13 Writing About Complex Worlds

AIMS OF THE CHAPTER

The more you find out about subjects, the more there is to think about. Your writing then begins to deal with this greater complexity. This chapter discusses how to write clearly while also recognizing that many facts, ideas, and viewpoints bear on one's subject.

KEY POINTS

1. In college you are often confronted by complex texts and complex issues. Material isn't simplified to provide easy answers or a single way of looking at something, especially if there is serious disagreement or if multiple factors are involved.
2. To write about complex subjects, you identify the several distinct ideas or elements that are simultaneously present.
3. One kind of complexity is an event or phenomenon that has many aspects, causes, factors, or consequences. The task here is to describe in clearest terms the multiple parts of the topic and how they fit together.
4. Another kind of complexity occurs when opinions conflict over an issue. In this case you have to understand the multiple viewpoints before you can come to your own understanding of the issue.

QUESTIONS TO THINK ABOUT

- In writing an essay, have you ever felt you had to oversimplify what you were discussing to make a clear point? How did you simplify your task? What did you leave out? What was the effect of leaving it out?
- In writing about a subject, did you ever have information that didn't fit together easily, or even conflicted? What did you do?
- What do you do when you discover credible authorities who disagree about a subject?

There are often many simple ways to talk about a subject, but they are often too simple. They leave things out, lead to poor decisions, or ignore the reality that other people with good reasons see things differently. Writing about complex subjects involves explaining them as simply and directly as you can but without hiding or distorting any of their complexity.

Textbooks at lower levels often present one single, authoritative way of looking at a subject so that students know what they have to learn. But as you advance in the subject, you find that often there are alternative points of view about many of its aspects, from the interpretation of current results to basic viewpoints. You move into areas about which there is little certainty and agreement, and into areas we all know less about. Professors often confront students with this complexity because they want them to be able to address the puzzles that still confront their disciplines.

In fact, university courses are often designed to immerse you in the complexity of problems and issues that you may have originally thought simple. Part of professors' professional task is to be as knowledgeable about their areas as possible so that they can develop accurate research and statements that will lead to more intelligent analysis and action. Their job is not to oversimplify. If they can find simple statements that explain much and do not overlook important data, then indeed they are fortunate — they have made a great discovery, a new theory that many people may find useful. However, breakthroughs to accurate and simple statements usually come only after one is immersed in the full confusion and complexity of a problem for a long time, for the solution has to draw together all those details. Even then, the new simplification may be difficult to understand. Quantum theory, although greatly simplifying our general understanding of the behavior of particles and energy, still remains complicated to understand and work with. Linguistic descriptions of grammar, although seeking accurate and powerful ways of understanding the complexity of language, nonetheless are often a challenge to understand and use.

NEWS FROM THE FIELD

The Simple Paper Clip Isn't So Simple

Everyday items that seem simple and self-evident often have complicated stories behind them. Every year, manufacturers produce more than 20 billion paper clips, most of which share the same basic design: a single piece of wire bent into an elongated loop with a second loop inside the first one. This paper clip design is so simple and functional that it would be difficult to imagine any other, but, in fact, the current design of the paper clip is less than a hundred years old, and reflects centuries of design evolution and improvement. In his book *The Evolution of Useful Things,* Henry Petroski, a civil engineering professor at Duke University, devotes 26 pages to tracing the history and development of the common paper clip.

Petroski writes that, for centuries after the invention of paper in first-century China, people bound multiple sheets of paper by cutting a small hole in them and tying them together with a piece of twine or thread. In the Middle Ages, people fastened paper together with straight pins, which, unlike paper clips, could be mass-produced without industrial technology. In his famous book *Wealth of Nations* (1776), Adam Smith noted that ten people working in a factory could produce 48,000 pins in a single day. While many of these pins would be used for sewing and other household

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operations, many more would be used by banks, businesses, and offices for the purpose of binding important documents together.

With the Industrial Revolution of the nineteenth century, machines soon replaced human labor as the chief manufacturer of straight pins. And since machines were capable of bending wire as easily as cutting it, manufacturers of "bank pins" (pins marketed for use in offices) began to introduce improvements. In 1864, a patent was issued for a "paper fastener" that turned out to be "a decorative metal device whose two small teeth pierced the papers and were folded over another piece of metal placed against the back side of the sheets, thus clasping them together." Though the paper fastener did not solve the main problem of straight pins — the fact that they left holes in the papers they attached — it did solve the problem of sharp points snagging other papers in the vicinity.

In 1887, a Philadelphia inventor named Ethelbert Middleton patented a paper fastener that did not use a paper-piercing point. This early prototype of the paper clip consisted of "malleable metal stamped in curious patterns whose use involved the action of folding various wings over the corners of the papers." The invention was useful but too complicated for mass appeal, since it required complicated manipulations of "various wings" to achieve its end. However, Middleton's invention was one of many signals that, by the latter half of the nineteenth century, engineers were taking the invention and improvement of paper fasteners seriously.

The search for a better paper fastener was guided by the principles of Hooke's Law. Named for its seventeenth-century discoverer, a British physicist named Robert Hooke, Hooke's Law states that metals will behave "elastically" up to a point — they will spring back to their original shape after being bent. But if they are stretched beyond a certain point, they will lose their spring and not return to their original shape. Toward the end of the nineteenth century, inventors began to apply the principles of Hooke's Law to bent pieces of wire in an attempt to discover a design that would use the elastic property of metal to hold pieces of paper together effectively.

The actual invention of the current paper clip cannot be accurately credited to any one inventor, though several patents issued at the turn of the century give us some clues. Many accounts credit the Norwegian inventor Johan Vaaler with the invention in 1899, and Vaaler did obtain an American patent of a "paper clip or holder" in 1901. However, earlier patents were granted to Americans Matthew Schooley (1896) and Cornelius Brosnan (1900), both of whose patent applications acknowledged the existence of other bent-wire devices that they were improving upon. Brosnan's invention, marketed as the "Konaclip," came close to the contemporary design except that, instead of featuring a loop within a loop like modern paper clips, it had an outside loop with a single piece of wire running down the center, making it more difficult to grasp and hold several pieces of paper at once.

