Formal Analytical Reports

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PURPOSE OF ANALYSIS

TYPICAL ANALYTICAL PROBLEMS

ELEMENTS OF A USABLE ANALYSIS

AN OUTLINE AND MODEL FOR ANALYTICAL REPORTS

A SITUATION REQUIRING AN ANALYTICAL REPORT

CHECKLIST for Usability of Analytical Reports

GUIDELINES for Reasoning through an Analytical Problem

The formal analytical report, like the shorter versions discussed in Chapter 17, usually leads to recommendations. The formal report replaces the memo when the topic requires lengthy discussion (roughly 10 or more pages). Formal reports generally include a title page, table of contents, a system of headings, a list of references or works cited, and other items of front-matter and end-matter supplements discussed in Chapter 25.

An essential component of workplace problem solving, analytical reports are designed to answer these questions:

- Based on the information gathered about this issue, what do we know?
- What conclusions can we draw?
- What should we do or not do?

Assume, for example, that you receive this assignment from your supervisor:

Recommend the best method for removing the heavy-metal contamination from our company dump site.

To recommend the most feasible method, you will have to learn everything you can about the nature and extent of the problem. Then you will compare the advantages and disadvantages of various options based on the criteria you are using to assess feasibility: say, cost-effectiveness, time required versus time available for completion, potential risk to the public and the environment.

For example, the cheapest option might also pose the greatest environmental risk and could result in heavy fines or criminal charges. But the safest option might simply be too expensive for this struggling company to afford. Or perhaps the Environmental Protection Agency has imposed a legal deadline for the cleanup. In making your recommendation, you will need to weigh all the criteria (cost, safety, time) very carefully, or you could land in jail.

The above situation calls for skills in critical thinking (Chapter 2) and in research (Chapters 7–10). Besides interviewing legal and environmental experts, you might search the literature and the Web. From these sources you can discover whether anyone has been able to solve a problem like yours, or learn about the newest technologies for toxic waste cleanup. Then you will have to decide how much, if any, of what others have done applies to your situation. (For more on analytical reasoning, see pages 607, 612.)

PURPOSE OF ANALYSIS

You may be assigned to evaluate a new assembly technique on the production line, or to locate and purchase the best equipment at the best price. You might have to identify the cause behind a monthly drop in sales, the reasons for low employee morale, the causes of an accident, or the reasons for equipment failure. You might need to assess the feasibility of a proposal for a company's expansion or investment.

The list is endless, but the procedure is always the same: (1) asking the right questions, (2) searching the best sources, (3) evaluating and interpreting your findings, and (4) drawing conclusions and making recommendations.

TYPICAL ANALYTICAL **PROBLEMS**

Far more than an encyclopedia presentation of information, the analytical report traces your inquiry, your evidence, and your reasoning to show exactly how you arrived at your conclusions and recommendations.

Workplace problem solving calls for skills in three broad categories: causal analysis, comparative analysis, and feasibility analysis. Each approach relies on its own type of reasoning.

Causal Analysis: "Why Does X Happen?"

Designed to attack a problem at its source, the causal analysis answers questions like this: Why do so many apparently healthy people have sudden heart attacks? Here is how causal reasoning proceeds:

Medical researchers at the world-renowned Hanford Health Institute recently found that 20 to 30 percent of deaths from sudden heart attacks occur in people who have none of the established risk factors (weight gain, smoking, diabetes, lack of exercise, high blood pressure, or family history).

To better identify people at risk, researchers are now tracking down new and powerful risk factors such as bacteria, viruses, genes, stress, anger, and depression.

Once researchers identify these factors and their mechanisms, they can recommend preventive steps such as careful monitoring, lifestyle and diet changes, drug treatment, or psychotherapy (H. Lewis 39–43). _

A different version of causal analysis employs reasoning from effect to cause, to answer questions like this: What are the health effects of exposure to electromagnetic radiation?

NOTE

Keep in mind that faulty causal reasoning is extremely common, especially when we ignore other possible causes or we confuse correlation with causation (page 182).

Comparative Analysis: "Is X or Y Better for Our Purpose?"

Designed to rate competing items on the basis of specific criteria, the comparative analysis answers questions like this: Which type of security (firewall/encryption) program should we install on our company's computer system? Here is how reasoning proceeds in a comparative analysis:

XYZ Corporation needs to identify exactly what information (personnel files, financial records) or functions (in-house communication, file transfer) it wants to protect from whom. Does it need both virus and tamper protection? Does it wish to restrict network access or encrypt (scramble) email and computer files so they become unreadable to unauthorized persons? Does it wish to restrict access to or from the Web? In addition to the level of protection, how important are ease of maintenance and user-friendliness?

After identifying their specific criteria, XYZ decision makers need to rank them in order of importance (for example, 1. tamper protection, 2. user-friendliness, 3. secure financial records, and so on).

On the basis of these ranked criteria, XYZ will assess relative strengths and weaknesses of competing security programs and recommend the best one (Schafer 93–94). _

Feasibility Analysis: "Is This a Good Idea?"

Designed to assess the practicality of an idea or plan, the feasibility analysis answers questions like this: Will increased business justify the cost of an interactive, multimedia Web site? Here is the reasoning process in a feasibility analysis:

Bigbyte, Inc., a retailer of discounted computer hardware and software, relies on catalog orders by telephone for its high-volume business. The company is now deciding whether to reallocate the bulk of its marketing resources to establish a high-profile presence on the Web.

Research uncovers numerous supporting reasons, including these: A Web site is an excellent medium for enhancing a company's name recognition and for announcing new products and catalog updates. Site visits can be tailored to individual customer preferences. "Cybershoppers" value the convenience of researching and comparing products from home, the absence of pressure from telephone salespersons, and the ability to customize their visits to a retailer's Web site.

Obstacles to Web-based sales include consumer reluctance to reveal credit card numbers and personal information online or to change their traditional shopping patterns, along with frustration with slow downloading. Also, creating and maintaining an attractive, navigable, and up-to-date site is costly, and few retail sites—even the most heavily visited—have shown actual profit.

After assessing the benefits and drawbacks of Web-based marketing in this situation, Bigbyte decision makers can make the appropriate recommendations (Hodges 22+). _

For more on feasibility reports, see page 395.

Combining Types of Analysis

Analytical categories overlap considerably. Any one study may in fact require answers to two or more of the previous questions. The sample report on pages 631–38 is both a feasibility analysis and a comparative analysis. It is designed to answer these questions: Is technical marketing the right career for me? If so, which is my best option for entering the field?

