

ARGUING ACROSS THE DISCIPLINES

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SAMPLE CHAPTER

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OVERVIEW: This chapter will introduce you to the conventions and assumptions that govern the kinds of issues and methods of inquiry that characterize the different disciplines across the curriculum.

Writers and researchers in all academic disciplines often are compelled to convince others (colleagues, fellow researchers, or the general public) of the validity of their ideas and discoveries. Discussion and debate accompany the development of central ideas, concepts, and laws in all fields of study. Writers in the liberal arts, the social sciences, and the sciences use strategies of argument to support new interpretations of known facts or establish plausible cases for new hypotheses.

Although arguments explore important issues and espouse specific theories, the forms in which they appear vary according to the style and format of the individual discipline. Evidence in different disciplines can appear in a variety of formats, including the interpretation of statistics, laws, precedents, or the citation of authorities. The means used to construct arguments depends on the audience within the discipline being addressed, the nature of the thesis being proposed, and the accepted methodology for that particular discipline.

Like general arguments, the structure of arguments within the disciplines requires (1) a clear statement of a proposition or claim, (2) grounds that are relevant to the claim and sufficient to support it, and (3) a warrant based on solid backing that guarantees the appropriateness and applicability of the grounds in supporting the claim. So, too, appropriate qualifiers or possible exceptions to the claim must be stated as part of the argument.

Inquiry in the Liberal Arts, Social Sciences, and Sciences

Each of the three broad areas in the curriculum—liberal arts, social sciences, and sciences—seeks different kinds of knowledge and, therefore, has a different method of inquiry. That is to say, each area stipulates what kinds of problems or issues it considers worth addressing.

In the liberal arts, critics evaluate and interpret works of art; review music, dance, drama, and the film; and write literary analyses. Philosophers probe the moral and ethical implications of people's actions, and advocate specific ways of meeting the ethical challenges posed by new technologies. Historians interpret political, military, and constitutional events; analyze their causes; and theorize about how the past has influenced the present. Historians study primary sources in an effort to create a coherent story as to what happened, when it happened, who was responsible and in what order events occurred. They must piece together fragments of information and make inferences that separate what is true from fictionalized versions.

Social scientists collect and analyze data about patterns and motivation of the behavior of people in groups. The results of the experiments that apply hypotheses from social theory to the real world are presented in statistical form.

Lawyers and constitutional scholars argue for specific ways of applying legal and constitutional theory to everyday problems. Economists debate issues related to changes wrought by technology, distribution of income, unemployment, and commerce. Political scientists look into how effectively governments initiate and manage social change, and ask basic questions about the limits of governmental intrusion into individual rights. Sociologists analyze statistics and trends to evaluate how successfully institutions accommodate social change.

In the sciences, biologists, as well as biochemists, zoologists, botanists, and other natural scientists, propose theories to explain the interdependence of living things and their natural environment. Psychologists champion hypotheses based on physiological, experimental, social, and clinical research to explain various aspects of human behavior. Physicists, as well as mathematicians, astronomers, engineers, and computer scientists, put forward and defend hypotheses about the basic laws underlying the manifestations of the physical world, from the microscopic to the cosmic.

The broad areas of the curriculum function as specific audiences. Each discipline has its own needs, aims, interests, and expectations and sets its own standards about what constitutes acceptable reasoning.

The kinds of knowledge sought and the procedures used by the social sciences are quite different from those of the liberal arts. These disciplines have, to a large extent, adapted the techniques and objectives of the physical and natural sciences to study how human beings interact within the context of social, political, business, legal, psychological, and cultural relationships.

The types of information sought and the methods employed within the domain of the sciences aim at providing an accurate, systematic, and comprehensive account of the world around us as well as a framework within which new hypotheses can be put forward and evaluated.

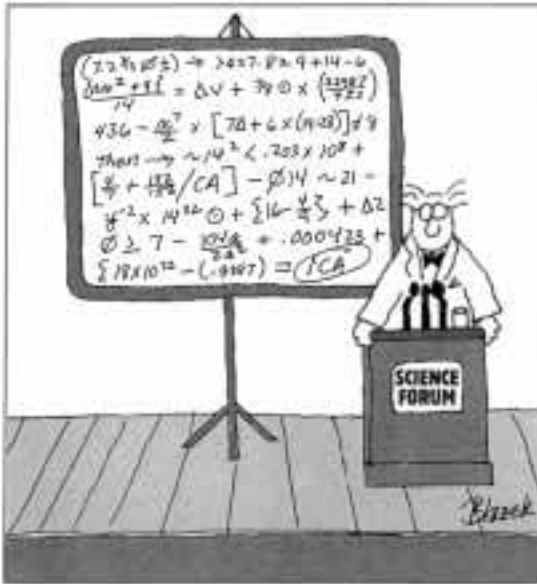
We can appreciate the relevance of claims only in the context of the requirements of the larger fields within which the claims are advanced. That is, there are certain defining features and distinctive goals of each discipline that determine which items, data, or evidence will be seen as relevant to the claim. Training in different fields consists in learning what kinds of evidence are accepted as appropriate in supporting claims within that particular field. (The following discussions applying the Toulmin model to a range of disciplines have been adapted from Stephen Toulmin, Richard Rieke, and Allan Janik, *An Introduction to Reasoning* [1984]. Future in-text citations refer to this source; page numbers are given in parentheses.)

Different fields have different concepts of what constitutes evidence to be introduced to support a claim. Grounds, evidence, and data that are appropriate in a legal argument will be of a different kind and will be judged differently than evidence in a scientific argument or in an argument in the arts. As in general arguments, warrants in the disciplines are statements, formulas, and rules that authorize the way evidence (all data: pertinent information, all that is known about a situation, the known variables, and so on) can be interpreted so as to justify the conclusion reached or the claim being made.

In fields such as natural and physical sciences, computer science, engineering, and mathematics, warrants most frequently take the form of exact formulas used to convert raw data (in the form of known variables) into a significant conclusion (50). In mathematics, for example, the circumference of a circle can be discovered by applying a relevant formula, 2π . For example, if the radius is measured at 3 feet, you would apply the formula multiplying 2 times pi times the radius to discover the value of the circumference. Of course, many more complex formulas govern other applied and theoretical sciences. These warrants are known, reliable, and exact, and can be depended on.

By contrast, the law, assuming there is no disagreement about what the facts of the situation are, applies warrants in the form of relevant statute or precedents to discover whether one has or has not violated the law in a given situation (51).

Loose Parts by Dave Blazek



Hodgkiss quieted the crowd with his mathematical proof that there is, indeed, no business like show business.

Source: © Tribune Media Services, Inc. All rights reserved. Reprinted with permission.

FIGURE 4.1

How does this cartoon illustrate different methods of proof used in different disciplines?

As in general arguments, warrants are backed up in different ways. In science, the backing is the theoretical and experimental basis on which the warrant relies for its authority. In law, all the legal history of a particular statute would constitute the backing (whereas the warrant would be the statute that is appropriate to apply in that particular case).

In medicine, the backing for a diagnosis would be all the research that the physician might consult to make sure that the diagnosis was based on a generalization (the warrant) that provided the most accurate interpretation of the facts (symptoms, results of laboratory work, past medical history, etc.) of a particular case (53). Backing in all disciplines always refers to the underlying body of research in that specific field that justifies using a particular warrant (67).

Professional training is designed to familiarize students with concepts of evidence, and with how the methodology of any particular field is related to its larger purposes or goals. Apprenticeship in various disciplines involves the process of discovering what warrants are appropriate to apply in different

circumstances. In many fields, warrants do not take the form of exact formulas or statutes, but rather are general principles, capable of being learned only through years of experience in that field. For example, in medicine, a skillful diagnostician draws on years of accumulated experience as well as information learned in medical school.

The way a veterinarian reaches a conclusion is characteristic of medical diagnoses. For example, James Herriot in *All Creatures Great and Small* diagnoses the true causes of a cow's sudden illness:

I have a vivid recollection of a summer evening when I had to carry out a rumenotomy on a cow. As a rule, I was inclined to play for time when I suspected a foreign body—there were so many other conditions with similar symptoms that I was never in a hurry to make a hole in the animal's side. But this time diagnosis was easy; the sudden fall in milk yield, loss of cudding; grunting, and the rigid sunken-eyed appearance of the cow. And to clinch it the farmer told me he had been repairing a hen house in the cow pasture—nailing up loose boards. I knew where one of the nails had gone.

In reaching his conclusion, Herriot is able to relate the meaning of the signs of illness the cow displays to general principles drawn from his experience and presumably from veterinary textbooks. In effect, he says, these kinds of symptoms can mean the cow has ingested a foreign body like a nail, and in this particular case, there is a good chance that is what happened. Therefore, he concludes that a rumenotomy, or surgical incision into the cow's stomach to remove a foreign body, should be performed.

