TENTH EDITION

The Structure of ARGUMENT

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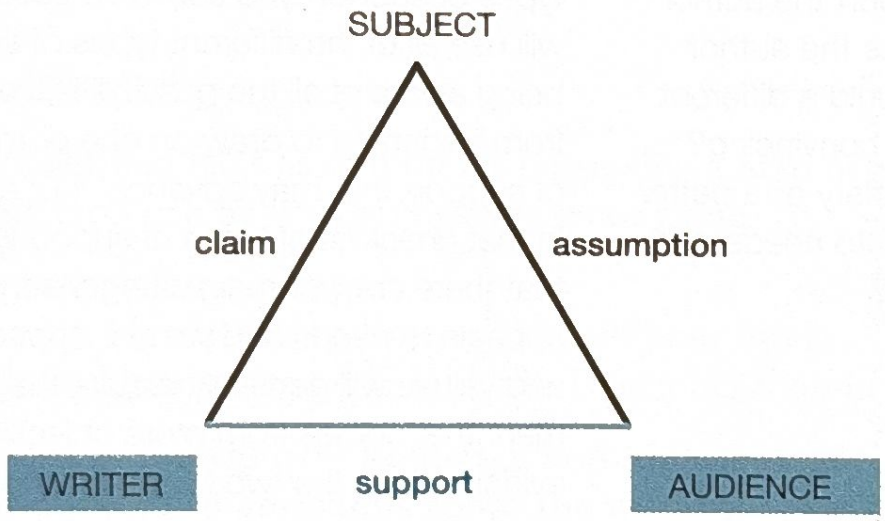
Support

CHAPTER 7

When you read or listen to a well-constructed argument, you should be aware of what the claim is. What you look for next is reasons to believe that claim. When you write your own arguments, you need to put yourself in the position of your readers or listeners and consider what reasons you can give them for accepting your claim. Support for a claim represents the answer to the question "What have you got to go on?"[1] All claims in an argument—whether of fact, of value, or of policy—must be supported. Sometimes an author will use his or her own experience as support for a claim. At other times, authors may conduct interviews, field research, lab experiments, or surveys to obtain support for their position. As a student, you will most likely turn primarily to print and electronic sources for your support. (See Chapter 13 for a full discussion of finding sources.)

The emphasis in providing support is on the relationship between writer and audience—the rhetorical leg of the communications triangle:



[1] Stephen Toulmin, *The Uses of Argument* (Cambridge: Cambridge University Press, 1958), 98.

You are presenting **evidence** to an audience in hopes of convincing that audience to see the subject in the same way you do. You may remember from the discussion of Aristotelian rhetoric in Chapter 5 that arguments rely on *ethos*, *logos*, and *pathos* for their effectiveness. You must present your evidence and yourself in such a way that your audience finds you trustworthy (*ethos*). You also have to consider what evidence your audience will find convincing—what examples, statistics, and opinions will appeal to them logically (*logos*). You are using emotional appeal (*pathos*) in conjunction with other types of appeal when you appeal to your audience's needs and values.

Strategies for Reading and Writing Support

READ: Support

- Consider what sort of audience the argument was addressed to. Does the author seem to be writing for a general audience, such as those who read a major newspaper, or for a more specialized audience that would already know the subject fairly well, such as those who would read a scholarly journal in a limited field? Does the author seem to be writing for those who already agree with the main claim, those who are hostile to it, or those somewhere in between?
- As you're reading, highlight or annotate the text to identify different types of support the author used. Consider whether the types the author chose are the most effective. Would a different type of support have been more convincing? Should there have been more variety or a better balance of evidence and appeals to needs and values to convince the audience?

WRITE: Support

- In deciding how much support you need for your claim, it is always a good idea to assume that you are addressing an audience that may be at least slightly hostile to that claim. Those who already agree with you do not need convincing.
- Keep a mental, if not a written, list of the different types of support you use in an essay. Few essays will use all of the different types of support, but being aware of all the possibilities will prevent you from forgetting to draw on one or more types of support that may advance your argument. In that checklist of types of support, don't forget that there are two main categories: evidence and appeals to needs and values. Appeals to needs and values will generally require the reinforcement that comes from more objective forms of evidence, but the two in combination can often provide the strongest case for your claim.

READ: Support

- Notice whether the author has correctly identified a source for any information that he or she did not have direct knowledge of or that is not common knowledge. Has the author established who the source is and that person's claim to authority on the subject under discussion? Putting a name in parenthesis after a quote or paraphrase, for example, does not establish that person's expertise on a subject unless the person is famous enough for his or her name to be instantly recognizable to the audience.

WRITE: Support

- Remember that you will usually need to give credit to your source(s) for information you use as support. See Chapter 15 for complete treatment of how to document sources.

Evidence

When authors provide evidence in support of their claim, they primarily use facts, examples, statistics, opinions (usually the opinions of experts), and images.

Factual Evidence

In Chapter 6, we defined facts as statements possessing a high degree of public acceptance. Some facts can be verified by experience alone.

- Eating too much will make us sick.
- We can get from Hopkinton to Boston in a half hour by car.
- In the Northern Hemisphere, it is colder in December than in July.

The experience of any individual is limited in both time and space, so we must accept as fact thousands of assertions about the world that we ourselves can never verify. Thus we accept the existence of black holes in space because we trust those who can verify their existence.

Facts can provide important support for a claim, as shown in the example here. The claim has been underlined.

> Nuclear energy has a wide-ranging value proposition. Nuclear energy
>
> - produces large amounts of electricity at industry-leading reliability and efficiency levels
> - is affordable and has forward price stability that will continue to fuel the nation's economy
> - provides more than half of all carbon-free electricity in the United States
> - maintains grid stability through nonstop operation of reactors
> - contributes to the fuel and technology diversity that is one of the bedrock characteristics of a reliable and resilient electric sector
> - is an economic driver through high-paying jobs and taxes in the communities and states where nuclear plants are located.[2]

Factual evidence appears most frequently as examples and statistics, which are a numerical form of examples.

Examples

Examples are the most familiar kind of factual evidence. In addition to providing support for the truth of a generalization, examples can enliven otherwise dense or monotonous prose. In the following paragraph, the writer supports the claim (underlined in the topic sentence) by offering a series of specific examples.

> You can hardly go anywhere these days and not see or hear an advertisement for college. Throughout Concourse B at Denver International Airport, nearly every other advertisement greeting passengers is for a higher-education institution: Colorado State University, the University of Wyoming, Colorado Mesa College, and the University of Northern Colorado. Airline magazines are filled with promotions for executive MBA programs. At least once an hour on the all-news radio station in Washington, D.C., listeners hear about the degree in cybersecurity offered by a University of Maryland campus. Sunday newspapers are filled with details on certificate programs in the latest hot job fields, such as social media and sustainability. Anyone checking email on Google will see ads pop up for the creative writing program at Southern New Hampshire University or the political management degree at George Washington University.[3]

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[2] "Nuclear Energy: Just the Facts," *Nuclear Energy Institute*, last modified September 2019, www.nei.org/CorporateSite/media/filefolder/resources/fact-sheets/just-the-facts-2019-09.pdf.

[3] Jeffrey J. Selingo, *College (Un)Bound: The Future of Higher Education and What It Means for Students* (New York: New Harvest, 2013), 6.

Hypothetical examples, which create imaginary situations for the audience and encourage them to visualize what might happen under certain circumstances, can also be effective. The following paragraph illustrates the use of hypothetical examples. (The author is describing megaschools—high schools with more than two thousand students—and her claim is underlined.)

> [I]n schools that big there is inevitably a critical mass of kids who are neither jocks nor artists nor even nerds, kids who are nothing at all, nonentities in their own lives. . . . The creditable ballplayer who might have made the team in a smaller school. . . . The artist who might have had work hung in a smaller school. . . . [T]he disaffected and depressed boy who might have found a niche, or a friend, or a teacher who noticed, falls between the cracks. Sometimes he quietly drops out. Sometimes he quietly passes through. And sometimes he comes to school with a gun.[4]

All claims about vague or abstract terms would be boring or unintelligible without examples to illuminate them. For example, if you claim that a movie contains "unusual sound effects," you will certainly have to describe some of the effects to convince the reader that your generalization can be trusted.

Statistics

Statistics express information in numbers. In the following example, statistics have been used to support the authors' claim, which has been underlined.

> To the kids growing up in a housing project on Chicago's south side, crack dealing was a glamour profession. For many of them, the job of gang boss—highly visible and highly lucrative—was easily the best job they thought they had access to. Had they grown up under different circumstances, they might have thought about becoming economists or writers. But in the neighborhood where J. T.'s gang operated, the path to a decent legitimate job was practically invisible. Fifty-six percent of the neighborhood's children lived below the poverty line (compared to a national average of 18 percent). Seventy-eight percent came from single-parent homes. Fewer than 5 percent of the neighborhood's adults had a college degree; barely one in three adult men worked at all. The neighborhood's median income was about $15,000 a year, well less than half the U.S. average. During the years that Venkatesh lived with J. T.'s gang, foot soldiers often asked his help in landing what they called "a good job": working as a janitor at the University of Chicago.[5]

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[4] Anna Quindlen, "The Problem of the Megaschool," *Newsweek*, March 26, 2001, 68.

[5] Steven D. Levitt and Stephen J. Dubner, *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything* (New York: William Morrow, 2005), 105.

