



Guidelines on writing analytical articles

June 1997

Guidelines on writing analytical articles

Introduction: Toward a better analytical article

What is Statistics Canada seeking in a well-written, effective analytical article? The Senior Editorial Board, composed of the Chief Statistician and senior managers and analysts, started tackling this issue in Spring 1995 when it turned its attention from major releases in *The Daily* to articles in various Agency publications.

The Board has reviewed articles in several publications, among them *Perspectives on labour and income*, *Canadian social trends*, *Education quarterly review*, *Focus on culture*, *Health reports* and *Travel-log* in an attempt to achieve the desired level of quality.

As it did with *The Daily*, the Board has now produced a set of Guidelines designed to help authors write an effective article. These Guidelines were distilled from discussions at Board meetings. They reflect comments by Board members, and are by no means intended to be either exhaustive, or a hard set of rules.

I. Know your audience

These Guidelines concern themselves not only with matters of structure and style, but also with the more fundamental question of whether the message will be understood by the target audience. The news media are the primary audience for major releases in *The Daily*. However, the scope is much wider for analytical articles.

Potential target audiences for Statistics Canada's publications can be diverse, varying widely in their knowledge of social and economic affairs. Even though a publication might cater to a particular audience, not all readers might have the same level of expertise. Everyone benefits from material written simply, clearly and concisely, in user-friendly language. Therefore, it is imperative that authors assess their audience at the outset.

An article should be written with a specific reader in mind. Authors should ask themselves a number of questions. Who is going to read the article, and why? What information does the reader need? What information might he or she already have? The article should try to anticipate and avoid the reader's difficulties. Authors must always be thinking of what the reader wants to learn, what they want the reader to learn, and, sometimes, what they want the reader to avoid.

II. Analytical considerations

Analysis is an intellectual operation that involves the decomposition of an idea, concept or problem into its essential component elements, in order to identify logical relations among those elements and by doing so, to contribute to a deeper understanding of the whole.

It may also involve deducing new insights or propositions, through logical means, from other propositions that are either known or are explicitly assumed to be correct. In either case, analysis results in new insights or understandings. The purpose of analytical articles is to communicate these insights.

Readers have good reason to expect thorough, rigorous analysis from Statistics Canada, which has been ranked as the number one fact-gathering agency in the world. Nevertheless, much of the commentary from Board reviewers has concerned minor -- and some major -- flaws in logic or presentation of argument. There is no excuse for superficial analysis, and authors and editors should guard against it. The Board has commented on a number of specific aspects of analysis, which follow.

a.) Think in terms of issues or themes

First and foremost, effective articles should have a **thesis, or story**. Authors should think in terms of issues or themes, rather than a description of data. Readers tend to recall ideas more easily than they do data.

More specifically, authors should ask themselves critical questions as they plan the analysis for their report. What is the issue to be addressed and why is it important? What are the observed or emerging trends? What can be found in the literature on this topic? Are there other reasonable explanations for the observed facts than the author's proposed thesis? What analytical techniques should be used? What data sources are available to study this question? What are the limitations of the data sources? It is necessary to state clearly the objectives of the study right in the first few paragraphs of the article.

Profile articles, which focus on data, are valid under certain circumstances. For example, they can be a good opportunity to dismiss mistaken beliefs about a particular population, or to provide more insight into known attributes of the population. But the Board feels that profile articles should not predominate in Statistics Canada's publications.

The reason is that profiles are not particularly interesting or illuminating. Some articles are merely a "bus tour" of the survey results, passing through available variables and pointing out the highlights. They fail to provide a story line. Conclusions become simply a summary. No context or comparisons are provided, no implications are drawn. It is frequently the case that several issue-oriented articles could result from a data set rather than just one profile. If authors cannot move to an issue-oriented analysis, they should at least mention in their introduction why their particular profile is worth reading.

Secondly, authors must offer **convincing support** for their thesis. Otherwise, it is impossible to defend the conclusions on the basis of the analysis. Supporting a thesis means demonstrating, based on the empirical facts and deductive logic, why the conclusion should be accepted by the reader as valid.

b.) ‘Cardinal Sin’: Failing to control for extraneous factors

A frequent flaw, and in the Board’s view, a cardinal sin, in many analytical articles has been the **failure to standardize**, or control for extraneous factors. It is important that the conclusions that authors draw when comparing two groups of individuals (or comparing anything, for that matter) are based on valid comparisons. Authors should be certain that the conclusions they reach are not the result of factors that haven’t been considered or controlled for.