Broken down into the separate elements in the argument, Herriot's line of thought appears as follows:

Grounds: Sudden fall in milk yield, loss of cudding, grunting, rigid sunken-eyed appearance, nails used to repair loose boards in a hen house in the cow pasture.

Warrant: A cow that swallows a foreign body like a nail can be expected to display characteristic symptoms of sudden fall in milk yield, and so forth.

Claim (Expressed as a Diagnosis): The cow needs a rumenotomy to remove the foreign body.

Qualifier or Exception: Unless it can be established that the cow definitely did not swallow one of the loose nails.

Because the purposes or goals of different disciplines are different, each field brings different perspectives to bear even when the same subject is

viewed. By examining how various disciplines look at what appears to be the same thing, we can see how the same phenomenon becomes, in effect, a different object of inquiry according to the conceptual framework within which it is investigated. For example, a psychiatrist, Judith L. Rapoport, has looked at the life and music of the early twentieth-century French composer, Erik Satie, in *The Boy Who Couldn't Stop Washing*, as part of her study of obsessive-compulsive disorder (OCD). Those suffering from OCD are compelled to repeat certain acts over and over again—washing, counting, checking, or other more elaborate rituals:

Although he lived alone in Paris and at times in great poverty, he dressed fastidiously and his personal trappings were typical of OCD. No one was allowed to enter his room during his life. When he died, his wardrobe was found to contain a dozen identical new suits, shirts, collars, hats, walking sticks, and a cigar box was found with several thousand pieces of paper with the same symbols and inscriptions. All of them for some unknown reason, about Charlemagne. Satie's OCD may have also influenced his music, although this is less clear. Satie's "trinitarian obsession" as musicologists refer to it was manifested in his works which were frequently conceived in groups of three. Within his music, Satie wrote he intended to present different views on a theme. Almost always, three were offered, the three *Gymnopédies* the best known.

By contrast, Joseph Machlis, a musicologist, in the *Introduction to Contemporary Music* views Satie and the same work *Gymnopédies* within the completely different conceptual framework of his discipline. For example:

Satie is best known to the public for his early piano pieces: the *Sarabandes* (1887), *Gymnopédies* (1887) and *Gnossiennes* (1890). Each set contains three dance pieces in the composer's characteristic manner. These works anticipate certain procedures that later became associated with Debussy, notably the unconventional handling of unresolved chords of the ninth, the modal idiom, and the movement of the harmony in parallel block-like formations.

This music has a grave simplicity. It displays certain hallmarks of Satie's style: short symmetrical phrases repeated over and over; an airy medodic line, with an easy swing; limpid harmony, whose modal character is brought into focus at the cadences; lightness of texture and establishment at the outset of a rhythmic pattern that persists throughout.

Professionals in other disciplines have also studied Satie from their perspective including his association with innovative movements in the world of art—cubism, dadaism, and surrealism.

Arguing in the Arts

The essential nature of the arts is to provide insight into the human condition, that is, to communicate what being human actually means and how humanity appears at different times under different social conditions. The ultimate criterion by which works of art (both creative and interpretive) are judged is how well this is done without falsifying or distorting the human condition. This primary concern with the often inexpressible qualitative sense of the human experience defines both the kinds of problems as well as the methods used to address them within the arts.

For the artist, the question is how well the techniques of the craft have been used to bring the audience into direct contact with internal real-life experiences each artist tries to express. Thus, arguments at this level are often technical over the best means of achieving a desired effect (352). We can see this at work in Tom Wolfe's "Why Aren't They Writing the Great American Novel Anymore?" where Wolfe analyzes how dissatisfaction with traditional techniques led innovative journalists to incorporate many of the narrative techniques of fiction—scene-by-scene construction; personal viewpoint; details of furnishings, clothes, and social status; eccentric punctuation; slang and the vernaculars of different subcultures—to enhance their ability to report on human experience. In schematic form, Wolfe's argument appears as follows:

Grounds: You, as a nonfiction writer, want to achieve the effects of immediacy, concrete reality, emotional involvement, and a gripping or absorbing quality.

Backing: The technical experiments and innovations of Fielding, Smollett, Balzac, Dickens, and Gogol have established that:

Warrant: In the genre of fiction writing an effective way of introducing realism is to introduce (1) scene-by-scene construction, (2) realistic dialogue, (3) third-person point of view, and (4) a record of people's everyday gestures, habits, manners, customs, and other details symbolic of the entire pattern of behavior through which people express their position in the world.

Claim: You, as a nonfiction writer, should try to use all the techniques of novelists to obtain the effects of immediacy, concrete reality, emotional involvement, and a gripping or absorbing quality.

The audiences for whom the arts are created judge an artist's work from a different perspective (353). For the audience, the key question is how effectively

the artist's work succeeds in deepening, enriching, or extending the sense of being human and conveying insight into human nature. As representative of and mediator for the audience's reactions, the critic or reviewer evaluates the work of art or the artist's performance. For example, in "The Boo Taboo" the acerbic theater critic John Simon offered this evaluation of Richard Tucker's performance in the opera *Carmen*:

The most illuminating occurrence for me was a recent Saturday matinee at the Met. It was Barrault's wretched staging of *Carmen*, with Richard Tucker as Don Jose. Now Tucker had once been in possession of a good, strong voice; but he had never been a genuine artist with a sense of shading, expressive range, a feeling for the emotional depth of the part or the language in which he was singing. By this time, with even his basic organ gone, Tucker is long overdue for retirement. In this Don Jose, Tucker's voice was as off as it had been for years, his phrasing as unlovely as it had always been. Visually, he was a geriatric travesty; histrionically, even by the shockingly low standards of operatic acting, a farce. Even his French was, let us say, hyper-Tourelan. After he got through mangling the Flower Song, and after the orchestra was through as well, I added to the general applause three loud *phooeys*—a *phooey* cuts through applause better than a boo or hiss.

When each of the elements in Simon's critique is identified, the outline of his argument appears this way:

Grounds: Tucker's basic singing voice although once good and strong was gone. His phrasing was unlovely; visually, he was a geriatric travesty; his acting fell below even the "shockingly low standards of operatic acting." His French was not authentic. He mangled the "Flower Song" from *Carmen*.

Backing: Viewers, listeners, and critics of operatic performances have generally agreed that:

Warrant: Good operatic singing requires a strong voice, a sense of shading, and expressive range, a feeling for the emotional depth of the part and the language in which the performer is singing, appropriate visual appearance, and competent acting ability.

Claim: Richard Tucker should not be performing since he can no longer meet the standards required for professional operatic singing.

Qualifier or Exception: Despite the fact that there was general applause for Tucker's performance.

The broadest perspectives are brought to bear by academic disciplines in the liberal arts that interpret the meaning of an individual work as it relates to other works of that type and to the historical context in which it was produced (354). For example, the art historian Alan Wallach views particular paintings by William L. Haney and Jan van Eyck as they relate to larger social and cultural contexts. Open-endedness of interpretive issues and problems are characteristic of the humanities and liberal arts. That is, although arguments take the form of interpretations (however well-supported and effective the arguments may be), they do not foreclose the possibility of new, different, and equally convincing interpretations in the future. Reduced to its essentials, Wallach's argument in "William L. Haney and Jan van Eyck" appears like this:

Grounds: In Haney's *The Root of It All*, the gold ring of the American Stock Exchange is drastically foreshortened and made to resemble a casino gambling table. Haney further complicates things by placing near the front of the gold ring an anamorphic image of a black man's severed head. . . . Another composite technique Haney shares with van Eyck is a picture within a picture. Van Eyck's *Giovanni Arnolfini and His Bride* contains a convex mirror at the rear of the marriage chamber which reflects in extraordinary detail the couple and the otherwise invisible witnesses to the scene. In *A Present Tense of Extinct Too*, Haney's painting of a CBS sound stage, five television monitors play a similar role, commenting on the picture and augmenting its meaning with images of the Vietnam War, a 19th-century buffalo hunt, a mushroom cloud, and so on.

Warrant: Artists, even those who live centuries apart, belonging to different worlds and different social conditions, often use the same techniques to express artistic judgments about the societies in which they live.

Claim: Both Haney and van Eyck solved problems of showing how spirituality was ruthlessly subordinated to materialism by (1) creating the illusion of unified compositions that break down upon closer inspection, (2) using architecture surrounding figures to bring together seemingly unrelated scenes, (3) using the technique of painting a picture within a picture, and (4) employing submerged symbolism to comment on the materialism of their respective societies.

How does the convex mirror in Jan van Eyck's *The Arnolfini Marriage* (1434), on the next page, illustrate the artist's unique approach? Can you see the reflection of van Eyck's image and another figure who may have been the official witness to the ceremony?