The design that has come to dominate the paper clips of the twentieth century is known as the "gem" clip, and it has never actually been

patented. However, in 1899 a patent was granted to William Middlebrook of Waterbury, Connecticut, for a machine designed to manufacture them. The drawings that Middlebrook submitted to the patent office showed a perfectly proportioned gem paper clip, suggesting that the design was known and used years before Vaaler, Schooley, and Brosnan claimed to "invent" their designs. By 1908, catalogues advertised the gem clip as "the most popular clip" and "the only satisfactory device for temporary attachment of papers" (69). The gem soon replaced the Konaclip as the paper fastener of choice, and has now become synonymous with the word *paper clip* throughout the world.

The gem paper clip is a complex piece of engineering whose subtleties eluded inventors for centuries. Before the paper clip could be developed and successfully manufactured, physicists had to understand the behavior of metal, and machinists had to perfect complicated methods for bending wire without the need of human intervention. However, this complex history usually remains hidden behind the apparent simplicity of the device — and this is not unique to paper clips.

Complexity Presented to You and Complexity You Find

Complexity can turn up in a variety of places in a course. Sometimes it can turn up in the professor's lectures or in a book you read: that is, a subject or issue is presented to you as complex or many-sided. However, the professor's lectures or the book will also provide some guidance by presenting the parts, pieces, or sides in an organized way, perhaps even showing a relationship among the parts. Thus the complexity is already presented to you with a coherence and a shape, the result of someone's hard thinking and work.

Consider the following passage from Charles Darwin's *The Origin of Species*. In the chapter from which this passage comes, Darwin is anticipating various objections to his theory of natural selection and attempting to answer them in advance. In this passage, he deals with the objection that the long-term, inexact process of selection would not be capable of producing a complicated, perfect organ such as the eye. He argues that the eye could have evolved in a series of stages, each useful and well formed for the creature that possessed it.

> To suppose that the eye with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration [that is, blurring and color distortion that occur when light passes through lenses], could have been formed by natural selection seems, I freely confess, absurd in the highest degree. When

> it was first said that the sun stood still and the world turned round, the common sense of mankind declared the doctrine false; but the old saying of *Vox populi, vox Dei* [that is, "The voice of the masses is the voice of God," or "Popular opinion is true"], as every philosopher knows, cannot be trusted in science. Reason tells me, that if numerous gradations from a simple and imperfect eye to one complex and perfect can be shown to exist, each grade being useful to its possessor, as is certainly the case; if further, the eye ever varies and the variations be inherited, as is likewise certainly the case; and if such variations should be useful to any animal under changing conditions of life, then the difficulty of believing that a perfect and complex eye could be formed by natural selection, though insuperable by our imagination, should not be considered as subversive of the theory.

From Charles Darwin, *The Origin of Species* (New York: Mentor, 1958): 168–69.

To understand the complexity of this passage, one must first understand the rhetorical aim of its author. In the book *The Origin of Species,* Darwin has argued that the various traits of different species evolve through a process of "natural selection" in which accidental mutations that benefit a species are gradually absorbed by the species. Darwin felt that the biological evidence in favor of his theory was overwhelming, but he also knew that it went against most people's notions of "common sense." In this passage, Darwin is setting up a lengthy presentation of biological evidence. He does not actually present the evidence in this paragraph; instead, he establishes a framework for his argument by doing three things:

1. He acknowledges that his theory goes against common expectations.
2. He asserts — through argument and example — that common opinion is not a good measure of scientific truth.
3. He states that, if he is able to demonstrate with scientific evidence that the eye has undergone mutations and improvements in the past, then he is justified in claiming that such mutations were indeed capable of producing the eye in its present complexity.

In class discussions, essays, and examinations, you will need to be able to avoid oversimplifications and to discuss the subject in a way that recognizes all the complexities suggested in the lecturer or book. But in doing this you need only follow the path already opened up by others. Once you have been given several examples of complex topics, the instructor may begin to expect more out of you. As you approach new subjects and topics, you may be expected to find the same kinds of complexities presented to you in previous cases and topics. The earlier examples will often be treated as models you should use for developing your own thoughts.

If you keep notes describing how complicated topics are treated in your readings and lectures, then you may have a better clue as to the kinds of thinking your professor would like you to develop. For example, a student

reading the above passage might make the following comment in a personal journal:

> This is an amazing passage, typical of what Darwin is doing throughout the The Origin of Species. He gets us to see opposite things about the eye at the same time. He shows us how wonderful, coordinated, and well-designed the eye is, solving complex problems in optics; at the same time he says that the wonderful design did not have to develop in a single coordinated way, but could be the result of simpler eyes, each of which worked at its level. Each level could then have evolved for the next.
>
> In addition to making his point about how the eye evolved, he is setting us up for all the detailed evidence he has found in nature for different levels of the eye. So now we know how to make sense of the many examples that follow. Evolution becomes a way of making sense of the great complexity of nature recorded in the book. Thus evolution as a theory tries to make complex things simple and understandable.

This student, by making sense of the passage, is also making sense of the meaning of Darwin's book and theory.

READING ABOUT COMPLEXITY

Read the following passages. Pick two that interest you and comment on their meaning in an informal journal entry. Consider how the author brings a complex situation together into a coherent description.

1. Psychology

Sigmund Freud (*Civilization and Its Discontents,* trans. James Strachey [New York: Norton, 1961]: 61) discusses how difficult it is for humans to live without aggressiveness.

> It is clearly not easy for men to give up the satisfaction of this inclination to aggression. They do not feel comfortable without it. The advantage which a comparatively small cultural group offers of allowing this instinct an outlet in the form of hostility against intruders is not to be despised. It is always possible to bind together a considerable number of people in love, so long as there are other people left over to receive the manifestations of their

aggressiveness. I once discussed the phenomenon that it is precisely communities with adjoining territories, and related to each other in other ways as well, who are engaged in constant feuds and in ridiculing each other — like the Spaniards and the Portuguese, for instance, the North Germans and the South Germans, the English and the Scotch, and so on. I gave this phenomenon the name of the "narcissism of minor differences," a name which does not do much to explain it. We can now see that it is a convenient and relatively harmless satisfaction of the inclination to aggression, by means of which cohesion between the members of the community is made easier.

