

The Research and Training Center on Independent Living
at the University of Kansas

How-To Guide:
Condensing and
Translating
“Researchese”
for the
General
Public



by
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The niftiest turn of phrase, the most elegant flight of rhetorical fancy, isn't worth beans next to a clear thought clearly expressed. Jeff Greenfield



Genius is the ability to reduce the complicated to the simple.

C. W. Ceram



Simple style is like white light. It is complex, but its complexity is not obvious. Anatole France.



When an idea is too weak to support a simple statement, it is a sign that it should be rejected.

Vauvenargues



Simplicity is the glory of expression. Walt Whitman

Introduction

Communicating in the easiest way possible makes sense. Yet, much of today's scientific writing is hard to understand. That is because researchers painstakingly record their rationale and the methods they used to arrive at their findings, then follow formal rules of presentation to communicate through journals, reports, or conferences.

The popular media publishes these findings in a much abbreviated form. Journalists cut to the quick of scientific studies—the results—and often sum up a whole study in a few paragraphs liberally sprinkled with quotations. Newspapers often run these abbreviated stories on the front page or clump several together on inside pages in a research “round-up.” An idea of the difference between scientists who write and journalists who write about science can be found in this offering by Meredith Small, a scientist and a journalist:

“Clearly, writing for the popular audience is different from writing for academic journals: Each has its own particular formula. A scientific journal piece is written after months or years of collecting data; the writing is the frosting on a cake that took forever to bake. The writing is dry and free of analogies, and it concentrates on methodology and results. More important, the subject is narrowly focused, any veering off from it is considered ‘interpretation’ and tolerated only in the last paragraph of the discussion. All statements must be backed up by references for older articles, as if in a court of law, and new information is sectioned off as ‘results.’

“. . . .The difference between academic writing and journalism is not just in the language. It is more in the approach—narrow versus broad, information versus education and entertainment, details versus major points. A scientist aims to tell the already informed audience about a particular point, and how he or she came to that point. They want to convince by using evidence, and it doesn't matter how long it takes or how many charts must be used to make a case. A journalist wants to explain, educate, and basically not bore the pants off the reader.”

From Abstracts and Beyond

A science abstractor leans more toward the journalism camp, but skips the need to entertain. However, space is an issue for both journalists and abstractors. There isn't much room in which to work, so information has to be winnowed.

The abstract that precedes a journal article follows a set format. It usually contains about 150 words with the first sentence stating the research purpose. The second sentence describes study participants; the third, what the participants did in the study; and the fourth identifies measures used. Following sentences summarize findings and implications.

Scientific publications and web sites have taken a cue from the popular media, and many offer short descriptions of studies on a page or two (e.g., "Brief Rapid Communications," "Clinical Update," "Of Special Interest," "Research Briefs"). Some go a step further with their jazzy titles: The Mayo Clinic terms its research offerings "Oasis," with titles such as "Pulling Your Hair Out: Literally," while another medical journal calls its offerings "Pearls."

At no time does the journal abstract try to "sell" the study, nor give a rationale for why it was done. Lynn Fuchs and Douglas Fuchs, in *Writing Research Reports for Publication*, offers the following as a generic example of abstract writing for journals:

The purpose of the study. . .The participants were. . . ., who were assigned randomly to the following treatments,, which lasted for X weeks. During the study, participants. . . .(describes what they did). Before and during implementation of the treatment, participants were measured with. . . .Analyses of variance indicated. . . Results are discussed in terms of. . .

Writing research summaries for the general public also follows the journalistic admonition to "cut to the quick," but uses an expanded set of guidelines. Before presenting these guidelines, let's distinguish between summary styles and examine the components of the scientific journal article.

Show, not Tell, Summaries

Distilling the essence is the goal of any summary. With practice, you should easily summarize research in one page. . .one paragraph. . .and, yes, in one sentence. (That's a headline, and the more attractive your headline, the more readers you will entice.) By summarizing, you efficiently inform readers of the most relevant facts.

Which Version Do You Want to Read?

USA TODAY SHORT VERSION

Congress doesn't cover the uninsured

The number of Americans without health insurance is 44 million and growing. Most of them have jobs. They just can't afford the insurance premiums.

Surprisingly, the plight of the uninsured has worsened even as the nation enjoys its longest economic expansion in history. But President Clinton, who often boasts about the state of the economy, does not talk much about the rising numbers of uninsured.

For that matter, neither the Republican nor the Democratic candidate hoping to succeed Clinton has highlighted the problem or talked about a big fix. Instead, Republican George W. Bush and Democrat Al Gore are focusing on piecemeal approaches.

USA TODAY SHORT VERSION

Prosperity doesn't cover the uninsured

All Carletta Brown needs to ease her mind is a simple medical procedure: the removal and biopsy of a suspicious mole her doctor recently noticed on her back.

But the \$100 or so it would cost is more than the Lake View, Iowa, nurse can afford right now. Although the hospital where she works offers a health plan to its employees, Brown earns less than \$10 an hour, and she says she can't spare \$150 a month out of her paycheck to sign up. So she's just praying that she'll stay healthy.

Brown, 49, has plenty of company. The number of Americans without health insurance is 44 million and growing. Most of them, like Brown, have jobs. They just can't afford the insurance premiums.

"The people hardest-hit by this phenomenon are working families," says Ron Pollack of Families USA, a consumer advocacy group based in Washington. "This is not a story about - whatever the stereotype is - some poor slob who doesn't want to work."