Arguing in Ethics

Originally a branch of philosophy, the field of ethics as a discipline in its own right has grown increasingly important as society has become more specialized and technological. As people are more locked into specialized roles and see things only from narrow viewpoints, an ethical view is required as a counterbalance so that they can evaluate the consequences of their actions in relation to society as a whole.

Ethics, as a field, tries to mediate claims between traditional professional or societal demands and those larger overriding human concerns by providing a systematic procedure that makes it possible to discover which course of action,

among many choices, is preferable. Because ethical dilemmas involve a choice of actions, the ability to create hypothetical or “what if” situations is invaluable, as it allows one to construct different scenarios in which the effects of different kinds of choices can be dramatized. A consideration of ethical choices should always involve understanding the consequences of choices for all those who will be affected.

Ethics is concerned with questions of what should be done because it seeks to investigate what kinds of actions are acceptable or unacceptable, right or wrong, good or bad, when judged according to a specified moral or ethical criterion. Thus, typical arguments require the writer to apply a general ethical principle in the form of a warrant to discover whether an action that has already happened or is being considered is good or bad, desirable or regrettable, and is to be chosen or avoided (402–3).

We can see how this works by examining the argument made by Terence Cardinal Cooke in an address delivered to the First Annual American Health Congress. Cooke argues that doctors, nurses, and other health care professionals need to think about their professional obligations in light of equally compelling ethical and moral considerations. The occasion prompting Cooke’s speech was the imminent passage of a “death with dignity” bill in the state legislature that would require health care professionals to take an active role in disconnecting life-support systems of terminally ill patients (without any immediate family with whom to confer) whose life, in the opinion of three physicians, was meaningless.

This is a typical ethical argument in that Cooke is addressing a conflict between a role health care professionals would be obligated to play and equally compelling moral considerations. Cooke argues that medical professionals should not be put in a situation where they are able to “play God” and decide when a patient’s life is or is not meaningful.

The ethical principle Cooke applies as a warrant is based on the assumption that life is a God-given gift and that no human being has the right to take the life of another regardless of the circumstances. Represented in outline form, Cooke’s argument appears thus:

Grounds: Allowing “death with dignity” would become an accepted part of health care professionals’ duties because the bill under consideration by the state legislature stated that any disabled person with no immediate family, and for whom, in the opinion of three physicians, the prolongation of life would be meaningless, could be granted “death with dignity.”

Warrant: Permitting a patient’s life to be terminated on the grounds that it is meaningless is against the law of God and should be justly labeled as “murdering a human being.”

Claim: Health care professionals should not be party to a practice labeled “death with dignity” because it is against the law of God and constitutes murder.

Arguing in History

History explains how the present has been affected by the past and provides a clear account of the conditions in which societies have lived. Historical research brings to life important military, social, economic, and political events from the past. To create a persuasive reconstruction of past events, historians need to examine a wide range of records (private journals, letters, newspaper accounts, photographs if available, and other primary documents from the period under study), as well as secondary documents (such as interpretations of the same events by other historians). In seeking to delineate a plausible explanation for past events, historians may also draw on the information and research methods of political science (which studies how governments manage their affairs), sociology (which investigates the relationships between individuals and institutions in society), anthropology and archaeology (which reconstruct past cultures and inquire into why they have different customs and patterns of development), and psychology (which studies human behavior). Historians may also use statistical and computer analyses to form a more accurate picture of past events.

The methods of inquiry used in history attempt to provide a clear picture of who, what, where, when, and how events took place. Some historians go beyond these basic issues and offer interpretations as to why the events took place. Arguments in history often take the form of revising older interpretations or taking into account new information that forces a reevaluation of previously held beliefs. For example, in *The Peculiar Institution: Slavery in the Ante-Bellum South* (1956), Kenneth M. Stampp, an American historian, has investigated the relationship between the southern plantation system and slavery. In contrast to previous historians, such as Ulrich B. Phillips, who claimed in *American Negro Slavery* (1918) that slavery was part of the social structure of the plantation system, Stampp asserted that a shortage of labor and a desire to increase profits were the real reasons behind the phenomenon of slave labor.

In “To Make Them Stand in Fear” from his 1956 work, Stampp uses a variety of source documents, including recorded testimony of slave owners in Mississippi, South Carolina, North Carolina, and Virginia, as well as quotations from the actual manuals written to advise plantation owners on the management of slaves, to support his analysis of conditioning procedures used to instill

fear and dependency in newly arrived blacks. In outline form, Stamp's argument appears as follows:

Grounds: The manual *Discourses on the Management of Slaves* provided specific instructions on all phases of the "programming process." Stamp identifies five separate steps: (1) establishing strict discipline modeled on army regulations, (2) implanting in the bondsman a consciousness of inferiority, (3) instilling a sense of awe at the master's enormous power, (4) persuading the bondsman to value the success of the master's enterprise, and (5) creating a habit of perfect dependence.

Warrant: The study of original source documents provides valuable new information with which to reevaluate and revise previously held interpretations of events in history. (The warrant expresses the methodology underlying the concept of historical revisionism practiced by Stamp.)

Claim: Contrary to historical interpretations that view slavery as an integral component of the plantation system, original source documents reveal a calculated effort on the part of slave owners to transform newly arrived blacks into slaves who would be psychologically conditioned to believe that what was good for the plantation owners was good for them as well.

Arguing in the Social Sciences

The social sciences are often referred to as the behavioral sciences because they focus on what can be observed objectively about human beings—their actions or behavior. These disciplines seek to discover causal connections (sometimes expressed as statistical laws) that have both descriptive and predictive value and that can be confirmed or refuted by data from subsequent research.

The social sciences have adapted in some measure both the techniques and the objectives of the physical and natural sciences in order to study how human beings interact in the context of social, political, business, legal, psychological, and cultural relationships.

To ensure an objectivity comparable to that of the physical and natural sciences, social science researchers rely on statistical surveys, questionnaires, and other data-gathering techniques. Social scientists draw on a whole range of theoretical models to explain human behavior and explore how individual behavior may be conditioned by expectations of the surrounding culture. The range of theories available often raises the question as to which theoretical model should

be applied to explain the data in question. Social scientists strive to achieve results in quantifiable and repeatable form so that other researchers can repeat and thereby confirm the validity of the results of their experiments.

The ways in which social sciences have adapted methodology from the natural and physical sciences can be seen in the procedures social scientists use for gathering evidence through observation and controlled experiments. First and foremost, social sciences (including sociology, psychology, anthropology, archaeology, education, economics, political science, business and management, and so forth) emphasize the importance of systematic and objective observation of events and people recorded in concrete language, without interposing any personal opinion as to motives. Events and human behavior must be recorded as objectively as possible so other social scientists can verify the observations and authenticate the findings. Of course, some social sciences such as archaeology have to gather information after the event has taken place and must gather data in the form of artifacts and records.

To look at this methodology more closely, we might examine its use in sociology, a discipline that is concerned with the observation, description, and explanation of the behavior of people in groups. Sociologists investigate institutions within society, their origins, their capacity for accommodating social change, and the mechanisms within them that influence the behavior of individuals.

Questions to be answered or problems to be solved are expressed in the form of hypotheses whose validity can be measured by empirical means. For example, in a classic experiment John Darley and Bibb Latané used small groups of people to test their “diffusion of responsibility” theory to answer the question of why people don’t help in a crisis. By varying the number of people who thought others also were aware of a crisis, Darley and Latané demonstrated in quantifiable form a plausible mechanism to explain the real causes of seeming apathy in bystanders.

Since it would be impractical for social scientists to test everyone in a particular population in order to gather evidence, researchers test a sample or small group of people from a specific population. Darley and Latané’s research took the typical form of an experimental study in which they manipulated one variable (the number of people in the group in a room filling with smoke) and observed the effect on a second variable (the likelihood that any of the subjects would report the smoke to an external authority).

The professional journal in which the results of their study appeared is an appropriate forum within which arguments can be tested and evaluated. By studying the methodology of this experiment, other researchers could set up comparable experiments to test for themselves the validity of Darley and

Latané's conclusions. The authors explain the design of the experiment, the hypothesis being tested, and the results in a brief abstract that precedes their article "Group Inhibition of Bystander Intervention in Emergencies":

Male undergraduates found themselves in a smoke-filling room, either alone, with 2 non-reacting others, or in groups of 3. Ss [subjects] were less likely to report the smoke when in the presence of passive others (10%) or in groups of 3 (38% of groups) than when alone (75%). These results seemed to have been mediated by the way Ss interpreted the ambiguous situation; seeing other people remaining passive led Ss to decide the smoke was not dangerous.