ELEMENTS OF A USABLE ANALYSIS

The formal analytical report incorporates many elements from assignments in earlier chapters, along with the suggestions that follow.

Clearly Identified Problem or Goal

To solve any problem or achieve any goal, you must first identify it precisely. Always begin by defining the main questions and thinking through any subordinate questions they may imply. Only then can you determine what to look for, where to look, and how much information you will need.

Your employer, for example, might pose this question: Will a low-impact aerobics program significantly reduce stress among my employees? The aerobics question obviously requires answers to three other questions: What are the therapeutic claims for aerobics? Are they valid? Will aerobics work in this situation? With the main questions identified, you can formulate a goal (or purpose) statement:

My goal is to examine and evaluate claims about the therapeutic benefits of low-impact aerobic exercise.

Words such as examine and evaluate (or compare, identify, determine, measure, describe, and so on) help readers

understand the specific analytical activity that forms the subject of the report. For more on asking the right questions, see pages 120-21.

Adequate but Not Excessive Data

A superficial analysis is basically worthless. Worthwhile analysis, in contrast, examines an issue in depth (as discussed on pages 122–23). In reporting on your analysis, however, you filter that material for the audience's understanding. deciding what to include and what to leave out. Do decision makers in this situation need a closer look or are we presenting excessive detail when only general information is needed? Is it possible to have too much information? In some cases, yes—as behavioral expert Dietrich Dorner explains:

The more we know, the more clearly we realize what we don't know. This probably explains why ... organizations tend to [separate] their information-gathering and decision-making branches. A business executive has an office manager; presidents have ... advisers; military commanders have chiefs of staff. The point of this separation may well be to provide decision makers with only the bare outlines of all the available information so they will not be hobbled by excessive detail when they are obliged to render decisions. Anyone who is fully informed will see much more than the bare outlines and will therefore find it extremely difficult to reach a clear decision. (99)

Confusing the issue with excessive information is no better than recommending hasty action on the basis of inadequate information (Dorner 104).

As you research the issue you may want to filter material for your own understanding as well. Whether to rely on the abstract or summary or to read the complete text of a specialized article or report all depends on the question you're trying to answer and the level of technical detail your readers expect. If you are expert in the field, writing for other experts, you probably want to read the entire document in order to assess the methods and reasoning behind a given study. But if you are less than expert, a summary or abstract of this study's findings might suffice. The fact sheet in Figure 24.1, for example, summarizes a detailed feasibility study for a general reading audience. Readers seeking more details, including nonclassified elements of the complete report, could visit the Transportation Security Administrations's Web site at <www.tsa.gov>.

NOTE

If you have relied merely on the abstract or summary instead of the full article, be sure to indicate this ("Abstract," "Press Release" or the like) when you document the source in your report (as shown on page 691).

Accurate and Balanced Data

Avoid stacking the evidence to support a preconceived point of view. Assume, for example, that you are asked to recommend the best chainsaw brand for a logging company. Reviewing test reports, you come across this information:

Of all six brands tested, the Bomarc chainsaw proved easiest to operate. However, this brand also offers the fewest safety features.

In citing these equivocal findings, you need to present both of them accurately, and not simply the first—even though the Bomarc brand may be your favorite. Then argue for the feature (ease of use or safety) you think should receive priority. (Refer to pages 121 and 172 for exploring and presenting balanced and reasonable evidence.)

Fully Interpreted Data

Interpretation shows the audience "what is important and what unimportant, what belongs together and what does not" (Dorner 44). For example, you might interpret the chainsaw data from page 610 in this way:

Our logging crews often work suspended by harness, high above the ground. Also, much work is in remote areas. Safety features therefore should be our first requirement in a chainsaw. Despite its ease of operation, the Bomarc saw does not meet our safety needs.

By saying "therefore" you engage in analysis—not just information sharing. Don't merely list your findings, explain what they mean. (Refer to pages 174–77.)

Subordination of Personal Bias

To arrive at the truth of the matter (page 174), you need to see clearly. Don't let your biases fog up the real picture. Each stage of analysis requires decisions about what to record, what to exclude, and where to go next. You must evaluate your data (Is this reliable and important?), interpret your evidence (What does it mean?), and make recommendations (What action is needed?). An ethically sound analysis presents a balanced and reasonable assessment of the evidence. Do not force viewpoints that are not supported by dependable evidence. (Refer to page 124.)

Appropriate Visuals

Graphs are especially useful in an analysis of trends (rising or falling sales, radiation levels). Tables, charts, photographs, and diagrams work well in comparative analyses. Be sure to accompany each visual with a fully interpreted "story."

NOTE

As the simplicity of Figure 24.2 and its brief caption illustrate, a powerful visual does not need to be complex and fancy, nor its accompanying story long and involved. Sometimes, less can be more.

Valid Conclusions and Recommendations

Along with the informative abstract (page 648), conclusions and recommendations are the sections of a long report that receive the most audience attention. The goal of analysis is to reach a valid conclusion—an overall judgment about what all the material means (that X is better than Y, that B failed because of C, that A is a good plan of action). Here is the conclusion of a report on the feasibility of installing an active solar heating system in a large building:

- 1. Active solar space heating for our new research building is technically feasible because the site orientation will allow for a sloping roof facing due south, with plenty of unshaded space.
- 2. It is legally feasible because we are able to obtain an access easement on the adjoining property, to ensure that no buildings or trees will be permitted to shade the solar collectors once they are installed.
- 3. It is economically feasible because our sunny, cold climate means high fuel savings and faster payback (fifteen years maximum) with solar heating. The long-term fuel savings justify our shortterm installation costs (already minimal because the solar system can be incorporated during the building's construction—without renovations).

Conclusions are valid when they are logically derived from accurate interpretations.

Having explained what it all means, you then recommend what should be done. Taking all possible alternatives into account, your recommendations urge the most feasible option (to invest in A instead of B, to replace C immediately, to follow plan A, or the like). Here are the recommendations based on the previous interpretations:

- 1. I recommend that we install an active solar heating system in our new research building.
- 2. We should arrange an immediate meeting with our architect, building contractor, and solar heating contractor. In this way, we can make all necessary design changes before construction begins in two weeks.

We should instruct our legal department to obtain the appropriate permits and easements immediately.

Recommendations are valid when they propose an appropriate response to the problem or question.