2. History

Thomas P. Hughes (*American Genesis* [New York: Penguin, 1989]: 184–85) presents the importance of technological systems in transforming modern life.

> Since 1870 inventors, scientists, and system builders have been engaged in creating the technological systems of the modern world. Today most of the industrial world lives in a made environment structured by these systems, not in the natural environment of past centuries. . . . Today machines such as the automobile and the airplane are omnipresent. Because they are mechanical and physical, they are not difficult to comprehend. Machines like these, however, are usually merely components in highly organized and controlled technological systems. Such systems are hard to comprehend, because they also include complex components, such as people and organizations, and because they often consist of physical components, such as the chemical and electrical, other than the mechanical. Large systems — energy, production, communication, and transportation — compose the essence of modern technology.

3. Music

Douglas R. Hofstadter (*Gödel, Escher, Bach* [New York: Vintage, 1979]: 8) describes the structure of a musical canon.

> The idea of a canon is that one single theme is played against itself. This is done by having "copies" of the theme played by the various participating voices. But there are many ways to do this. The most straightforward of all canons is the round, such as "Three Blind Mice," "Row, Row, Row Your Boat," or "Frere Jacques." Here, the theme enters in the first voice and, after a fixed time-delay, a "copy" of it enters, in precisely the same key. After the same fixed time-delay in the second voice, the third

> voice enters carrying the theme, and so on. Most themes will not harmonize with themselves in this way. In order for a theme to work as a canon theme, each of its notes must be able to serve a dual (or triple, or quadruple) role: it must firstly be part of a melody, and secondly it must be part of a harmonization of the same melody. When there are three canonical voices, for instance, each note of the theme must act in two distinct harmonic ways, as well as melodically. Thus, each note in a canon has more than one musical meaning; the listener's ear and brain automatically figure out the appropriate meaning, by referring to context.

4. Literary Criticism/Feminist Studies

Gayle Greene and Coppelia Kohn (*Making a Difference* [London: Metheun, 1985]: 1–2) present an overview definition of feminist literary criticism.

> Feminist literary criticism is one branch of interdisciplinary enquiry which takes gender as its fundamental organizing category of experience. This enquiry holds two related premises about gender. One is that inequality of the sexes is neither a biological given nor a divine mandate, but a cultural construct, and therefore a proper study for any humanistic discipline. The second is that a male perspective, assumed to be 'universal', has dominated fields of knowledge, shaping their paradigms and methods. Feminist scholarship, then, has two concerns: It revises concepts previously thought universal but now seen as originating in particular cultures and serving particular purposes; and it restores a female perspective by extending knowledge about women's experience and contributions to culture.

5. Sociology/ Cultural Studies

Pierre Bourdieu, a French sociologist, in "How Can One Be a Sports Fan," begins to consider the process by which sports has come to take a large place in the modern world.

> It is possible to consider the whole range of sporting activities and entertainments offered to social agents — rugby, football, swimming, athletics, tennis, golf, etc. — as a *supply* intended to meet a *social demand.* If such a model is adopted, two sets of questions arise. First, is there an area of production, endowed with its own logic and history, in which 'sports products' are generated, i.e., the universe of the sporting activities and entertainments socially realized and accepted at a given moment in time? Secondly, what are the social conditions of possibility of the appropriation of the various 'sports products' that are thus produced — playing golf or reading *L'Equipe* [the French equivalent of Sports Illustrated], cross-country skiing or watching the World Cup on TV?

In other words, how is the demand for 'sports products' produced, how do people acquire the 'taste' for sport, and for one sport rather than another, whether as an activity or a spectacle?

6. Politics

James Madison (*The Federalist* #51) comments on how the ambitions of politicians may be controlled.

> But of the great security against a gradual concentration of the several powers in the same department consists in giving to those who administer each department the necessary constitutional means and personal motives to resist encroachments of the others. The provision for defense must in this, as in all other cases, be made commensurate to the danger of attack. Ambition must be made to counteract ambition. The interest of the man must be connected with the constitutional rights of the place. It may be a reflection on human nature that such devices should be necessary to control the abuses of government. But what is government itself but the greatest of all reflections on human nature? If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions.

7. Politics

Alexis de Tocqueville (*Democracy in America*, Book Two, Chapter 26) discusses different ways in which people may enjoy equality and how these ways are different from absolute freedom.

> The principle of equality may be established in civil society, without prevailing in the political world. Equal rights may exist of indulging in the same pleasures, of entering the same professions, of frequenting the same places; in a word, of living in the same manner and seeking wealth by the same means — although all men do not take an equal share in the government. A kind of equality may even be established in the political world, though there should be no political freedom there. A man may be the equal of all his countrymen save one, who is the master of all without distinction, and who selects equally from among them all the agents of his power. Several other combinations might be easily imagined, by which very great equality would be united to

institutions more or less free, or even to institutions wholly without freedom.

Although men cannot become absolutely equal unless they are entirely free; and consequently equality, pushed to its furthest extent, may be confounded with freedom, yet there is good reason for distinguishing the one from the other. The taste which men have for liberty, and that which they feel for equality, are, in fact, two different things; and I am not afraid to add, that, amongst democratic nations, they are two unequal things.

8. Physics

Nigel Calder (*Einstein's Universe* [New York: Penguin, 1980]: 122) describes Einstein's concept of gravity waves.

One of Einstein's most remarkable conclusions was that packets of curved space — tidal ripples, in effect — should travel through empty space, far from the massive objects that created them. Nothing would bring curved space to life better than to sense the curvature changing: to feel a disturbance running though space like an earthquake. That is one reason why the search for "gravity waves" became an obsession of experimentalists in the late 1970s.

Einstein predicted gravity waves in 1916, as a quick by-product of his theory of gravity, in much the same way as James Clark Maxwell had earlier predicted electromagnetic waves as a consequence of his unified theory of electricity and magnetism. The parallel goes further. Electromagnetic waves are created by the jerking or vibration of electric charges. In a radio transmitter, electrons oscillate rapidly to and fro; in an atom, electrons can "jump" into a different orbit, creating visible light in the process; in a hospital x-ray machine, a beam of energetic electrons smashes into a target and the violent arrest of the electrons produces the x-rays. Similarly any vibration or jerking of masses ought to produce gravity waves. And, just as an electromagnetic wave exerts a force at the end of its journey by shaking other electric charges, so a gravity wave can in principle travel through space and shake other masses.