In outline form, Darley and Latané's argument appears as follows:

Grounds: Male undergraduates found themselves in a smoke-filling room, either alone, with two nonreacting others, or in groups of three. Ss (subjects) were less likely to report the smoke when in the presence of passive others (10 percent) or in groups of three (38 percent of groups) than when alone (75 percent).

Backing: Prior research by social psychologists (Darley and Latané, Latané and D. C. Glass, S. Schacter, E. Goffman, R. Brown) makes it probable that the diffusion-of-responsibility model determines how people in groups react to a crisis.

Warrant: The diffusion-of-responsibility hypothesis states that if an individual is alone when an emergency occurs, he or she feels solely responsible. When others are present, individuals feel that their own responsibility for taking action is lessened, making them less likely to help.

Claim: The behavior of the people in the situation is explained by the diffusion-of-responsibility model. As Darley and Latané conclude, "seeing other people remaining passive led Ss to decide the smoke was not dangerous."

Arguing in the Law

Features of legal arguments are determined by the purpose of the law, that is, to provide protection for individuals in society and for society as a whole. Accordingly, legal decisions have to do with protecting life and liberty, property, and public order and with providing systematic guidelines in ensuring the performance of contractual relationships (281).

The law provides a procedure for reaching decisions that are binding on all parties. Beyond this goal, the law strives to make decisions that are consistent

with previous statutes, codes, and precedents, and with what society considers to be fair, equitable, and just (284). As with other arguments, the process of legal reasoning depends on the interplay between evidence or grounds and claims and warrants to produce the legal decision expressed as a claim.

In court, legal reasoning makes use of an adversarial procedure whereby two opposing parties present the strongest case they can assemble for their proposed claims. Each party tells its story or version of the truth, and the court (judge or jury) decides which version is more credible (284). The court chooses between the two opposing versions rather than working out a negotiated settlement that would be acceptable to both parties. The adversary character of legal reasoning can be seen in other legal forums where arguments are heard such as congressional hearings where individuals provide competing versions of the facts.

The examination of evidence is at the center of legal reasoning. Evidence is entered in the form of exhibits. Letters, documents, contracts, tape recordings, videotapes, and a wide range of physical evidence are then evaluated to see whose claim they best support (302).

Evidence or grounds can also take the form of testimony of witnesses to be tested by cross-examination, or the expert opinion of authorities, which is also subjected to cross-examination. Cross-examination is an important feature of legal reasoning, as are rules governing what evidence the jury will or will not be allowed to hear (302). For example, evidence cannot be admitted from certain kinds of protected relationships (doctor-patient, lawyer-client, priest-parishioner, husband-wife). In other cases, the court must rule whether particular circumstantial or hearsay evidence is admissible.

As with other types of arguments, a range of warrants specific to the law authorizes a connection between the claim and the evidence (304). Some warrants justify the use of expert testimony (for example, taking the form of an assumption that the testimony of a person with extensive experience and expertise in a particular field can be taken as authoritative). Other legal warrants justify the use of circumstantial, physical evidence to reach a conclusion. Still others take the form of particular cases to be used as precedents in reaching a decision on a current case (307).

Whereas regular legal arguments simply apply rules and precedents, some arguments challenge the very procedures or rules used in arriving at judgments. (308).

To see how rule-setting decisions become precedents that lawyers can use in ordinary legal arguments, we might examine the legal reasoning underlying the historic 1954 Supreme Court ruling on segregation in public schools (*Brown v. Board of Education of Topeka*). The decision was written by Earl Warren, then

Chief Justice of the Supreme Court. In outline form, Warren's decision on behalf of the Court appears this way:

Grounds: Warren cites the results of psychological studies showing that segregated schools instill a sense of inferiority, retard mental development, and deprive the children of minority groups of equal educational opportunities.

Warrant: A crucial clause in the Fourteenth Amendment, namely, "no state shall . . . deny to any person within its jurisdiction the equal protection of the laws," empowers the court to evaluate how well states manage the important function of education for citizens.

Claim: Warren concluded that "in the field of public education the doctrine of 'separate but equal' has no place." The Court ruled that separate educational facilities are inherently unequal and found that segregation in the public schools deprives children of minorities of the educational opportunities they should rightfully enjoy under the Fourteenth Amendment.

An argument like this, which challenges the very interpretation of what the law is, is obviously of a different order than an argument that simply applies accepted rules or methodology. This Supreme Court decision served as a catalyst for the civil rights movement, and permanently altered existing social attitudes toward the acceptability of racial discrimination.

Arguing in Business

Every phase of business production—finance, research and development, purchasing, marketing, and organizational development—entails a variety of decisions. Business in the present context refers to the part of the economy that provides goods and services for society.

Arguments in business differ from arguments advanced by scientists, historians, literary critics, ethicists, and so forth, in several important respects. Because the goal of business is to make a profit, arguments tend to focus on questions of tactics or strategy in accomplishing this purpose.

In contrast to law, where arguments take place in an adversary framework, business and management decisions require all the parties involved to arrive at a consensus or practical compromise (370). Furthermore, most business decisions have to be made within a certain time. Not to decide within the time available is equivalent to not making the decision at all. Moreover, business decisions sometimes have to be made despite the fact that circumstances are not completely

understood or information is incomplete. In this respect, business decisions are unlike those arguments advanced by historians and scientists where time constraints play almost no part and where the emphasis is on taking as much time as is necessary to understand circumstances as fully as possible (371).

The forums within which business arguments take place include board room conferences, stockholder meetings, consultations between managers, and any other administrative setting where management must explain the basis of its decision to others both inside and outside the company—that is, to employees, stockholders, and government officials (370).

Claims in business take the form of policy recommendations. These proposals may concern actions that should be taken to introduce a new product or service, decisions as to whether to invest in a new plant, and proposals covering a wide range of issues (383). For example, should the company branch out, change its pricing strategies? How should it best respond to the marketing strategies of the competition? What use should be made of market research data in order to market a product more effectively? Most business arguments are utilitarian, short-or medium-term proposals, and are concerned with questions of strategies and tactics rather than discussions of ultimate goals and purposes.

Grounds or support in business arguments consist of all the information on which claims can be based (383–84). This includes economic information and data gleaned from market research, as well as relevant government regulations. Information used to support claims frequently appears as a detailed breakdown of all types of expenses (administrative, market research, and costs of development). Business today also avails itself of a whole range of systematized information in the form of databases.

The manipulation of information in business uses a problem-solving model that defines the nature of the problem, uses a variety of search techniques (brainstorming, breaking it into subproblems, and so forth), and generates a list of alternative solutions. The most feasible solution is presented as a proposal or claim. Solutions are evaluated in terms of what constitutes the best match of the company's resources and proven competence consistent with government regulations and expectations of society.

Most business warrants relate directly to the underlying purpose of business itself; that is, whatever promises to produce a greater profit consistent with the proven methods should be selected from any field of alternatives (385–86). Likewise, whatever promises to lessen the cost of operation in producing a product or service, or promises to promote the more efficient functioning of the company should be chosen from any field of various alternatives.

We can see these basic elements operating in a typical situation where a municipality has entered into a long-term agreement to have trash collected by a private contractor. Town officials must now decide whether to sell their own equipment (trucks, shovels, plows) that the municipality no longer needs for the present and probably will not need for some years in the future.

Arguments in favor of selling the equipment emphasize the cost of maintaining and repairing it and the revenue its sale could generate. Arguments against selling the equipment refer to the experience of other municipalities that, having sold their trucks and so on, were at the mercy of the contractor when the agreement came up for renegotiation. Ultimately, the municipality officials decided not to sell in order to avoid a situation where they would be dependent on private contractors who would know they would be forced to pay because they could not provide the service themselves. In outline form, the argument appears as follows:

Grounds: The projected cost of maintaining the equipment, the revenue its sale would generate, and the projected costs of hiring and keeping a private contractor to collect the trash.

Backing: Precedents are provided by other municipalities that initially entered into long-term service contracts because of low prices, sold their equipment, and subsequently were at the mercy of contractors who raised their prices dramatically when the service agreement came up for renewal.

Warrant: In the short term the sale would produce apparent savings, but in the long term it might prove very costly. In weighing two alternatives, long-term disadvantages outweigh short-term advantages.

Claim: The municipality should keep its equipment (trucks, plows, etc.) rather than put it up for sale.

Qualifier or Exceptions: Unless unforeseen costs in maintenance and storage become excessive.

Arguing in the Sciences

The types of information sought and the methods employed within the domain of the sciences aim at providing an accurate, systematic, and comprehensive account of the world around us as well as a framework within which new hypotheses can be put forward and evaluated (315).

The forums in which argumentation takes place in the sciences include professional meetings, refereed journals, and conferences. These public forums guarantee that all ideas will be tested to determine their underlying validity.