Because they culminate your research and analysis, recommendations challenge your imagination, your creativity, and—above all—your critical thinking skills. What strikes one person as a brilliant suggestion might be seen by others as irresponsible, offensive, or dangerous. (Figure 24.3 depicts the kinds of decisions writers encounter in formulating, evaluating, and refining their recommendations.)

NOTE

Keep in mind that solving one problem might create new and worse problems—or unintended consequences. For example, to prevent crop damage by rodents, an agriculture specialist might recommend trapping and poisoning. While rodent eradication may increase crop yield temporarily, it also increases the insects these rodents feed on—leading eventually to even greater crop damage. In short, before settling on any recommendation, try to anticipate its "side effects and long-term repercussions" (Dorner 15).

When you do achieve definite conclusions and recommendations, express them with assurance and authority. Unless you have reason to be unsure, avoid noncommittal statements ("It would seem that" or "It looks as if"). Be direct and assertive ("The earthquake danger at the reactor site is acute," or "I recommend an immediate investment"). Announce where you stand.

If, however, your analysis yields nothing definite, do not force a simplistic conclusion on your material (pages 124–26). Instead, explain your position ("The contradictory responses to our consumer survey prevent me from reaching a definite conclusion. Before we make any decision about this product, I recommend a full-scale market analysis"). The wrong recommendation is far worse than no recommendation at all. (Refer to Chapter 10, pages 192–93 for helpful guidelines.)

Self-Assessment

The more we are involved in a project, the larger our stake in its outcome—making self-criticism less likely just when it is needed most! For example, it is hard to admit that we might need to backtrack, or even start over, in instances like these (Dorner 46):

• During research you find that your goal isn't clear enough to indicate exactly what information you need.

• As you review your findings, you discover that the information you have is not the information you need.

It is even harder to test our recommendations and admit they are not working:

 After making a recommendation, you discover that what seemed like the right course of action turns out to be the wrong one.

If you meet such obstacles, acknowledge them immediately, and revise your approach as needed.

AN OUTLINE AND MODEL FOR ANALYTICAL REPORTS

Whether you outline earlier or later, the finished report depends on a good outline. This model outline can be adapted to most analytical reports.

- I. Introduction
 - A. Definition, Description, and Background
 - B. Purpose of the Report, and Intended Audience
 - C. Method of Inquiry
 - D. Limitations of the Study
 - E. Working Definitions (here or in a glossary)
 - F. Scope of the Inquiry (topics listed in logical order)

G.Conclusion(s) of the Inquiry (briefly stated)

- II. Collected Data
 - A. First Topic for Investigation
 - 1. Definition
 - 2. Findings
 - 3. Interpretation of findings
 - B. Second Topic for Investigation
 - 1. First subtopic
 - a. Definition
 - b. Findings
 - c. Interpretation of findings
 - 2. Second subtopic (and so on)
- III. Conclusion
 - A. Summary of Findings
 - B. Overall Interpretation of Findings (as needed)
 - C. Recommendations (as needed and feasible)

(This outline is only tentative. Modify as necessary.)

Two sample reports in this chapter follow the model outline. The first one, "Children Exposed to Electromagnetic Radiation: A Risk Assessment" (minus the document supplements that ordinarily accompany a long report), begins on this page. The second report, "The Feasibility of a Technical Marketing Career," appears in Figure 24.4.

Supplements (front and end matter) for this report appear in Chapter 25 and on page 713.

Each report responds to slightly different questions. The first tackles these questions: What are the effects of X and what should we do about them? The second tackles two questions: Is X feasible, and which version of X is better for my purposes? At least one of these reports should serve as a model for your own analysis.

Introduction

The introduction engages and orients the audience and provides background as briefly as possible for the given situation. Often, writers are tempted to write long introductions because they have a lot of background knowledge about the issue. But readers generally don't need long history lessons on the subject.

In your introduction, identify your topic's origin and significance, define or describe the problem or issue, and explain the report's purpose. (Stipulate your audience only in the version your instructor will read and only if you don't attach an audience and use profile.) Briefly identify your research methods (interviews, literature searches, and so on) and explain any data omissions (person unavailable for interview, research still in progress, and so on). List working definitions, but if you have more than two or three, place definitions in a glossary. List the topics you have researched. Finally, briefly preview your conclusion; don't make readers wade through the entire report to find out what you are recommending or advising.

NOTE

Not all reports require every element. Give readers only what they need and expect.

As you read the following introduction, think about the elements designed to engage and orient the audience (i.e., local citizens), and evaluate their effectiveness. (Review pages 120–24 for the situation that gave rise to this report.)

Children Exposed to Electromagnetic Radiation: A Risk Assessment

LAURIE A. SIMONEAU

INTRODUCTION

Wherever electricity flows—through the largest transmission line or the smallest appliance—it emits varying intensities of charged waves: an *electromagnetic field* (EMF). Some medical studies have linked human

exposure to EMFs with definite physiologic changes and possible illness including cancer, miscarriage, and depression.

Experts disagree over the health risk, if any, from EMFs. Some question whether EMF risk is greater from high-voltage transmission lines, the smaller distribution lines strung on utility poles, or household appliances. Conclusive research may take years; meanwhile, concerned citizens worry about avoiding potential risks.

In Bocaville, four sets of transmission lines—two at 115 Kilovolts (kV) and two at 500 kV—cross residential neighborhoods and public property.

The Adams elementary school is less than 100 feet from this power line corridor. EMF risks—whatever they may be—are thought to increase with proximity.

Based on examination of recent research and interviews with local authorities, this report assesses whether potential health risks from EMFs seem significant enough for Bocaville to (a) increase public awareness, (b) divert the transmission lines that run adjacent to the elementary school, and (c) implement widespread precautions in the transmission and distribution of electrical power throughout Bocaville.

This report covers five major topics: what we know about various EMF sources, what research indicates about physiologic and health effects, how experts differ in evaluating the research, what the power industry and the public have to say, and what actions are being taken locally and nationwide to avoid risk.

The report concludes by acknowledging the ongoing conflict among EMF research findings and by recommending immediate and inexpensive precautionary steps for our community.

Body

The body section describes and explains your findings. Present a clear and detailed picture of the evidence, interpretations, and reasoning on which you will base your conclusion. Divide topics into subtopics, and use informative headings as aids to navigation.

NOTE

Remember your ethical responsibility for presenting a fair and balanced treatment of the material, instead of "loading" the report with only those findings that support your viewpoint. Also, keep in mind the body section can have many variations, depending on the audience, topic, purpose, and situation.

