Fourth Edition

Glenn G. Sparks

MEDIA EFFECTS RESEARCH

A Basic Overview

Media Effects Research: A Basic Overview, Fourth Edition
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Cover Designer: Gary Ragaglia

Cover Image: Getty Images

Compositor: PreMediaGlobal

Library of Congress Control Number: 2011936658

ISBN-13: 978-1-111-34445-0

ISBN-10: 1-111-34445-0

Wadsworth
20 Channel Center Street
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Printed in the United States of America
1 2 3 4 5 6 7 15 14 13 12 11

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A Scientific Approach to the Study of Media Effects

On April 16, 2007, almost exactly 8 years after the horrible assault of gunfire and bombs that left many students and one teacher dead at Columbine High School in Littleton, Colorado, another deadly assault took place at Virginia Tech University. The aftermath of the Virginia Tech horror was even more gruesome than Columbine. Including the gunman who took his own life, a total of 33 people died—making it the worst school shooting in America's history.

The national discussion that followed both the Columbine and Virginia Tech incidents had some striking similarities. After Columbine, a persistent theme was sounded over and over again: The mass media must share a significant part of the blame for this incident and others like it. President Clinton called on the producers of mass media messages to reduce gratuitous violence. The clear implication of Clinton's rhetoric was that exposure to violent entertainment images increased the probability of this type of violent behavior. Similarly, after Virginia Tech, it took only hours before the media devoted intense coverage to the possibility that the perpetrator of the shootings had been influenced by playing a violent video game. The prominent TV psychologist Dr. Phil McGraw appeared on CNN's *Larry King Live* and said: "We're going to have to start … recognizing that the mass murderers of tomorrow are the children of today that are being programmed with this massive [media] violence overdose."[1]

Related to Dr. Phil's concern about exposure to media violence is the potential effect of the massive amounts of news coverage that events like those at Columbine and Virginia Tech inevitably spawn. After U.S. congresswoman, Gabrielle Giffords, was shot on January 8, 2011 in Tucson, AZ while meeting publicly with her constituents, commentators wondered aloud whether the intense news coverage of the shooting, which killed six people and injured 13 others, might trigger "copycat" crimes. Vern Ehlers, a retired congressman, was quoted as saying, "When an event like this happens and it hits the news,

very frequently it gives others the idea they should do that too."[2] In contrast to the congressman's view, others preferred to dismiss the Tucson shootings as the acts of a deranged person that would do little to inspire similar acts of violence.

In the days and weeks that followed all of these violent episodes, the media discussions mirrored similar themes. Some thought that media violence in the form of movies, video games, or news coverage may have played a direct role in causing the violent attacks. Others thought that the media were being used as scapegoats in an effort to identify a simple cause instead of recognizing a much more complex set of circumstances. If you listened carefully to any of these national discussions, you may have heard viewpoints that seemed consistent with your own values or political positions. It may have seemed tempting to embrace one or more of the ideas that you heard about how to prevent similar events in the future.

In the end, *opinions* about the events at Columbine, Virginia Tech, and Tucson were easy to come by. But if you were thinking carefully about the variety of opinions that were expressed about the causes of these shootings, you probably realized that opinions had limited ability to bring you to an understanding of the truth. Despite the fact that President Clinton, Dr. Phil, and Congressman Ehlers were nationally recognized by many as credible leaders, their opinions about the role of the mass media in these shootings were still only opinions. To see whether their views have any scientific merit, you can read more about the actual effects of media violence in Chapter 5. In this chapter, you will learn about how science is different from casual opinion.

WAYS OF KNOWING

Experience

There are many ways that we try to know things about the world around us. One way is through direct **experience**. This approach is sometimes called **empiricism**. Experience is often a reliable path to knowledge. One morning many years ago when I was just a youngster, I left my home in the Chicago area without a map and found myself a few hours later in Milwaukee, Wisconsin. The only problem was that I was trying to get to Muskegon, Michigan. If you consult a map, you will discover that I had gone up the wrong side of a rather large lake (Lake Michigan). I have now learned from my experience to consult a map before I travel long distances. My family eventually complied with my request for a GPS navigation unit, and I'm confident that it has saved me from additional navigating disasters. But learning by experience can also be filled with many trials and errors. Progress can be painfully slow and can lead down blind alleys. For nearly 300 years, the people of Europe were afraid to eat tomatoes, which had been introduced from Central America in the 1500s. Personal experience told them that any fruit from the nightshade family was unsafe.[3] Legend has it that someone may have eaten a tomato and died shortly thereafter. In this case, experience proved to be very misleading.

When it comes to our knowledge of media effects, many of us tend to rely on our own personal experience to reach a conclusion. In class discussions about the media violence controversy, it is not uncommon for me to hear students expressing the following viewpoint:

> Well, I don't really think that media violence makes us more violent. After all, look at me. On Saturday mornings, I watched every violent cartoon that the networks put on. Today, I love movies like the ones in the Saw series. The more blood and guts, the better. My parents love violent movies, too. I grew up on them. But am I a violent person? Of course not! I have never even gotten into a fight. I don't own a gun. I've never been arrested for anything. I'm a peaceful and law-abiding citizen. In fact, my whole life is a personal testimony to the fact that media violence has no negative effect at all. Kids can tell the difference between real violence and fantasy violence. So, I'm sorry, I just don't buy it. Media violence is just fun entertainment. I don't see the harmful effects.

It shouldn't be difficult to recognize that this viewpoint is a great example of knowledge gained through personal experience. It should also be relatively easy to see that a person's individual experience may be a poor guide to the best *general* knowledge on a given topic. Just as people thought that tomatoes were poisonous for everyone, people might also think that media violence is benign for everyone. In both cases, personal experience might seem to point to a solid conclusion. But a more careful look might show such a conclusion to be solidly wrong. One possibility is that the conclusion from personal experience is valid for oneself but not for others. The fact that violent media might not trigger aggressive behavior for one individual does not necessarily imply that media violence functions the same way for everyone. Another possibility is that one's impression about being invulnerable to media impact is simply incorrect. Perhaps the effects of media violence are difficult for people to detect in themselves—even though the effects are definitely present.