Surprisingly, the plight of the uninsured has worsened even as the nation enjoys its longest economic expansion in history. But President Clinton, who often boasts about the state of the economy, does

not talk much about the rising numbers of uninsured, although he had vowed during his 1992 campaign to solve the problem by establishing universal health care.

For that matter, neither the Republican nor the Democratic candidate hoping to succeed Clinton highlights the problem or talks about a big fix. Instead, Republican George W. Bush and Democrat Al Gore are focusing on piecemeal approaches. Examples:

- Giving seniors prescription-drug coverage under Medicare.
- Covering more children under a 1997 program financed jointly by the federal and state governments.
- Offering tax credits for families that buy private health insurance.

To many health care advocates, Bush's and Gore's proposals fall far short of helping the one in six Americans lacking coverage.

In 1992, then-president George Bush proposed a \$100 billion, five-year plan to control costs and shrink the numbers of uninsured. The plan was condemned by liberals and conservatives alike as timid, and it went nowhere.

Today, the candidates are proposing to spend much less: Gore would spend \$120 billion and Bush \$132 billion, both over 10 years instead of five.

"We haven't even seen proposals as bold and far-reaching as President Bush's," says Dallas Salisbury, president of the Employee Benefit Research Institute, a non-partisan organization that focuses on issues such as education and health care.

Cautious approaches

Experts cite several reasons Bush and Gore are moving cautiously:

- The collapse of Clinton's costly and controversial 1994 health care plan, a massive overhaul that sought to expand coverage by imposing new regulations and mandates. Some estimates said the plan would cost as much as \$50 billion a year, and Republicans and the health care industry helped turn the public against the plan by successfully portraying it as an intrusive, big-government solution.

The issue was so powerful, it helped Republicans capture control of Congress in the 1994 elections.

- The issue has less resonance among insured workers in today's strong job market. Eight years ago, workers with insurance were far more anxious than they are today about losing their jobs and health coverage because of layoffs.
- Although health care premiums are showing double-digit increases in some areas of the country, studies show that employers are covering most of the increases so they don't lose workers. As a result, employees are less likely to worry about having to drop out of their insurance plans because of steep increases in premiums.

Robert Helms, director of health policy at the conservative American Enterprise Institute, says polls may show that most Americans support the idea of universal coverage, but in reality, people don't want to pay more in taxes or insurance premiums to make sure everyone has coverage.

The percentage of people without insurance has continued to climb during these good times, experts say, because rising insurance premiums discourage some cost-conscious companies from offering employer-sponsored plans. Another reason: Many families moving from welfare to work under the 1996 welfare reform act are losing coverage under Medicaid, the federal health program for the poor.

Even so, the problem "has lost credibility with a lot of voters because people look at the uninsured and say, 'People do this (forgo coverage) by choice,'" Helms says.

That's true for Brown. The divorced mother of three grown children is trying to build a better life. Most of the elements are in place. She has a job working 30-35 hours a week. She meets her mortgage and car payments and pays her utility bills. And she recently scraped together enough cash to buy badly needed tires for her 1991 Ford Tempo and \$235 worth of books for the classes she's taking to get an advanced nursing degree.

The article continues onto to another page this same size. . . and another page after that.

It's a good article with lots of facts, but how much time do you have to read all of this?

How much can you remember once you've finished?

Two types of summary styles dominate the scientific field: The descriptive and informative. Descriptive summaries tell what information will be found in the document. They are a general overview, a table of contents, a preview of what the reader will find.

Descriptive Summary Example:

This study performed by the Rehabilitation Research and Training Center on Blindness and Low Vision describes the differences in the proportions of rehabilitation professionals and recipients of blindness rehabilitation. It also reveals possible reasons and opinions given by the participants of this study as to why this career is not chosen by African-Americans. This study explores the amount of exposure to and the effects of both publicity and recruiting of blindness career opportunities.

The above example tells readers what is in the report. The informative summary sums up significant points and stands alone. All unusual terms are defined. Instead of telling, informative summaries—the type we will be focusing on from now on—"show:"

Informative Summary Example:

Answers from the 622 students in the social science college tract revealed they were not interested in working with people with blindness. Out of the 68-72% students who were interested in working with people with disabilities, only 11% said they would consider working specifically with people who are blind. Only 3% of the all the students who were questioned knew “quite a bit” about the blindness rehabilitation profession. These numbers reveal that students lacked information regarding professions in blindness rehabilitation. Students also revealed in the study that there was a lack of education, qualification, incentive, and opportunities in this field.

Informative writing explains something. It does not try to persuade nor evoke feelings. Neither does it relate the original source in the same sequence. The informative summary highlights select journal article information. Journal articles, as stated earlier, follow a standard format. They contain the following parts:

- Title
- Abstract that gives a brief summary of the article
- Introduction that tells what is known about the subject
- Methods section that tells how the study was done
- Results and discussion
- Conclusion section in which the author puts his or her interpretation of the study
- References, which list all the sources referred to in the study.

Introductions explain how the research fits in with other past and present research. They also tell why the research was done and what questions the researcher hoped to answer. Following the introduction is the method section. Here, researchers try to give enough information so that other researchers can repeat the study. (Ideally, other researchers would get similar results, which validates the original researchers.) In the methodology, study participants are described; measures (e.g., surveys), procedures, and design and data analysis.

The guts of the research are in the title (well, usually), the abstract (often too skeletal), and the discussion/conclusion. The discussion section contains (a) how the results relate to the study purpose and other studies; (b) how the results add to the field; (c) why the results turned out as they did; (d) the study’s

limitations; and (e) the study's implications for practice and future research. Sometimes this section stands alone or is part of the conclusion.