As you read the following section, evaluate how effectively it informs readers, keeps them on track, reveals a clear line of reasoning, and presents an impartial analysis.

DATA SECTION

Sources of EMF Exposure

Electromagnetic intensity is measured in *milligauss* (mG), a unit of electrical measurement. The higher the mG reading, the stronger the field. Studies suggest that consistent exposure above 1–2 mG may increase cancer risk significantly, but no scientific evidence concludes that exposure even below 2.5 mG is safe.

Table 1 gives the EMF intensities from electric power lines at varying distances during average and peak usage.

As Table 1 indicates, EMF intensity drops substantially as distance from the power lines increases.

Although the EMF controversy has focused on 2 million miles of power lines criss-crossing the country, potentially harmful waves are also emitted by household wiring, appliances, computer terminals—and even from the earth's natural magnetic field. The background magnetic field (at a safe distance from any electrical appliance) in the average American home varies from 0.5 to 4.0 mG (United States Environmental 10). Table 2 compares intensities of various sources.

EMF intensity from certain appliances tends to be higher than from transmission lines because of the amount of current involved.

Voltage measures the speed and pressure of electricity in wires, but *current* measures the volume of electricity passing through wires. Current (measured in *amperage*) is what produces electromagnetic fields. The current flowing through a transmission line typically ranges from 200 to 400 amps.

Most homes have a 200-amp service. This means that if every electrical item in the house were turned on at the same time, the house could run about

200 amps—almost as high as the transmission line. Consumers then have the ability to put 200 amps of current-flow into their homes, while transmission lines carrying 200 to 400 amps are at least 50 feet away (Miltane).

Proximity and duration of exposure, however, are other risk factors. People are exposed to EMFs from home appliances at close proximity, but appliances run only periodically: exposure is therefore sporadic, and intensity diminishes sharply within a few feet (Figure 1).

As Figure 1 indicates, EMF intensity drops dramatically over very short distances from the typical appliance.

Power line exposure, on the other hand, is at a greater distance (usually

50 feet or more), but it is constant. Moreover, its intensity can remain strong well beyond 100 feet (Miltane).

Research has yet to determine which type of exposure might be more harmful: briefly, to higher intensities or constantly, to lower intensities. In either case, proximity seems most significant because EMF intensity drops rapidly with distance.

Physiologic Effects and Health Risks from EMF Exposure

Research on EMF exposure falls into two categories: epidemiologic studies and laboratory studies. The findings are sometimes controversial and inconclusive, but also disturbing.

Epidemiologic Studies. Epidemiologic studies look for statistical correlations between EMF exposure and human illness or disorders. Of 77 such studies in recent decades, over 70 percent suggest that EMF exposure increases the incidence of the following conditions (Pinsky 155–215):

- cancer, especially leukemia and brain tumors
- miscarriage
- stress and depression
- learning disabilities
- heart attacks

For example, a 38-year study of nearly 140,000 electrical employees in the United States indicates that those who routinely worked in high-EMF environments were about three times more likely to die from heart attacks than coworkers in low-EMF environments (Raloff, "Electromagnetic ... Hearts" 70).

Following are summaries of four noted epidemiologic studies implicating EMFs in cancer.

A Landmark Study of the EMF/Cancer Connection. A 1979 Denver study by Wertheimer and Leeper was the first to implicate EMFs as a cause of cancer. Researchers compared hundreds of homes in which children had developed cancer with similar homes in which children were cancer free. Victims were two to three times as likely to live in "high-current homes" (within 130 feet of a transmission line or 50 feet of a distribution line).

This study has been criticized because (1) it was not "blind" (researchers knew which homes cancer victims were living in), and (2) researchers never took gaussmeter readings to verify their designation of "high-current" homes (Pinsky 160–62; Taubes 96).

Follow-up Studies. Several major studies of the EMF/cancer connection have confirmed Wertheimer's findings:

- In 1988, Savitz studied hundreds of Denver houses and found that children with cancer were 1.7 times as likely to live in high-current homes. Unlike his predecessors, Savitz did not know whether a cancer victim lived in the home being measured, and he took gaussmeter readings to verify that houses could be designated "high-current" (Pinsky 162–63).
- In 1990, London and Peters found that Los Angeles children had 2.5 times more risk of leukemia if they lived near power lines (Brodeur 115).
- In 1992, a massive Swedish study found that children in houses with average intensities greater than 1 mG had twice the normal leukemia risk; at greater than 2 mG, the risk nearly tripled; at greater than 3 mG, it nearly quadrupled (Brodeur 115).
- Most recently, in 2002, British researchers evaluated findings from 34 studies of power line EMF effects (*a meta-analysis*). This study found "a degree of consistency in the evidence suggesting adverse health effects of living near high voltage powerlines" (Henshaw et al. 1).

Workplace Studies. More than 80 percent of 51 studies from 1981 to 1994—most notably a 1992 Swedish study—concluded that electricians, electrical engineers, and power line workers constantly exposed to an average of 1.5 to 4.0 mG had a significantly elevated cancer risk (Brodeur 115; Pinsky 177–209).

Notable Recent Studies. Three recent workplace studies seem to support or even amplify the above findings.

- A 1994 University of Southern California study indicates that high workplace exposure to EMFs triples the risk of Alzheimer's disease (Des Marteau 38).
- A 1995 University of North Carolina study of 138,905 electric utility workers concluded that occupational EMF exposure roughly doubles brain cancer risk. This study, however, found no increased leukemia risk (Cavanaugh 8, Moore 16).
- A Canadian study of electrical-power employees published in 2000 indicates that those who had worked in strong electric fields for more than 20 years had "an eight- to tenfold increase in the risk of leukemia," along with a significantly elevated risk of lymphoma ("Strong Electric Fields" 1–2).

Although none of the above studies can be said to "prove" a direct cause-effect relationship, their strikingly similar results suggest a conceivable link between prolonged EMF exposure and illness.

Laboratory Studies. Laboratory studies assess cellular, metabolic, and behavioral effects of EMFs on humans and animals. EMFs directly cause the following physiologic changes (Brodeur 88; Pinsky 24–29; Raloff, "EMFs" 30):

- reduced heart rate
- altered brain waves
- impaired immune system
- interference with the synthesis of genetic material
- disrupted regulation of cell growth
- interaction with the biochemistry of cancer cells
- altered hormonal activity
- disrupted sleep patterns

These changes are documented in the following summaries of several significant laboratory studies.