Authority

Another way of knowing is to rely on **authority**. Obviously, we can't know everything there is to know. When we get sick, we usually consult a doctor and follow whatever advice he or she gives. We recognize that long years of study and practice tend to have qualified the doctor as an authority on medical diagnosis. Often the trust we place in medical authorities is rewarded with a cure. But, as some have learned, medical authorities are only human. They make mistakes. Some doctors are better than others. Medical horror stories of incompetent physicians who ruin the lives of their patients are not difficult to find. Blind allegiance to authority can often have debilitating effects on our search for reliable knowledge. Our awareness that doctors generally know more than we do about medical cures can lead to a shortcut in our thinking that results in the conclusion that *any* doctor can be trusted as an authority. That kind of

mental shortcut can lead to an undesirable and even dangerous result. Another risky mental shortcut that often occurs with authority figures is to transfer their authority to an area that is unrelated to their area of expertise. My doctor might be an authority in prescribing medication, but there may be little reason to trust the doctor's advice when it comes to finding a good auto mechanic or trying to figure out the best way to motivate my children to do well in school.

Hundreds of years ago, religious authority figures were adamant that the earth was the center of the universe and that every celestial body revolved around it. However, astronomical discoveries by Copernicus indicated that the earth actually revolved around the sun. Copernicus feared the actions of the church leaders so much that he kept his discoveries secret for over a decade before publishing them. Nearly 100 years later, Galileo was still confronting resistance from the Roman Catholic Church with regard to the Copernican model of the solar system.[4] Many people continued to reject the truth about the movement of the celestial bodies, because they relied on religious authorities for all knowledge. In this case, reliance on authority resulted in incorrect beliefs.

Over the years, television network executives have made various statements about the effects of media violence that tend to minimize the possibility of negative impact. Shouldn't these network executives be regarded as authorities on the topic? After all, they are in the day-to-day programming business. They sell advertising time on the basis of their understanding of the effects of commercials. If network executives say that media violence isn't a problem, shouldn't we listen? As we shall see later, one of the problems with arriving at knowledge by appeal to authority is that the supposed authority figures often have interests to protect. Just as religious authorities rejected new views of the solar system to protect what they believed to be their religious interests, so the TV networks can probably be blamed for issuing statements downplaying the importance of media violence out of their concern for maintaining economic profits.[5]

Science

In the chapters that follow, I have attempted to summarize the key scientific theories and scientific evidence on the question of media effects. **Science** is a particular way of knowing. One of the hallmarks of the scientific method is **systematic observation**, as opposed to casual observation. Science combines empiricism with logical thought and is always pressing onward toward greater precision of observation.[6] One of the best arguments in favor of the power of the scientific way of knowing is the observation that *science works*. A commitment to science has brought us powerful antibiotics to cure our diseases. It has also put human beings on the moon and enables you to browse the Internet and send text messages to your friends. Although science is a human activity that suffers from the multitude of human shortcomings, it is still the most powerful way of knowing what humans have at their disposal. One of the best ways to understand the scientific method of arriving at new knowledge is to understand the **goals of science**.[7] Whether one is doing natural science or social science, the goals are the same. Natural scientists attempt to achieve the goals of science in their

study of biology, chemistry, physics, astronomy, and the like. Social scientists attempt to achieve the goals of science in their study of social and psychological phenomena that involve human beings.

GOALS OF SCIENCE

Prediction

Accurate prediction is one of the coveted goals of science. If you turn on the weather forecast tonight on your local TV news, you will discover that the meteorologist has employed a wide array of instruments, maps, and satellite photos in an attempt to provide an accurate prediction of tomorrow's weather. **Prediction** can be defined simply as **foretelling the future**. Over the years, the science of meteorology has produced increasingly accurate forecasts. Forecasts for a day in advance are usually reliable enough that people can trust them in planning their picnics. When nearly the entire nation experienced a huge winter storm that killed at least a dozen people at the beginning of February, 2011, most people had two days of advance warning. In this case, accurate prediction undoubtedly saved lives. But the state of the art is not advanced enough to predict weather accurately over the long term. Science is in continual pursuit of better prediction.

In the area of media effects, accurate prediction is also one of the chief goals. For example, if researchers can predict ahead of time which children are most likely to imitate violent behavior seen in films, parents might be able to intervene to prevent exposure to films. Likewise, if scholars can predict that certain types of characters will facilitate learning on programs like *Sesame Street* or *Barney & Friends*, then young children might have a better start upon entering elementary school.

Explanation

Science certainly has no monopoly on prediction. Insurance companies are also in the prediction business. When each of my children, David, Erin, and Jordan, celebrated their twenty-first birthdays, I received notice that my auto insurance rates would be going down. Data collected by the insurance industry led to the prediction that unmarried drivers who have reached their twenty-first birthdays will be much less likely to have accidents than those who are younger. The next price break based on accident rates for females comes at the twenty-fifth birthday. For males, it comes when they reach 30. The data also indicate that females who marry after their seventeenth birthdays enjoy the same reduced risk as an unmarried twenty-five-year-old. These statistics are so dramatic that the insurance companies can pass on premium savings to the customer. The insurance companies don't really care much about *why* accidents drop off after female drivers turn 21 or male drivers turn 30. You can probably identify several possible reasons without thinking too long (more years of driving experience, increased

social maturity, and so on). The insurance companies care mainly about the fact that they can predict that the decrease will happen. It is on this point that the scientist and the insurance company may begin to part ways. They are both interested in prediction. But the scientist is also interested in **explanation**—knowing *why* something occurs the way it does.