Scientists, even those on the losing side of an argument, have a common interest in gaining a more accurate picture of the natural world, its origin, makeup, and functioning (317). Thus, the putting forth and disputing of claims is not an end in itself as it is in the law, but a means to clarify and improve a picture of the world.

The way science solves problems and generates new knowledge can be seen by examining procedures used by the biologists Arthur D. Hasler and James A. Larsen in “The Homing Salmon.” Their experiments solved the mystery of how salmon could find their way back to the exact streams where they were born, even from distances as great as 900 miles, by pinpointing the role played by the salmon’s olfactory sense.

Well-documented observations based on the recovery of tagged salmon in the streams where they were originally born had established that the homing instinct was a scientific problem worth investigating. For scientists, observation plays a crucial role in identifying mysterious phenomena or anomalies (319). How salmon remember their birthplace and find their way back to the stream in which they were born, sometimes from great distances, is an enigma that has fascinated naturalists for many years.

Once observations show the existence of a problem needing explanation, scientists formulate a tentative explanation or hypothesis to account for this otherwise inexplicable event.

Scientists then design specific experiments to measure in objective and quantifiable form whether the hypothesis provides an adequate explanation of the phenomenon. A scientific hypothesis, if true, should have both descriptive and predictive value. That is, it must accurately predict that in particular circumstances (which other scientists can duplicate) certain kinds of measurable effects can be observed. These effects should confirm the truth of the hypothesis.

For this reason, the design of the experiment is the essential feature of scientific research. The experiment should make it possible to isolate, control, and measure the role played by one key variable. In Hasler and Larsen’s experiment, half of a group of salmon were marked and deprived of their olfactory sense and the other half were used as a control group. When all the salmon were released downstream, it was determined that the control group correctly returned as usual to the original stream, whereas the “odor-blinded” fish migrated in random fashion “picking the wrong stream as often as the right one.”

The way in which evidence or grounds, warrants, and claims play a part in scientific problem solving as a method of inquiring into the truth (as opposed to advocating a position, as in the law) can be seen in the following outline:

Grounds:

We took water from two creeks in Wisconsin and investigated whether fish could learn to discriminate between them. Our subjects, first minnows, then salmon, were indeed able to detect a difference. If, however, we destroyed a fish's nose tissue, it was no longer able to distinguish between the two water samples. Chemical analysis indicated that the only major difference between the two waters lay in the organic material. By testing the fish with various fractions of the water, separated by distillation, we confirmed that the identifying material was some volatile organic substance. The idea that fish are guided by odors in their migrations was further supported by a field test. From each of the two different branches of the Issaquah River in the state of Washington, we took a number of sexually ripe silver salmon which had come home to spawn. We then plugged with cotton the noses of half the fish in each group and placed all the salmon in the river below the fork to make the upstream run again. Most of the fish with unplugged noses swam back to the stream they had selected the first time. But the 'odor-blinded' fish migrated back in random fashion, picking the wrong stream as often as the right one.

Backing: The experience of scientists in developing systematic procedures for testing hypotheses that claim to account for otherwise inexplicable phenomena.

Warrant: The established procedures of scientific research state that the results of an experiment designed in such a way as to make it possible to isolate, control, and measure the role played by one key variable can be reliably depended on to explain and predict a previously inexplicable phenomenon.

Claim: (takes the form of a clear-cut working hypothesis for investigating the mystery of the homing salmon):

We can suppose that every little stream has its own characteristic odor, which stays the same year after year; that young salmon become conditioned to this odor before they go to sea; that they remember the odor as they grow to maturity, and that they are able to find it and follow it to its source when they come back upstream to spawn.

Sometimes the anomalies observed and theories formulated to explain them are in such conflict with existing paradigms or agreed-upon scientific laws that they demand the establishment of new theoretical models to guide further research

(328–29). Charles Darwin’s observations (*On The Origin of Species by Means of Natural Selection*, 1859) in the Galapagos Islands of adaptive mutations in finches, tortoises, and other species, ultimately led him to formulate a theory of evolution.

In outline form, Darwin’s argument appears as follows:

Grounds: On journeys to the Galapagos Islands (over a period of some five years) Darwin observed different kinds of finches on different islands, with different bill structures suited to the kind of food available on individual islands (on some islands, finches ate insects and on others they ate seeds). Darwin thought that variations among individual representatives of a species make some better equipped to survive than others in a particular environment. These qualities are selected, passed on to their descendants, and over the passage of time, these changes are sufficient to result in a complete change of species. Darwin termed this evolutionary adaptive mechanism “natural selection” and thereby explained how new varieties of species continued to develop—a phenomenon previous scientific studies could not explain.

Warrant: A new theory that explains phenomena that are not explicable by previous theories should supercede previous explanations.

Claim: Darwin’s theory of “natural selection” deserves to supercede previous scientific explanations.

Thus, Darwin advanced science by challenging existing theories and replacing them with a new theoretical model.

Three Short Arguments for Analysis

Kenneth M. Stamp

To Make Them Stand in Fear

Kenneth M. Stamp (b. 1912) earned a Ph.D. from the University of Wisconsin in 1942. Stamp was Morrison Professor of American History at the University of California at Berkeley and Harmsworth Professor of American History at Oxford University. His works include And the War Came (1950) and The Peculiar Institution: Slavery in the Ante-Bellum South (1956) from which the following essay is drawn. His latest book is The United States and National Self-Determination: Two Traditions (1991).

Thinking Critically

Consider what you know about various techniques of behavioral conditioning and the goals they seek to accomplish.

A wise master did not take seriously the belief that Negroes were natural-born slaves. He knew better. He knew that Negroes freshly imported from Africa had to be broken to bondage; that each succeeding generation had to be carefully trained. This was no easy task, for the bondsman rarely submitted willingly. Moreover, he rarely submitted completely. In most cases there was no end to the need for control—at least not until old age reduced the slave to a condition of helplessness.

Masters revealed the qualities they sought to develop in slaves when they singled out certain ones for special commendation. A small Mississippi planter mourned the death of his “faithful and dearly beloved servant” Jack: “Since I have owned him he has been true to me in all respects. He was an obedient trusty servant. . . . I never knew him to steal nor lie and he ever set a moral and industrious example to those around him. . . . I shall ever cherish his memory.” A Louisiana sugar planter lost a “very valuable Boy” through an accident: “His life was a very great one. I have always found him willing and obedient and never knew him to fail to do anything he was put to do.” These were “ideal” slaves, the models slaveholders had in mind as they trained and governed their workers.

How might this ideal be approached? The first step, advised those who wrote discourses on the management of slaves, was to establish and maintain strict discipline. An Arkansas master suggested the adoption of the “Army Regulations as to the discipline in Forts.” “They must obey at all times, and under all circumstances, cheerfully and with alacrity,” affirmed a Virginia slaveholder. “It greatly impairs the happiness of a negro, to be allowed to cultivate an insubordinate temper. Unconditional submission is the only footing upon which slavery should be placed. It is precisely similar to the attitude of a minor to his parent, or a soldier to his general.” A South Carolinian limned a perfect relationship between a slave and his master: “that the slave should know that his master is to govern absolutely, and he is to obey implicitly. That he is never for a moment to exercise either his will or judgment in opposition to a positive order.”

The second step was to implant in the bondsmen themselves a consciousness of personal inferiority. They had “to know and keep their places,” to “feel the difference between master and slave,” to understand that bondage was their natural status. They had to feel that African ancestry tainted them, that their color was a badge of degradation. In the country they were to show respect for even their master’s nonslaveholding neighbors; in the towns they were to give way on the streets to the most wretched white man. The line between the races must never be crossed, for familiarity caused slaves to forget their lowly station and to become “impudent.”

5 Frederick Douglass explained that a slave might commit the offense of impudence in various ways: “in the tone of an answer; in answering at all; in not answering; in the expression of countenance; in the motion of the head; in the gait, manner and bearing of the slave.” Any of these acts, in some subtle way, might indicate the absence of proper subordination. “In a well regulated community,” wrote a Texan, “a negro takes off his hat in addressing a white man. . . . Where this is not enforced, we may always look for impudent and rebellious negroes.”

The third step in the training of slaves was to awe them with a sense of their master’s enormous power. The only principle upon which slavery could be maintained, reported a group of Charlestonians, was the “principle of fear.” In his defense of slavery James H. Hammond admitted that this, unfortunately, was true but put the responsibility upon the abolitionists. Antislavery agitation had forced masters to strengthen their authority: “We have to rely more and more on the power of fear. . . . We are determined to continue masters, and to do so we have to draw the reign tighter and tighter day by day to be assured that we hold them in complete check.” A North Carolina mistress, after subduing a troublesome domestic, realized that it was essential “to make them stand in fear”!