EMF Effects on Cell Chemistry. Recent studies have demonstrated previously unrecognized effects on cell growth and division.

- A 1995 University of Wisconsin study showed that cell metabolism is influenced by electromagnetic fields—the extent of effect depending on a cell's age and health. While this type of cellular stress does not appear to initiate cancer, it might help promote growth of an existing tumor (Goodman, Greenebaum, and Marron 279–338).
- A 2000 study by Michigan State University found that EMFs equal to the intensity that occurs "within a few feet" of outdoor power lines caused cells with cancer-related genetic mutations to multiply rapidly (Sivitz 196).

EMF Effects on Hormones. Several studies have found that EMF exposure (say, from an electric blanket) inhibits production of melatonin, a hormone that fights cancer and depression, stimulates the immune system, and regulates bodily rhythms.

A 1997 study at the Lawrence National Laboratory found that EMF exposure can suppress both melatonin and the hormonelike, anticancer drug Tamoxifen (Raloff, "EMFs" 30). A 2004 British

- study of Oxford University, however, found no association between decreased melatonin levels and breast cancer (Travis).
- In 1996, physiologist Charles Graham found that EMFs elevate female estrogen levels and depress male testosterone levels—hormone alterations associated respectively, with risk of breast or testicular cancer (Raloff, "EMFs" 30)

EMF Effects on Life Expectancy. A 1994 South African study at the University of the Orange Free State measured the life span of mice exposed to EMFs. Both first and second generations of exposed mice showed significantly shortened life expectancy (de Jager and de Bruyn 221–24).

EMF Effects on Behavior. Recent studies indicate that people who live adjacent to power lines have roughly twice the normal rate of depression (Pinsky 31–32). Also, rats exposed to EMFs exhibit slower rates of learning (Beardsley 20).

Although laboratory studies seem more conclusive than the epidemiologic studies, what these findings *mean* is debatable.

Debate over Quality, Cost, and Status of EMF Research Experts differ over the meaning of EMF research findings largely because of the following limitations attributed to various studies.

Limitations of Various EMF Studies

Epidemiologic studies are criticized for overstating the evidence. For example, after reviewing the research, the American Physics Society reported "no consistent link between cancer and power line fields" (Broad A19). Some critics claim that so-called EMF-cancer links are produced by "data dredging" (making countless comparisons between types of cancers and EMF sources until certain random correlations appear) (Taubes 99). Other critics argue that news media distort the issue by publicizing studies with positive findings while often ignoring studies with negative or ambiguous findings (N. Goodman). Some studies are also accused of mistaking *coincidence* for *correlation*, without exploring "confounding factors" (e.g., exposure to toxic substances or to other adverse conditions—including the earth's natural magnetic field) (Moore 16).

Supporters of EMF research respond that the sheer volume of epidemiologic evidence seems overwhelming (Kirkpatrick 81, 83). Moreover, the Swedish studies cited earlier seem to invalidate the above criticisms (Brodeur 115).

- Laboratory studies are criticized—even by scientists who conduct them—because effects on an isolated culture of cells are not always equal to effects on the total human or animal organism. Also, effects in experimental animals are not always equivalent to effects in humans (Jauchem 190–94).
- Until recently critics argued that no scientist had offered a reasonable hypothesis to explain the possible health effects (Palfreman 26). However, a 1997 study at Minnesota's Hughes Institute identified the precise biological mechanism by which EMF exposure activates tyrosine kinase enzymes that produce DNA damage (Raloff, "Electromagnetic ... Enzymes" 119).

Also, a 2004 University of Washington study showed that a weak electromagnetic field can break DNA strands and lead to cell death in brain cells of rats. Researchers hypothesize that EMF exposure promotes increased formation of cell-damaging agents known as free radicals (Lal and Singh).

Costs of EMF Research. Critics claim that research and publicity about EMFs are becoming a profit venture, spawning "a new growth industry among researchers, as well as marketers of EMF monitors" ("Electrophobia" I). Environmental expert Keith Florig identifies adverse economic effects of the EMF debate that include decreased property values, frivolous lawsuits, expensive but needless "low field" consumer appliances, and costly modifications to schools and public buildings (Monmonier 190).

Present Status of EMF Research. In July 1998, an editor at the *New England Journal of Medicine* called for ending EMF/cancer research. He cited studies from the National Cancer Institute and other respected sources that showed "little evidence" of any causal connection. In a parallel development, federal and industry funding for EMF research has been reduced drastically (Stix 33). But, in August 1998, experts from the Energy Department and the National Institute of Environmental Health Sciences (NIEHS) announced that EMFs should be officially designated a "possible human carcinogen" (Gross 30).

However, one year later, in a report based on its seven-year review of EMF research, NIEHS concluded that "the scientific evidence suggesting that ... EMF exposures pose any health risk is weak." But the report also conceded that such exposure "cannot be recognized at this time as entirely safe" (1–2).

In short, after more than twenty years of study, the EMF/illness debate continues, even among respected experts. While most scientists agree that EMFs exert measurable effects on the human body, they disagree about whether a real hazard exists. Given the drastic cuts in research funding, definite answers are unlikely to appear anytime soon.

Views from the Power Industry and the Public

While the experts continue their debate, other viewpoints are worth considering as well.

The Power Industry's Views. The Electrical Power Research Institute (EPRI), the research arm of the nation's electric utilities, claims that recent EMF studies have provided valuable but inconclusive data that warrant further study (Moore 17).

What does our local power company think about the alleged EMF risk? Marianne Halloran-Barney, Energy Service Advisor for County Electric, expressed this view in an email correspondence:

There are definitely some links, but we don't know, really, what the effects are or what to do about them. ... There are so many variables in EMF research that it's a question of whether the studies were even done

correctly Maybe in a few years there will be really definite answers.

Echoing Halloran-Barney's views, John Miltane, Chief Engineer for County Electric, added this political insight:

The public needs and demands electricity, but in regard to the negative effects of generation and transmission, the pervasive attitude seems to be "not in my back yard!" Utilities in general are scared to death of the EMF issue, but at County Electric we're trying to do the best job we can while providing reliable electricity to 24,000 customers.

Public Perception. Industry views seem to parallel the national perspective among the broader population: Informed people are genuinely concerned, but remain unsure about what level of anxiety is warranted or what exactly should be done.

A 1998 survey by the Edison Electric Institute did reveal that EMFs are considered a serious health threat by 33 percent of the American public (Stix 33).