If prediction means foretelling the future, then what does it mean to say that something has been explained? Think about something simple, like flicking a light switch. If someone asked you to explain why the lights go on and off each time you flick the switch, what would you say? You would probably say something about the electric circuitry behind the switch, including wires, light-bulb filaments, and the flow of electricity. All of these ingredients provide a broader framework or pattern that you invoke to help uncover the "why" behind the phenomenon of the light switch. And this is usually what it means to explain something. **Explanations place the phenomenon to be explained into a broader framework or pattern that doesn't really require much additional elaboration.**

Scientists are always searching for the best explanation of why something happens the way it does. You can probably appreciate the fact that arguments will often erupt about the adequacy of specific explanations. A parent might answer a three-year-old child's question about why the leaves turn colors in autumn by saying something like "That's the way God made trees." In this case, "God" becomes the broader framework or pattern that requires no additional elaboration. Such an answer might satisfy the three-year-old but will seem increasingly inadequate as the child gets older. On occasion, you've probably witnessed a child responding to an adult's explanations by repeatedly asking, "Why?" While the adult who has to endure this steady line of questioning may not appreciate it, the child has actually discovered something very important about explanations. Explanations can continually be scrutinized and pressed until more detail emerges that seems more satisfying. It isn't necessarily the case that an explanation with less detail is wrong. It just might not provide the desired level of intellectual satisfaction. The esteemed geneticist Francis Collins, former director of the National Human Genome Institute and current director of the National Institutes of Health, has made landmark discoveries about the genetic contributions to certain diseases and also led the stunningly successful Human Genome Project. In his book, *The Language of God*, Collins readily acknowledges his own personal belief that God is the master designer behind the complexity of life.[8] But in his explanations for why a given individual inherits a particular disease, Collins finds a simple appeal to God to be an unsatisfactory *scientific* explanation. Instead, he wants to delve into the particular complexities of human DNA. One of the characteristics of science is that it always encourages additional scrutiny. Sometimes, deeper levels of explanation are perfectly compatible with simpler levels. In other cases, the push for deeper explanations might completely challenge the simpler explanations that seek to account for a given phenomenon.

In media effects research, as in other sciences, scholars argue about how adequate certain explanations are for given research findings. For example, some researchers have located the primary explanation for people's increased tendency

toward aggression after seeing media violence in the aggressive images shown in programs or films.[9] Other researchers have argued that these images are not the most important factor. Instead, they have identified the increased physiological arousal caused by exposure to violent images as the critical explanatory ingredient in the increase in aggressive behavior.[10] You will read more about these explanations in Chapter 5 on media violence.

Understanding

Good explanations provide a sense of **understanding**. What does it mean to say that we understand how something works? Usually, **understanding relates to knowing the particular sequence of causal events** that unfold in a given phenomenon of interest. An explanation that yields a high level of understanding of how the light switch turns on the light would be one that ordered the causal chain of events beginning with the flick of the switch and ending with the illumination of the bulb. Because good explanations provide understanding, these two goals of science are closely related and tend to go hand in hand.

In the case of explanations of how watching media violence might increase aggressive behavior, our understanding would not be very deep if the explanation simply amounted to the statement that children watch the shows and then copy what they see. If this were the extent of the explanation, we might ask what really happens between the viewing and the copying. In other words, what is the exact causal sequence of events? Another hallmark of science is the constant quest for deeper levels of understanding.

Control

When scientists can accurately predict, explain, and understand a phenomenon, they are afforded greater **control** over that phenomenon. In the wake of the killer tornadoes that hit Oklahoma City in 1999, a number of news features appeared on TV that explained how the science of meteorology has advanced over the past few decades. With the help of such developments as Doppler radar, satellite cloud images, and computer analyses of storm data, meteorologists are now much better able than in the past to forecast the occurrence of a tornado. Though still far from perfect, the level of explanatory insight that scientists can claim for the tornado phenomenon is greater than it once was. Today's scientists, in contrast to those of the past, understand some of the causal forces that produce these extraordinary storms. Advances in prediction, explanation, and understanding provide a greater sense of control over the tornado event. People who live in areas that the data show are particularly susceptible can now be warned to take safety precautions. Broadcast practices can be modified to get the word out when meteorologists detect the early signs of a tornado.

Much like the scientific investigation of tornadoes, the investigation of media effects also holds ramifications for controlling events. A good example of the control implications of media effects research is easily seen in a study conducted by researchers Brad Bushman (University of Michigan) and Joanne

Cantor (University of Wisconsin-Madison) in 2003. Bushman and Cantor discovered that over the years, there had been a total of 18 research reports on how different media ratings systems affected attraction to media content. For example, if a movie is rated R, will people be more attracted to it than if it carried a rating of PG-13? The total number of people involved in these 18 studies exceeded 5,000, so there was a reasonable basis for drawing some firm conclusions. What did Bushman and Cantor discover? In fact, just as they suspected, they found that "media ratings do more to attract than to repel viewers." The research in this area makes a distinction between "descriptive" ratings, which simply provide information about the nature of the content, and "evaluative" ratings, which make recommendations about who should be restricted from media exposure. The rating system used by the Motion Picture Association of America (MPAA) is an evaluative rating system (G, PG, PG-13, R, and NC-17). Both descriptive and evaluative ratings made programming more attractive—particularly for male viewers. The authors believe that viewers use the ratings as a general clue to how much violence, sexual content, or other themes of a mature nature might be present in a movie. Being curious about these themes, children and adolescents are more attracted to films that carry ratings suggesting the presence of this sort of content. One implication of this research is that the ratings system used by the MPAA may actually tend to attract older children to the very film material that is, theoretically, not intended for their consumption. As a result of their study, Bushman and Cantor have several different recommendations about how the entertainment industry ought to use rating systems (see Study Box 1-1).[11] Just as in tornado prediction, an increase in the ability to predict and understand a given media effect results in increased control.

Sometimes the implications for control that may arise out of scientific research are controversial. The MPAA has resisted the policy suggestions that spring from Bushman and Cantor's research. This is not the first time that research has ultimately led to controversy about media policy. Back in 1974, researchers discovered that a short commercial message ("The Swing") that was designed to promote sharing and turn-taking behavior in young children was effective in modifying children's behavior. But the commercial caused great controversy among some people who were concerned about its potential to "brainwash" children. According to these critics, the message about sharing a swing on the playground might promote passive compliance among children who need to learn to stand up for their rights.[12]

Although lawmakers, organizations, and other policymakers might debate the pros and cons of particular strategies for controlling a phenomenon, scientists usually hesitate to become identified too closely with a particular policy. Instead, they are more comfortable pointing out the range of control strategies that are available as a result of the increased ability to predict, explain, and understand a given phenomenon. Although the goal of science is not necessarily to push any particular remedy for controlling an event, scientific progress is generally oriented toward providing greater measures of control over the things that are studied.