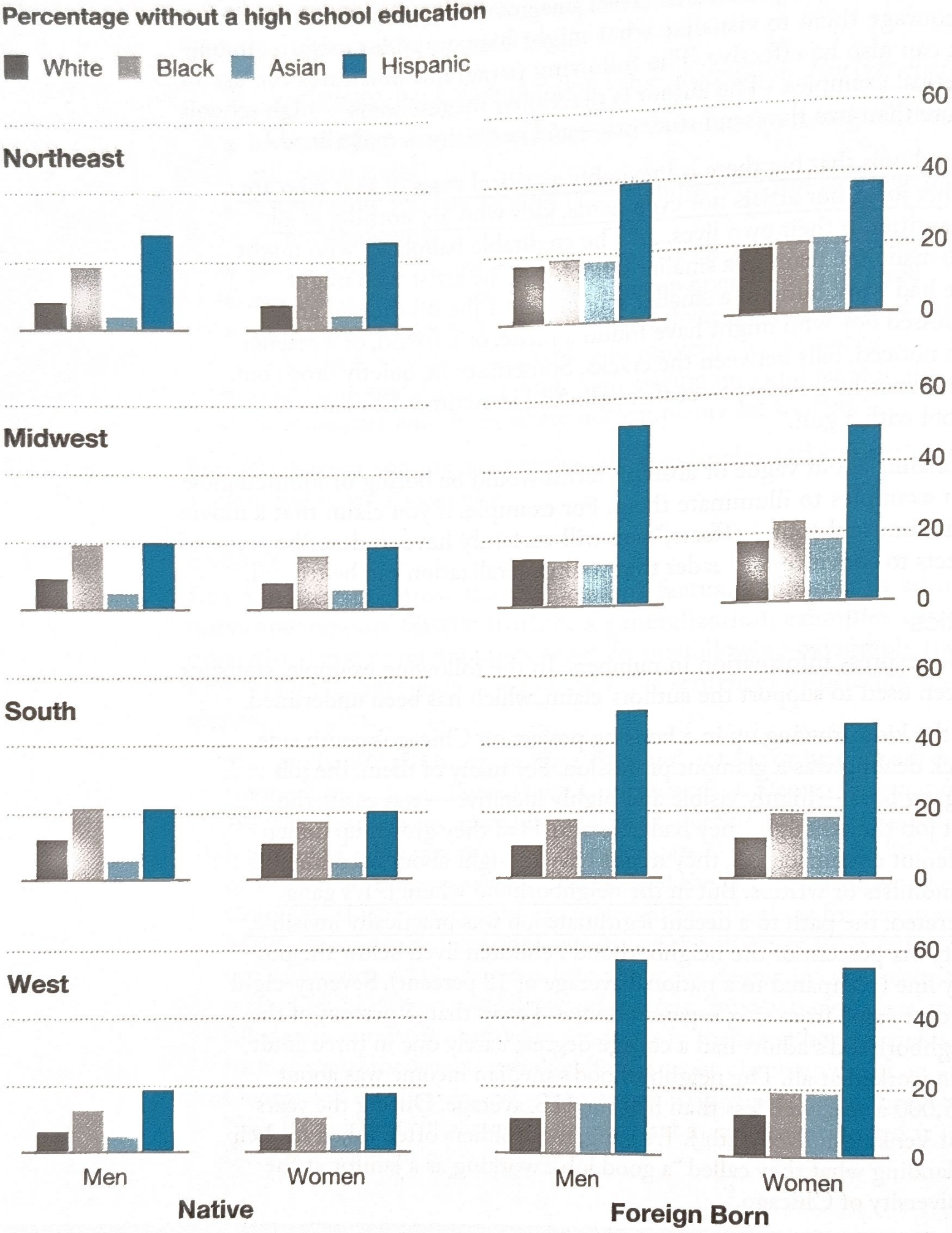

FIGURE 7.1 Without a High School Education. U.S. Census Bureau.
http://www.census.gov/dataviz/visualizations/035/

Statistics are more effective in comparisons that indicate whether a quantity is relatively large or small and sometimes even whether a reader should interpret the result as gratifying or disappointing. For example, if a novice gambler were told that for every dollar wagered in a state lottery, 50 percent goes back to the players as prizes, would the gambler be able to conclude that the percentage is high or low? Would he be able to choose between playing the state lottery and playing a casino game? Unless he had more information, probably not. But if he were informed that in casino games, the return to the players is over 90 percent and in slot machines and racetracks the return is around 80 percent, the comparison would enable him to evaluate the meaning of the 50 percent return in the state lottery and even to make a decision about where to gamble his money.[6]

Comparative statistics are also useful for measurements over time. For instance, the following statistics show what comparisons based on BMI, or body mass index, reveal about how Miss America contestants have changed over the years.

> Miss America contestants have become increasingly thinner over the past 75 years. In the 1920s, contestants had BMIs in the normal range of 20–25. . . . Since 1970, nearly all of the winners have had BMIs below the healthy range, with some as low as 16.9, a BMI that would meet part of the diagnostic criteria for anorexia nervosa.[7]

Diagrams, tables, charts, and graphs can make clear the relations among many sets of numbers. Such charts and diagrams enable readers to grasp the information more easily than if it were presented in paragraph form. For example, Figure 7.1 shows bar graphs used by the Census Bureau to explore the issue of high school education attainment among selected groups. Figure 7.2 (p. 198) is a graphic compiled by the Congressional Budget Office to show the 2018 U.S. Federal Budget.

Images

Evidence does not always have to be verbal. Images can also provide support for an argument. Before there were photographs, paintings and even crude cave drawings provided evidence of the cultures that produced them. A man named Mathew Brady captured the reality of war through his photos of the Civil War and thus earned the title the Father of Photojournalism. Crime scene photos and video surveillance tapes provide evidence on screen and in real life. In April 2013, the Boston Marathon bombers were identified through photos from more than one source, some of them first circulated via reddit.com and Facebook.

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[6] Curt Suphee, "Lotto Baloney," *Harper's,* July 1983, 201.

[7] S. Rubenstein and B. Caballero, "Is Miss America an Undernourished Role Model?" in *JAMA,* 1569, (2000): 1569, quoted in Jillian Croll, "Body Image and Adolescents," *Guidelines for Adolescent Nutrition Services,* ed. J. Stang and M. Story (2005), June 9, 2007. http://www.epi.umn.edu/let/pubs/adol_book.shtm.