In this the slaveholders had considerable success. Frederick Douglass believed that most slaves stood “in awe” of white men; few could free themselves altogether from the notion that their masters were “invested with a sort of sacredness.” Olmsted saw a small white girl stop a slave on the road and boldly order him to return to his plantation. The slave fearfully obeyed her command. A visitor in Mississippi claimed that a master, armed only with a whip or cane, could throw himself among a score of bondsmen and cause them to “flee with terror.” He accomplished this by the “peculiar tone of authority” with which he spoke. “Fear, awe, and obedience . . . are interwoven into the very nature of the slave.”

The fourth step was to persuade the bondsmen to take an interest in the master’s enterprise and to accept his standards of good conduct. A South Carolina planter explained: “The master should make it his business to show his slaves, that the advancement of his individual interest, is at the same time an advancement of theirs. Once they feel this, it will require but little compulsion to make them act as it becomes them.” Though slaveholders induced only a few chattels to respond to this appeal, these few were useful examples for others.

The final step was to impress Negroes with their helplessness, to create in them “a habit of perfect dependence” upon their masters. Many believed it dangerous to train slaves to be skilled artisans in the towns, because they tended to become self-reliant. Some thought it equally dangerous to hire them to factory

owners. In the Richmond tobacco factories they were alarmingly independent and “insolent.” A Virginian was dismayed to find that his bondsmen, while working at an iron furnace, “got a habit of roaming about and *taking care of themselves*.” Permitting them to hire their own time produced even worse results. “No higher evidence can be furnished of its baneful effects,” wrote a Charlestonian, “than the unwillingness it produces in the slave, to return to the regular life and domestic control of the master.”

10 A spirit of independence was less likely to develop among slaves kept on the land, where most of them became accustomed to having their master provide their basic needs, and where they might be taught that they were unfit to look out for themselves. Slaves then directed their energies to the attainment of mere “temporary ease and enjoyment.” “Their masters,” Olmsted believed, “calculated on it in them—do not wish to cure it—and by constant practice encourage it.”

Here, then, was the way to produce the perfect slave: accustom him to rigid discipline, demand from him unconditional submission, impress upon him his innate inferiority, develop in him a paralyzing fear of white men, train him to adopt the master’s code of good behavior, and instill in him a sense of complete dependence. This, at least, was the goal.

But the goal was seldom reached. Every master knew that the average slave was only an imperfect copy of the model. He knew that some bondsmen yielded only to superior power—and yielded reluctantly. This complicated his problem of control.

ENGAGING the Text

1. Stamppp demonstrates that the process of conditioning newly arrived blacks depended on instilling a set of psychological controls. What are these, and what were they designed to achieve?
2. As Stamppp describes it, slaveholders were fearful of allowing slaves to be trained as independent workers. In a paragraph or two, discuss the reasons for this.

EVALUATING the Argument

1. How does Stamppp’s division of the conditioning process into a number of distinct steps help his readers to grasp his thesis and understand his analysis?
2. The manuals Stamppp uses to illustrate his analysis describe the goal to be achieved and the methods for achieving it as an ideal. Is it plausible that the methods described here could have produced the required results? Why or why not?

EXPLORING the Issue

1. How does Stampf's use of source documents, including extensive quotations from discourses on the management of slaves, typify the methods historians use to reconstruct and interpret past events?
2. How does the historian's analysis of past events resemble, yet differ from, the analysis of current political or social events by news commentators?

CONNECTING Different Perspectives

1. How does Stampf's use of primary source documents reflect R. G. Collingwood's description of what historians do in "What Is History?"

John M. Darley and Bibb Latané**Why People Don't Help in a Crisis**

John M. Darley (b. 1938) received a Ph.D. from Harvard in 1965. Since 1972 he has been professor of psychology at Princeton University where the focus of his research concerns the principles of moral judgment in children and adults. With Bibb Latané, Darley has coauthored The Unresponsive Bystander: Why Doesn't He Help? (1970) and Help in a Crisis: Bystander Response to an Emergency (1976). Bibb Latané (b. 1937) received a Ph.D. from the University of Minnesota (1963) and was a professor of psychology at the University of North Carolina–Chapel Hill. This essay, drawn from their prize-winning research, describes an ingenious experiment designed to identify the causes of noninvolvement in bystanders who witness street crimes.

Thinking Critically

What factors determine if a bystander is willing to help a victim of street crime?

Kitty Genovese is set upon by a maniac as she returns home from work at 3 A.M. Thirty-eight of her neighbors in Kew Gardens, N.Y., come to their windows when she cries out in terror; not one comes to her assistance, even though her assailant takes half an hour to murder her. No one so much as calls the police. She dies.

Andrew Mormille is stabbed in the head and neck as he rides in a New York City subway train. Eleven other riders flee to another car as the 17-year-old boy bleeds to death; not one comes to his assistance, even though his attackers have left the car. He dies.

Eleanor Bradley trips and breaks her leg while shopping on New York City's Fifth Avenue. Dazed and in shock, she calls for help, but the hurrying

stream of people simply parts and flows past. Finally, after 40 minutes, a taxi driver stops and helps her to a doctor.

How can so many people watch another human being in distress and do nothing? Why don't they help?

- 5 Since we started research on bystander responses to emergencies, we have heard many explanations for the lack of intervention in such cases. "The megalopolis in which we live makes closeness difficult and leads to the alienation of the individual from the group," says the psychoanalyst. "This sort of disaster," says the sociologist, "shakes the sense of safety and sureness of the individuals involved and causes psychological withdrawal." "Apathy," says others. "Indifference."

All of these analyses share one characteristic: they set the indifferent witness apart from the rest of us. Certainly not one of us who reads about these incidents in horror is apathetic, alienated or depersonalized. Certainly these terrifying cases have no personal implications for us. We needn't feel guilty, or re-examine ourselves, or anything like that. Or should we?

If we look closely at the behavior of witnesses to these incidents, the people involved begin to seem a little less inhuman and a lot more like the rest of us. They were not indifferent. The 38 witnesses of Kitty Genovese's murder, for example, did not merely look at the scene once and then ignore it. They continued to stare out of their windows, caught, fascinated, distressed, unwilling to act but unable to turn away.

Why, then, didn't they act?

There are three things the bystander must do if he is to intervene in an emergency: *notice* that something is happening; *interpret* that event as an emergency; and decide that he has *personal responsibility* for intervention. As we shall show, the presence of other bystanders may at each stage inhibit his action.

The Unseeing Eye

- 10 Suppose that a man has a heart attack. He clutches his chest, staggers to the nearest building and slumps sitting to the sidewalk. Will a passerby come to his assistance? First, the bystander has to notice that something is happening. He must tear himself away from his private thoughts and pay attention. But Americans consider it bad manners to look closely at other people in public. We are taught to respect the privacy of others, and when among strangers we close our ears and avoid staring. In a crowd, then, each person is less likely to notice a potential emergency than when alone.

Experimental evidence corroborates this. We asked college students to an interview about their reactions to urban living. As the students waited to see the interviewer, either by themselves or with two other students, they filled out a

questionnaire. Solitary students often glanced idly about while filling out their questionnaires; those in groups kept their eyes on their own papers.

As part of the study, we staged an emergency: smoke was released into the waiting room through a vent. Two thirds of the subjects who were alone noticed the smoke immediately, but only 25 percent of those waiting in groups saw it as quickly. Although eventually all the subjects did become aware of the smoke—when the atmosphere grew so smoky as to make them cough and rub their eyes—this study indicates that the more people present, the slower an individual may be to perceive an emergency and the more likely he is not to see it at all.

Seeing Is Not Necessarily Believing

Once an event is noticed, an onlooker must decide if it is truly an emergency. Emergencies are not always clearly labeled as such; “smoke” pouring into a waiting room may be caused by fire, or it may merely indicate a leak in a steam pipe. Screams in the street may signal an assault or a family quarrel. A man lying in a doorway may be having a coronary—or he may simply be sleeping off a drunk.

A person trying to interpret a situation often looks at those around him to see how he should react. If everyone else is calm and indifferent, he will tend to remain so; if everyone else is reacting strongly, he is likely to become aroused. This tendency is not merely slavish conformity; ordinarily we derive much valuable information about new situations from how others around us behave. It’s a rare traveler who, in picking a roadside restaurant, chooses to stop at one where no other cars appear in the parking lot.

15 But occasionally the reactions of others provide false information. The studied nonchalance of patients in a dentist’s waiting room is a poor indication of their inner anxiety. It is considered embarrassing to “lose your cool” in public. In a potentially acute situation, then, everyone present will appear more unconcerned than he is in fact. A crowd can thus force inaction on its members by implying, through its passivity, that an event is not an emergency. Any individual in such a crowd fears that he may appear a fool if he behaves as though it were.