STUDY BOX 1-1

Policy Recommendations from Research on the Effects of Media Rating Systems

1. Rating systems need to provide guidance by using a system that people can easily understand without having to memorize definitions or decode letters and icons. Current ratings systems tend to be vague and confusing, and they provide insufficient guidance for parents.
2. Rating systems need to provide information about the content of the media. Parents are less interested in what the MPAA recommends for their children and more interested in what specific material is present in movies.
3. The criteria used for assigning ratings need to be explicated clearly. In general, there is a need for the ratings committees to include psychologists, who can explain exactly why certain movies should be rated in a particular way.
4. Many ratings of media material are self-assigned by the distributor or producer of the material. Consumers need to have a procedure for appealing a rating or putting the rating through some sort of public review.
5. The media industries need to devote significant efforts toward educating parents about their rating systems and attempting to make it easier for parents to find ratings information and apply it without confusion.
6. In the American media environment, censorship is not a practical solution. Parents assume the burden for controlling their children's viewing. But if this system is to work effectively, parents must have clear, reliable information about media content.

Source: Summarized and paraphrased from Bushman, B. J., & Cantor, J. (2003). Media ratings for violence and sex: Implications for policymakers and parents. *American Psychologist*, 58(2), 130–141.

HOW ARE THE GOALS OF SCIENCE ACHIEVED?

Theory

When I teach the fundamentals of science to students, and I ask them how they think the goals of science are usually achieved, I typically get a variety of answers. Students often identify experiments, testing, observation, data analysis, surveys, and so on. While these are all tools of the scientist that certainly help, the most powerful single way to achieve the goals of prediction, explanation, understanding, and control does not appear on that list. The most important factor in generating experiments, testing, data analysis, and the like is **theory**. It is also true that theories often arise *after* making observations from data, so some would say that we have a classic example of the "chicken and egg" problem—which comes first? The answer is that it can work both ways. But ultimately, having a strong theory to guide observation probably places the scientist in the most advantageous position to best achieve the goals of science.

Scientific theory is a bit different from the kind of theory that we might refer to in everyday conversation. When my wife and I were driving home from campus one evening, we noticed that there was much more traffic than usual, and we wondered about the reason for the increase. I announced that

I had a theory about the change, and I proceeded to speculate that road construction in another part of town had caused traffic to divert to our usual route home. Thus, we were in a traffic jam—even though the road construction was nowhere near our location. In this case, my casual use of the term *theory* was really just a synonym for the word *idea*. I could just as easily have said that I had an *idea* about the traffic change. The meaning would have been the same. But in science, the word *theory* cannot easily be replaced with the word *idea*.

There are several parts to the notion of scientific theory. First, a scientific theory **consists of more than one statement**. My notion of why traffic had increased on our route home was easily stated in a single sentence. But scientific theories take much more than a sentence to state completely. Often, they involve an entire manuscript that might even be as long as a book. Darwin explicated his theory of evolution in a book called *The Origin of Species*.[13] Albert Bandura took an entire book chapter to present his "social cognitive theory of mass communication."[14] You will read more about that theory in Chapter 5. The point here is that scientific theories consist of a *set* of statements—not just a single statement.

One thing that this set of statements does is to **identify the key concepts of the theory and specify how they are related**. In meteorology, a theory about tornado formation might include the concepts of warm air, cold air, and updrafts. The theory might describe how these concepts relate to one another to produce conditions that are favorable for tornadoes. A theory about how media violence affects viewers might describe how the concepts of attention, role models, identification, rewards, and punishments relate to one another to lead to the anticipation of viewers' aggressive behavior.

Perhaps the most important characteristic of scientific theories is that **they yield hypotheses that are testable by observation**. **A hypothesis is a specific prediction about what will happen under a certain set of well-specified conditions.** Hypotheses are not theories. They are produced by theories. Copernicus presented his heliocentric theory of celestial motion in the 1500s. The theory yielded a hypothesis that the earth rotates around the sun. One way to test this hypothesis was to look at the stars. As one scientist put it, "If Copernicus's theory were true... then stars nearer the Earth should seem to change their position relative to more distant stars as the Earth moved around the sun."[15] This change in position is called *parallax*. Once powerful telescopes were invented, parallax was actually observed, thus lending credence to Copernicus's theory. If parallax had never been observed, the heliocentric theory would have eventually been discredited and replaced by a theory that gave a better account of the data.

In the research about media ratings, before they actually looked at the data, Bushman and Cantor thought that there might be evidence for the hypothesis known as the **forbidden fruit effect**. This hypothesis actually comes from a theory in psychology that was formulated years ago by the psychologist Jack Brehm in a theory that he called **psychological reactance theory**.[16] According to this theory, whenever a person's behavioral freedom is threatened or restricted, the person will feel psychological reactance, which is a very unpleasant

feeling. In an effort to get rid of this feeling, the person will attempt to restore his or her freedom. One way to accomplish this is to engage in the behavior that is threatened or restricted. Bushman and Cantor thought that perhaps evaluative movie ratings, which suggest restriction of exposure to people of particular ages, might induce psychological reactance. If this were the case, people might be more attracted to movies that carry a restrictive rating. However, the data from their study didn't offer strong evidence for the forbidden fruit effect. As it turned out, although evaluative ratings *did* tend to attract viewers, so did the descriptive ratings, which, theoretically, should not have created any psychological reactance. Descriptive ratings, after all, simply provide a description of the content. They don't make any recommendations about who should be restricted from exposure. Bushman and Cantor concluded, then, that the forbidden fruit effect was not the best way to explain their data. Instead, they thought that both types of ratings were being used as a guide to content that people were curious about.