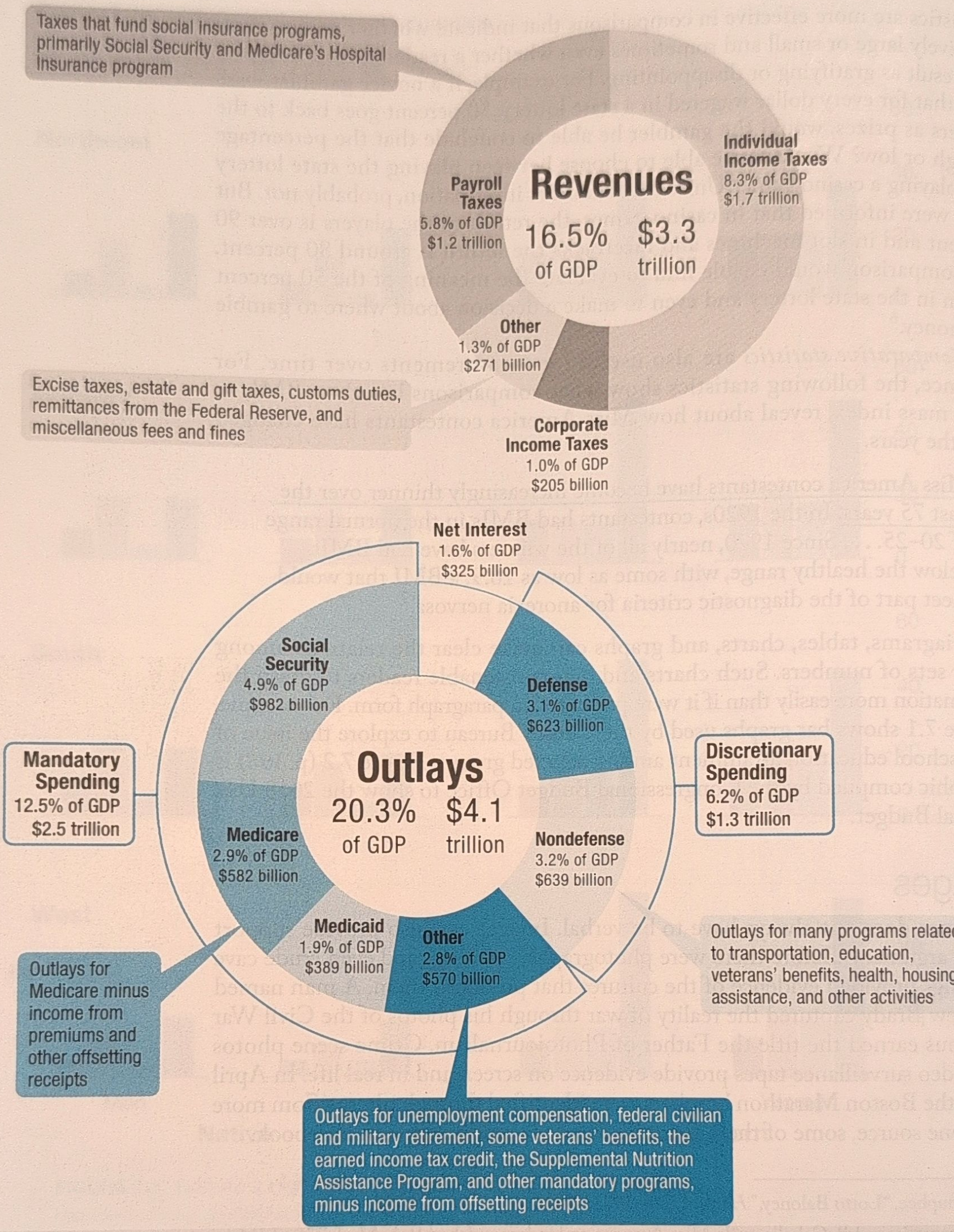

FIGURE 7.2 The U.S. Federal Budget. U.S. Congressional Budget Office

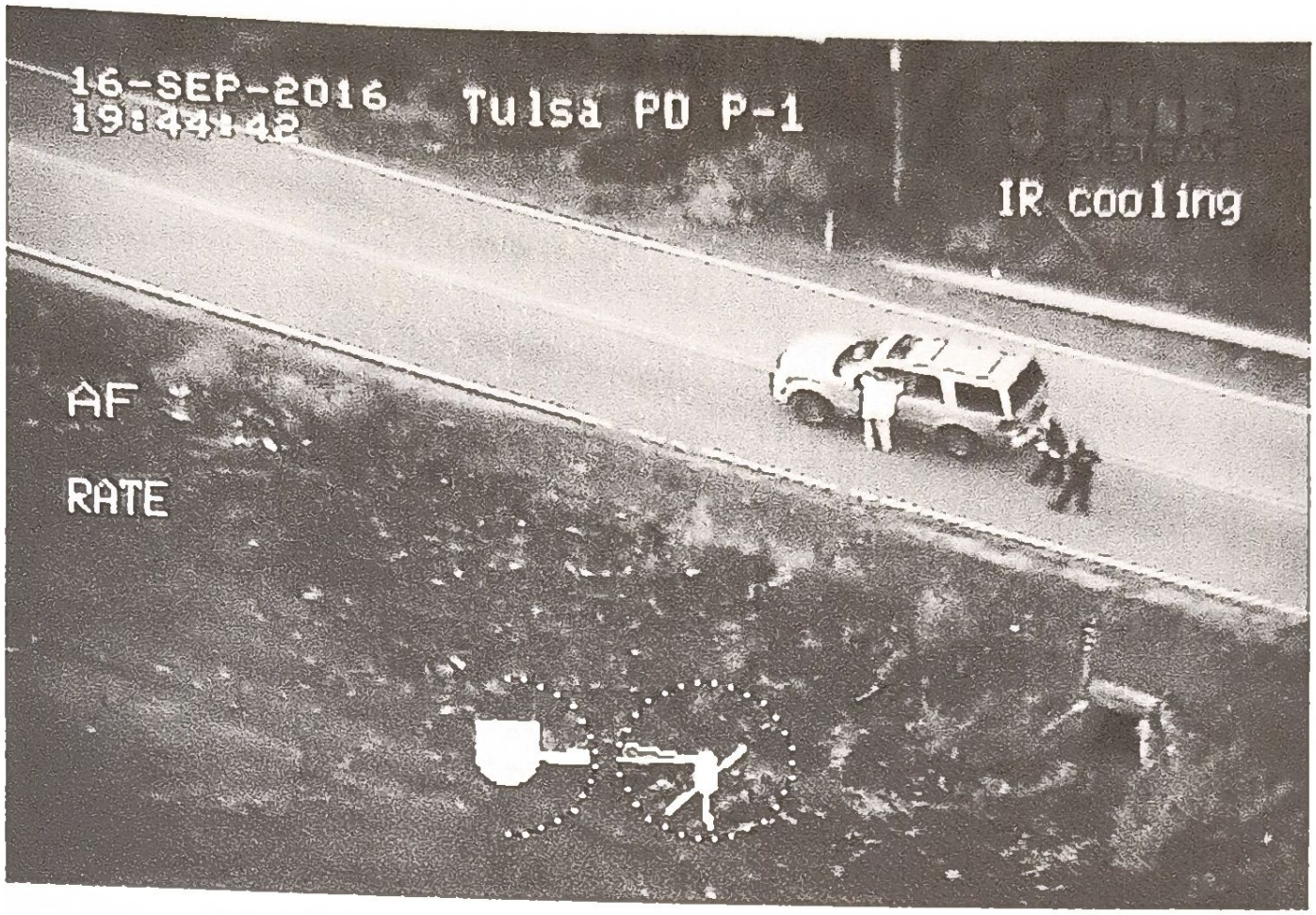

FIGURE 7.3 A police shooting. Tulsa Police Department via AP

Figure 7.3 is from a police video taken from a helicopter by the Tulsa Police Department on September 16, 2016. Terence Crutcher, left, held his arms up as he walked next to his stalled SUV before he was shot and killed by one of the police officers. The video has brought into question whether the officer was justified. Videos such as the one this still is taken from and those taken routinely now by dash-cams can provide critical support in such a situation.

Images are also critical as evidence in scientific research. Proof of a hypothesis often takes the form of plants and animals viewed in the wild or in the lab, of cells viewed through a microscope, or of distant objects viewed through a telescope. The photo shown in Figure 7.4 was released by NASA in December 2013, as possible evidence of liquid water active on Mars.

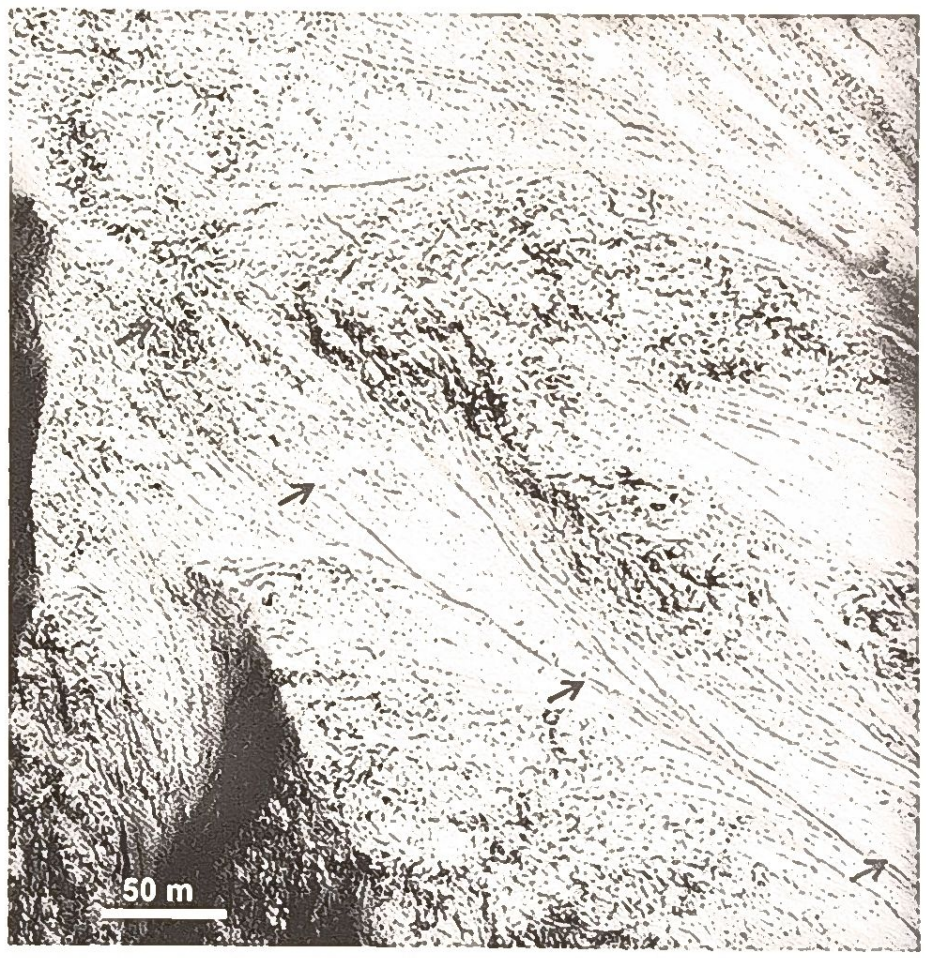

FIGURE 7.4 Martian surface. NASA/JPL-Caltech/University of Arizona

RESEARCH SKILL Evaluating Factual Evidence

Before you begin to write, you must determine whether the evidence you have chosen to support your claim is sound. Can it convince your readers?

- **Are the facts up to date?** The importance of up-to-date information depends on the subject. For many of the subjects you write about, recent research and scholarship will be important, even decisive, in proving the soundness of your data. "New" does not always mean "best," but in fields where research is ongoing — education, psychology, technology, medicine, and all the natural and physical sciences — you should be sensitive to the dates of the research.
- **Is the factual evidence sufficient?** The amount of factual evidence you need depends on the complexity of the subject and the length of your paper. Given the relative brevity of most of your assignments, you will need to be selective. For the claim that indoor pollution is a serious problem, one supporting fact would obviously not be enough. For a 750- to 1,000-word paper, three or four supporting facts would probably be sufficient. The choice of evidence should reflect different aspects of the problem: in this case, different sources of indoor pollution — gas stoves, fireplaces, kerosene heaters, insulation — and the consequences for health.
- **Are the facts relevant?** All the factual evidence should, of course, contribute to the development of your argument. Also keep in mind that not all readers will agree on what is relevant. Is the unsavory private life of a politician relevant to his or her performance in office? If you want to prove that a politician is unfit to serve because of his or her private activities, you may first have to convince some members of the audience that private activities are relevant to public service.

Examples

- **Are the examples representative?** This question emphasizes your responsibility to choose examples that are typical of all the examples you do not use. If you were trying to build a case about the economic impact of illegal immigrants in the United States but took your statistics from Maine, Vermont, Montana, North Dakota, and West Virginia, your sample would not be representative because these states have the smallest numbers of illegal immigrants, estimated to be less than 0.5 percent of the population for each of the five states.
- **Are the examples consistent with the experience of the audience?** The members of your audience use their own experiences to judge the soundness of your evidence. If your examples are unfamiliar or extreme, they will probably reject your conclusion. If most members of the audience find that your examples don't reflect their own attitudes, they may question the validity of the claim.

Statistics

- **Do the statistics come from trustworthy sources?** You should ask whether the reporter of the statistics is qualified and likely to be free of bias. Among the generally reliable sources are polling organizations such as Gallup, Roper, and Louis Harris and agencies of the U.S. government such as the Census Bureau and the Bureau of Labor Statistics. Other qualified sources are well-known research foundations, university centers, and insurance companies that prepare actuarial tables.
- **Are the terms clearly defined?** The more abstract or controversial the term, the greater the necessity for clear definition. *Unemployment* is an example of a term for which statistics will be difficult to read if the definition varies from

one user to another. For example, are seasonal workers employed or unemployed during the off-season? Are part-time workers employed?

- **Are the comparisons between comparable things?** Folk wisdom warns us that we cannot compare apples and oranges. Population statistics for the world's largest city, for example, should indicate the units being compared. Greater London is defined in one way, greater New York in another, and greater Tokyo in still another. The population numbers will mean little unless you can be sure that the same geographical units are being compared.
- **Has any significant information been omitted?** Consider an example: A company called Lifestyle Lift has advertised a procedure as a revolutionary approach to facial rejuvenation. What the website does not mention is that as a result of a probe in Florida, the company was ordered by Florida's attorney general in June 2013 to stop calling its procedures revolutionary and that a similar probe in New York "found evidence that company employees were posing as satisfied customers." Florida's attorney general ordered the company to make clear whether its satisfied customers were compensated for their testimonials. The Lifestyle Lift company still advertises its procedures as groundbreaking in spite of the fact that they are tried and true plastic surgery methods done with local instead of general anesthesia.

Images

- **Is the image relevant?** The photograph or other image should advance your argument. If it doesn't, it is not effective support. If it does, it must deserve the trust put in it as legitimate support. In the 2012 movie *Promised Land*, unscrupulous businessmen posing as environmental activists try to prove that fracking is killing livestock in the surrounding area by showing the locals a photograph of dead cows. They lose local support, however, when a closer look at the photo reveals that it was taken in a completely different part of the country.
- **Are you confident the photograph has not been altered?** It is so easy these days to photoshop or otherwise alter images that we can hardly trust what our eyes tell us.
- **Does the image depend too much on emotional appeal?** Emotional appeal is a legitimate form of appeal if it complements, instead of replaces, logic. We have all seen pictures of starving children and abused animals used to move us to donate money to alleviate their suffering. That is a legitimate use of emotional appeal as long as the money really goes to help the suffering children or animals. A little research can reveal what percentage of money donated to a given charity actually reaches those in need.