Starting the Summary

Science writing doesn't follow a recipe, because all studies differ. But certain guidelines can help you take the most amount of information and present it in the least amount of reading time.

Here's a hint: When reading a journal article, begin with the front, focus on the back, and then take a look at the in-between. You'll get a good idea of what the contents are and what the authors think is important.

You will find that 500-700 words can hit the highlights of most journal articles and reports. The trick is to get the best 500 words that provide an accurate, quickly understandable, and informative summary. To start, follow the time-honored newspaper formula: The inverted pyramid formula. That's where a newspaper, which has more news than space, trims by putting the most important facts first, lesser facts in the middle, and the least important at the end. Now, what are the most important facts?

Answering "So What?"

Audience members prioritize information on how the information relates to their own life. The question running through their heads is "So what?" or "How will this affect my life?" They especially want to know whether the information will benefit them. As advertisers know, the benefit—the "what's in it for me"—is the first interest of any consumer. If you can't convince the audience that the message is important to them. . . not you. . . them, then audience members will tune you out.

How do you stress importance? Maybe it is "This finding will save you, the taxpayer, ___ million dollars." Or "This is one step closer to. . ." Or, "By figuring out the problem, we can now figure out a solution." Make the audience feel the study is important, so they will listen to what you have to say.

That doesn't mean you have to spin the story so it is "splashy" or a major breakthrough. Overemphasizing is risky and indeed harmful, especially when applied to new treatments that can raise false hopes and expectations. When hopes are dashed, the public becomes cynical and loses faith in future scientific announcements. "Miracle cure" breakthroughs can also backfire on organizations depending on public support. Donations to AIDS organizations, for instance, decline significantly when AIDS treatments were overstated causing the public to think that a "cure" had been found.

Scientists themselves have been prone to exaggerate the importance of their findings in attempts to secure research grants, satisfy university publication requirements, or win congressional approval when budgets are being approved. Egos also can cause scientists to be self-serving and ballyhoo their research. So, while it is true that "cure" and "breakthrough" are often-used tickets to a page one story, and "on the threshold of" and "one step closer to solving" to a lesser extent, practice caution in reporting. Use necessary qualifiers and let readers know the study is limited and further studies are needed.

Standing on the Shoulders of Giants

Scientific studies, for the most part, are more interesting to other scientists than the general public. Said Joe Palca, National Association of Science Writers president and science reporter for National Public Radio, "We could probably ignore 99 percent of the science news in a given year because its intrinsic value won't be known for many years or may not be that great."

One of the toughest studies to report is one that produced no results or failed. In these situations, a writer can cite the importance of other studies that succeeded because of their failure (e.g., the failure of Michelson and Morley a century ago to detect the earth's' passage through a hypothetical ether that, in fact, gave support to the relativity theory). Another reporting tactic is to remind readers of the scientific process itself.

The scientific process has a hard time fitting into today's news packaged world, and, if you think about it, putting a discovery in context is at direct odds

with summarizing a piece as succinctly as possible. A new insight typically builds on an insight from a few years ago, which itself stemmed from an earlier insight and so forth. Isaac Newton, who set the stage for modern physics and mathematics, said that he could never have seen so far if he hadn't been able to stand on the shoulders of giants—those scientists before him.

The public often has to be reminded that a research study is often a single point in a continuum (that's why most research studies conclude with the advice that more research is needed no matter what the subject is), one piece of a complex jigsaw puzzle. Wrote David Shaw:

Science is both a methodical and a somewhat messy process, a gradual exploration of the unknown that moves slowly, with each study building on the one before it—brick by brick by brick. Most discoveries are partial improvements, steps forward (or backward), subtle gradations and even contradictions. There's seldom a true end point in science. Almost invariably, the breakthrough that's published today is the final stage in a series of studies that began years, perhaps decades ago, and it, too, may still be subject to revision by future studies. Genuine breakthroughs, giant leaps forward—penicillin, for example, or the Salk polio vaccine—are rare.

Yet to make a science story good, you have to not only report the news but the context to do it right. So put your information in context in terms of scientific discovery itself if necessary, and in relation to similar studies and history if you can do so without leading readers too far off the track.

Example:

The results of this study show that the number of centers for independent living (CILs) that intervene for consumers with health care complaints is increasing. Intervention ranges from information and referral to education of both consumers and health care providers to individual and systems advocacy. However, the number of centers that actually provide health care services is still relatively small.

The last sentence adds the context and perspective that this story needs for accuracy.

Give 'Em the Box Scores, Not the Play-by-Play Action

Get to the point: The results. Don't make results follow methodology or end the article as journals do. In fact, description of the research process should come last. Newspaper wire reports about science discoveries give a sentence tops to most methodologies, if that. Here's how a general magazine described a science study in a few words:

Example:

Sleep Loss May Make You Age Faster

Researchers at the University of Chicago measured the metabolism and hormone function of 11 volunteers after they'd slept just four hours a night for nearly a week. At the end of the week, the volunteers weren't just tired—they showed changes in important functions similar to those brought on by the normal aging process. After a few nights of longer sleep, everything was back to normal.

One more time: What's important? The results! Tell your audience in the first sentence or paragraph what the researchers discovered.

Examples of Opening Sentences That Report Results:

The findings, echoing other recent studies, are based on _____ . . .