Risk-Avoidance Measures Being Taken

Although conclusive answers may require decades of research, concerned citizens are already taking action against potential EMF hazards.

Risk Avoidance Nationwide. Here are steps taken by various communities to protect schoolchildren from EMF exposure:

- Hundreds of individuals and community groups have taken legal action to block proposed construction of new power lines. A single Washington law firm has defended roughly 140 utilities in cases related to EMFs (Dana and Turner 32).
- Houston schools "forced a utility company to remove a transmission line that ran within 300 feet of three schools. Cost: \$8 million" (Kirkpatrick 85).
- California parents and teachers are pressuring reluctant school and public health officials to investigate cancer rates in the roughly 1,000 schools located within 300 feet of transmission lines, and to close at least one school (within 100 feet) in which cancer rates far exceed normal (Brodeur 118).

Given the expense of modifying power lines to reduce EMFs (an estimated \$1 billion to \$3 billion yearly), critics argue that the questionable risks fail to justify the costs of measures like those above (Broad A19). Nonetheless, widespread expressions of concern about EMF exposure continue to grow.

Risk Avoidance Locally. Local awareness of the EMF issue seems low. The main public concern seems to be with property values. According to Halloran-Barney, County Electric receives one or two calls monthly from concerned customers, including people buying homes near power lines. The lack of public awareness adds another dimension to the EMF problem: People can't avoid a health threat that they don't know exists.

John Miltane stresses that County Electric takes the EMF issue very seriously: Whenever possible, new distribution lines are run underground and configured to diminish EMF intensity:

Although EMFs are impossible to eliminate altogether, we design anything we build to emit minimal intensities.... Also, we are considering underground cable (at \$1,200 per ft.) to replace 8,000 feet of transmission lines, but the bill would ring up to nearly \$10

million, for the cable alone, without labor: You don't get environmental stuff for free, which is one of the problems.

Before risk avoidance can be considered on a broader community level, the public must first be informed about EMFs and the associated risks of exposure.

Conclusion

The conclusion is likely to interest readers most because it answers the questions that originally sparked the analysis.

NOTE

Many workplace reports are submitted with the conclusion preceding the introduction and body sections.

In the conclusion, you summarize, interpret, and recommend. Although you have interpreted evidence at each stage of your analysis, your conclusion presents a broad interpretation and suggests a course of action, where appropriate. The summary and interpretations should lead logically to your recommendations.

- The summary accurately reflects the body of the report.
- The overall interpretation is consistent with the findings in the summary.
 - The recommendations are consistent with the purpose of the report, the evidence presented, and the interpretations given.

NOTE

Don't introduce any new facts, ideas, or statistics in the conclusion.

As you read the following conclusion, evaluate how effectively it provides a clear and consistent perspective on the whole document.

CONCLUSION

Summary and Overall Interpretation of Findings

Electromagnetic fields exist wherever electricity flows; the stronger the current, the higher the EMF intensity. While no "safe" EMF level has been identified, long-term exposure to intensities greater than 2.5 milligauss is considered dangerous. Although home appliances can generate high EMFs during use, power lines can generate constant EMFs, typically at 2 to 3 milligauss in buildings within 150 feet. Our elementary school is less than 100 feet from a high-voltage power line corridor.

Notable epidemiologic studies implicate EMFs in increased rates of medical disorders such as cancer, miscarriage, stress, depression, and learning disabilities—all directly related to intensity and duration of exposure. Laboratory studies show that EMFs cause the kinds of cellular, metabolic, and behavioral changes that could produce these disorders.

Though still controversial and inconclusive, most of the various findings are strikingly similar and they underscore the need for more research and for risk avoidance, especially as far as children are concerned. Especially striking are the 1997 and 2004 discoveries of a direct biological link between EMF exposure and DNA damage.

Concerned citizens nationwide are beginning to prevail over resistant school and health officials and utility companies in reducing EMF risk to schoolchildren. And even though our local power company is taking reasonable risk-avoidance steps, our community can do more to learn about the issues and diminish potential risk.

Recommendations

The National Institute of Environmental Health Sciences cautions that the health evidence against EMF exposure "is insufficient to warrant aggressive regulatory concern" (NIEHS 2). In light of this "official" position, any type of government regulation anytime soon seems highly unlikely. Also, considering the limitations of what we know, drastic and enormously expensive actions (such as burying all the town's power lines or increasing the height of utility towers) seem inadvisable. In fact, these might turn out to be the wrong actions.

Despite this climate of uncertainty, however, our community still can take some immediate and inexpensive steps to address possible EMF risk:

- A version of this report should be distributed to all Bocaville residents.
- Our school board should hire a qualified contractor to take milligauss readings throughout the elementary school, to determine the extent of the problem, and to suggest reasonable corrective measures.
- Our Town Council should meet with County Electric Company representatives to explore options and costs for rerouting or burying the segment of the power lines near the school.
- A town meeting should then be held to answer citizens' questions and to solicit opinions.
- A committee (consisting of at least one physician, one engineer, and other experts) should be appointed to review emerging research as it relates to our school and town.

As we await conclusive answers, we need to learn all we can about the EMF issue, and to do all we can to diminish this potentially significant health issue.

NOTE

The Works Cited section for the preceding report appears on pages 700 and 701. Simoneau uses MLA documentation style.

Supplements

Submit your completed report with these supporting documents, in this order:

- title page
- letter of transmittal
- table of contents
- list of tables and figures
- abstract
- report text (introduction, body, conclusion)
- glossary (as needed)
- appendices (as needed)

• Works Cited page (or alphabetical or numbered list of references)

For discussion and examples of the above items, see Chapter

A SITUATION REQUIRING AN ANALYTICAL REPORT

The report in Figure 24.4, patterned after the model outline, combines a feasibility analysis with a comparative analysis. The Situation

Richard Larkin, author of the following report, has a workstudy job fifteen hours weekly in his school's placement office. His boss, John Fitton (placement director), likes to keep up with trends in various fields. Larkin, an engineering major, has developed an interest in technical marketing and sales. Needing a report topic for his writing course, Larkin offers to analyze the feasibility of a technical marketing and sales career, both for his own decision making and for technical and science graduates in general. Fitton accepts Larkin's offer, looking forward to having the final report in his reference file for use by students choosing careers. Larkin wants his report to be useful in three ways: (1) to satisfy a course requirement, (2) to help him in choosing his own career, and (3) to help other students with their career choices.