Expert Opinion

Based on their reading of the facts, experts express opinions on a variety of controversial subjects: whether capital punishment is a deterrent to crime; whether legalization of marijuana will lead to an increase in its use; whether children, if left untaught, will grow up honest and cooperative; whether sex education courses will result in less sexual activity and fewer illegitimate births. The interpretations of the data are often profoundly important because they influence social policy and affect our lives directly and indirectly.

For the problems mentioned above, the opinions of people recognized as authorities are more reliable than those of people who have neither thought about nor done research on the subject. But opinions may also be offered by student

writers in areas in which they are knowledgeable. If you were asked, for example, to defend or refute the statement that work has advantages for teenagers, you could call on your own experience and that of your friends to support your claim. You can also draw on your experience to write convincingly about your special interests.

One opinion, however, is not always as good as another. The value of any opinion depends on the quality of the evidence and the trustworthiness of the person offering it. Clayton M. Christensen and Henry J. Eyring are both experts on the subject of education. Christensen held a named professorship in Business Administration at the Harvard Business School, and Eyring has been director of Brigham Young University's MBA program and is currently the president of BYU–Idaho. In spite of their own credentials, when they wrote their book *The Innovative University: Changing the DNA of Higher Education from the Inside Out* (2011), they were careful to establish the expertise of those whose ideas they drew upon:

> No one could doubt that U.S. Education Secretary Margaret Spellings meant business. In upbraiding the nation's universities and colleges, the 2006 report of her commission on the future of higher education used the language of business:
>
> > What we have learned over the last year makes clear that American higher education has become what, in the business world, would be called a mature enterprise: increasingly risk-averse, at times self-satisfied, and unduly expensive. It is an enterprise that has yet to successfully confront the impact of globalization, rapidly evolving technologies, an increasingly diverse and aging population, and an evolving marketplace characterized by new needs and paradigms. . . .
>
> The Spellings Commission was not a lone voice of criticism in 2006. That same year two distinguished academics, Derek Bok and Harry Lewis, both of Harvard, published books critical of higher education.[8]

What happens when authoritative sources disagree? Such disagreement is probably most common in the social sciences. They are called the "soft" sciences precisely because a consensus about conclusions in these areas is more difficult to reach than in the natural and physical sciences. The following two paragraphs show experts disagreeing over the reason for rises in college tuition costs.

> Suppose we asked the president of a public university to explain what he or she sees. Very likely that president would point out the fact that tuition and fees tend to rise very rapidly after decreases in growth in the overall economy. Your attention would be drawn to the rapid tuition increases following the episodes of negative GDP growth in 1982 and 1991 and the very slow GDP growth in 2001. Even the decade of falling tuition in the 1970s was interrupted by the oil shock years around 1974.

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[8] Clayton M. Christensen and Henry J. Eyring, *The Innovative University: Changing the DNA of Higher Education from the Inside Out* (Hoboken, NJ: Jossie-Bass, 2011), 4–5.

> The university president would say something like this: "When the overall economy slows down, state tax collections fall, and states cut appropriations for universities. As a result public universities have to resort to large tuition increases to make up for lost public funding."
>
> If we asked Representatives Boehner and McKeon to comment on the data, they would focus on an entirely different phenomenon. In *The College Cost Crisis* they say "the facts show tuition increases have persisted regardless of the circumstances such as the economy or state funding, and have far outpaced inflation year after year, regardless of whether the economy has been stumbling or thriving." Essentially, they are looking at the fact that after 1980 the "real" growth in college tuition and fees always has been positive. This means that tuition and fees always have grown more rapidly than the CPI (Consumer Price Index). Representatives Boehner and McKeon also claim they know why this has happened. They place the blame squarely on "wasteful spending by college and university management."[9]

But even in the natural and physical sciences, where the results of observation and experiment are more conclusive, we encounter heated differences of opinion. A popular argument concerns the extinction of the dinosaurs. Was it the effect of an asteroid striking the earth? or widespread volcanic activity? or a cooling of the planet? All these theories have their champions among the experts. A debate of more immediate relevance concerns the possible dangers of genetically modified foods, as distinguished from foods modified by traditional breeding practices. Jeffrey M. Smith, director of the Institute for Responsible Technology and author of *Seeds of Deception: Exposing Industry and Government Lies about the Safety of the Genetically Engineered Foods You're Eating* (2003) and *Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods* (2007), presents a different perspective on the issue:

> In addition to unintended changes in the DNA, there are health risks from other aspects of GM crops. When a transgene starts to function in the new cell, for example, it may produce proteins that are different from the one intended. The amino acid sequence may be wrong, the protein's shape may be different, and molecular attachments may make the protein harmful. The fact that proteins act differently in new plant environments was made painfully clear to developers of GM peas in Australia. They cancelled their ten-year, $2 million project after their GM protein, supposedly identical to the harmless natural version, caused inflammatory responses in mice. Subtle, unpredicted changes in molecular attachments might have similarly triggered deadly allergic reactions in people if the peas were put on the market.[10]

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[9] Robert B. Archibald and David H. Feldman, *Why Does College Cost So Much?* (New York: Oxford, 2010), 9.

[10] Jeffrey M. Smith, *Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods* (St. Louis: Yes!, 2007).

In 2000, at a hearing before the U.S. Senate Committee on Foreign Relations, Subcommittee on International Economic Policy, Export and Trade Promotion, Roger N. Beachy made the following statement. Beachy produced the world's first genetically modified tomato and in 2009–2011 was President Obama's director of the National Institute for Food and Agriculture.

> Agricultural producers in the U.S. have a growing awareness of their duties as keepers of the environment; many are actively reducing the use of harmful agrichemicals while maintaining highly efficient production of safe foods. Plant scientists and agriculturists have developed better crops and improved production methods that have enabled farmers to reduce the use of insecticides and chemicals that control certain diseases. Methods such as integrated pest management, no-till or low-till agriculture have been tremendously important in this regard. Some of the success has come through the judicious application of biotechnology to develop new varieties of crops that resist insects and that tolerate certain herbicides. For example, biotechnology was used to develop varieties of cotton and corn that are resistant to attack by cotton bollworm and corn borer. These varieties have allowed farmers to reduce the use of chemical insecticides by between 1.5 and 2 million gallons, while retaining or increasing crop yields. Crops that are tolerant to certain "friendly" herbicides have increased no-till and low-till agriculture, reducing soil erosion and building valuable topsoil to ensure the continued productivity of our valuable agricultural lands.[11]

How can you choose between authorities who disagree? If you have applied the tests discussed so far and discovered that one source is less qualified by training and experience or makes claims with little support or appears to be biased in favor of one interpretation, you will have no difficulty in rejecting that person's opinion. If conflicting sources prove to be equally reliable in all respects, then you should continue reading other authorities to determine whether a greater number of experts support one opinion rather than another. Although numbers alone, even of experts, don't guarantee the truth, nonexperts have little choice but to accept the authority of the greater number until evidence to the contrary is forthcoming. Finally, if you are unable to decide between competing sources of evidence, you may conclude that the argument must remain unsettled. Such an admission is not a failure; after all, such questions are considered controversial because even the experts cannot agree, and such questions are often the most interesting to consider and argue about. In some cases, you may be able to synthesize or combine the authorities' ideas into a new idea that you state as a claim, then bring together the differing perspectives as support.

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[11] "World Renowned Plant Scientist Dr. Roger N. Beachy Testifies before U.S. Senate Committee to Explain the Role of Agricultural Biotechnology in the Battle against Poverty and Hunger in Developing Countries," *agbioworld.org*, July 12, 2000.

RESEARCH SKILL

Evaluating Expert Opinion

Before you begin to write, you must determine whether the expert opinion you have chosen to support your claim is convincing.

- **Is the source of the opinion qualified to give an opinion on the subject?** Certain achievements by the interpreter of the data — publications, acceptance by colleagues — can tell us something about his or her competence. The answers to questions you must ask are not hard to find: Is the source qualified by education? Is the source associated with a reputable institution — a university or a research organization? Is the source credited with having made contributions to the field — books, articles, research studies? If the source is not clearly identified, you should treat the data with caution.

  In addition, you should question the identity of any source listed as "spokesperson" or "reliable source" or "an unidentified authority." Even when the identification is clear and genuine, you should ask if the credentials are relevant to the field in which the authority claims expertise. All citizens have the right to express their views, but this does not mean that all views are equally credible or worthy of attention.
- **Is the source biased for or against his or her interpretation?** Even authorities who satisfy the criteria for expertise may be guilty of bias. Bias arises as a result of economic reward, religious affiliation, political loyalty, and other interests. The expert may not be aware of the bias; even an expert can fall into the trap of ignoring evidence that contradicts his or her own intellectual preferences. Before accepting the interpretation of an expert, you should ask: Is there some reason why I should suspect the motives of this particular source?

  This is not to say that all partisan claims lack support. They may, in fact, be based on the best available support. But whenever special interest is apparent, there is always the danger that an argument will reflect this bias.
- **Has the source bolstered the claim with sufficient and appropriate evidence?** An author might claim, "Statistics show that watching violence on television leads to violent behavior in children." But if the author gave no further information — neither statistics nor proof that a cause-effect relation exists between televised violence and violence in children — the critical reader would ask, "What are the numbers? Who compiled them?"

  Even those who are reputed to be experts on the subjects they discuss must do more than simply allege that a claim is valid or that the data exist. They must provide facts to support their interpretations.

ARGUMENT ESSENTIALS

Evidence

- Evidence can take the form of facts, or statements possessing a high degree of public acceptance.
- Evidence can take the form of examples, which provide specific support for a generalization and enliven prose.
- Evidence can take the form of statistics, or information expressed in numbers.
- Evidence can take the form of images, or nonverbal support for an assertion.
- Evidence can take the form of expert opinion, or the interpretations of facts by people recognized as authorities on or at least knowledgeable about the subject.