Dr. _____ and his team at _____ compared

A study of _____ suggests that

A team of researchers at _____

While _____, a study published in _____, states that

Based on their findings, the researchers suggested _____

A study released _____, suggested that

_____, suggested a study out _____

_____, scientists reported at the _____ conference.

In a _____ study, researchers looked at _____

_____, said a report in _____

_____, a study said, but _____

A report in _____ confirmed _____

According to research in _____, _____

The work identified _____

The nationwide study conducted by _____, found that

By _____, scientists estimated _____ -

Verb Examples Used With Result Reporting

Introduced, Explored, Pinpointed, Provided, Produced, Reported, Reversed, Wrote, Expanded, Enhanced, Modified, Showed that, Proposed, Focused on, Discovered, Found, Uncovered, Determined, Disclosed, Revealed, Noted, Re-examined, Looked at again, Confirmed, Established, Concluded, Deemed, Tentatively suggested, Speculated, Reasoned, Decided, Hinted, Spotted

Often, a study has several findings. The researchers may have set out to answer a few related questions or even tested one theory that produced many results. The findings may not easily wrap up in a concise, opening sentence. So, let the audience know in the introductory statement what you are going to tell them:

Example:

Three results stand out from this study. The first showed that on days when pain or fatigue increased from morning to evening, women with fibromyalgia thought pain or fatigue reduced their progress toward a goal. Secondly, poor sleep the night before tended to diminish daily progress toward health goals, but not social goals. Finally, the more the women with this condition made progress with their social relationships, the more they had a positive mood all day long, regardless of that day's pain or fatigue.

If identifying several findings or listing elements in a series, you may want to use bullets.

Example:

- On days when pain or fatigue increased from morning to evening, women with fibromyalgia thought pain or fatigue reduced their progress toward a goal
- Poor sleep the night before tended to diminish daily progress toward health goals, but not social goals
- The more the women with this condition made progress with their social relationships, the more they had a positive mood all day long, regardless of that day's pain or fatigue.

In some research, more than one group of participants may have been studied, and each group generated many findings. This situation makes

information delivery more complicated and is best done with a minimum of words:

Example:

Administrators recommended more training for teachers, use of best practices, and better utilization of existing resources. **Families** suggested positive support strategies, collaboration, committed people, friendship building, research/training, and nontraditional strategies. **Friends** believed relationships and information about the individual lessened behavioral challenges. **Teachers** recommended increased administration support, collaboration, improved pre- and in-service training (for instance, positive behavioral support and peer mentoring). **Researchers** desired increased training in behavioral technology for practitioners. Individuals with challenging behavior wanted improved quality of life, individualized outside support, and environmental adaptations.

Often, the implications of the study are that even more research is needed.

Example:

Results did, however, suggest a number of research possibilities. Among these would be a study of attitudes toward information or a look at groups (for instance, fathers, other cultural groups) under-represented in the study.

After answering the “what,” follow through with the journalistic basics: “Who was involved, when did it happen and what were the results, where did it happen, why did it happen, and how did it happen.”

About the “how,” downplay research methodology, because most people selectively tune out information that isn’t readily useful. Keep in mind what interests the audience, not what you think should interest them. When writing about research participants, stick with the basics, age, gender, and other relevant terms. Try to include at least three or four descriptors.

Example:

From the list of callers to the toll-free Family Connection number, 150 parents were contacted; 108 returned signed consent forms agreeing to be in the study. Of that number, 79% completed and returned the survey. Participants ranged in age from 30 to 49 with most having incomes between \$25,000-\$75,000. The majority of participants were mothers (85.7%) and had children ages 3-11 (65.4%). They reported that their children had autism (60.5%), followed by mental retardation (31.4%), learning disability (18.6%), emotional disability (12.8%), physical disability (10.5%), and other (36%).

Another scientific standard to leave behind: Citations (references to previously published works). Authors in the general media don't use them. They assume authority. If they do refer to a source, it is "Dr. Bob Brown, Boston University, said" or "according to a member of the city council." Throw in some "he said" or "she said's." That makes the writing fresh. But leave the have-to-cite obligation behind. Ditto for footnotes.

Continuing on the list of "do's and don'ts" is don't include information that does not appear in the journal article. Report article information rather than evaluate the information. If you are in doubt about anything, leave it out; write only what you understand. If the article contains relevant information from other studies, use it. But keep in mind the focus is on the study in the publication being summarized. One more thing about related research: When citing other studies, don't feel obligated to cite authors or give specific details from the other studies mentioned.

Example:

Results of one 1982 study suggested that having physical comforts increased patients' sense of security and self-identity. A 1987 study found that fewer windows affected hospital patients negatively. Appearance also matters. At one psychiatric program, units redesigned to add color graphics and furniture led to a reduction of inappropriate behavior by patients. Other studies have shown that programs with more social-recreation aids give patients fewer opportunities to withdraw socially.

Regarding the question of what information should you omit or include, the answer to that is another question: Who's your audience? Put yourself in your audiences' shoes to figure out what is most important. Or ask your audience. Each audience has something different that it thinks is the most important from a study. A service provider, a person with a disability, a policy maker—each has information they want to know. Excessive detail and explanation, too, can be confusing. Readers get lost in the verbiage. Omitting information can be frustrating for the original author. But it is a lose-the-battle-to-win-the-war situation.

Communicate Directly to Your Audience—Not Above, Nor Below

Readers should be comfortable with your publication and not feel as if they are outsiders. Don't assume the reader understands nothing. . .or everything. Talk to your Aunt Nancy in Centerville, Iowa. That is whom I talk with. She is not going to let me get away with a bunch of puffy phrases or undigested information.