To determine how the presence of other people affects a person’s interpretation of an emergency, Latané and Judith Rodin set up another experiment. Subjects were paid \$2 to participate in a survey of game and puzzle preferences conducted at Columbia University by the Consumer Testing Bureau. An attractive young market researcher met them at the door and took them to the testing room, where they were given questionnaires to fill out. Before leaving, she told them that she would be working next door in her office, which was separated

from the room by a folding room-divider. She then entered her office, where she shuffled papers, opened drawers and made enough noise to remind the subjects of her presence. After four minutes she turned on a high-fidelity tape recorder.

On it, the subjects heard the researcher climb up on a chair, perhaps to reach for a stack of papers on the bookcase. They heard a loud crash and a scream as the chair collapsed and she fell, and they heard her moan, "Oh, my foot . . . I . . . I . . . can't move it. Oh, I . . . can't get this . . . thing . . . off me." Her cries gradually got more subdued and controlled.

Twenty-six people were alone in the waiting room when the "accident" occurred. Seventy percent of them offered to help the victim. Many pushed back the divider to offer their assistance; others called out to offer their help.

20 Among those waiting in pairs, only 20 percent—8 out of 40—offered to help. The other 32 remained unresponsive. In defining the situation as a non-emergency, they explained to themselves why the other member of the pair did not leave the room; they also removed any reason for action themselves. Whatever had happened, it was believed to be not serious. "A mild sprain," some said. "I didn't want to embarrass her." In a "real" emergency, they assured us, they would be among the first to help.

The Lonely Crowd

Even if a person defines an event as an emergency, the presence of other bystanders may still make him less likely to intervene. He feels that his responsibility is diffused and diluted. Thus, if your car breaks down on a busy highway, hundreds of drivers whiz by without anyone's stopping to help—but if you are stuck on a nearly deserted country road, whoever passes you first is likely to stop.

To test this diffusion-of-responsibility theory, we simulated an emergency in which people overheard a victim calling for help. Some thought they were the only person to hear the cries; the rest believed that others heard them, too. As with the witnesses to Kitty Genovese's murder, the subjects could not *see* one another or know what others were doing. The kind of direct group inhibition found in the other two studies could not operate.

For the simulation, we recruited 72 students at New York University to participate in what was referred to as a "group discussion" of personal problems in an urban university. Each student was put in an individual room equipped with a set of headphones and a microphone. It was explained that this precaution had been taken because participants might feel embarrassed about discussing their problems publicly. Also, the experimenter said that he would not listen to the initial discussion, but would only ask for reactions later. Each person was to talk in turn.

The first to talk reported that he found it difficult to adjust to New York and his studies. Then, hesitantly and with obvious embarrassment, he mentioned that he was prone to nervous seizures when he was under stress. Other students then talked about their own problems in turn. The number of people in the “discussion” varied. But whatever the apparent size of the group—two, three or six people—only the subject was actually present; the others, as well as the instructions and the speeches of the victim-to-be, were present only on a pre-recorded tape.

25 When it was the first person’s turn to talk again, he launched into the following performance, becoming louder and having increasing speech difficulties: “I can see a lot of er of er how other people’s problems are similar to mine because er I mean er they’re not er e-easy to handle sometimes and er I er um I think I I need er if if could er er somebody er er er give me give me a little er give me a little help here because er I er *uh* I’ve got a a one of the er seiz-er er things coming *on* and and er uh uh (choking sounds) . . .”

Eighty-five percent of the people who believed themselves to be alone with the victim came out of their room to help. Sixty-two percent of the people who believed there was *one* other bystander did so. Of those who believed there were four other bystanders, only 31 percent reported the fit. The responsibility-diluting effect of other people was so strong that single individuals were more than twice as likely to report the emergency as those who thought other people also knew about it.

The Lesson Learned

People who failed to report the emergency showed few signs of the apathy and indifference thought to characterize “unresponsive bystanders.” When the experimenter entered the room to end the situation, the subject often asked if the victim was “all right.” Many of them showed physical signs of nervousness; they often had trembling hands and sweating palms. If anything, they seemed more emotionally aroused than did those who reported the emergency. Their emotional behavior was a sign of their continuing conflict concerning whether to respond or not.

Thus, the stereotype of the unconcerned, depersonalized *homo urbanus*,¹ blandly watching the misfortunes of others, proves inaccurate. Instead, we find that a bystander to an emergency is an anguished individual in genuine doubt, wanting to do the right thing but compelled to make complex decisions under pressure of stress and fear. His reactions are shaped by the actions of others—and all too frequently by their inaction.

¹City dweller.

And we are that bystander. Caught up by the apparent indifference of others, we may pass by an emergency without helping or even realizing that help is needed. Once we are aware of the influence of those around us, however, we can resist it. We can choose to see distress and step forward to relieve it.

ENGAGING the Text

1. What experiment did Darley and Latané design to investigate why bystanders were unwilling in some situations to help victims of street crime?
2. How did the results challenge the conventional idea that apathy explained why people would not come to the aid of victims? What factors actually determine whether a bystander is willing to help a victim?

EVALUATING the Argument

1. How was Darley and Latané's experiment designed to isolate the key variable that came into play when social pressures altered the behavior of individual bystanders when they were in a group?
2. What evidence did Darley and Latané present to disprove the conventional idea that bystanders who failed to help others are merely apathetic?

EXPLORING the Issue

1. To what extent was deception involved in creating this experiment? In a short essay, address the ethical issues of manipulating subjects in order to obtain data.
2. Have you ever had an experience where you could observe the relationship between the number of people in a group who witness a crime and the willingness of any one person to do something about it? Do your experiences confirm Darley and Latané's findings?

CONNECTING Different Perspectives

1. Apply Darley and Latané's findings to Philip G. Zimbardo's study "The Stanford Prison Experiment" in terms of the results obtained and the insights into peer pressure and social roles.

Arthur D. Hasler and James A. Larsen

The Homing Salmon

Arthur D. Hasler (1908–2001) earned a Ph.D. in zoology from the University of Wisconsin in 1937. He served as president of the American Society of Zoologists. His pioneering studies into the migration of fish and the study of freshwater habitats shed light on the crucial role played by

the sense of smell in orienting fishes in parent streams. In 2004, the Madison campus of the University of Wisconsin dedicated the Arthur D. Hasler Laboratory of Limnology.

James A. Larsen (b. 1921) earned a Ph.D. in ecology in 1968 and has distinguished himself as a botanist studying bioclimatology in the Arctic. The classic experiment “The Homing Salmon” (the results of which appeared in Scientific American, June 1955) describes an ingenious experiment that solved the riddle of how the adult Chinook salmon finds its way back to the stream where it was born, 900 miles away.

Thinking Critically

What mechanisms might be responsible for the patterns of migration in different species?

A learned naturalist once remarked that among the many riddles of nature, not the least mysterious is the migration of fishes. The homing of salmon is a particularly dramatic example. The Chinook salmon of the U.S. Northwest is born in a small stream, migrates downriver to the Pacific Ocean as a young smolt and, after living in the sea for as long as five years, swims back unerringly to the stream of its birth to spawn. Its determination to return to its birthplace is legendary. No one who has seen a 100-pound Chinook salmon fling itself into the air again and again until it is exhausted in a vain effort to surmount a waterfall can fail to marvel at the strength of the instinct that draws the salmon upriver to the stream where it was born.

How do salmon remember their birthplace, and how do they find their way back, sometimes from 800 or 900 miles away? This enigma, which has fascinated naturalists for many years, is the subject of the research to be reported here. The question has an economic as well as a scientific interest, because new dams which stand in the salmon’s way have cut heavily into salmon fishing along the Pacific Coast. Before long nearly every stream of any appreciable size in the West will be blocked by dams. It is true that the dams have fish lifts and ladders designed to help salmon to hurdle them. Unfortunately, and for reasons which are different for nearly every dam so far designed, salmon are lost in tremendous numbers.

There are six common species of salmon. One, called the Atlantic salmon, is of the same genus as the steelhead trout. These two fish go to sea and come back upstream to spawn year after year. The other five salmon species, all on the Pacific Coast, are the Chinook (also called the king salmon), the sockeye, the silver, the humpback and the chum. The Pacific salmon home only once: after spawning they die.

A young salmon first sees the light of day when it hatches and wriggles up through the pebbles of the stream where the egg was laid and fertilized. For a few

weeks the fingerling feeds on insects and small aquatic animals. Then it answers its first migratory call and swims downstream to the sea. It must survive many hazards to mature: an estimated 15 percent of the young salmon are lost at every large dam, such as Bonneville, on the downstream strip; others die in polluted streams; many are swallowed up by bigger fish in the ocean. When, after several years in the sea, the salmon is ready to spawn, it responds to the second great migratory call. It finds the mouth of the river by which it entered the ocean and then swims steadily upstream, unerringly choosing the correct turn at each tributary fork, until it arrives at the stream, where it was hatched. Generation after generation, families of salmon return to the same rivulet so consistently that populations in streams not far apart follow distinctly separate lines of evolution.