A case in point was an article in a Statistics Canada publication which examined the differences in education and employment outcomes between participants in co-operative education programs. The author compared aspects of co-op students to the general student population to make points about the impact of co-op programs on success in employment.

As co-op programs exist only in certain disciplines, the comparison of co-op students should have been with students in the same disciplines who were not in co-op programs, not with the general student population.

By contrast, an article on the same subject in another publication used statistical modelling to control for a wide variety of factors so that the effect of the co-op program itself could be studied. The results showed, for example, that co-op programs have an effect on earnings for the mathematics and physical sciences, and the commerce and economics programs, but not for engineering.

c.) Stating causality

Authors must weigh their words carefully when stating or implying a causality. Unless authors are certain that a specific causality is the single one consistent with the facts, an article should cite all possible explanations, not just one.

For example: The author of an article on combining school and work suggested that working long hours eventually caused many students to drop out of school. That is, working long hours got in the way of the school work and the prospect of an independent income enticed the students to leave.

However, there was another acceptable interpretation. Without further information, it was equally plausible that students who got bored with school began to work longer as a step in the process of dropping out. In other words, working long hours was a symptom, not a cause, of students likely to be leaving school. Authors should question, at least for themselves, whether alternative causalities are at work.

The Board encourages the inclusion of “possible explanations” in cases where available evidence appears to have an impact on the issue. At other times, it may be better to talk not in terms of causality, but in terms of the contribution of certain factors, or the relationship or association between factors.

d.) Context, context

Data are tools. Too often authors organize their analysis around a single data set, and permit it to define the scope of their inquiry. They have a tendency to structure their analysis by asking “what can I say about topic x from data set y?” rather than “which are the best tools to address topic x?” The result is a one-dimensional article that fails to put the issue into context, to give any perspective or, often, to provide any relevance to the topic. At Statistics Canada, the aim is to provide meaning to data.

Wherever possible, draw on information from other sources, both from within and outside Statistics Canada. It is good practice to consult colleagues about their interpretation of data from other programs, and to read other publications regularly to see how other analysts have interpreted economic and social developments. Authors should compare their results to other countries, other studies, other divisions within Statistics Canada.

e.) Programs and policies

Often, an author’s findings will have a bearing on a government program or policy. It is not the Agency’s intention to tell the government what it should do. However, authors should be encouraged to put their data in context with the “real world” and point out how the findings are related to policy choices. Certainly, they should not ignore the impact of previous legislative changes on their data.

Example:

Legislation that came into effect in 1991 not only increased RRSP contribution opportunities for many taxfilers, but also allowed unused RRSP room to be carried forward to future years.

“RRSPs -- unused opportunities,”
Perspectives on labour and income, Winter 1995

f.) Trend

Calculated trend lines and associated statistics may be helpful to authors in preparing their article or charting trends. But they are usually only useful to readers when the data series is erratic. Instead, authors are encouraged to analyse data from the perspective of short-, medium- and long-term trends in plain language, not as trend statistics.

Short-term trend: recent month-over-month comparison.

Medium-term trend: the period since the last major turning point in the series.

Long-term trend: an analytically significant period stretching beyond the last turning point, such as a recession, or recovery.

It is dangerous to comment on short-term trends without first inspecting them in the light of medium- and long-term trends. It is quite possible that a sharply rising short-term trend is simply another gyration around a basically flat medium- and/or long-term trend.

g.) Arbitrary time periods

Avoid analytically meaningless time periods wherever possible, such as year-to-date or year-over-year comparisons. Periods with more analytical relevance should be chosen.

Concentrate on changes from the last major turning point in the case of economic statistics, or from other meaningful reference periods, for example, generation to generation for demographic statistics, or a legislative change for social statistics.

h.) Future considerations

An article may raise a series of questions or implications that may have a bearing on future research. Authors should consider outlining these questions in their text. Part of the job of a good conclusion is to point out future avenues for research, or to underscore other perspectives that would be possible if different, or better, data were available to tackle the issue at hand.

III. Writing your article

a.) Preparing the outline

Effective articles don't write themselves. They take a lot of planning. Clear, concise writing comes from thinking your way through to essentials, eliminating the extraneous and irrelevant.

After authors have clearly established the purpose of their study, completed their analysis, and reached their conclusions, their job becomes organizing the article. One of the best ways of doing this is to prepare an outline.

An outline forces authors to organize their material and argument to achieve clarity and coherence. In general, an effective analytical article has three fundamental features which should be reflected in an outline - **an interesting question** (introduction); a logical organization of **the evidence** used to answer the question (the body); and **an answer** (conclusion).