READING ARGUMENT

Seeing Evidence

The following student essay on organic food has been annotated to highlight the use of evidence. At the time she wrote this essay, Kristen Weinacker was an undergraduate at Clemson University.

"Safer? Tastier? More Nutritious?" The Dubious Merits of Organic Foods

KRISTEN WEINACKER

Kristen Weinacker
ENGL 203
Dr. Winchell
October 23, 2017

"Safer? Tastier? More Nutritious?" The Dubious Merits of Organic Foods

Causal connections

Organic foods are attractive to some consumers because of the principles behind them and the farming techniques used to produce them. There is a special respect for organic farmers who strive to maintain the ecological balance and harmony that exist among living things. As these farmers work in partnership with nature, some consumers too feel a certain attachment to the earth (Wolf 1–2). They feel happier knowing that these foods are produced without chemical fertilizers, pesticides, and additives to extend their shelf life (Pickrell; Agricultural Extension Service 5). They feel that they have returned to nature by eating organic foods that are advertised as being healthy for maintaining a vigorous lifestyle. Unfortunately, research has not provided statistical evidence that organic foods are more nutritious than conventionally grown ones.

Claim of fact

The debate over the nutritional benefits has raged for decades. Defenders of the nutritional value of organic foods have employed excellent marketing and sales strategies. First, they freely share the philosophy behind their farming and follow up with detailed descriptions of

their management techniques. Second, organic farmers skillfully appeal to our common sense. It seems reasonable to believe that organic foods are more nutritious since they are grown without chemical fertilizers and pesticides. Third, since the soil in which these crops are grown is so rich and healthy, it seems plausible that these crops have absorbed and developed better nutrients. As Lynda Brown asserts in her book *Living Organic,* "Organic farmers believe that growing crops organically provides the best possible way to produce healthy food" (26). Brown provides beautifully illustrated and enlarged microscopic photographs to show the more developed structure of organic foods compared to conventional products to convince the consumer to believe that organic foods are more nutritious (27). Fourth, many consumers view the higher price tags on organic foods and assume that they must be more nutritious. Generalizations permeate the whole world of organic foods. These marketing strategies persuade the consumer that organic foods are healthier than conventional foods without providing any factual comparisons.

Expert opinion

Causal connection: Consumers believe organic foods are healthier because of these marketing strategies.

In their book *Is Our Food Safe?* Warren Leon and Caroline Smith DeWaal compare organic and conventionally produced foods. They strongly suggest that consumers buy organic foods to help the environment (68). They believe that organic foods are healthier than conventional ones. However, statistics supporting this belief are not provided. The authors even warn consumers that they need to read product labels because some organic foods may be as unhealthy as conventional ones (68–69). An interesting poll involving 1,041 adults was conducted by ABC News asking, "Why do people buy organic?" Analyst Daniel Merkle concluded that 45 percent of the American public *believes* that organic products are more nutritious than conventionally grown ones. Also, 57 percent of the population maintains that organic farming is beneficial for the environment. According to the pollsters, the primary reason why people bought organic foods is the belief that they are healthier because they have less pesticide residue. However, there has never been any link established between the nutritional value of organic foods and the residue found on them. Clever marketing strategies have made the need for concrete data really not of prime importance for the consumer to join the bandwagon promoting organic foods.

Expert opinion

Statistics

This pervasive belief among the American public that organic foods are probably healthier than conventionally grown foods was

Expert opinion

Suspected causal connections, but not supported by statistical evidence

Expert opinion

Causal connections cannot be drawn.

Another expert opinion that causal connections cannot be drawn

reiterated in my telephone interview with Mr. Joseph Williamson, an agricultural county extension agent working with Clemson University. When asked if organically grown foods are more nutritious than those grown conventionally, he replied that they probably were for two reasons. First, organic crops tend to grow more slowly. Therefore, the nutrients have more time to build up in the plants. Second, organic plants are usually grown locally. The fruits and vegetables are allowed to stay on the plants for a longer period of time. They ripen more than those picked green and transported across miles. He contends that these conditions promote a better nutrient buildup. Unfortunately, the extension agent acknowledges that statistical evidence is not available to support the claim that organic products are more nutritious.

An article entitled "Effect of Agricultural Methods in Nutritional Quality: A Comparison of Organic with Conventional Crops" reports on conclusions drawn by Dr. Virginia Worthington, a certified nutrition specialist. Worthington examines why it is so difficult to ascertain if organic foods are more nutritious. First, "the difference in terms of health effects is not large enough to be readily apparent." There is no concrete evidence that people are healthier eating organic foods or, conversely, that people become more ill eating conventionally grown produce. Second, Dr. Worthington notes that variables such as sunlight, temperature, and amount of rain are so inconsistent that the nutrients in crops vary yearly. Third, she points out that the nutrient value of products can be changed by the way products are stored and shipped. After reviewing at least thirty studies dealing with the question if organic foods are more nutritious than conventionally grown ones, Dr. Worthington concludes that there is too little data available to substantiate the claim of higher nutritional value in organic foods. She also believes that it is an impossible task to make a direct connection between organic foods and the health of those people who consume them.

After being asked for thirty years about organic foods by her readers and associates, Joan Dye Gussow, writer for *Eating Well* magazine, firmly concludes that there is "little hard proof that organically grown produce is reliably more nutritious." Reviewing seventy years' worth of studies on the subject, Gussow has no doubt that organic foods should be healthier because of the way

they are produced and cultivated. Gussow brings up an interesting point about chemical and pesticide residue. She believes that the fact that organic foods have been found to have fewer residues does not make them automatically more nutritious and healthier for the consumer. As scientific technologies advance, Gussow predicts that research will someday discover statistical data that will prove that organic foods have a higher nutritional value compared to conventionally grown ones.

In order to provide the public with more information about the nature of organic foods, the well-known and highly regarded magazine *Consumer Reports* decided to take a closer look at organic foods in their January 1998 magazine, in an article entitled "Organic Foods: Safer? Tastier? More nutritious?" By conducting comparison tests, their researchers discovered that organic foods have less pesticide residue, and that their flavors are just about the same as conventionally grown foods. These scientists came to the conclusion that the "variability within a given crop is greater than the variability between one cropping system and another." *Consumer Reports* contacted Professor Willie Lockeretz from the Tufts University School of Nutrition Science and Policy. He told researchers that "the growing system you use probably does affect nutrition. . . . But it does it in ways so complex you might be studying the problem forever." Keeping in mind these comments made by Dr. Lockeretz, *Consumer Reports* believes it would be an impossible task to compare the nutritional values of organic and conventional foods. Therefore, researchers at *Consumer Reports* decided not to carry out that part of their comparison testing.

More expert opinion

Although statistical evidence is not available at this time to support the claim that organic foods are more nutritious than conventionally grown ones, there is a very strong feeling shared by a majority of the general public that they are. We are called back to nature as we observe the love that organic farmers have for the soil and their desire to work in partnership with nature. We are easily lured to the attractive displays of organic foods in the grocery stores. However, we must keep in mind the successful marketing techniques that have been used to convince us that organic foods are more nutritious than conventionally grown ones. Although common sense tells us that organic foods should be more nutritious, research has not provided us with any statistical data to prove this claim.

Restatement of thesis

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Reading, Writing, and Discussion Questions

1. Looking back over the annotations, what types of support did you find noted most often?
2. What is unusual about the use of causal connections in this particular piece? How does that contribute to Kristen Weinacker's thesis?
3. Does Weinacker come across as a reliable and credible writer (*ethos*)? Why or why not?

Practice: Evidence

Read the following essay on sports fans and annotate the author's use of evidence, using the annotations on the previous essay by Weinacker as a model. Then answer the questions following the essay.

Are Sports Fans Happier?

SID KIRCHHEIMER

Let the madness begin!

March is the time when vasectomies increase by 50 percent thanks to the much-anticipated opportunity for patients to "recover" in front of their TVs.

March is also the time when workplaces do some real number-crunching: on the expected loss in employee productivity (estimated at 8.4 million hours and $192 million last year); on money bet on office pools (a hefty chunk of the $2.5 billion in total sports wagering each year); and even on the number of times workers hit the so-called "Boss Button" (computer software that instantly hides live video of games with a phony business spreadsheet), which was activated more than 3.3 million times during the first four days of last year's tournament.

But mostly, the NCAA Basketball Championship—better known as "March Madness" or "The Big Dance"—is a time that gives us something to cheer about beyond the game itself. If history and science hold true, no matter the outcome of the three-week tournament that begins in March, most of the millions who will follow its hard-court action will emerge as winners. "That's because in the long run it's really not the games that matter," says Daniel Wann, Ph.D., a professor of psychology at Murray State University in Kentucky and author of *Sports Fans: The Psychology and Social Impact of Spectators*. "Being a fan gives us something to talk about, to share and bond with others. And for the vast majority of people, it's psychologically healthier when you can increase social connections with others."

After conducting some 200 studies over the past two decades, Wann, a leading researcher on "sports fandom," finds consistent results: people who identify themselves as sports fans tend to have lower rates of depression and higher self-esteem than those who don't. Blame it on our primal nature. "Sports fandom is really a tribal thing," says Wann, a phenomenon that can help fulfill our psychological need to belong—providing similar benefits to the social support achieved through religious, professional, or other affiliations. "We've known for decades that social support—our tribal network—is largely responsible for keeping people mentally sound. We really do have a need to connect with others in some way." 5

But when it comes to opportunities to connect, the Big Dance may have a foothold over other sporting events. "The beauty of March Madness is that it attracts people of all levels of sports fandom—and for different reasons," says Edward Hirt, Ph.D., a professor of psychology at Indiana University who researches how fanship affects social identity.

Some watch, whether or not they usually follow sports, because they are alumni or have another previous affiliation to these "tribal networks"—the 60-plus participating college teams. Others connect on the spot, perhaps

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because it's easier to form emotional allegiances with gutsy amateur athletes who compete with heart and soul (and while juggling mid-term exams) rather than for the paychecks collected by millionaire pros.

Also consider the unique nature of the tournament itself—a series of back-to-back games over the course of several weeks with little to no idle time in between during which a casual fan might lose interest. "I have not seen any empirical evidence to support that March Madness is necessarily better than other sports events" for promoting mood and mindset enhancements. "But theoretically I expect it could be," says Wann.

"There are only a couple of events—the Super Bowl also comes to mind—that seem to transcend typical fandom into being akin to a national holiday . . . a reason for people to get together. But with the Super Bowl, everything leads to one game—and most of the time it's an anticlimactic one that's over by half-time."