Just imagining that I am talking with her shows me how well I understand what I am trying to communicate and also causes me to translate automatically. That's basically what you do when you write about science: Translate. Researchers have spent years learning "Researcherese" and have treasure words and phrases. If I start communicating that way, I imagine Aunt Nancy's reaction. Researchers who can't switch to everyday vocabulary create a "I am one of the insiders and you are an outsider" situation. When you exclude your audience, you lose your audience. Walter Cronkite imagined he talked to his mother each night when he did the 6 p.m. newscast. It kept him at the top of network news for decades.

Good writing mimics the spoken word, but does not duplicate it. An analogy might be that good writing hums speech, but does not sing the words. To mimic, use everyday words as stated earlier, vary sentence length and sentence construction (that's what people do when they talk). About the latter, people don't

say all their sentences with a subject followed by a predicate followed by an object (e.g., The researchers gave a survey. The participants filled out the survey. Then, the researchers studied the survey results.”) Actually, write better than normal speech, which has repetitions, pauses, and too many connectives—all taken out during the editing phase described next.

Revise, Revise, Revise

Translation makes complicated thoughts easier to understand. Once information has been made more comprehensible, it needs to be polished and refined through revision. About polishing, Mark Twain wrote: “The difference between the right word and the almost right word is the difference between lightning and the lightning bug.” For example, two words used regularly in conversation are “it” and “they.” The meaning of these words is understood in reference to preceding information. However, when writing about science, try to avoid the indefinite use of “it” and “they” unless they clearly refer to a specific word or phrase.

To avoid: *Psychology Today* commonly runs articles on unhealthy relationships. It also spotlights depression disorders,

Instead, either combine sentences (*Psychology Today* commonly runs articles on unhealthy relationships and depression disorders) or clarify “it” (*Psychology Today* commonly runs articles on unhealthy relationships. The magazine also spotlights depression disorders).

Sometimes “it” is used as padding in scientific writing (“It is known that this group tends to be more economically disadvantaged and requires different services”). Either eliminate “it is known that” and assume authority or be more precise (“Six research studies have found that this group tends to be more economically disadvantaged and requires different services”).

“It” and “they” are not taboo words. Rather both are better avoided when writing clearly. However, either one may be used in cases of substitution (i.e., a long phrase) or to reduce repetition. Science is based on precise measures;

science writing also requires precision. A “sizable” reduction in parking space violation takes on new meaning if the reduction is 10%, 40%, or 95%.

In science writing, choose words with care. The following are examples of words or phrases you may want to use in your writing:

Illustration:

To demonstrate
Specifically
For instance
As an illustration
e.g. (for example)
For example

Clarification:

That is to say
In other words
To explain
i.e., (that is)
To clarify
To put another way

Cause:

Because
On account of
Since
For that reason

Qualification:

Almost
Perhaps
Never
Nearly
Maybe
Always
Probably
Although
Frequently

Comparison:

Similarly
Likewise
In the same way

Contrast:

Yet
At the same time
But
However
Though
Otherwise
On the contrary
In contrast

Fine tuning applies to sentences and paragraphs, too, where the general rule, similar to words, is: Shorter is better. If possible, limit each sentence to one idea, because even highly educated people find it's easier to decipher complex material presented clearly. Unlike a mystery story, the reason for your communication should be bold and clear in each sentence.

Which sentence is easier to read?

1. Many institutions of higher education recognize the need for youth at the threshold of maturity to confront the choice of life's endeavor and thus require students to select a field of concentration.
2. Many colleges and universities force students to make decisions about their careers by requiring them to select a major.

They both say the same thing except the first author did not choose exact, economic words. Also, sentences more than 25 words overwhelm short-term memory. Why? It's the sentence complexity, not length that confuses readers.

The shorter-is-better advice applies to each paragraph. In most writing, lengthy paragraphs indicate a lack of focus. Measure paragraphs by number of text lines, not sentences. Here is an example:

Fifty southeast Kansas women ages 38 to 45 periodically kept five-day diaries of everything they ate. The researchers tracked their hormonal levels and bone density changes. Doctors recommend 400 to 800 units of vitamin D a day. The women averaged 341. Thirteen got less than 100 units.

Coming up with simpler words is often the hardest task for those trained in a particular science. To include, not exclude, keep your audience's vocabulary in mind as you write. A scholarly document, for example, uses the technical language of its particular field to reach a strictly-defined audience and abounds with formal, multi-syllabic words. Jargon is the term used for the special vocabulary of any discipline or profession. Jargon also describes inflated language that camouflages simple ideas in unnecessarily complicated ways.

A news article, on the other hand, aims for as wide an audience as possible and avoids technical terms except when needed. Instead of using arcane acronyms and technical words, substitute common words, such as do (*implement*), bring about (*facilitate*), price (*cost impact considerations*), or 100% mortality response (*dead*). If it is necessary to use a certain technical word for precision of meaning, do so. Give a concise, working definition for an unfamiliar term as soon as you use it.

Also, refrain from using foreign phrases and words built on Latin and Greek prefixes, suffixes, and roots. Shorter, more common words are easier to understand. That is, unless the word is an abbreviation, which doesn't make sense to readers unless it was carefully defined earlier. Even so, an abbreviation is hard to process. However, if using a lengthy term repeatedly (e.g., Home and Community Based Waivers/HCB Waivers; Americans With Disabilities Act/ADA), abbreviations may be necessary.