- 5 The homing behavior of the salmon has been convincingly documented by many studies since the turn of the century. One of the most elaborate was made by Andrew L. Pritchard, Wilbert A. Clemens and Russell E. Foerster in Canada. They marked 469,326 young sockeye salmon born in a tributary of the Fraser River, and they recovered nearly 11,000 of these in the same parent stream after the fishes' migration to the ocean and back. What is more, not one of the marked fish was ever found to have strayed to another stream. This remarkable demonstration of the salmon's precision in homing has presented an exciting challenge to investigators.

At the Wisconsin Lake Laboratory during the past decade we have been studying the sense of smell in fish, beginning with minnows and going on to salmon. Our findings suggest that the salmon identifies the stream of its birth by odor and literally smells its way home from the sea.

Fish have an extremely sensitive sense of smell. This has often been observed by students of fish behavior. Karl von Frisch showed that odors from the injured skin of a fish produce a fright reaction among its schoolmates. He once noticed that when a bird dropped an injured fish in the water, the school of fish from which it had been seized quickly dispersed and later avoided the area. It is well known that sharks and tuna are drawn to a vessel by the odor of bait in the water. Indeed, the time-honored custom of spitting on bait may be founded on something more than superstition; laboratory studies have proved that human saliva is quite stimulating to the taste buds of a bullhead. The sense of taste of course is closely allied to the sense of smell. The bullhead has taste buds all over the surface of its body; they are especially numerous on its whiskers. It will quickly grab a piece of meat that touches any part of its skin. But it becomes insensitive to taste and will not respond in this way if a nerve serving the skin buds is cut.

The smelling organs of fish have evolved in a great variety of forms. In the bony fishes the nose pits have two separate openings. The fish takes water into the front opening as it swims or breathes (sometimes assisting the intake with

ilia), and then the water passes out through the second opening, which may be opened and closed rhythmically by the fish's breathing. Any odorous substances in the water stimulate the nasal receptors chemically, perhaps by an effect on enzyme reactions, and the resulting electrical impulses are relayed to the central nervous system by the olfactory nerve.

The human nose, and that of other land vertebrates, can smell a substance only if it is volatile and soluble in fat solvents. But in the final analysis smell is always aquatic, for a substance is not smelled until it passes into solution in the mucous film of the nasal passages. For fishes, of course, the odors are already in solution in their watery environment. Like any other animal, they can follow an odor to its source, as a hunting dog follows the scent of an animal. The quality or effect of a scent changes as the concentration changes; everyone knows that an odor may be pleasant at one concentration and unpleasant at another.

10 When we began our experiments, we first undertook to find out whether fish could distinguish the odors of different water plants. We used a special aquarium with jets which could inject odors into the water. For responding to one odor (by moving toward the jet), the fish were rewarded with food; for responding to another odor, they were punished with a mild electric shock. After the fish were trained to make choices between odors, they were tested on dilute rinses from 14 different aquatic plants. They proved able to distinguish the odors of all these plants from one another.

Plants must play an important role in the life of many freshwater fish. Their odors may guide fish to feeding grounds when visibility is poor, as in muddy water or at night, and they may hold young fish from straying from protective cover. Odors may also warn fish away from poisons. In fact, we discovered that fish could be put to use to assay industrial pollutants: our trained minnows were able to detect phenol, a common pollutant, at concentrations far below those detectable by man.

All this suggested a clear-cut working hypothesis for investigating the mystery of the homing of salmon. We can suppose that every little stream has its own characteristic odor, which stays the same year after year; that young salmon become conditioned to this odor before they go to sea; that they remember the odor as they grow to maturity, and that they are able to find it and follow it to its source when they come back upstream to spawn.

Plainly there are quite a few ifs in this theory. The first one we tested was the question: Does each stream have its own odor? We took water from two creeks in Wisconsin and investigated whether fish could learn to discriminate between them. Our subjects, first minnows and then salmon, were indeed able to detect a difference. If, however, we destroyed a fish's nose tissue, it was no longer able to distinguish between the two water samples.

Chemical analysis indicated that the only major difference between the two waters lay in the organic material. By testing the fish with various fractions of the water separated by distillation, we confirmed that the identifying material was some volatile organic substance.

15 The idea that fish are guided by odors in their migrations was further supported by a field test. From each of two different branches of the Issaquah River in the State of Washington we took a number of sexually ripe silver salmon which had come home to spawn. We then plugged with cotton the noses of half the fish in each group and placed all the salmon in the river below the fork to make the upstream run again. Most of the fish with unplugged noses swam back to the stream they had selected the first time. But the “odor-blinded” fish migrated back in random fashion, picking the wrong stream as often as the right one.

In 1949 eggs from salmon of the Horsefly River in British Columbia were hatched and reared in a hatchery in a tributary called the Little Horsefly. Then they were flown a considerable distance and released in the main Horsefly River, from which they migrated to the sea. Three years later 13 of them had returned to their rearing place in the Little Horsefly, according to the report of the Canadian experimenters.

In our own laboratory experiments we tested the memory of fish for odors and found that they retained the ability to differentiate between odors for a long period after their training. Young fish remembered odors better than the old. That animals “remember” conditioning to which they have been exposed in their youth, and act accordingly, has been demonstrated in other fields. For instance, there is a fly which normally lays its eggs on the larvae of the flour moth, where the fly larvae then hatch and develop. But if larvae of this fly are raised on another host, the beeswax moth, when the flies mature they will seek out beeswax moth larvae on which to lay their eggs, in preference to the traditional host.

With respect to the homing of salmon we have shown, then, that different streams have different odors, that salmon respond to these odors and that they remember odors to which they have been conditioned. The next question is: Is a salmon’s homeward migration guided solely by its sense of smell? If we could decoy homing salmon to a stream other than their birthplace, by means of an odor to which they were conditioned artificially, we might have not only a solution to the riddle that has puzzled scientists but also a practical means of saving the salmon—guiding them to breeding streams not obstructed by dams.

We set out to find a suitable substance to which salmon could be conditioned. A student, W. J. Wisby, and I [Arthur Hasler] designed an apparatus to test the reactions of salmon to various organic odors. It consists of a compartment from

which radiate four runways, each with several steps which the fish must jump to climb the runway. Water cascades down each of the arms. An odorous substance is introduced into one of the arms, and its effect on the fish is judged by whether the odor appears to attract fish into that arm, to repel them or to be indifferent to them.

- 20 We needed a substance which initially would not be either attractive or repellent to salmon but to which they could be conditioned so that it would attract them. After testing several score organic odors, we found that dilute solutions of morpholine neither attracted nor repelled salmon but were detectable by them in extremely low concentrations—as low as one part per million. It appears that morpholine fits the requirements for the substance needed: it is soluble in water; it is detectable in extremely low concentrations; it is chemically stable under stream conditions. It is neither an attractant nor a repellent to unconditioned salmon, and would have meaning only to those conditioned to it.

Federal collaborators of ours are now conducting field tests on the Pacific Coast to learn whether salmon fry and fingerlings which have been conditioned to morpholine can be decoyed to a stream other than that of their birth when they return from the sea to spawn. Unfortunately this type of experiment may not be decisive. If the salmon are not decoyed to the new stream, it may simply mean that they cannot be drawn by a single substance but will react only to a combination of subtle odors in their parent stream. Perhaps adding morpholine to the water is like adding the whistle of a freight train to the quiet strains of a violin, cello and flute. The salmon may still seek out the subtle harmonies of an odor combination to which they have been reacting by instinct for centuries. But there is still hope that they may respond to the call of the whistle.

ENGAGING the Text

1. How was Hasler and Larsen's experiment designed to test their hypothesis as to how salmon were able to return to their exact birthplace over 900 miles away?
2. How did Hasler and Larsen's experiment disclose that the salmon's homeward migration is guided solely by its memory of the odors of the parent stream in which it was spawned?

EVALUATING the Argument

1. What technical terms do the authors define to help their readers understand the process they are investigating?
2. How might the organization of Hasler and Larsen's research, in which they list assumptions they wish to test, reports of past research, alternate

theories, and a model designed to test key variables in a form that can be duplicated, illustrate the scientific method?

EXPLORING the Issue

1. Since the salmon reproduces only once in its lifetime, why would the results of Hasler and Larsen's research be important in deciding where to place dams in the tributaries of streams?
2. What mechanisms have scientists identified to explain migratory patterns or the homing instinct in other species?

CONNECTING Different Perspectives

1. Compare the role of instinct examined by Hasler and Larsen in the homing salmon and by Jean Henri Fabre in "The Praying Mantis."