10 With March Madness, however, Wann notes, "there's a longer, more drawn out event that provides more opportunities to engage in social opportunities and connections. And bonds tend to be stronger with a longer passage of time."

Do the math: More games + more time = more opportunities to share for better bonding. "Because upsets are a normal occurrence, and you get runs by Cinderella teams knocking off the perennial favorites, there's enough uncertainty and unpredictability in this tournament to get people excited—and keep them excited," adds Hirt. "Early games affect later decisions; there's a cascading effect, as opposed to a one-time pick . . . and that allows for the pride that comes with someone with no sports expertise being able to win the office pool."

Maybe that's why despite a short-term productivity loss many experts believe that March Madness actually benefits the workplace in the long term. Bonds formed in office pools and post-game water-cooler chatter build morale and inspire teamwork. At afterwork get-togethers in front of the tube, buddies can share chicken wings—and their emotions. "You have guys hugging each other, cursing at the ref, and bonding by sharing a sense of commonality," says Hirt. "Where else can guys express their emotions like that?"

And those other relationships? Although studies show that two to four percent of marriages are negatively affected when one spouse is an ardent fan (think of the so-called "football widow"), sports fandom has a positive or neutral effect on nearly half of relationships, says Wann. "It gives many couples something to do together or allows one to have time to go off and do their own thing."

Even if you watch in solitude, March Madness and other sporting events provide a diversion from the woes of everyday life—if only for a few hours. "Older people, especially when widowed or physically incapacitated, are more likely than others to relate to televised events," says Stuart Fischoff, Ph.D., senior editor of the *Journal of Media Psychology* and a California State University, Los Angeles, professor emeritus of psychology. "Watching sports helps us get outside ourselves."

With the thrill of victory, many fans experience bona fide joy—complete with hormonal 15

and other physiological changes such as increased pulse and feelings of elation. And with defeat, the overwhelming majority may initially feel sadness and disappointment, but usually rebound within a day or two, studies show.

However, lest we present too rosy a picture, it must be said that sports fandom can also be a health hazard. In a 2008 study published in the *New England Journal of Medicine*, researchers found that on days when Germany's soccer team played in the World Cup, cardiac emergencies more than tripled for German men and nearly doubled for women. Of course, European soccer fans are an extreme bunch; but even in the U.S., although visits to hospital emergency rooms tend to decrease during a much-anticipated sports game, there's a higher-than-usual surge immediately after the game ends. The explanation: To see a game's final outcome, some die-hard fans delay making that trip to the ER.

And, of course, no story about March Madness would be complete without mention of gambling. The odds of predicting all game winners are about 9.2 quintillion to one. Yet when it comes to sports betting, nothing turns John Q. Fan into Jimmy the Greek more than the NCAA tournament. Workplace camaraderie is one reason. But there's another important factor.

Bragging rights.

With Super Bowl pools there's just a series of boxes with different scores. If you're lucky enough to pick the right one, you win. "But it's a more complex task in filling out all the March Madness brackets, and a seductive pleasure in trying to predict the upsets," says psychologist Edward Hirt.

Another reason why nearly twice as much money is wagered on March Madness than the Super Bowl: More than in other events, NCAA tournament fans simultaneously root for more than one team, triggering a greater likelihood of making multiple bets. 20

With other sports championships you have to wait a week or at least several days between games, but this sports soap opera—with its David versus Goliath battles—continues night and day, providing a stronger hook.

So let the games begin. Whatever the final outcome, odds are good that the overall advantage—for mind, body, and spirit—is definitely in your court.

Reading, Writing, and Discussion Questions

1. Write an essay in which you explain the types of support that Sid Kirchheimer makes use of the most in his essay "Are Sports Fans Happier?" You will need to provide examples of the types of support that he uses.
2. Do you find Kirchheimer's essay effective? Why, or why not? If you were going to write an evaluative essay about "Are Sports Fans Happier?" what would its thesis be?
3. How does Kirchheimer appeal to the needs and values of his readers?

Appeals to Needs and Values

Good factual evidence is usually enough to convince an audience that your factual claim is sound. Using examples, statistics, and expert opinion, you can prove, for example, that women do not earn as much as men for the same work. But even good evidence may not be enough to convince your audience that unequal pay is wrong or that something should be done about it. In making value and policy claims, an **appeal to the needs and values** of your audience is absolutely essential to the success of your argument. If you want to persuade the audience to change their minds or adopt a course of action—in this case, to demand legislation guaranteeing equal pay for equal work—you will have to show that assent to your claim will bring about what they want and care deeply about.

If the audience concludes that the things you care about are very different from what they care about, if they cannot identify with your goals and principles, they may treat your argument with indifference, even hostility, and finally reject it. But you can hope that decent and reasonable people will share many of the needs and values that underlie your claims. Finding these shared needs and values is what Carl Rogers was advocating when he said that the way to improved communication is to try to express your audience's position fairly and to look for common ground between their position and yours. The appeal to these needs and values was what Aristotle called *pathos*.

Appeals to Needs

The most familiar classification of needs was developed by the psychologist Abraham H. Maslow in 1954.[12] These needs, said Maslow, motivate human thought and action. In satisfying our needs, we attain both long- and short-term goals. Because Maslow believed that some needs are more important than others, he arranged them in hierarchical order from the most urgent biological needs to the psychological needs that are related to our roles as members of a society (Fig. 7.5).

For most of your arguments, you won't have to address the audience's basic physiological needs for nourishment or shelter. The desire for health, however, now receives extraordinary attention. Appeals to buy health foods, vitamin supplements, drugs, exercise and diet courses, and health books are all around us. Many of the claims are supported by little or no evidence, but readers are so eager to satisfy the need for good health that they often overlook the lack of facts or authoritative opinion. The desire for physical well-being, however, is not so simple as it seems; it is strongly related to our need for self-esteem and love.

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[12] Abraham H. Maslow, *Motivation and Personality* (New York: Harper and Row, 1954), 80–92.

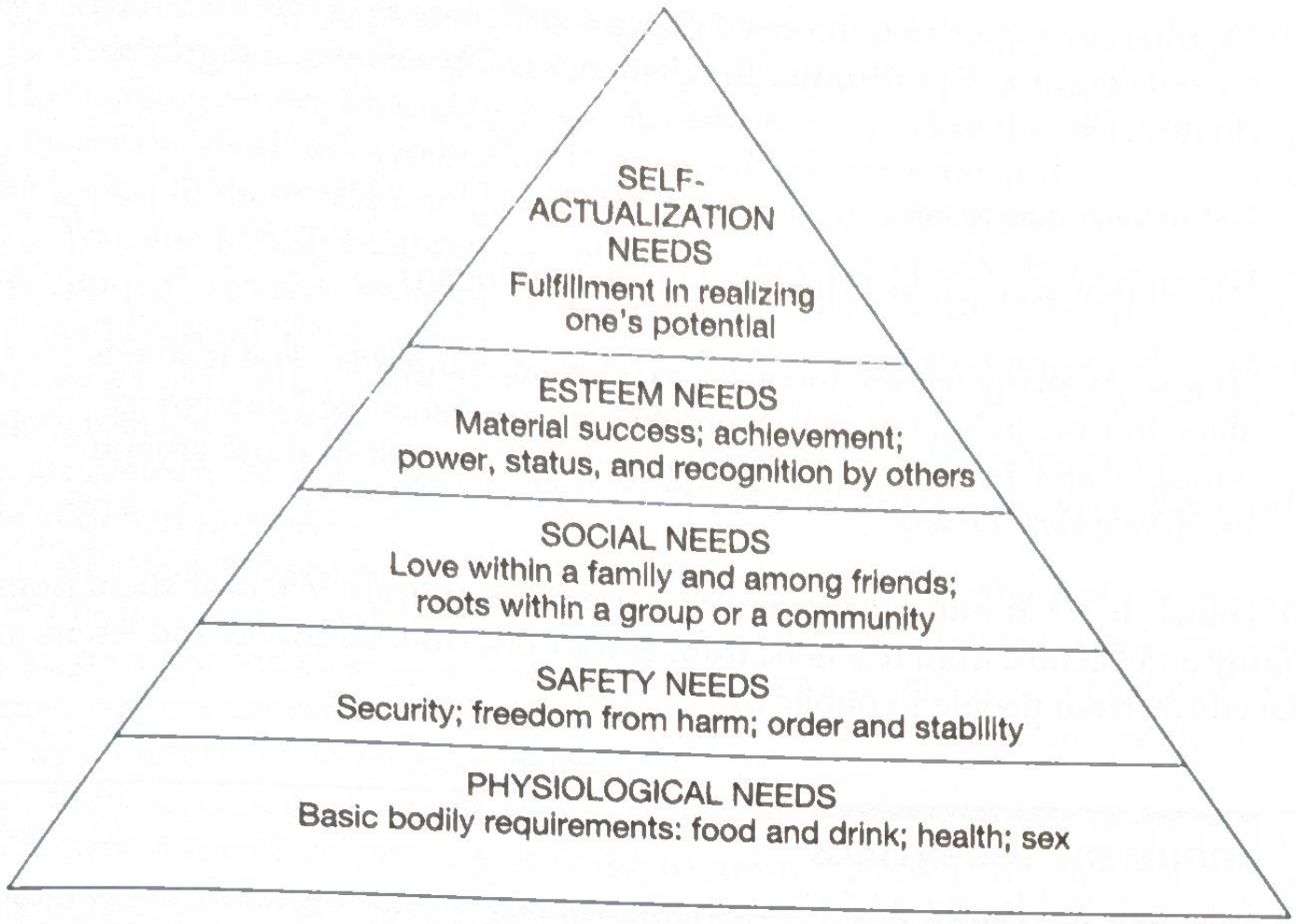

Figure 7.5 Maslow's Hierarchy of Needs

Appeals to our needs to feel safe from harm, to be assured of order and stability in our lives, are also common. Insurance companies, politicians who promise to rid our streets of crime, and companies that offer security services all appeal to this profound and nearly universal need. (We say "nearly" because some people are apparently attracted to risk and danger.) Those who monitor terrorist activity are attempting both to arouse fear for our safety and to suggest ways of reducing the dangers that make us fearful.

The last three needs in Maslow's hierarchy are the ones you will find most challenging to appeal to in your arguments. It is clear that these needs arise out of human relationships and participation in society. Advertisers make much use of appeals to these needs.