As one advertising copywriter said, “Great writing is always deceptively and disarmingly simple. It has the common touch without being patronizing.” If you write too simply, text will sound patronizing.

Use Word-Processing Software to Increase Readability

The “Tool” section of most word processing programs contains a grammar check program. Not only does it highlight possible grammatical problems, the program also measures readability.

Using a calculation that factors the size of syllables, words, sentences, and paragraphs, this program produces a readability index. If the end number is more than 13, you are sure to lose reader interest.

Don’t rely too much on these formulas and index numbers. Scoring does not take into account such factors as numerals (which read as shorter words); titles (each one can add many words to a sentence); or necessary technical words (sometimes there is no way around words such as *empowerment* or web site addresses—both of which then raise the syllable count.)

As Dr. Rudolph Flesch, the inventor of a readability test once said, “Readability doesn’t mean blindly following a formula. It means trying to write so that the average reader will read, understand, and remember.”

Verb Power

Grammar use in summaries is the same for all expository writing. However, many of those rules you learned in high school often are forgotten during science writing. To review, about verbs, don’t make phrases out of verbs. Write “contact,” not “make contact with.” And don’t use nouns as verbs.

Most importantly, use the active verb voice. Scientific journals typically employ the passive verb voice for an impersonal description of processes. (When the subject is acted upon, the verb is passive, e.g., *The report was written by the researcher.*) General audience publications instead use the active verb voice for a strong, direct style. (If the subject performs the action, the verb is in the active

voice, e.g., *The researcher wrote the report.*) This is because the active voice is less evasive than passive and engages readers quicker.

Original: There were several reasons for the government’s entrance into the health insurance field.

Revision: The government entered the health insurance field for several reasons.

(“It is” and “there are” are the sign of a writer who doesn’t edit his or her own work. They are weak, stretcher phrases.)

One thing they didn’t teach in high school that applies to the science field, use the past tense when describing how the research was done and the present tense for results and conclusions that continue to apply.

Untangle Convolved Writing

Avoid tedious grammatical constructions. The number one offender is padded prepositional phrases. Carefully examine the phrases on the left and the simpler replacements on the right:

at this point in time:	now
at that point in time	then
in light of the fact that	because
in the event that	if
in the vicinity of	near
the question as to whether	whether

See the words that don’t need to be there? Other offenders are multiple negatives (e.g., *not uncooperative*) and long strings of nouns.

Using Quotations

Quotation marks have two main purposes. The first is to emphasize a certain word or phrase, express irony: Women are treated just as “fairly” as men

in the biomedical field, or introduce an unfamiliar word (“Independent living” is..)
In abstracts, the only probable use will be for word introduction purposes.

The second typical use is to introduce and end the use of another’s words. Before you decided to use a quotation, ask yourself whether it can be paraphrased better. Often, paraphrasing eliminates unnecessary words and distracting information. If you think you can’t say it better, think again. You probably can.

The best reason to use quotations is if the words particularly enlighten the subject matter or are said in a style different from the rest of your writing. Direct quotations must follow the working, spelling, and punctuation of the original sources even if the source is incorrect. In writing research summaries, often no source or attribution is needed because the reader will assume it is from the article.

If attribution is necessary (for instance, a person is quoted) then the attribution verbs “said” is preferred over all others, because it carries no editorializing. Compare “said” with “reveals” or “admitted.” The quoted matter speaks for itself and should not need editorializing. “Explained” or “noted” are okay substitutes; “added” should only be is used for an afterthought.

A short quotation is less than 40 words and is incorporated into the text with double quotation marks before and after. Longer quotes should be displayed in a block of typewritten lines without quote marks. Start the block quotation on a new line and indent it five spaces from the left margin.

If omitting information, use three ellipsis points (. . .) within the sentence to show omitted information within a sentence. Use four ellipsis points (. . . .) to indicate omission between sentences. (was incorporated. . . .Next, they)

When using two or more paragraphs of quoted material, put quotes at the start of the first paragraph and at the start of each succeeding paragraph and only at the end of the last paragraph.

“XXXXXXXXXXXX.

“XXXXXXXXXXXX.”)

Other information to know:

- A quotation within a quotation requires single quote marks.
- Quotations more than 500 words require permission from the author.
- Identify the speaker at the beginning of the quotation to make the speaker clear.
- Veer from unspecific sources such as “a spokesperson” or “government official.” Give the person’s name and title and other pertinent information, if necessary.
- Periods and commas go inside the quotes: colons and semicolons (:) go outside quotes (okay”;))

Getting Reader Attention

Metaphors and Analogies. Readers drowning in generalities appreciate the life saving abilities of metaphors and analogies. You pack a lot of information in an analogy when you compare the obscure with the familiar. Better yet, you make it memorable. Analogies are a great way to turn the light bulb on and prompt the “ooooohhhh” factor. If you think that analogies deviate from scientific presentation, note that Albert Einstein used them extensively in his own writing. If you are stuck with coming up with a comparison, one way is to use a popular reference (think cinema, sports, music, etc.) to get the point across.

Examples. Examples (remember math class?), in the form of anecdotes and vignettes, also personalize research and present it in a way that people can understand. See how these vignettes make the information more understandable:

1. Before members were placed in specific community jobs, they usually worked on a crew within the agency to practice job skills along with a job coach. Then, they transitioned to a time-limited position supervised by a manager. After being matched to a job, the member then went to a permanent unsupported job with assistance as needed. Frank, for instance, got a job at a local motel as a desk clerk. He called his support person several times. Once he called about making an error when balancing the cash register at his shift end and wondered whether he should personally make up the difference. Another time he called about a letter demanding he repay his student loan. Frank’s support person helped him work through problems and emotions and to fill out paper work, use public transportation, and deal with personality conflicts.