With his topic approved, Larkin begins gathering his primary data, using interviews, letters of inquiry, telephone inquiries, and lecture notes. He supplements these primary sources with articles in recent publications. He will document his findings in APA (author-date) style.

As a guide for designing his final report, Larkin completes the following audience and use profile (based on the worksheet on page 36).

Audience and Use Profile for a Formal Report

Audience Identity and Needs

My primary audience consists of John Fitton, Placement Director, and the students who will refer to my report. The secondary audience is my writing instructor.

Because he is familiar with the marketing field, Fitton will need very little background to understand my report. Many student readers, however, will have questions like these:

- What, exactly, is technical marketing and sales?
- What are the requirements for this career?
- What are the pros and cons of this career?
- Could this be the right career for me?
- How do I enter the field?

Attitude and Personality

Readers likely to be affected by this document are students making career choices. I expect readers' attitudes will vary:

- Some readers should have a good deal of interest, especially those seeking a people-oriented career.
- Others might be only casually interested as they investigate a range of possible careers.
- Some readers might be skeptical about something written by a fellow student instead of by some expert. To connect with all these people, I need to persuade them that my conclusions are based on reliable information and careful reasoning.

Expectations about the Document

All readers expect me to spell things out, but to be concise. Visuals will help compress and emphasize material throughout.

Essential information will include an expanded definition of technical marketing and sales, the skills and attitudes needed for success, the career's advantages and drawbacks, and a description of various paths for entering the career.

This report combines feasibility and comparative analysis, so I'll want to structure the report to reveal a clear line of reasoning; in the feasibility section, reasons for and reasons against; in the comparison section, a block structure and a table that compares the four entry paths point by point. The report will close with recommendations based solidly on my conclusions.

For various readers who might not wish to read the entire report, I will include an informative abstract. _

NOTE

This report's front matter (title page, information abstract, and so on) and end matter are shown and discussed in Chapter 25 and on page 713.

EXERCISE

Prepare an analytical report, using these guidelines:

- a. Choose a subject for analysis from the list at the end of this exercise, from your major, or from a subject of interest.
- b. Identify the problem or question so that you will know exactly what you are looking for.
- c. Restate the main question as a declarative sentence in your statement of purpose.
- d. Identify an audience—other than your instructor—who will use your information for a specific purpose.
- e. Hold a private brainstorming session to generate major topics and subtopics.
- f. Use the topics to make an outline based on the model outline in this chapter. Divide as far as necessary to identify all points of discussion.
- g. Make a tentative list of all sources (primary and secondary) that you will investigate. Verify that adequate sources are available.
- In a proposal memo to your instructor, describe the problem or question and your plan for analysis. Attach a tentative bibli-ography.

- i. Use your working outline as a guide to research and observation. Evaluate sources and evidence, and interpret all evidence fully. Modify your outline as needed.
- j. Submit a progress report to your instructor describing work completed, problems encountered, and work remaining.
- k. Compose an audience and use profile. (Use the sample on page 000 as a model, along with the profile worksheet on page 68.)
- 1. Write the report for your stated audience. Work from a clear statement of purpose, and be sure that your reasoning is shown clearly. Verify that your evidence, conclusions, and recommendations are consistent. Be especially careful that your recommendations observe the critical-thinking guidelines in Figure 24.3.
- m. After writing your first draft, make any needed changes in the outline and revise your report according to the revision checklist. Include all necessary supplements.
- n. Exchange reports with a classmate for further suggestions for revision.
- o. Prepare an oral report of your findings for the class as a whole.

Base your analysis on a question similar to these:

- What has and hasn't been done to protect a nearby port, nuclear plant, or chemical plant from sabotage or attack?
- How adequate is your area's evacuation plan?
- How can local hospitals reduce medical errors?
- Who are the biggest polluters in your area, and what can be done?
- How should your state deal with discarded computers and other ewaste?
- What can local schools do to stem the obesity epidemic?
- Is mass smallpox vaccination a good idea?
- How safe is our food supply, and what can be done to protect it?
- How should we deal with the Mad-Cow threat?
- Which gender is the more competitive, and what could this difference mean in the workplace?
- How will digital convergence change our work and our world?
- Which diets should be avoided, and why?
- How can future skyscrapers be made safer?
- can wind power be profitable?
- Are efforts to deflect incoming asteroids worth the cost?
- Stem cell research: What progress has been made so far? Prospects?
- Can nuclear power plants be dismantled safely?
- What are the unintended consequences of banning DDT, or some other major policy decision?
- What are pros and cons of distance learning?
- Are treatments such as homeopathy or acupuncture feasible alternatives to traditional medicine?
- Are irradiated or genetically modified foods safe?
- What are the pros and cons of legalizing gambling in your state?
- Which should you buy: condominium or house?
- Should you move to a different part of the country or the world?
- How have budget cuts affected your public schools?
- Is police protection adequate in your area?
- How should people prepare for long-term job prospects in your field?
- In which fields are women paid less than men? Why?
- What are pros and cons of home birth (vs. hospital delivery).
- How can tourism be promoted in your area?
- Should you work before graduate school?

COLLABORATIVE PROJECTS

- 1. Divide into small groups. Choose a topic for group analysis—preferably, a campus issue—and brainstorm. Draw up a working outline that could be used as an analytical report on this subject.
- Prepare a questionnaire based on your work above, and administer it to members of your campus community. Report the findings of your questionnaire and your conclusions and recommendations. (Review pages 154–61, on questionnaires and surveys.)

What readers of an analytical report want to know

A typical analytical problem

Recommendations have legal and ethical implications

Using analysis on the job

Identify the problem

Examine possible causes

Recommend solutions

Identify the criteria

Rank the criteria

Compare items according to the criteria, and recommend the best one

24.1

For model feasibility studies visit

<www.ablongman.com/

lannonweb>

Consider the strength of supporting reasons

Consider the strength of opposing reasons

Weigh the pros and cons and recommend a course of action

Define your goal

Goal statement

Decide how much is enough

Excessive information hampers decision making

When you might consult an abstract or summary instead of the complete work

Give readers all they need to make an informed judgment

FIGURE 24.1 A Summary Description of a Feasibility Study. Notice that the criteria for assessing feasibility include passenger wait times, passenger receptiveness to screening, and—most important—effectiveness of screening equipment in this environment.

Source: Transportation Security Administration. Press Release.

