technical writing: Principles, strategies, and readings.* 2nd ed. Boston: Allyn and Bacon.

Riordan, D. G., & Pauley, S. E. (1996). *Technical report writing today.* 6th ed. Boston: Houghton Mifflin.

Rodman, L. (1991). Anticipatory *It* in scientific discourse. *Journal of Technical Writing and Communication, 21,* 17–27.

Rude, C. D. (1991). *Technical editing.* Belmont, CA: Wadsworth.

Saxena, S. C., N. S. Rao, & Saxena, A. C. (1992). Heat transfer and gas holdup studies in a bubble column: Air-water-sand system. *The Canadian Journal of Chemical Engineering, 70,* 33–41.

Taglicht, J. (1984). *Message and emphasis: On focus and scope in English.* London: Longman.

Williams, J. M. (1988). How can functional sentence perspective help technical writers compose readable documents? In L. Beene and P. White (Eds.), *Solving problems in technical writing* (pp. 91–107). New York: Oxford.