This example from the research on media ratings illustrates an important point about how the goals of science are actually achieved. Even though theory is a crucial element in the process, there is a constant interplay between theory and data. New theories are often inspired by certain observations. Existing theories are often modified, qualified, or discarded on the basis of data. Ultimately, theory without data is not very useful in contributing to the goals of science. In media effects research, just as in research on physical theory, hypotheses are often proposed from theories and then tested by observing the data.

Falsifiability

What does it mean to say that a theoretical hypothesis must be testable by observing the data? A key aspect of the meaning of testability is that the hypothesis must be **falsifiable**. This does not mean that the hypothesis has to turn out to be false. Instead, it means that it **should be possible to specify ahead of time what sort of data, if observed, would make the hypothesis false**. If one is able to clearly specify in advance the data that would falsify the hypothesis, and those data are never observed in systematic tests, the hypothesis has to be taken seriously. But if one is unable to specify in advance the data that would falsify the hypothesis, then one will not be able to determine whether the hypothesis has any merit. Em Griffin uses an analogy involving a trick basketball shot to illustrate this concept in his book about communication theory.[17] His description reminded me of an experience from my own childhood that makes essentially the same point.

During the summer, I used to play a series of Wiffle-ball games with one of my friends. During that series, my friend boasted that he had found a way to throw a secret pitch that was impossible to hit. The first time he threw me the pitch, I swung and missed. "See," boasted my friend, "the pitch just can't be hit." When I swung and missed a second time, I started to wonder if he might be right. But the third time he gave me the secret pitch, I hit it down the left-field line. Before I could say a word, my friend announced, "That wasn't my

secret pitch. I didn't have my fingers lined up right." For several more innings, my friend tried to protect his thesis that the secret pitch could not be hit. Each time I swung and missed, he declared that he had thrown the secret pitch. But each time I managed to hit a double or a home run, I would inevitably discover afterward that it hadn't been the secret pitch after all.

What was wrong with my friend's claim? As he eventually discovered, I couldn't take his thesis about the secret pitch very seriously. If he had really wanted to convince me that the thesis was true, he needed to announce *ahead of time* what would have to happen to disconfirm his claim. He needed to say something like, "This is the secret pitch—and if you hit it, then I can no longer say that my secret pitch is impossible to hit." The fact that he couldn't make his claim a falsifiable one undermined his ability to determine if the claim was valid.

This is exactly the case with scientific theory. If a theory yields a hypothesis that can never be falsified, the theory will not ultimately enjoy acceptance in the scientific community, because there is no way to determine if the theory's claims are valid. Sometimes theories, including theories of mass communication that may sound provocative, are not able to contribute very much to the goals of prediction, explanation, understanding, and control because there is no way to falsify them. If you make it all the way to Chapter 12, you'll read about some theoretical ideas that media scholars who take a scientific approach have great difficulty accepting. A good part of their difficulty has to do with the fact that there isn't any clear way to collect evidence that disconfirms the ideas. Just like my friend's trick pitch, if there isn't any way to disconfirm the theoretical idea, there's no way to gather much confidence about it either.

Creativity

Where do theories come from? As obvious as it may seem, the answer to that question is worth noting. Theories are created by human beings. They're made up in the heads of people. They don't just drop down from the sky as some sort of revealed truth. This is an important point to realize—especially for students of communication who are studying theory. There's a tendency to treat theory as some sort of sacred text that is beyond the ability of any mere mortal to invent. Nothing could be farther from the truth. Virtually every theoretical idea that you'll read about in this text was *made up* by a person who was once a student just like you. The notion that theories are "made up" might suggest that building a theory is similar to painting a picture or writing a poem. In fact, that's not such an outlandish thought.

Albert Einstein's theory of relativity is considered by many to be one of the most "beautiful" theories ever created. It might surprise you to learn that Einstein actually believed that if a theory wasn't pleasing to the aesthetic sensibilities in much the same way as a beautiful painting, then the theory wasn't very good. For Einstein, "we can use our aesthetic judgment to ascertain how close a scientific theory is to the truth."[18] If a theory seems appealing, it's probably closer to the truth than some uglier alternative. Just as artists may disagree about the elements of a painting that contribute to its beauty scientists may also

disagree about the elements of a theory that make it aesthetically appealing. Nevertheless, there are at least two points to take away from this discussion: 1) If you judge a theory to be "messy" or "ugly," some scientists would argue that those are perfectly legitimate criteria to invoke in judging a theory's value, and 2) the fact that theories are created by human beings means that you shouldn't count yourself out when it comes to making up theory. Perhaps as you study some of the media phenomena mentioned later in the book, you'll invent your own theory to provide an explanation of what's going on.

The Nature of Science

Theories that are simultaneously beautiful and falsifiable certainly form an important foundation for the achievement of the goals of science. Without research generated by such theories, there would be little progress toward those goals. A great deal of scientific activity is devoted to the actual details of the research process: What methods can be used to actually test a hypothesis? Chapter 2 will introduce you to some of the methods used to investigate mass media effects from a scientific perspective. But before we move along to a consideration of these methods, it is important to understand some of the underlying commitments of the scientific enterprise. Although we live in a culture that enjoys the numerous benefits of these commitments, the commitments themselves are not often articulated clearly—even by scientists.

At this moment, I am witnessing an event that people who lived 100 years ago would find unbelievable. My fingers are tapping on lettered keys, and words are instantly appearing on an illuminated screen. If, during this process, I get a headache, I know that I can take two aspirin tablets and my headache likely will disappear in less than an hour. The application of science is responsible for these benefits—for my opportunity to use the computer and for the relief of my headache. It is easy to take the benefits of science for granted while simultaneously remaining ignorant of how these benefits were derived. To the extent that we can understand the underlying nature of science, we will be in a better position to actually implement the scientific method, understand the outcomes of science, and make additional advances. In Study Box 1-2, you will find a brief list of qualities that a sociologist, Earl Babbie, identified as describing the nature of social science.[19] Following this list, I expand on one of the dimensions noted by Babbie, and I also add a few other aspects of science that are important to grasp.