9. Physics

Stephen Hawking (*A Brief History of Time* 135–36) considers the shape and age of the universe, in relation to theories of gravity and geometry.

In the classical theory of gravity, which is based on real space-time, there are only two possible ways the universe can behave: either it has existed for an infinite time, or else it had a beginning

at a singularity at some finite time in the past. In the quantum theory of gravity, on the other hand, a third possibility arises. Because one is using Euclidean space-times, in which the time direction is on the same footing as directions in space, it is possible for space-time to be finite in extent and yet to have no singularities that formed a boundary or edge. Space-time would be like the surface of the earth, only with two more dimensions. The surface of the earth is finite in extent but it doesn't have a boundary or edge: if you sail off into the sunset, you don't fall off the edge or run into a singularity.

Complexity from Multiple Perspectives

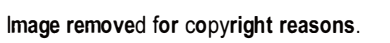
To help you develop more complex approaches to your subject, professors may assign readings that don't fit together easily, that contradict each other, or that look at something from different angles. Books of readings in subjects like public policy, history, ethics, or literary studies often include multiple viewpoints. Then in discussion or essays you may be asked to make sense of the complexity.

Consider, for example, the following two passages about the dropping of the atomic bombs in Hiroshima and Nagasaki, which you might examine in a contemporary world history course. The first passage defends the U.S. decision made by President Truman in 1945 on the grounds that the bomb saved many U.S. and Japanese lives that would have been lost had World War II dragged on. The second passage contests that, arguing that the war would likely have ended without nearly as much bloodshed as others predicted.

> Japan's defeat was sure, but her leaders were refusing to admit it. They looked determined to take their people into national suicide — together with perhaps hundreds of thousands of Allied lives in a hopeless fight to a finish. . . .
>
> The decision to use the atomic bombs was made on this one overriding consideration: to save countless thousands of Allied lives that were bound to be the price of having to overwhelm the Japanese in their own land. That it would also be bound to prevent the deaths of many more Japanese than died at Hiroshima and Nagasaki was unlikely to have figured much, if at all, in the consideration of military leaders hardened by years of total war. But apart from the battle casualties involving civilians on a huge scale, millions would probably have died from starvation had every yard of Japanese territory been fought and won.

From Stephen Harper, *The Miracle of Deliverance: The Case for the Bombing of Hiroshima and Nagasaki* (London: Sidgwick & Jackson, 1985).

On August 6, 1945, the American plane Enola Gay dropped an atomic bomb on the Japanese city of Hiroshima.



The conventional justification for the atomic bombing is that the only alternative capable of securing Japan's surrender was Allied invasion, which would necessarily result in massive U.S. casualties. The most influential text is Truman's 1955 *Memoirs*, which states that the atomic bomb probably saved a half a million U.S. lives — anticipated casualties in an Allied invasion of Japan planned for November. Stimson [Truman's Secretary of War] subsequently talked of saving one million U.S. casualties, and Churchill of saving one million and half that number of British lives. . . .

Nevertheless, retrospective accounts by Truman, LeMay, Stimson, Churchill, and other U.S. and British leaders claiming that the atomic bomb saved half a million or more Allied lives are grossly inflated. Declassified files reveal that U.S. military planners at the time worked with estimates in the range of 20,000 to 46,000 American lives as the projected cost of landing in Kyushu. Most important, given the destruction of Japan's naval and air power, and the Soviet decision to enter the war, there is strong reason to believe

that without the atomic bomb, Japan's surrender could have been secured well before the planned invasion.

From Kyoko Selden and Mark Selden, *The Atomic Bomb: Voices from Hiroshima and Nagasaki* (New York: M. E. Sharpe, 1989): xxx–xxxi.

Although we can never know what actually would have happened if the bomb had not been dropped, by examining the reasons for and against the decision we can develop a fuller picture of the situation at the time and the decision-making process that led to the destruction of two Japanese cities, the immediate end to the war with Japan, and the beginning of a nuclear cold war with the Soviet Union. The sample student paper on pages 303–306 examines this subject in greater depth.

Over a period of classes, a course may present a series of different theories and several sets of facts on an issue. The professor may make comparisons or ask you to compare the different approaches you have been studying. Particularly toward the end of the course, you may be asked to compare the different approaches or to see how they might provide different ways of looking at a particular case. Often exams or final papers will involve some comparison, evaluation, choice, or synthesis.

The instructor may also use the perceptions, analysis, or research of members of the class to present complexities. Through class discussions, group activities, or other assignments, you and other students will present the many sides of an issue or subject.

Facing Complexity

If the instructor designs the course to have you confront the complexity of a subject in some way, you are put on a new kind of spot. You are in the position of having to recognize and sort out the complications using all you have learned and your best judgment. Beyond being able to perform well, what is your stake in doing this? After all, seeing complexity is confusing. You may no longer have a simple direct answer or response to various situations. You may no longer know what is right or wrong as you see that people who hold opposite positions have their reasons. You may find you get caught up in tangles of considerations when you feel as if you just want to act.

These are serious issues, for complexity can easily become an excuse for not making choices, for not taking action, or for not participating in important activities. On the other hand, intelligent choice, focused and fair action, and cooperative participation with people of many views is made more likely the more fully you see all the issues and viewpoints at play. Being able to make sense of all the pieces and putting them together in some coherent shape that allows you to evaluate the totality of information can keep you from being overwhelmed. This is true whether you are doing academic research or making business decisions. The purpose of addressing complexity

is not to become buried in it, but to be constantly seeing your way through it to informed choice and action.

Two Kinds of Complexity

Let us consider one kind of complexity you may encounter in one of your courses: an event that looks simple but that can be seen as having many dimensions. For example, the old joke goes that only two things are inevitable: death and taxes. We seem fatalistic about them, treat them pretty much as a simple and incontrovertible fact of life. But of course, taxes have a history that is related to the changing forms of rule, the tasks that governments take on that require expenses, the changing structures of economies, and the rights and protections granted to citizens. So there is little that is really inevitable about taxes. Indeed, some people manage to live their lives outside the tax system, and others have no tax system to contend with. Even death, although we all are subject to it, has a history, a sociology, a psychology, and a literature, as well as a biology. Where and when it occurs, with whose involvement, and with what causes and meanings we attribute to it are the kinds of issues that make death far from a simple subject. Indeed, there is little about death that is inevitable other than it will overtake us. And even that many people will deny, resist, or explain away.