2. Disclosing disability status at a One-Stop Center is voluntary. Disclosure may help determine certain service eligibility. For example, Jen, who has a visual disability, registered at a One-Stop Center and a staff person helped her fill out forms. She used its resource library, attended job fairs, and faxed her resume from there to employers. The staff sent her information in a format she could use, and her job counselor met with her weekly. The Massachusetts Commission for the Blind paid for her to attend workshops. Now employed, Jen credits the One-Stop Center for her current job.

3. For instance, Darin, 58, lived 47 years in a state institution before moving to a supported apartment. He could not talk, read, write, and used a wheel chair. He went to work in an office to open envelopes, stamp dates on mail, collate, and staple. His employer decided he was not productive enough to receive nonsubsidized wages, but others in his life thought he should keep working for subsidized dollars because the job gave him other benefits, especially support from coworkers. After three years, his employer decided Darin was productive enough to earn nonsubsidized wages.

Visual aids. Take advantage of visual aids to emphasize significant details. Often that pie chart or photograph is the only piece of information a reader will take note of and retain. One mistake that many make is to feature a figure that is too complex to quickly decipher. The figure should be self-explanatory, follow the text reference, and have a good caption. Another pitfall is to overly rely on visual aids. Enamoured of computer's abilities to produce colorful, image-laden overheads and slides, many researchers bore their audience and overwhelm with visuals rather than straightforward information presentations.



Headlines. Make the most of headlines, which themselves summarize the news. Let readers have an idea of the research contents so they can determine whether they will read it or not. Because the headline is a summary, write the headline after you read or write the article.

One way to highlight the most relevant information is to think of key words—words significant to a topic. For instance, in writing about disability, key words might be “personal assistance,” “ADA” (Americans With Disabilities Act), “universal design,” “advocacy,” etc.

Often a study will have several key points. How can you fit all of them into a headline? You probably can't. But you may find a generalization consolidates all the points. Another option available is to pick one study finding that has the most appeal and use it for the headline. Be careful to avoid the temptation to use an item that may border on sensationalization. The point is to attract readers, not entice them falsely by distorting article contents. In some cases, findings are fairly obvious (“Physical Exercise Improves Health”), hard to understand, or of relevance only to a small audience. In these circumstances, you may have to use a minor finding that has more appeal.

Think “who does what” when writing, such as “Feds Slash Services,” or “Mentors Encourage Job Seeking.” Or, think “what does what,” as in “Adventure Programs Promote Effective Rehabilitation.”

Ideally, the headline will have a subject and predicate, and usually a direct object presented in a easy-to-digest capsule. Other grammar “no no's” are, to start, never use a verb to begin a headline. Because if you did, the headline would read as a command: “Use Vouchers for Transportation.” Eliminate articles, adjectives, and adverbs—they clutter a headline. And, never use a question for a headline. On a final grammatical note, watch the abbreviations. We know what the FBI is, but how many know that BSA stands for Boy Scouts of America?

Of course, be concise. Headlines offer just enough to get your attention; they don't tell the whole story. Use short, simple words. Be as specific as possible. A general rule is to be positive rather than negative. People are flooded with “bad” news; good news is far more attractive.

A good headline draws attention to a story that otherwise may have been ignored. It usually addresses how the news will affect the reader. For instance, if budget cuts will jeopardize certain services, readers want to know that piece of information.

Often headlines that attract us are clever or unusual. That's fine with general news, but news of a scientific nature may not lend itself to a frivolous come-hither headline. Take care, also, because a headline also matches the mood of the story: A clever pun does not necessarily represent a serious story.

With all this advice, feel free to do what works if you have a reason. You may have to punt with a lifeless head on occasion, because sometimes there are only a few ways to announce a study's findings. Although, you want to avoid stating the obvious, such as "People With Multiple Sclerosis Need Support Services."

Headlines attract attention, lure readers, and summarize information. Use them well!

When Finished, Take One More Look!

The first writing time around, you concentrated on recording facts correctly. Once you have put together the parts, you understand the whole article better. Revision helps you see the article highlights and what is missing. Ask:

- Does each sentence and paragraph develop the summary?
- What details or examples are needed to support assertions?
- Is the tone consistent and appropriate?
- How effective is the introductory and concluding paragraphs?
- Were all uncommon words spelled correctly and explained?

The big question now is: Have you translated from the academic world to the everyday world? Read sentences aloud to test clarity. Reading helps you hear whether the sentence is too awkward, confusing, or long. Imagine your reader as you read.

Each person will have their own style when condensing research.

Take a look at the following and figure out which you like best.

1. The New Route to Carnegie Hall

Practice, practice, practice, then do something mindless for a while, according to research from Johns Hopkins University in Baltimore. It takes approximately six hours for the memory of a new physical skill to be stored permanently in the brain. Trying to cram something even newer into your cranium during that time just might interfere with learning the original skill. (*Self*, Jan. 1998, 39)

2. Free Speech

About one in 700 babies is born with a cleft palate. Even after surgery to suture the lip or the hard and soft palates, some 20 to 30 percent of such children have lingering speech impediments—and evaluating the problem often requires threading a fiber-optic camera up the patient’s nose. If plastic surgeon Alex Kane and radiologist John Butman have their ways, such unpleasantness will soon be replaced by magnetic resonance imaging (MRI), which is both painless and far more revealing.