Social Needs

"Whether you are young or old, the need for companionship is universal." (ad for dating app)

"Share the Fun of High School with Your Little Girl!" (ad for a Barbie doll)

Esteem Needs

"The power to be your best." (Apple)

"Apply your expertise to more challenges and more opportunities. Here are outstanding opportunities for challenge, achievement, and growth." (Perkin-Elmer Co.)

Self-Actualization Needs

"Be all that you can be." (former U.S. Army slogan)

"It goes by many names: integrity, excellence, standards. And it stands alone in final judgment as to whether we have demanded enough of ourselves and, by that example, have inspired the best in those around us." (*New York Times*)

Of course, it is not only advertisers who use these appeals. We hear them from family and friends, from teachers, from employers, from editorials and letters to the editor, from people in public life.

ARGUMENT ESSENTIALS

Appeals to Needs and Values

- In making value and policy claims, it is essential to appeal to the needs and values of your audience, but first you must identify what those needs and values are.
- Needs can be viewed on a hierarchy developed by psychologist Abraham Maslow.
- Values are the principles by which we judge what is good or bad, beautiful or ugly, worthwhile or undesirable.

Appeals to Values

Needs give rise to values. If we feel the need to belong to a group, we learn to value commitment, sacrifice, and sharing. And we then respond to arguments that promise to protect our values. It is hardly surprising that **values**, the principles by which we judge what is good or bad, beautiful or ugly, worthwhile or undesirable, should exercise a profound influence on our behavior. Virtually all claims, even those that seem to be purely factual, contain expressed or unexpressed judgments.

For our study of argument, we will speak of groups or systems of values because any single value is usually related to others. People and institutions are often defined by such systems of values.

Values, like needs, are arranged in a hierarchy; that is, some are clearly more important than others to the people who hold them. Moreover, the

arrangement may shift over time or as a result of new experiences. In 1962, for example, two speech teachers prepared a list of what they called "Relatively Unchanging Values Shared by Most Americans."[13] Included were "puritan and pioneer standards of morality" and "perennial optimism about the future." Now, an appeal to these values might fall on a number of deaf ears.

You should also be aware of not only changes over time but also different or competing value systems that reflect a multitude of subcultures in the United States. Differences in age, sex, race, ethnic background, social environment, religion, even in the personalities and characters of its members, define the groups we belong to. Such terms as *honor*, *loyalty*, *justice*, *patriotism*, *duty*, *responsibility*, *equality*, *freedom*, and *courage* will be interpreted very differently by different groups.

All of us belong to more than one group, and the values of the several groups may be in conflict. If one group to which you belong—say, peers of your own age and class—is generally uninterested in and even scornful of religion, you may nevertheless hold to the values of your family and continue to place a high value on religious belief.

How can a knowledge of your readers' values enable you to make a more effective appeal? Suppose you want to argue in favor of a sex education program in the high school you attended. The program you support would not only give students information about contraception and venereal disease but also teach them about the pleasures of sex, the importance of small families, and more inclusive sexual orientations. If the readers of your argument are your classmates or your peers, you can be fairly sure that their agreement will be easier to obtain than that of their parents, especially if their parents think of themselves as conservative. Your peers are more likely to value experimentation, tolerance of alternative sexual practices, freedom, and novelty. Their parents are more likely to value restraint, conformity to conventional sexual practices, obedience to family rules, and foresight in planning for the future.

Knowing that your peers share your values and your goals will mean that you need not spell out the values supporting your claim; they are understood by your readers. Convincing their parents, however, who think that freedom, tolerance, and experimentation have been abused by their children, will be a far more challenging task. In one written piece you have little chance of changing their values, a result that might be achieved only over a longer period of time. So you might first attempt to reduce their hostility by suggesting that even if a community-wide program were adopted, students would need parental permission to enroll. This might convince some parents that you share their values regarding parental authority and primacy of the family. Second, you

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[13] Edward Steele and W. Charles Redding, "The American Value System: Premises for Persuasion," *Western Speech*, no. 26 (Spring 1962): 83–91.

might look for other values to which the parents subscribe and to which you can make an appeal. Do they prize maturity, self-reliance, responsibility in their children? If so, you could attempt to prove, with authoritative evidence, that the sex education program would promote these qualities in students who took the course.

But familiarity with the value systems of prospective readers may also lead you to conclude that winning assent to your argument will be impossible. It would probably be fruitless to attempt to persuade a group of lifelong pacifists to endorse the use of nuclear weapons. The beliefs, attitudes, and habits that support their value systems are too fundamental to yield to one or two attempts at persuasion.

Strategies for Evaluating Appeals to Needs and Values

If your argument is based on an appeal to the needs and values of your audience, the following questions will help you evaluate the soundness of your appeal.

- **Have the values been clearly defined?** Because value terms are abstractions, you must make their meaning explicit by placing them in context and providing examples. If a person values his Second Amendment rights, does that mean he is opposed to any restrictions on gun ownership? Does another's opposition to abortion extend to cases of rape and incest?
- **Are the needs and values to which you appeal prominent in the reader's hierarchy at the time you are writing?** Gun control becomes a focus in the media and on people's minds whenever a mass shooting occurs. The need for election reform is a hot topic every four years but fades from memory in between.
- **Is the evidence in your argument clearly related to the needs and values to which you appeal?** Remember that readers must see some connection between your evidence and their goals. Statistics can be impressive, for example, but your audience must see their relevance.

READING ARGUMENT

Seeing Appeals to Needs and Values

The following essay on genetics has been annotated to highlight appeals to needs and values. Read the selection, and answer the questions that follow. The annotations in paragraphs 5–9 point out threats to human needs and values posed by reprogenetics. The annotations in paragraphs 11–14 sum up the author's response.

Building Baby from the Genes Up

RONALD M. GREEN

The two British couples no doubt thought that their appeal for medical help in conceiving a child was entirely reasonable. Over several generations, many female members of their families had died of breast cancer. One or both spouses in each couple had probably inherited the genetic mutations for the disease, and they wanted to use in-vitro fertilization and preimplantation genetic diagnosis (PGD) to select only the healthy embryos for implantation. Their goal was to eradicate breast cancer from their family lines once and for all.

Appeal to physiological need for health

In the United States, this combination of reproductive and genetic medicine—what one scientist has dubbed "reprogenetics"—remains largely unregulated, but Britain has a formal agency, the Human Fertilization and Embryology Authority (HFEA), that must approve all requests for PGD. In July 2007, after considerable deliberation, the HFEA approved the procedure for both families. The concern was not about the use of PGD to avoid genetic disease, since embryo screening for serious disorders is commonplace now on both sides of the Atlantic. What troubled the HFEA was the fact that an embryo carrying the cancer mutation could go on to live for 40 or 50 years before ever developing cancer, and there was a chance it might never develop. Did this warrant selecting and discarding embryos? To its critics, the HFEA, in approving this request, crossed a bright line separating legitimate medical genetics from the quest for "the perfect baby."

Appeal to values: Was it right to reject an embryo that would develop into a person who might never get the disease or live 40 to 50 years without it?

Like it or not, that decision is a sign of things to come—and not necessarily a bad sign. Since the completion of the Human Genome Project in 2003, our understanding of the genetic bases of human disease and non-disease traits has been growing almost exponentially. The National Institutes of Health has initiated a quest for the "$1,000 genome," a 10-year program to develop machines that could identify all the genetic letters in anyone's genome at low cost (it took more than $3 billion to sequence the first human genome). With this technology, which some believe may be just four or five years away, we could not only scan an individual's—or embryo's—genome, we could also rapidly compare

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thousands of people and pinpoint those DNA sequences or combinations that underlie the variations that contribute to our biological differences.

Appeal to need for health, physical and cognitive

With knowledge comes power. If we understand the genetic causes of obesity, for example, we can intervene by means of embryo selection to produce a child with a reduced genetic likelihood of getting fat. Eventually, without discarding embryos at all, we could use gene-targeting techniques to tweak fetal DNA sequences. No child would have to face a lifetime of dieting or experience the health and cosmetic problems associated with obesity. The same is true for cognitive problems such as dyslexia. Geneticists have already identified some of the mutations that contribute to this disorder. Why should a child struggle with reading difficulties when we could alter the genes responsible for the problem?

Appeal to need for love and community

Many people are horrified at the thought of such uses of genetics, seeing echoes of the 1997 science-fiction film *Gattaca*, which depicted a world where parents choose their children's traits. Human weakness has been eliminated through genetic engineering, and the few parents who opt for a "natural" conception run the risk of producing offspring—"invalids" or "degenerates"—who become members of a despised underclass. *Gattaca*'s world is clean and efficient, but its eugenic obsessions have all but extinguished human love and compassion. 5

These fears aren't limited to fiction. Over the past few years, many bioethicists have spoken out against genetic manipulations. The critics tend to voice at least four major concerns. First, they worry about the effect of genetic selection on parenting. Will our ability to choose our children's biological inheritance lead parents to replace unconditional love with a consumerist mentality that seeks perfection?

Appeal to need for self-actualization

Second, they ask whether gene manipulations will diminish our freedom by making us creatures of our genes or our parents' whims. In his book *Enough*, the techno-critic Bill McKibben asks: If I am a world-class runner, but my parents inserted the "Sweatworks2010 GenePack" in my genome, can I really feel pride in my accomplishments? Worse, if I refuse to use my costly genetic endowments, will I face relentless pressure to live up to my parents' expectations?

Appeal to values—threat of increased social division and a return to the horrors of the Holocaust

Third, many critics fear that reproductive genetics will widen our social divisions as the affluent "buy" more competitive abilities for their offspring. Will we eventually see "speciation," the emergence of two or more human populations so different that they no longer even breed with one another? Will we re-create the horrors of eugenics that led, in Europe, Asia and the United States, to the sterilization of tens of thousands of people declared to be "unfit" and that in Nazi Germany paved the way for the Holocaust?

Finally, some worry about the religious implications of this technology. Does it amount to a forbidden and prideful "playing God"?

Appeal to religious values

10 To many, the answers to these questions are clear. Not long ago, when I asked a large class at Dartmouth Medical School whether they thought that we should move in the direction of human genetic engineering, more than 80 percent said no. This squares with public opinion polls that show a similar degree of opposition. Nevertheless, "babies by design" are probably in our future—but I think that the critics' concerns may be less troublesome than they first appear.