Most things you look at, as you look more closely, become more complex. Political parties, popular music, the workings of corporations, and even comic books are no simple matter, each having many varieties or subcomponents, each being the result of complex histories, and each being influenced by many social and economic forces. As Henry Petroski, the writer on engineering history, has noted, even the pencil and the paper clip have complicated stories behind them. This is one kind of complexity, where something that appears massive, incontrovertible, and obvious in its meaning turns out to contain many aspects, variables, and meanings as we look into it.

You will also frequently run into a second kind of complexity, one in which there is no simple answer to a problem or a definite way to understand what is going on. In these cases, the complexity is in the *discussion* that is trying to sort out the issue, rather than in the phenomenon itself. Different people may hold and argue different positions, each for their own reasons. To sort through the discussion, you have to take each of the positions seriously until you have reason to think otherwise. Only once you understand the various positions and examine who is holding which position for which reasons can you begin to evaluate them.

Take, for example, the frequent conflicts that occur when protection of the environment seems to restrict economic development. People on one side or another may have a strong commitment to a single principle such as jobs or the future of the planet, and they may believe that their opponents are either innocent idealists or selfish exploiters. But when one starts to look at the

controversies, one finds that there are informed and intelligent people on both sides and that they all have their individual reasons. Working through to some resolution is not simply a matter of picking one side or another on the basis of a simple decision. Coming to an intelligent resolution requires understanding the complexity of the problem and the complexity of the points of view.

Complex conflicts exist not only in the public domain, where people fight over policies that affect their interests. Among researchers and experts there are often major disputes as to which account or description of a phenomenon ought to be accepted. What is the cause of AIDS, and what kind of treatments or potential cures look promising? What is memory? How does photosynthesis work? What are the origin and nature of dreams? What are the meanings and consequences of the violence in our media? The more you look into such questions, you find that there are not only surface differences on the question at hand, but deeper differences in the way researchers approach their subjects and why they take their various approaches.

To help you develop skill in these two kinds of complexity, the remainder of this chapter will present two kinds of assignments: a description of a complex event and an open-question paper. In the first you will start to show the complexity in a seemingly simple event by examining some of its many facets, showing why and how it is interesting and revealing to look at closely. In the second you will look at an issue where people may hold alternative views to figure out what the different positions are, why different people hold them, and how you might evaluate those alternatives. In all cases it is important to not jump to an overall understanding right away, but to use various forms of intermediate writing to work your way through the multiple issues and ideas.

Assignment 1: A Complex Event

For this assignment you will describe some event that depends on many different factors. In an environmental science course you might need to describe a balance or crisis within an ecosystem that depends on the interaction of each of several biological and physical systems, the requirements, contributions, and effects of which need to be described and put into relations to each other. In a history course you might have to describe an event, such as the collapse of apartheid in South Africa, that is the outcome of many individuals or groups interacting politically, economically, and personally. In a sociology course you may be asked to describe a complex social problem, such as violence in schools, that is influenced by many factors, and that affects several groups of people. Or in a cultural studies or communication course you may examine some contemporary cultural phenomenon, such as the rise of TV shopping networks, that grows out of a complex of forces and is viewed differently by different groups of people.

Of course, each of these assignments would require substantial knowledge about the topic, perhaps drawing on material presented in the course or

requiring additional research. Seeing complexity depends on knowing a great deal about a subject. So for such assignments it is important to find something you would like to know about in some depth.

Once you have identified a topic of sufficient interest to explore, you then identify its various aspects and dimensions. This process will vary with the nature of the subject, but in any case this is a time for making *lists* — the different people, groups, components, organisms, or processes that might be relevant to the subject and the different ways of looking at each of them. In making lists, you can draw from the professor's lectures and the textbooks. What kinds of pieces and what aspects did they consider relevant in discussing similar subjects? Then for each of the elements you identify how you will find out about them or what information you have at hand (such as from your course and textbook) that will tell you about their role.

After you have gathered information about each of the elements, you start sketching out how the parts fit together or relate to each other. This is a time for *outlines, matrixes, flow charts,* or other devices that help in putting material together. If after juggling the pieces together for a while, no picture becomes clear, you might begin *freewriting* or even do a first draft, in the hope that once you begin to lay the parts out through writing you will begin to grasp the overall picture. As you come up with some kind of big picture, you should try writing a few summary sentences identifying the major parts of the picture and how they fit together — and then suggesting some conclusions.

Once you have written these preliminary pieces, you are ready to start writing a regular draft, using your summary statement or something like it in the opening to help your reader become oriented to the subject. Even though the topic was confusing to you as you were working your way through it, it should *not* be confusing for your reader. All your work in sorting through the subject has its payoff in your being able to explain it clearly to the reader. You should present the vision you have at the end of your work rather than throwing readers into the confusion you had to work through.

Sample Student Essay

The following paper from a sociology course in contemporary urban problems shows how one student moves beyond simplistic views of the Los Angeles riots of 1992 to examine the many factors that contributed to the violent outbreak.

Moira Jimson

The Rodney King Riots: A Case of Complexities

When four Los Angeles police officers were videotaped using what appeared to be excessive force

against Rodney King, Americans saw excerpts of the tape on an almost daily basis for more than a year. When the officers were finally brought to trial in April of 1992, most people assumed that it would be an open-and-shut case. And when the jury returned verdicts of not guilty on almost all counts, the City of Los Angeles erupted in violent riots that became one of the worst civil disturbances in our nation's history. But what was behind the violence? Conservative commentators were quick to judge the riots as a procession of "thugs and hoodlums" who were "enjoying the opportunity to wreak havoc on society, without fear of reprisal by law enforcement" (Limbaugh 220-221). But, in retrospect, most social commentators see the riots as a very complex phenomenon. The initial, widespread shock at the Rodney King verdict set off a spark, but the explosion was caused by economic and racial tensions that have been brewing in Los Angeles — and other large urban centers — for many years.