Science Is General

One of the important aspects of science that is often misunderstood is the quest for generality. Think back to the opening discussion about the shootings at Columbine High School, Virginia Tech University, and Tucson, Arizona. Most of the public discussion that followed these incidents focused on uncovering the particular reasons a person would turn guns on other people. Social commentators cited a wide range of possible explanations, including mental illness, parental neglect, social isolation from some larger community, the influence of violent

STUDY BOX 1-2 | CHARACTERISTICS OF SOCIAL SCIENCE

Social science is:

Logical: Scientists use inductive and deductive logic to achieve their goals. Theories must not contain logical inconsistencies.

Deterministic: Scientists assume that events happen for reasons. Things do not "just happen."

General: The aim is to understand overall patterns of events. The larger the scope that is explained, the more useful the explanation is.

Parsimonious: The aim is to gain the greatest amount of understanding from the smallest number of variables.

Specific: Scientists must be specific about the methods of measurement used to investigate a given phenomenon.

Empirically verifiable: Propositions and theories must be testable in the real world.

Intersubjective: Descriptions of observations must be sufficiently detailed that other scientists will be able to replicate the observations.

Open to modification: As time passes, new evidence may be expected to revise existing ways of thinking about a phenomenon.

Source: Babbie, E. R. (1973). *Survey research methods*. Belmont, CA: Wadsworth.

video games (particularly, *Counter-Strike*), the impact of a particular scene from the movie *Basketball Diaries*, and the impact of mood-altering drugs. You may have noticed that on the various news and talk shows that proliferated in the aftermath of these shootings, few scientists went before the cameras claiming that the cause of the shootings was easy to identify. Their reluctance to identify the specific causes may not have been very satisfying to the news media, but it made sense from the standpoint of what constitutes good science.

The predominant quest of the news commentators following the events of Columbine, Virginia Tech and Tucson was to find the particular reason or reasons for the attacks. In research, this would be analogous to a "case study" approach to knowledge. In such an approach, the investigator seeks to describe a given case with as much detail as possible—invoking as many variables as possible—so that a full and complete understanding of the event can be achieved. Once this understanding is reached, it *could* be helpful in generalizing to other cases—but the details of a given case are typically so idiosyncratic that generalizing is likely to be impossible. For example, one of the boys who did the shooting at Columbine was an avid participant in a fantasy baseball league. In the case study approach, this fact could turn out to be highly significant. Perhaps the boy had become disenchanted with his team's progress and his mood had sunk, thus contributing to his outrage. While this detail could be crucial for understanding a single case, it isn't likely that participation in fantasy baseball leagues would ever become a key variable in generalizing to other school shooting cases.

Unlike the case study approach to knowledge, science searches for general patterns or principles. These patterns are usually stated in terms of probability and attempt to employ as *few* variables as possible. For example, researchers might know that the probability of antisocial behavior among youth increases with parental neglect. Or media researchers might know that boys who play violent video games are more likely to exhibit aggressive behaviors. Notice that it might be difficult or nearly impossible for a scientist to connect these *general* findings with a *specific* case. In a given incident, violent video games or parental neglect may have little to do with a specific crime. And even if they were contributors, it might be difficult for any scientist to proclaim this on the basis of any compelling evidence. In dealing with specific cases, it may be quite difficult to know exactly why a person acted in a particular way. Even though scientific research on fantasy baseball leagues might reveal that such a hobby is generally healthy (I've never read any scientific research on this topic), it might turn out to be a significant culprit in a crime in any given case.

In the end, case studies do much more to inform us about idiosyncratic cases than they do to help us understand broader patterns. Scientific research does more to inform us about broad, general patterns across large groups of individuals than it does to help us understand the particulars of a given case. Scientists who did participate in the public discussions after the Columbine, Virginia Tech, and Tucson shootings tended to take the opportunity to discuss the general patterns found in research pertaining to playing violent video games, taking mood-altering drugs, or mental illness. The fact that they stopped short of claiming that these variables had anything to do with the actual shootings may have frustrated some viewers. But the commitment of science to uncovering general patterns is viewed among scientists as more valuable to society than an emphasis on specific cases. You would probably appreciate this value if your doctor informed you that the drug you were about to take was effective in 99 percent of cases that had been observed in a very large scale clinical trial. The information about this general pattern of effectiveness would undoubtedly be much more pertinent to your decision to take the drug, than if he told you that his only knowledge of the drug was based on how his friend had reacted to it when he took it.

Science Acknowledges the Existence of Objective Truth

It is fashionable today to proclaim that there is no objective **truth** to be uncovered. Some of my students can often be overheard saying that there is no such thing as truth—truth is relative. Something may be true for you but not true for me. When classroom discussions turn to the effects of the media, I can almost always count on at least one person saying something like the following:

> It is certainly OK for you to believe that media have bad effects on children. I mean, if that's true *for you*, then no one can really argue with you about that. And I'm certainly not going to argue with you. But *for me*, the media don't have bad effects on children. I grew up with TV and I don't think it hurt me at all. I kind of liked cartoons and then

> I got into science fiction for a while. So no one will convince me that it has bad effects. But if it does *for you*, that's OK. You know—what is true for you is true *for you* and what is true for me is true *for me*. There is no such thing as something that's true for everybody.