Explain the significance of your data

Explain the meaning of your evidence

Evaluate and interpret evidence impartially

Use visuals generously

Be clear about what the audience should think and do

Offer a final judgment

FIGURE 24.2 A Simple but Richly Informative Visual. The visual and caption alone capsulize the troubling implications revealed by the lengthy analysis described in the article.

Source: Grossman, Daniel, "Spring Forward." Scientific American Jan. 2004: 85-91.

Tell what should be done

FIGURE 24.3 How to Think Critically About Your Recommendations

Source: Adapted from The Art of Thinking, 5th ed. Vincent R. Ruggiero, copyright © 1998. Reprinted by permission of Pearson Education, Inc.

Assess your analysis continuously

Things that might go wrong with your analysis

24.2

For more model

reports visit

<www.ablongman.com/lannonweb>

Definition and background of the problem

Description of the problem

Purpose and methods of this inquiry

Scope of this inquiry

Conclusions of the inquiry (briefly stated)

First topic

Definition

Findings

Interpretation

Interpretation

Definitions

Finding

Finding

Interpretation

Second topic

First subtopic

Definition

General findings

Detailed findings

Critique of findings

Detailed findings
Detailed findings

Interpretation

Second subtopic

General findings Detailed findings

Detailed findings

Detailed findings

Detailed findings

Interpretation

Third topic

First subtopic

Critiques of population studies

Responses to critiques

Critiques of lab studies

Responses to critiques

Second subtopic

Cost objections

Third subtopic

Conflicting scientific opinions

Interpretation

Fourth topic

Findings

Findings

Interpretation

Finding Fifth topic

First subtopic

Findings

Second subtopic Findings

Interpretation

Elements of a logical conclusion

Review of major findings

An overall judgment about what the findings mean

A feasible and realistic course of action

A closing call to action

Front matter precedes the report

End matter follows the

report

\$\rightarrow\$ CHECKLIST for Usability of Analytical Reports

For evaluating your research methods and reasoning, refer also to the checklist on page 194. (Numbers in parentheses refer to the first page of discussion.)

Content

- Does the report grow from a clear statement of purpose? (609)
- ② Is the report's length adequate and appropriate for the subject? (609)

- ♦ Are all limitations of the analysis clearly acknowledged? (614)
- ♦ Are visuals used whenever possible to aid communication? (612)
- Are all data accurate? (610)
- ♦ Are all data unbiased? (612)
- Are all data complete? (610)
- ♦ Are all data fully interpreted? (612)
- ♦ Is the documentation adequate, correct, and consistent? (685)
- ♦ Are the conclusions logically derived from accurate interpretation? (614)
- ② Do the recommendations constitute an appropriate response to the question or problem? (614)

Arrangement

- Ts there a distinct introduction, body, and conclusion? (616)
- Are headings appropriate and adequate? (356)
- ♦ Are there enough transitions between related ideas? (Appendix C)
- ♦ Is the report accompanied by all needed front matter? (628)
- ♦ Is the report accompanied by all needed end matter? (628)

Style and Page Design

- \$\psi\$ Is the level of technicality appropriate for the stated audience? (30)
- \$\Psi\$ Is the writing style throughout clear, concise, and fluent? (244)
- ♦ Is the language convincing and precise? (264)
- ♦ Is the report written in grammatical English? (Appendix C)
- Ts the page design inviting and accessible? (340)

FIGURE 24.4 An Analytical Report

GUIDELINES for Reasoning through an Analytical Problem

Audiences approach an analytical report with this basic question:

Is this analysis based on sound reasoning?

Whether your report documents a causal, comparative, or feasibility analysis (or some combination) you need to trace your line of reasoning so that readers can follow it clearly.

As you prepare your report, refer to the usability checklist on page 000 and observe the following guidelines:

For Causal Analysis

- 1. Be sure the cause fits the effect. Keep in mind that faulty causal reasoning is extremely common, especially when we ignore other possible causes or we confuse mere coincidence with causation.
- 2. Make the links between effect and cause clear. Identify the immediate cause (the one most closely related to the effect) as well as the distant cause(s) (the ones that precede the immediate cause). For example, the immediate cause of a particular airplane crash might be a fuel-tank explosion, caused by a short circuit in frayed wiring, caused by faulty design or poor quality

- control by the manufacturer. Discussing only the immediate cause often just scratches the surface of the problem.
- 3. Clearly distinguish between possible, probable, and definite causes. Unless the cause is obvious, limit your assertions by using *perhaps*, *probably*, *maybe*, *most likely*, *could*, *seems to*, *appears to*, or similar qualifiers that prevent you from making an insupportable claim.

For Comparative Analysis

- 1. Rest the comparison on clear and definite criteria: costs, uses, benefits/drawbacks, appearance, results. In evaluating the merits of competing items, identify your specific criteria and rank them in order of importance.
- 2. *Give each item balanced treatment*. Discuss points for each item in identical order.
- 3. Support and clarify the comparison or contrast through credible examples. Use research, if necessary, for examples that readers can visualize.
- 4. Follow either a block pattern or a point-by-point pattern. In the block pattern, first one item is discussed fully, then the next. Choose a block pattern when the overall picture is more important than the individual points.

In the point-by-point pattern, one point about both items is discussed, then the next point, and so on. Choose a point-by-point pattern when specific points might be hard to remember unless placed side by side.

Block pattern Point-by-point pattern

Item A first point of A/first point of B, etc.

first point

second point, etc.

Item B second point of A/second point of B, etc.

first point second point, etc.

- 5. Order your points for greatest emphasis. Try ordering your points from least to most important or dramatic or useful or reasonable. Placing the most striking point last emphasizes it best.
- 6. In an evaluative comparison ("X is better than Y"), offer your final judgment. Base your judgment squarely on the criteria presented.

For Feasibility Analysis

- 1. Consider the strength of supporting reasons. Choose the best reasons for supporting the action or decision being considered—based on solid evidence.
- 2. Consider the strength of opposing reasons. Remember that people usually see only what they want to see. Avoid the temptation to overlook or downplay opposing reasons, especially for an action or decision that you have been promoting. Consider alternate points of view and examine all the evidence.

3. Recommend a realistic course of action. After weighing all the pros and cons, make your recommendation—but be prepared to backtrack if you discover that what seemed like the right course of action turns out to be the wrong one.

24.3

Consider the cultural contexts of your analysis at <www.ablongman. com/lannonweb>

24.4 For more on usability testing visit
<www.ablongman.com/ lannonweb> For more exercises, visit <www.ablongman.com/lannon>