The initial spark that set off the riots came from people's shock at the not guilty verdicts. This shock went far beyond mere disappointment; it was something that people could literally not believe or understand. Every American with a television set had seen countless replays of a videotape that showed the police beating King relentlessly and repeatedly. For most people, the tape alone proved beyond a shadow of a doubt that the officers were guilty. A CNN/Time poll taken immediately after the verdict was announced showed that 78% of black respondents and 79% of white respondents expected a guilty verdict ("The Fire" 22). Many activists were so sure of the evidence that they were already considering the case a victory for the African-American community — something that showed that the legal system could sometimes work to protect the rights of minorities and punish police who abused their power. June Jordan, in an editorial for Progressive magazine, expressed the sense of betrayal and frustration that she and many others felt upon hearing the outcome of the Jury's deliberations:

> Because there had been a videotape documentary of the police assault on Rodney King, I had expected, along with millions of other African-Americans, that for once

> the guilty would be punished and the victim would be protected by due process under the law. But the visual documentary evidence of unlawful police violence — evidence that was sickening to watch even at the remove of a TV set — that evidence did not carry the day. Racism carried the day. (Jordan 12)

But the disappointment caused by the verdict did not cause the riots; it merely triggered them. The underlying causes are far more complex. In the first place, the Los Angeles inner-city area had been hit hard by an economic recession between 1988 and 1992. At the time of the riots, the countywide unemployment rate was 10.4% — three and a half points higher than the national average, and the poverty rate for families in South Central Los Angeles was higher than it was in 1965 — the year of the famous Watts Riots (Lacayo 28). Not only was the economic situation grim, but it was disproportionately so for the African-American community. The Rodney King verdict ignited feelings of helplessness and rage that had been collecting throughout the long recession in a community that had been harder hit in that recession than almost any other in the country.

But the racial factors involved in the riots go far beyond these economic factors. The King verdict set off racial tensions that have been building in Los Angeles — and in America — for many years. Many people saw the King case as a microcosm of race relations in America. Writing in the wake of the LA riots, political scientist Roger Wilson argues that the riots were caused by "widening racial polarization, inequalities, and tension" between blacks and whites in America. Wilson contends that these tensions have resulted in a feeling of hopelessness and despair that makes unrest inevitable:

> Many African-Americans, especially young males, living in inner cities see themselves as becoming worse off in the 1990s. For black males between the ages of 15 and 34, homicide is the leading cause of death, one fourth are in prison or on parole or probation, and the unemployment

> rate is twice that of young white men. . . . The notion of a genocide conspiracy is growing within African-American communities, and with such observable social disparities and discrimination, racial tension is bound to run high.

The Rodney King case, then, became a test case for the future. Had the jury returned a guilty verdict, people would have felt that, in the words of one African-American law student, "we do have rights and you can't beat us within an inch of our lives and get away with it" ("The Fire" 22).

Despite what many people think, the Rodney King Riots were not just an opportunity to loot, kill, and sow discord in American society. They were the end result of a very complex set of social, political, and cultural conditions — every one of which contributed in its own way to the tragedy. Had the verdict been announced at another time, or in another city, it might have been received with only mild disgust. Had economic conditions been better, people might not have been frustrated enough to riot. And had journalists, news commentators, and politicians been less certain of a guilty verdict, they might have better prepared us for the actual decision and prevented the initial shock that ignited the violence. But the shock of the decision, combined with the social conditions that existed at the time, set off an explosion that will not be forgotten soon.

Works Cited

"The Fire this Time." Time 11 May 1992: 18-25.

Jordan, June. "The Truth of Rodney King." Progressive, June 1993: 12-21.

Lacayo, Richard. "Unhealed Wounds." Time 19 April 1993: 26-31.

Limbaugh, Rush. The Way Things Ought to Be. New York: Pocket Books, 1993.

Wilson, Roger. "Repairing Race Relations." Spectrum: The Journal of State Government 66.3 (Summer 1993): 8-14.

Thinking About Student Writing

1. What is the event that Moira Jimson tries to explain in this paper? What are the basic facts of that event?
2. What previous event is usually thought of as causing the riots? Why is this event seen as a cause? Why doesn't Moira Jimson see this as adequate explanation?
3. What does Moira see as the underlying causes of the L.A. riots? What does she use to explain and support her reasoning? What conclusion does she come to?
4. What is the overall organization of this essay? How does Moira Jimson gradually lead the reader into the complexity of her subject?

Assignments

DESCRIBING COMPLEXITY

1. Describe a poem, short story, piece of music, video, or work of art that you are familiar with and in which you find several things going on simultaneously. In your description, make clear several kinds of experience or elements the work offers and how the several parts are related to the total experience.
2. Describe an event in your community or college that is the result of complex forces. Present a view of the event that allows us to see all the elements that went into bringing the event together. You may use newspaper and other sources for both facts and the opinions of various people involved in the event.
3. Describe the way a group of your friends relate to each other. Show how this interaction is a result of their different personalities, histories, interests, and goals.

Assignment 2: An Open Question

All fields have open questions — that is, questions on which people hold a variety of positions for good reasons. In your courses your textbooks and instructors may present you with alternative views and theories to show you that several positions are possible and to give you practice in comparing perspectives. As you become more involved in your field, you may be asked to read or write reviews-of-the-literature papers. This kind of paper summarizes current research around open questions in a field to see what conclusions are emerging and what future research is needed.

In writing any such comparison or synthesis, it is important to begin with a careful understanding of each of the texts or statements you are examining, taking it seriously in its own terms. To aid in this process, it is often useful to begin by summarizing each of the articles or texts. In these summaries, identify the reasons for which the authors hold their positions. What kinds of arguments and evidence do they use? What kinds of orientation toward ideas, theories, and problems are unstated but help explain their position? How do their positions relate to their other interests or ideas? Will the position presented in one article help advance some other cause or help solve some problem? You can explore these background questions in informal journal entries or notes after you finish the summary.