If all of my students take this sort of perspective, it certainly produces great harmony in the classroom. It sounds very tolerant. But tolerance notwithstanding, there are certain features of the statement that make little sense when subjected to critical scrutiny. Let's start with the last statement: "There is no such thing as something that's true for everybody." The problem can be uncovered quite simply by asking this question: Is the statement itself true for everybody? If, on the one hand, the statement is true for everybody, then the existence of this fact stands as a complete disconfirmation of the statement itself. In other words, if the statement is true for everybody, then the claim in the statement is false. In this case, the statement would be self-contradictory. If, on the other hand, the statement is *not* true for everybody, then it might not be true for you or me. If it isn't true for you or me, then we can reject the statement as false. In either case, the statement runs into significant problems as a claim to be taken seriously as a "true" statement. Two scientists, Theodore Schick Jr. and Lewis Vaughn, have summarized the situation this way:

> Each time we assert that something is the case or we think that something is a certain way, we assume that there is objective reality. Each time a relativist denies it, he entangles himself in self-refutation and contradictions. In the very argument over the existence of objective truth, both those who accept it and those who deny it must assume it or the argument would never get off the ground. (p. 80)[20]

With respect to arguments about media effects, the assertion that the media affect children is incompatible with the assertion that they don't affect children. The two assertions cannot both be true. There is, in fact, an objective reality "out there" to be discovered by the media effects researcher. The fact that the truth is out there to be discovered is no guarantee that scientists will actually discover it. But when one takes a scientific approach, one is definitely committing oneself to the notion that objective truth exists.

Let's go back to the student's statement about media effects, just to make sure that we don't get things confused. It may well be that the media might affect two people differently. If that is the point the student is trying to make, then we surely have to grant it. But when this position gets articulated in a general way that results in the denial of the existence of an objective truth, the scientist would issue a correction. Look again at the student's statement. The actual effects of the media may, in fact, be relative. That is, the media may affect various people differently. But the *fact* that the media affect people differently is an objective truth for everyone. As Schick and Vaughn note, "Certain states-of-affairs … may be relative to individuals. *But the truth about those states-of-affairs isn't relative*" [emphasis in original].[21] The point, then, is to recognize that **scientific activity is concerned with uncovering the truth about things**. In the area of media effects, scientists want to uncover the truth about media impact.

Science Assumes a Skeptical Attitude

If you scan through the ads in some popular magazines and newspapers, it probably won't be long before you come to an ad that advertises psychic advice. Such ads were especially prevalent on cable TV until a 2002 decision by the Federal Trade Commission charged that ads placed by "Miss Cleo" were fraudulent because they promised "free" advice but then charged customers large telephone fees. Nevertheless, if you want advice about your future, you can still find a psychic to satisfy your desire. Many self-professed psychics will talk to you over the telephone and tell you things about your life that the psychic supposedly knows only by some psychic process. After you become convinced (if you do) that the psychic knows the details of your life, he or she will proceed to give you advice about how to conduct your future affairs. Of course, this advice usually doesn't come for free. In past years, the telephone psychic industry has done literally billions of dollars of business.[22] Obviously, many people believe the psychics and take their advice. But should they?

A person with a **scientific attitude** would approach the phenomenon of psychic advice with great skepticism. If such a psychic process did actually exist, it would violate the current understanding of natural law. That is, scientists currently would have no way to explain how such a process took place. This feature alone would not cause the scientist to rule out psychic phenomena. For years, scientists could not explain how the firefly lit up, but there was no disagreement that it did. Now, of course, scientists understand the chemistry of the firefly's light so well that they have been able to harness it. Children now carry luminescent sticks on Halloween and wear luminescent necklaces that became possible after the chemistry of the firefly was discovered and explained. However, upon examining the claims of the psychic's ability to see into the future, a scientist still has many unanswered questions. Unlike the firefly phenomenon, about which there was no disagreement, scientists are quite skeptical about the claim that psychics can know the future any better than the average person. If psychics can really see future events, why can't they purchase winning lottery tickets before a drawing for a huge jackpot? Psychics inevitably dodge such questions with a variety of explanations of how the psychic process doesn't permit them to see lottery numbers. But it is harder for the psychic to deal with the fact that certain people who have studied their craft can seem to duplicate their amazing powers—without claiming any psychic ability.

Finally, remember the acid test of science—falsifiability. If the psychic's power is real, then why not offer a specific prediction about a future event that would clearly demonstrate that power? Actually, there is a large monetary award (more than $1 million) waiting for the first psychic who can meet this challenge successfully. It is offered by the professional magician and illusionist James Randi.[23] In the final analysis, scientists are skeptical about psychic claims because no scientific evidence exists for their validity. Social scientists should likewise be skeptical about claims of media impact until clear evidence is offered in favor of those claims. As you will read in some of the later chapters, plenty of ideas have been offered about media effects that turn out not to be supported.

Science's Skeptical Attitude Often Leads to Controversy

The fact that some scientific claims appear initially to be promising but end up with little support is a fact that implies something that's very important to realize about the nature of science: the application of the scientific method almost guarantees that controversies will emerge. At any given time, science can be characterized as an activity that has numerous, new unsupported claims being touted by some and viewed by others with suspicion. It also has claims that have been around for a while and may be waning in support—but might not be completely dead.

A recent example of a running controversy in the social science literature concerns the evidence pertaining to the existence of ESP (extra-sensory perception). In January 2011, Professor Daryl Bem, a widely respected social psychologist with an illustrious career, reported the results of research on over 1,000 people that he claimed supported the existence of ESP.[24] For example, when participants in one experiment were asked to click on one of two identical curtains to reveal the one that hid an erotic picture instead of a blank wall on their computer screen, there was a slight tendency (about 53% of the time) for participants to correctly click on the curtain that hid the picture. In fact, a computer randomly generated where the pictures showed up only *after* participants had indicated their choices, so Bem reasoned that the evidence indicated a slight tendency for his participants to be able to forecast a future event. The difference between 53% and 50% (50% would be expected by chance) might seem small. But the statistical tests that Bem employed showed that this difference was not likely to occur by chance alone (you will read more detail about "statistically significant differences" in the next chapter). Bem's conclusion was that some sort of pre-cognition or ESP process seemed to be taking place—although he didn't attempt to explain that process. The results of his experiments were compelling enough to lead the editors of the flagship journal in social psychology to publish the findings. As you might imagine, his research has generated controversy. It earned him a special TV appearance on the *The Colbert Report*.[25] It also generated a scholarly rebuttal written by several other scientists that was published in the same issue of the journal that carried the report of Bem's experiments.[26] If you asked scholars who have read the research, you'd probably find some who believe that ESP has now been confirmed as a real phenomenon. You'd also find some who believe nothing of the sort.