During speech, the soft plate normally shifts upward to close off the air passageway between the mouth and the nose. If the palate can’t move easily, air escapes through the nose, and speech is indistinct. Additional operations can correct these post-reconstruction defects, but only if the doctor can see where the problem lies. Conventional MRI requires that the subject be motionless, so erratic motions of the soft palate can be studied. Kane has overcome that limitation using “gated” MRI, a method originally developed to view a heart beating. While the patient repeats a simple phrase up to 200 times, the imaging machine collects snapshots at successive stages of speaking. When viewed one after another, the resulting stills play like a three-dimensional movie of the palate at work. “We hope to have an all-purpose tool to study speech, not only in cleft lip-and-palate kids but also in people who’ve had strokes,” says Kane. (*Discover*, July 2000, p. 24)

3. Around the House

Arranging a house for safety and independent living is more than shifting furniture. It is also shifting gears. The following are suggestions for safer living for those with mobility and sensory impairment:

- Overhead lighting provides better overall lighting and eliminates connecting cords that can be tripped over.
- Have a nightlight in every room, not just the bedroom, for better visibility at night. Get scatter rugs with nonskid backing and tack down loose carpeting
- Adhesive nonskid strips can be added to indoor and outdoor trips for better traction
- Arrange furniture so each room has an uncluttered path

- Use chairs heavy enough to support weight when leaned on
- Consider eliminating footstools because they are a common source of stumbling
- Knob turners can be placed on existing knobs for easier turning
- Light switches should be next to the bed
- Attach grab bars in the bathing area and do not rely on flimsy towel racks or soap holders
- Removable seats can add up to six inches to toilet seats for easier sitting and getting up
- Use a wheeled cart to transport heavy or bulky objects

4. Did you know that. . .

. . .many doctors bend insurance rules so patients who need treatment can have their care covered? Almost 40% of doctors confided to researchers that they have manipulated insurance rules in some way. Example: Some doctors exaggerate symptom severity so patients can spend extra time recovering in a hospital. The study did not deal with deception to increase doctors' revenue—only to improve patient care.

Survey of 720 doctors by American Medical Association's Institute for Ethics, reported in *The Journal of the American Medical Association*.

. . .the service sector will account for virtually all new U. S. jobs through 2008? Miscellaneous services alone, including everything from barbers to civic associations, now have more than \$266 billion in revenues each year.

Census Bureau and U. S. Bureau of Labor Statistics.

5. Family-Centered Behavior Scale

Who: 443 parents/caregivers

What: Development of a tool that programs can use to measure their family-centeredness

When: 2000-2002

Where: The Family Institute, University of Florida

Relevant findings: The three most desired staff behaviors (according to families) were: Listening to families, treating families with respect, and accepting families as important team members for a child.

(This information comprises one-half of the front page. The remaining page and page back expand on the initial information with headings such as "Literature review," "Methodology," "Results," and "References." Text written in this section uses citations and field-specific terminology as key information has already been presented in the abbreviated initial section.)

6. A Comparison of Resident and Faculty Attitudes Toward Physician-assisted Suicide and Active Voluntary Euthanasia

Bruce Bushwick, MD; David Emrhein, MEd; Kristi Peters, MS

Purpose: Assisted death practices such as physician-assisted suicide (PAS) and active voluntary euthanasia (AVE) are becoming more acceptable to the public

and the medical profession. This study compared the attitudes and practices of resident house staff physicians with the medical staff physicians responsible for teaching them regarding PAS and AVE.

Methods: A convenience sample of 372 medical staff and 105 resident house staff from a multi-residency community teaching hospital were anonymously surveyed. The overall response rate was 47%. The questionnaire consisted of 10 questions that examined the subjects' professional and legal values, willingness to participate in assisted death practices, and personal preferences for assisted death practices.

Results: The resident house staff differed significantly from the medical staff in attitudes toward assisted death practices. The resident house staff was less likely to support the traditional prohibitions against PAS and AVE. The resident house staff was also more likely to offer assisted death practices if they were legal. There was no significant difference, however, in the participation of assisted death practices between the groups respectively for PAS and AVE. The residents were more likely to request PAS or AVE for themselves or family members.

Conclusions: There are significant differences in attitudes and practices between resident physicians and medical staff physicians concerning PAS and AVE. These differences could lead to professional conflicts when setting clinical goals for end-of-life care and could compromise patient care.

7. Untitled

To investigate the concept of incompetence in terms of specific deficits, this study explored beliefs cited in proceedings concerning legal guardianship of elders. The beliefs of key decision makers in guardianship determinations were examined through focus group discussions. Using probate court records, potential participants were identified, and three focus groups were developed: (1) a group of seven legal professional (lawyers and judges); (2) a group of seven health professionals (social workers, counselors, a case manager, a family practice physician, and a professional guardian); and (3) a group of six family caregivers (four of whom had been appointed guardians and two who were refused guardianships). The social context of the study's time frame (1991-1992), an important factor in grounded theory, was characterized by "a societal spirit of independence." Ten deficits were identified and grouped in four core categories: (1) awareness (self-care and safety); (2) cognition (memory, disorientation, and layered thoughts); (3) decision making (changes in self, emotions, and trust); and (4) communication (physical status, interpersonal relationships, social isolation, and social nuisance). A final element cited was context, that is, consideration of all subcategories within the context of an individual's life. (Abstracts *in Social Gerontology*, 38 (4), 1995