As a rule, a statement of the problem or issue should appear early in the article. Authors should offer a clear statement of their objectives and how they intend to reach them. The introduction should contain a statement of what? and why?. That is, what is the objective of the paper or what question is being addressed, and why is it important. The "why?" question should refer to the broader issues of economic and social concern which are relevant to current debate and policy formation.

The body of the article should contain thorough, accurate analysis which sheds light on the underlying factors of the phenomenon being studied. Doing so provides some insurance against gross lapses of logic, and it usually provides a natural, logical flow to the discussion. When the "why?" question is well answered and the analysis is thorough, readers will stay focused on the paper. Otherwise, they risk going off on tangents as they start to think about all the missing bits. An effective article is one which keeps the reader focused and gets the author's ideas across in an orderly, logical sequence.

Last, but not least, is a conclusion or summary which refers to the specific issue(s) and the broader context discussed at the beginning. A comprehensive summary with some discussion of the implications makes an article much more useful to the reader. Ideally, authors should write the summary without any numbers (or with just a few) to emphasize the ideas that emerge from the analysis. The result is often a richer, more well thought out, concluding section.

b.) Organizing for style and clarity

An essential characteristic of a good article is organization. Ideas must flow in a logical sequence, building to a point where the reader becomes convinced of the report's arguments and conclusions.

Keep articles clear and concise. Arrange ideas in logical order, and in order of their relevance or importance, to add force to an argument. Headings and subheadings are effective tools for strengthening the organization of an article. They help show the relationship between ideas, and break the text into manageable, meaningful portions.

The language and structure of an article -- particularly the sentence structure -- should be as simple as the subject permits. Complex reasoning does not demand complex sentence structure. Complexity makes reading more difficult and tends to obscure the message.

Start paragraphs with a topic sentence which introduces a theme or idea without a lot of data. This gives readers a better grasp of points which you want to convey. The data can follow later.

Avoid jargon. There is always an acceptable way of explaining Statistics Canada jargon in a more meaningful way for readers.

Keep human interest in mind. Instead of discussing what the data are doing (an index goes up or down), write about the real world in which real people do real things. Use the active voice, and help readers understand how the data affect them.

Don't necessarily confine notes on methodology and definitions to the end of the article. If some of the material is critical to understanding your points, introduce it into the text directly whenever possible, or as footnotes if necessary. When this information is too long for the text, and too essential to be lost in a footnote, try writing a "sidebar". Sidebars are excellent devices for providing supplementary material at the location readers need it. They are easy on the eye, and readers don't have to search for the information.

c.) Controlling for quality

Authors, and their editors, have a responsibility to check, cross-check and re-check every detail in their article. This includes ensuring the consistency of figures used in text, tables and charts, and checking that simple arithmetic is correct. If data come from a source with which the author or editor is not familiar, the data should be confirmed with the source to ensure that the points made are legitimate.

Authors and editors must also make fundamental checks to ensure the integrity of articles, before and after editing. In many cases, authors outline certain intentions in their introduction, but their analysis fails to deliver the goods. Similarly, articles have contained conclusions for which there is no supporting information or argument.

Finally, editors have the responsibility to ensure that the translated text matches the original, and to ensure correctness in the other official language!

d.) Numbers and charts: the right balance

Try not to burden the reader with too many numbers. Profile articles tend to have a high proportion of numbers in the text. Put only key figures in the text; less important figures can be relegated to accompanying tables. Use the text to present analysis and context, not to verbalize tables.

A picture is indeed worth a thousand words. Charts can be extremely effective in expressing key results. However, they should be kept simple and clear. An effective chart has a clear visual message.

Instead of traditional chart titles, use analytical interpretive headings containing verbs. Wherever possible, talk about real people in the headings, not just variables. Take care to avoid ambiguity between the heading and the message in the chart.

Help readers understand the information in the charts by juxtaposing them beside the relevant analysis in the text. The chart is a picture and the reader's eye will gravitate to it naturally. The links between the text and graphs should be easy to follow.

IV. The reviewing stage

The Board has learned that in many cases, operational reviews of articles are performed in a perfunctory manner, often because reviewers don't have the time to do a thorough job.

Analysts should look upon reviews of outlines and drafts as an essential part of the quality control process. They should seek and welcome commentary at all phases through informal reviews by their colleagues. In addition, editors must insist that peer and institutional reviews be conducted with some rigor. This might be done through checklists of certain aspects of the articles on which reviewers should specifically comment.