Over the years, I've noticed that beginning students often become impatient and frustrated with the controversies that characterize the scientific literature. They desire clear, unambiguous conclusions about scientific findings. Controversy seems to cloud the search for truth. Sometimes this frustration leads students to adopt a very low view of the value of scientific thinking. Preconceived notions about the precision and accuracy of scientific procedures can exacerbate the frustration. When a student begins with the assumption that science always yields definitive conclusions and then discovers uncertainty in so many areas, it's easy to become disconcerted. Some students even jettison the whole scientific enterprise as a worthless endeavor. That's unfortunate. The fact that we can't

always tell with certainty whether something is happening is a poor reason for discarding science as a powerful way of knowing. It's true that the pace of scientific progress can be painstakingly slow and marked by controversy. But over time, the application of the scientific method usually clarifies what's going on and leads to stronger and stronger consensus. Healthy skepticism might mean that it takes science much longer to come to consensus about something—but it also means that once consensus is formed around a particular conclusion, that conclusion is more likely to be correct. In the final analysis, science actually thrives on controversy. The same frustration that might lead some to form a low view of science serves as a powerful motivation for scientists to move forward in the quest for truth. Susan Haack, a professor in philosophy, understands the temptation to dismiss the scientific method as nothing special. She admits that science, "is a thoroughly human enterprise, fallible and messy, its progress ragged and uneven."[27] But she also points out that this doesn't mean that science is not a very distinguished way of knowing things. In the end, she embraces science—with all of its flaws—as the most powerful way we've found to accumulate knowledge.

Science Can't Answer Certain Kinds of Questions

Some people think that a scientist is a person who believes that all things are knowable and that scientists are "know-it-alls" who look down on others as "know-nothings." Unfortunately, there are too many scientists who don't do a lot to combat this image. One of the things that a good scientist will readily admit is that certain kinds of questions fall outside the purview of scientific investigation. Scientists may have invented the atom bomb, but science can never give a definitive answer to the question of how the bomb should be used. In the area of media effects research, science can tell us *how* viewing violent images is likely to affect children, but it can't tell us *what* the federal government should do about media violence—or whether it should do anything at all.

There are other kinds of mass communication theory and research that won't be presented in this book, because they are not really concerned with documenting the effects of the media. These other theories (e.g., critical and normative theories) address questions that scientists can't answer by applying scientific methods. Likewise, by applying their methods of criticism or interpretation these other theories can't answer questions that science can answer about media impact. In their book *Mass Communication Theory*,[28] two media scholars, Stanley Baran and Dennis Davis, present a number of questions that don't lend themselves well to scientific methods—including these:

- Should media do something more than merely distribute whatever content will earn them the greatest profits in the shortest time?
- Should media become involved in identifying and solving social problems?

In contrast, questions such as the following are most appropriately addressed within a scientific framework:

- Does viewing media violence cause people to become desensitized to violence in real life?

- Are the outcomes of political elections affected by the news media's projections of winners prior to the closing of the polls?

Scholars who take different perspectives in their search for knowledge may be trying to answer different questions. Sometimes the tension that exists between scholars who identify with different traditions of inquiry can be alleviated a bit by recognizing the differences in the kinds of questions that are capable of being addressed from each perspective. Scientists do themselves no favor when they give the impression that their perspective can be used to answer every kind of question. It can't. But the general power of science as a mode of inquiry can hardly be denied. Without the knowledge that has been generated about media effects from a scientific perspective, we would be left with little but opinion and speculation. Science is not after opinion and speculation. It is after truth. As Ralph Estling, a writer from the United Kingdom, has recently argued in an essay,

> In science, pluralism and tolerance will imperceptibly fade into relativism where there is no such thing as external truth, objective facts, intrinsic, self-sustaining reality, where there is only "my truth" and "your truth." There is never any need to compare, contrast, question, doubt, argue, seek to learn from what the data say and what the Universe tells us. When this happens, truth—for there is such a thing—is in dire peril. And science ceases to function. (p. 55)[29]

Some of the most interesting questions to consider regarding mass media are questions that can't be answered by any sort of scientific study. For example, should journalists be permitted to ride on tanks with the soldiers on the front line? Should individual states design powerful shield laws to protect journalists from having to reveal their confidential sources? Should the Federal Communications Commission (FCC) reinstitute the "fairness doctrine" requiring broadcasters to give coverage of differing viewpoints on controversial issues? Questions such as these are addressed best by normative and critical theory—not scientific theory. On the other hand, questions about how media content affects people's thoughts, feelings, and actions are best addressed by scientific theory. The focus of this book is on theory and research that is properly situated within the scientific tradition of the field.

SUMMARY

This chapter began with a discussion of the tragic events at Columbine High School, Virginia Tech University, and Tucson, Arizona. Many opinions about the causes of those events were expressed in the popular press, but it is often difficult to determine the truth from sifting through a host of opinions. Personal experience and appeal to authority are different ways of knowing—but they don't apply the systematic observation and logic that is included in a scientific approach. The goals of science are prediction, explanation, understanding, and

control. Scientists achieve these goals by creating theories and testing theoretical hypotheses that are falsifiable. There are a number of important ingredients that characterize a scientific approach. Science is concerned with uncovering truth. But it maintains a **skeptical attitude** and acknowledges that it can't answer every question. Although controversies abound in science, that's no reason to become disenchanted with a way of knowing that has demonstrated its power over the centuries. Ultimately, the scientific method seeks to make general statements about the way variables are related. Consequently, while scientists may have much to contribute to a general discussion about events such as the shootings at Columbine, Virginia Tech, and Tucson, they will probably refrain from making statements about the particular causes involved in an isolated incident.

KEY TERMS AND CONCEPTS

experience
empiricism
authority
science
systematic observation
goals of science
prediction
foretelling the future
explanation
understanding
control
theory
hypothesis
forbidden fruit effect
psychological reactance theory
falsifiability
truth
scientific attitude
skeptical attitude

To learn more about the topics in this chapter, enter the Key Terms and Concepts found in this chapter as subject and keyword searches on your InfoTrac® College Edition.

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