Will critical scrutiny replace parental love? Not likely. Even today, parents who hope for a healthy child but have one born with disabilities tend to love that child ferociously. The very intensity of parental love is the best protection against its erosion by genetic technologies. Will a child somehow feel less free because parents have helped select his or her traits? The fact is that a child is already remarkably influenced by the genes she inherits. The difference is that we haven't taken control of the process. Yet.

Author responds with faith in parental love.

Knowing more about our genes may actually increase our freedom by helping us understand the biological obstacles—and opportunities—we have to work with. Take the case of Tiger Woods. His father, Earl, is said to have handed him a golf club when he was still in the playpen. Earl probably also gave Tiger the genes for some of the traits that help make him a champion golfer. Genes and upbringing worked together to inspire excellence. Does Tiger feel less free because of his inherited abilities? Did he feel pressured by his parents? I doubt it. Of course, his story could have gone the other way, with overbearing parents forcing a child into their mold. But the problem in that case wouldn't be genetics, but bad parenting.

Author responds that there will be no threat to self-actualization.

Granted, the social effects of reproductive genetics are worrisome. The risks of producing a "genobility," genetic overlords ruling a vast genetic underclass, are real. But genetics could also become a tool for reducing the class divide. Will we see the day when perhaps all youngsters are genetically vaccinated against dyslexia? And how might this contribute to everyone's social betterment?

Author responds that some divisions could be reduced.

As for the question of intruding on God's domain, the answer is less clear than the critics believe. The use of genetic medicine to cure or prevent disease is widely accepted by religious traditions, even those that oppose discarding embryos. Speaking in 1982 at the Pontifical Academy of Sciences, Pope John Paul II observed that modern biological research "can ameliorate the condition of those who are affected by chromosomic diseases," and he lauded this as helping to cure "the smallest and weakest of human beings . . . during their

Author responds that religions tend to accept modification for disease cures or prevention but not for other reasons.

intrauterine life or in the period immediately after birth." For Catholicism and some other traditions, it is one thing to cure disease, but another to create children who are faster runners, longer-lived, or smarter.

But why should we think that the human genome is a once-and-for-all-finished, untamperable product? All of the biblically derived faiths permit human beings to improve on nature using technology, from agriculture to aviation. Why not improve our genome? I have no doubt that most people considering these questions for the first time are certain that human genetic improvement is a bad idea, but I'd like to shake up that certainty.

Human genetic improvement is not a bad thing.

Genomic science is racing toward a future in which foreseeable improvements include reduced susceptibility to a host of diseases, increased life span, better cognitive functioning, and maybe even cosmetic enhancements such as whiter, straighter teeth. Yes, genetic orthodontics may be in our future. The challenge is to see that we don't also unleash the demons of discrimination and oppression. Although I acknowledge the risks, I believe that we can and will incorporate gene technology into the ongoing human adventure.

Claim

Reading, Writing, and Discussion Questions

1. Remember that the annotations here focus only on appeals to needs and values because that is the focus of this portion of the chapter. That does not mean that those are the only types of support in the essay. What other types of support did you notice? To begin with, what type of support does the first paragraph provide?
2. The annotations make the organization of most of the essay fairly obvious. Explain the organizational pattern.
3. If you were going to write an essay analyzing Ronald M. Green's use of support, what would your thesis be?
4. Green builds a case for the use of genetic engineering in some cases. What are some of the reasons that people oppose it? How does Green respond to those critics?
5. Write an essay explaining whether or not you believe that it was acceptable for the HFEA to approve the request made by two British couples in Ronald M. Green's "Building Baby from the Genes Up." Use specific evidence from the essay to support your opinion.

Practice: Appeals to Needs and Values

In the following essay, Sarah Griffiths looks at what happens inside our brains when we have a crush. Read the essay, and use the questions that follow it to consider what Griffiths is saying about our needs and values.

Why Having a Crush Is Good for You

SARAH GRIFFITHS

We've all played the lead role in a teen drama laden with angst, sweaty palms, a racing heart, and an inability to concentrate on anything or anyone else but the object of our desire. And just as every Hollywood scenario depicts, crushes can be excruciatingly embarrassing in high school, but can also affect us in adulthood. So it might seem difficult to imagine that all this cringe-worthy behavior has a purpose and is actually good for us—at least most of the time.

Adults can also be taken unaware when cupid strikes, suddenly becoming self-conscious around someone attractive at work or swooning over a celebrity, even when they're happily married. Why this happens is a bit of a mystery. "Crushes have more to do with fantasy than with reality," psychologist and author Dr. Carl Pickhardt has written. "They tell much more about the admirer than the admired."

In its purest sense, a crush is a form of parasocial relationship; a one-sided relationship where you have feelings for someone else but those feelings are not reciprocated, according to Dr. Anna Machin, an evolutionary anthropologist at the University of Oxford's Department of Experimental Psychology. "The research into the brain isn't there yet, so we still don't know whether crushes generate the same [neural] patterns as when someone is genuinely in love," she said. Despite this, she added, the feeling of infatuation or love that crushes produce is real.

What Goes On in Our Heads?

It's thought that when we're in love or lust, the stress and reward systems in our brain are working overtime, and the same is possibly true of having a crush. Nerve cells in the brain release a chemical called norepinephrine that stimulates the production of adrenaline, and give us the feeling of arousal that causes our palms to sweat and our hearts to pound. The feel-good chemical dopamine is also released, making us excitable and talkative, and perhaps explains why we sometimes blurt out unimaginably embarrassing things. This is charmingly described as "word vomit" in the cult film *Mean Girls*, and exemplified by the mortifying line, "I carried a watermelon" in *Dirty Dancing*.

"If we were to reduce down what love is, in a neural sense, it's a neurochemical reward, so the feelings you have are a mixture of chemicals . . . and dopamine is your go-to reward chemical in life," said Dr. Machin. "When you're in love or you have a crush, you'll still get your dopamine reward for that, even if your feelings are not reciprocated." It's this process that seems to account for our slightly obsessive behavior when we have a crush—think Cameron in *Ten Things I Hate about You*—because thinking of an unintended brief encounter can make us feel happy, and that's addictive.

The limbic area of the brain is thought to be involved both in love and crushes. When examined in an MRI scanner, someone in love will typically have high activity in an area of the limbic system called the caudate nucleus. That's important, because it links to the neocortex, which handles the more cognitive or sensible

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Sarah Griffiths is a freelance science journalist. Her essay appeared on the Relationships vertical of Medium.com on December 3, 2018.

aspects of love, Dr. Machin explained. Perhaps, this is the area we refer to if we trust our head more than our hearts when it comes to finding a partner. But it means that rather than slavishly following our amorous fantasies, our rational mind regulates the limbic brain's desire for dopamine. While it wins out most of the time, because the limbic system is associated with addiction, getting over a crush can be tough, and some of us hold a torch for years.

Why Do We Have Crushes Anyway?

Is there a higher purpose for having a crush, beyond just making us feel good? Dr. Machin believes they play a strong evolutionary role. "Parasocial relationships in adolescence are a very valuable experience," she explained. "They are something that's part of our development because they allow an adolescent to start to explore relationships and their own sexuality and understand what attracts them in a safe way, because they're not going to get hurt in the same way as they might in a real relationship."

Whereas many of us have dated the wrong "type" of person, and had our hearts broken as a result, crushes can help ensure this doesn't happen. "This person [the crush] is the right person because you idolize them," Dr. Machin said. "They're going to be who you want them to be, therefore, it's very safe. It's a training ground for proper relationships in the real world." Harry Styles, then, might be building a generation's romantic resilience. "In adolescence, crushes are a healthy thing and teenagers shouldn't feel embarrassed," she added.

In adulthood, things are more complicated. It's important to distinguish between imagining what a relationship could be like, and having a crush with the intention of exploring a real relationship. Dr. Gary W. Lewandowski Jr., a writer and relationship scientist at Monmouth University in New Jersey, said that our evolutionary history suggests we are not a monogamous species. So crushes could be a way to help identify a future or additional partner to meet our needs—or they could be the sign of adults who are simply stuck in adolescence and unable to have a real relationship. "A crush could be a gateway behavior that eventually leads to cheating," said Dr. Lewandowski.

What Are the Upsides to This Embarrassing Behavior?

Left as daydreams, crushes are usually harmless. Research shows that people with crushes often feel like they are in a real relationship, which could be a way to decrease loneliness, and may even boost our confidence. Crushes could help reinvigorate stale relationships by revealing what they are lacking, and give people insight into how to improve their love lives. And even the most unlikely or strange crushes could be enlightening. "People aren't always good at knowing what they want, so a crush may actually be insight into something you don't like and didn't realize or didn't want to admit," Dr. Lewandowski said.

How do you cope with a crush as a teenager or an adult? "I'd encourage people to recognize that they are idealizing their crush," said Dr. Lewandowski. Perhaps take the advice of Cher from *Clueless* and send yourself flowers and love letters—because ultimately, you can't control who you have a crush on, so you may as well have fun.

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Reading, Writing, and Discussion Questions

1. How does Sarah Griffiths define the term *crush*?
2. What happens in our brains when we have a crush? What needs does that brain activity meet for us?
3. According to Dr. Anna Machin, what needs does a crush fulfill for us?
4. According to Dr. Gary W. Lewandowski Jr., what needs does a crush fulfill for us?
5. Based on what Griffiths says, that a crush is physiological, should there be no guilt involved, even if one is married? In your answer, explain what values are addressed.
6. Write an essay explaining how effective you think Griffiths is in supporting the claim that having a crush is good for a person.

Assignments for Support

Reading and Discussion Questions

1. Consider what types of evidence you find most convincing in an argument. Is the best type of evidence dependent on the topic and the context? Explain.
2. Look for examples in the media of the misuse of evidence. Explain why the evidence is misleading.
3. Use examples to explain which news shows depend on factual evidence and which depend largely on opinion. Do both have a useful role to play in our society? Explain.
4. In the aftermath of the many recent school shootings, there has been talk of passing laws requiring teachers to carry weapons on school and college campuses. What needs of the people were those who proposed the law appealing to? How could opponents of such laws have used similar types of appeal to argue their case?
5. Consider presidential debates you have seen or other televised coverage of candidates during the months leading up to an election. What are some specific examples of how the candidates try to appeal to the voters' needs and values?
6. The average American citizen is usually ignorant of much of the reality of what goes on in the Islamic world. When Americans take a stand on issues such as U.S. involvement in Syria, to what extent do you believe they are basing that stand on solid supporting evidence?