After you have summarized and explored the background of each of the statements, then you can compare them, both in what they explicitly state and in their background. Comparison charts, informal journal entries, or visual representations may be helpful in sorting out how the articles relate to each other. First you define exactly what the issue under discussion is. What common issue are all these positions addressing? Then you pinpoint the division or differences among the various statements. They may agree on a number of points and their differences may be focused on a few issues, or they may differ on all counts. Next compare the reasons for which they hold their position — the kinds of arguments and evidence they use — not only to determine who has the better, more complete, or more accurate support, but also to see if they use different kinds of evidence and reasons. Then you consider any underlying reasons for which the writers might hold to their positions.

Once you have sorted out how the positions stand with respect to each other, you explore how you stand with respect to them. How do you evaluate them? Can you reconcile or synthesize the points of view? Do you find one more reasonable or useful than another? Do you find the whole debate misguided? Use an informal journal entry to explore your ideas.

Having worked through the issues and developed your own overview of the discussion and your position with respect to it, you are ready to write a draft. As with the previous paper, write the draft from the perspective you have now developed. Lay out your overview and position right in the opening of the paper. Frame your presentation of each of the writers by relating their positions to your overview and to the other work you are talking about. Then go back to examine where each of the authors stands, what kind of argument they make and the relevant background. That is, don't make the readers do the work you have just done — rather present what you have found so that they can gain by the perspective you have developed. Your instructor will be looking for the kind of perspective you have developed as well as the carefulness and fairness with which you treat each of the positions.

USEFUL CONCEPTS FROM RHETORIC

Stasis, Where Disagreements Meet

Although people may have different points of view, those differences only become focused and possible to discuss when they meet over a specific issue. Without a meeting point people can circle around their beliefs and differences all day without getting anywhere. And unless there is a specific issue at question, there may be no reason to state just how different your views are on one subject or another; it may just get people upset to no purpose. To have a useful conflict that can lead to resolution or at least clarification of the issues, a specific point of opposition needs to be located and the "question joined," as they say in law. You may, for example, have differences with your roommate over politics, but unless you just want to have the fun of comparing thoughts and matching wits there is usually no need for your taking up precious time and building up animosity over a topic you will never agree on. If, however, your roommate decides to make your room the campus headquarters for her advocacy group, you do have an issue to discuss. But the issue is likely not to be the value of her cause, but rather your rights to use the room to study and sleep in.

In classical rhetoric this point of juncture is called the *stasis* (or "standing point"). This is the point where the argument stands still long enough for people to define their disagreements and arguments. In criminal cases, for example, the issue is usually defined by a criminal charge — for example, whether the defendant is guilty of murder. The defense, however, can decide more precisely where the issue should be joined:

1. *Over the facts.* If it can be established that the defendant was in another city or the deceased died of natural causes, the murder charge goes away.
2. *Over the definition or meaning of the facts.* The defense can admit all the facts but still argue that the killing was not murder but an act of self-defense. This changes the focus of the argument to motives and perception of threat.
3. *Over the value of the act.* If one cannot deny the facts or define the act differently, one can still argue that the act was a good thing. Perhaps the murdered person deserved his or her fate because of evil he or she had done to the murderer's family, or perhaps the murder was an act of compassion for a terminally ill comatose patient.
4. *Over procedure.* If all stronger arguments fail, the defense can try to shift the issue to whether this court has jurisdiction over the case. If the case could be moved to another county or to juvenile court or the events had passed beyond the statute of limitations, perhaps the victim can still get off.

These four kinds of issues are in fact the standard stases in classical rhetorical argument: *fact, definition, value,* and *procedure.*

Sample Student Essay

The following paper from a contemporary world history course combines insights from both sides of the controversial decision to drop the A-bomb. The result is that the essay moves beyond simple oppositions of right and wrong to see how the dropping of the bomb influenced many different aspects of international politics, to which there were no simple answers. Decisions were made on the best estimates and judgments people at the time could come up with, no matter how we may come to judge them at some later date.

Robert Higginson
Dropping the A-Bomb: Conflicting Views
and Complex Realities

On August 6, 1945, the American plane Enola Gay dropped an atomic bomb on the Japanese city of Hiroshima. Two days later, another plane dropped a similar bomb on Nagasaki, and by the time the mushroom clouds cleared, the two bombs had killed more than 110,000 people on impact, with many more deaths to come from fallout and radiation poisoning. President Truman's decision to use nuclear weapons was undoubtedly one of the most fateful decisions of our century, and it has also become one of the most controversial. For some, the decision to drop the atomic bomb was a cruel, racist, unnecessary action that took civilian lives unnecessarily and has caused America to be "branded with the mark of the beast" (Baldwin 107). For others, the atomic bomb was a "miracle of deliverance" (Harper) that shortened the war and saved hundreds of thousands of lives in both America and Japan. Both of these positions, though, represent simplistic reductions of complex historical conditions. The decision to drop the atomic bomb was bound up with two very complicated sets of considerations: the necessity of ending the war with Japan without a costly invasion, and the desire to establish supremacy over the Soviet Union in the postwar era. Both of these are complex considerations that have occasioned a great deal of debate among laypeople and scholars of history alike.

The initial justification for using atomic weapons was that they were the quickest way to end the war and save lives. One recent historian who has taken this view is Stephen Harper, whose 1985 book Miracle of Deliverance: The Case for the Bombing of Hiroshima and Nagasaki presents a strong case for the use of the

A-bomb. Harper documents the fact that, before they knew that atomic weapons would be available, the Allies were planning a massive invasion of the Japanese mainland—one that was expected to draw high casualties on both sides. Truman himself, writing in his 1955 Memoirs, put the number of expected American deaths at least half a million (Truman 416), while Henry Stimson, Truman's Secretary of War, projected that, by the end of a prolonged military campaign, the figure could have gone as high as one million (Stimson and Bundy 630). In addition to these American casualties, Americans had every reason to suspect that the Japanese, though hopelessly outnumbered and outgunned, would fight a desperate battle on the homefront. "They looked determined," Harper writes, "to take their people into a national suicide . . . in a hopeless fight to the finish" (205).

However, not all historians share Harper's high estimates of American casualties or his conclusion that Japan would never have surrendered without a costly military invasion. In their book The Atom Bomb: Voices from Hiroshima and Nagasaki, Kyoko and Mark Selden argue against both contentions:

> Declassified files reveal that U.S. military planners at the time worked with estimates in the range of 20,000 to 46,000 American lives as the projected cost of landing in Kyushu. Most important, given the destruction of Japan's naval and air power, and the Soviet decision to enter the war, there is strong reason to believe that without the atomic bomb, Japan's surrender could have been secured well before the planned invasion. (xxxi)

If we accept this evidence, then there are serious reasons to believe that America dropped the atomic bombs unnecessarily. If the Japanese forces were so close to defeat and so demoralized that they would have surrendered before any planned American invasion, then the civilian casualties incurred at Hiroshima and Nagasaki might have been avoided without any great loss of life to either side.

But both authors agree that, despite what press reports said at the time, the American leaders who decided to drop the bombs were thinking of more than just

a Japanese surrender. As the Seldens write, "their analysis of planning for the postwar period, from 1942 forward, underscores official designation of the Soviet Union as the primary threat to U.S. supremacy in world affairs" (xxxi). Americans knew that their possession of nuclear weapons would be a decisive advantage in postwar dealings with the Soviet Union, and, before giving the final order to drop the first bomb on Hiroshima, Truman is reported to have said, speaking of the Soviets, "if it explodes like I think it will, I'll certainly have a hammer on those boys" (Norton 827). From the Seldens' perspective, American leaders were acting in bad faith by using Japanese civilians as demonstration models of American superiority.

While Harper admits that the Soviet threat was important in the decision to drop the bomb, he argues that this ultimately worked in favor of the Japanese, since, before the explosions, the Soviets had already declared their intentions to participate in the invasion and annex a portion of Japan as their reward:

> There is little doubt that some American chiefs welcomed the exclusiveness of the power which possession of the atomic bomb gave them to restrain growing Soviet assertiveness. Stalin had steamrollered the West into acceptance of his plans for Poland, the Baltic States, Finland and the rest of Eastern Europe. After that, Western hands were strengthened to resist not only his ambitions in the Bosphorus but also his desire for a share in the occupation and control of Japan — the same desire which was even then causing problems in Germany. (206)

Had the bomb not been used, Harper argues, there is a very good chance that Japan, much like Germany and Korea, would have been carved up among competing Superpowers and never allowed to develop political or economic independence as a whole country.

In human terms, the bombs dropped on Hiroshima and Nagasaki were great tragedies, but so were the purely conventional bombings of Dresden and Tokyo — both of which killed more civilians than either of the atomic bombs that were dropped. However, these atomic

weapons did more than just end one war, they also began another war—the Cold War. For fifty years, the nuclear terror that was unleashed on Japan served as a symbol of the ultimate destruction that always lurked just around the corner. We can never know for sure what was going through Truman's head when he gave the ultimate order to use these weapons, nor can we say with any certainty what would have happened had he made the opposite decision. However, the factors involved in the decision, and the myriad of historical forces that it set in place are much too complex to be reduced to simple absolute statements. In deciding to drop the atomic bombs, the Americans were neither righteous saviors of the world nor depraved monsters intent on genocide; they were ordinary people dealing—sometimes well and sometimes poorly—with a very complex set of historical variables that they could only partially control.

Works Cited

Baldwin, Hanson W. Great Mistakes of the War. New York: Harper, 1949.

Harper, Stephen. Miracle of Deliverance: The Case for the Bombing of Hiroshima and Nagasaki. London: Sidgwick & Jackson, 1985.

Norton, Mary Beth, et al. A People and a Nation: A History of the United States. 4th ed. Boston: Houghton Mifflin, 1994.

Selden, Kyoko and Mark Selden. The Atomic Bomb: Voices from Hiroshima and Nagasaki. New York: M. E. Sharpe, 1989.

Stimson, Henry L., and McGeorge Bundy. On Active Service in Peace and War. New York: Harper, 1947.

Truman, Harry S. Memoirs: Year of Decisions. Garden City: Doubleday, 1955.

Thinking About Student Writing

1. What is the controversy that Robert Higginson examines? What historical event is at the heart of the controversy? What sides to the controversy does the essay present?
2. What facts and ideas lie behind the two positions? Why do the two sides disagree? What is at stake in one side or the other being right?
3. What specific points of disagreement between the two sides does Robert Higginson identify? What points of agreement? To what extent is Robert Higginson able to reconcile or adjudicate the two views? What does he leave unresolved? What conclusions does he come to?
4. How does the structure of the presentation balance the two views? Which paragraphs about one side mirror paragraphs about the other sides? Which paragraphs and sentences bring the two sides together? In what way? Which paragraphs and sentences create a broader view that encompasses both views?

Assignments

WRITING ABOUT OPEN QUESTIONS

1. Choose a recent, controversial issue in your school or community and conduct research into the different points of view. Look at official publications, statements, newspaper articles, speeches, letters to the editor, and any other forum where this issue is discussed. Using the information you gather, write a brief paper summing up the different sides of the controversy.
2. Select an issue in your major field of study where experts disagree with each other. Read at least one major statement (book chapter, article, etc.) from an expert on each side of the issue and then write a brief summary of this disciplinary conflict.
3. Read the following passages on intelligence testing and the way it is applied to individuals and groups. Then write a paper giving an overview on the issues and the various positions people take.

A. Howard Gardner

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Excerpt removed for copyright reasons.

Excerpt removed for copyright reasons.

From Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences.* (Basic Books, 1983): 3–4, 8–9.

B. Richard Herrnstein and Charles Murray

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Excerpt removed for copyright reasons.

Excerpt removed for copyright reasons.

Excerpt removed for copyright reasons.

From Richard Herrnstein and Charles Murray, *The Bell Curve: Intelligence and Class Structure in American Life.* (Free Press, 1994): 19–21.

C. Richard Nisbett

Excerpt removed for copyright reasons.

Excerpt removed for copyright reasons.

Excerpt removed for copyright reasons.

From Richard Nisbett, "Blue Genes," *The New Republic* 31 October 1994: 15.

Locate an electronic database or Web home-page for some complex issue or event. This database or page should incorporate many different kinds of information and sources or contain links to many other different resources. Discuss the various kinds of information and resources that are considered relevant to the issue or event, why they are all considered relevant, and what they each lend to understanding. If you are examining a Web page, you may also consider how the hyper-text organization of material either helps or hurts our comprehension of the complexity of the issue or event.