



Information Overload, Concept of

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GLOSSARY

cultural ADD The recently observed social variant of Attention Deficit Disorder. The classic form of ADD is thought to be a biologically based condition causing a persistent pattern of difficulties resulting in inattention, hyperactivity, and impulsivity. Cultural ADD attributes the same set of behaviors to the overwhelming speed of information and our increasing culture of distraction.

data smog An unexpected and unwelcome new component to the age of information, data smog is an expression for the overwhelming volume of e-mail, voice mail, faxes, junk mail, up-to-the-minute news flashes, and mesmerizing electronic images that we now come into contact with regularly.

meta-analysis The study of studies; a method of combining pools of statistics from a wide range of studies and making a comprehensive analysis based on the whole.

spam Unsolicited e-mail; the term is derived from a comedy skit by the absurdist troupe Monty Python in which unsuspecting diners are informed that the restaurant menu includes “egg and bacon, egg sausage and bacon, egg and Spam, egg bacon and Spam, egg bacon sausage and Spam, Spam bacon sausage and Spam, Spam egg Spam Spam bacon and Spam” [and so on]. When, in the early 1990s, it was noticed that certain individuals got a kick out of interrupting text-based Net dialogues with useless and irrelevant drivel, the term “spam” seemed apt.

stat wars Michael Kinsley’s term for the exhaustive, constant policy arguments fueled by seemingly unlimited amounts of data. Factionalism gets a big boost from the volleys of data, while dialogue and consensus—the marrow of democracy—run thinner and thinner every year.

Just as fat has replaced starvation as the number one dietary concern of the United States, information overload has replaced information scarcity as an important new emotional, social, and political problem.

We have quite suddenly mutated into a radically different culture, a civilization that trades in and survives on stylized communication. And as we enjoy the many fruits of this burgeoning information civilization, we also have to learn to compensate for the new and permanent side effects of what sociologists, in an academic understatement, call a “message dense” society.

If scientific discovery has not been an unalloyed blessing, if it has conferred on mankind the power not only to create but also to annihilate, it has at the same time provided humanity with a supreme challenge and a supreme testing.

—John F. Kennedy, 1963

I. THE SURPRISING TRADEOFFS OF INFORMATION PROLIFERATION

Something marvelous has been happening to humankind—not just in the past three or four years with computers and the Internet, but more broadly in the past several decades. Information is moving faster and becoming more plentiful, and people everywhere are benefiting from this change.

But there is a surprising postscript to this story. When it comes to information, it turns out that one can have too much of a good thing. At a certain level of input, the law of diminishing returns takes effect; the glut of information no longer adds to our quality of life, but instead begins to cultivate stress, confusion, and even ignorance. Information overload threatens our ability to educate ourselves and leaves us more vulnerable as consumers and less cohesive as a society. For most of us, it actually diminishes our control over our own lives, while those already in power find their positions considerably strengthened.

This is not the first time we have been confronted by the unpleasant side effects of abundance. Those of us who live in the United States, the most sophisticated and successful nation on Earth, also routinely find ourselves burdened by problems of excess. Now, for all the

wonders of the information revolution, a menacing cloud of "data smog" has drifted in. In this article, we will explore its unwholesome properties and suggest some healthful remedies to recollect the critical distinction between information and understanding and to demonstrate why you do not have to feel personally overloaded with information to be a victim of the information glut.

Information used to be as rare and precious as gold. It is estimated that one weekday edition of today's *New York Times* contains more information than the average person in 17th-century England was likely to come across in an entire lifetime. Now it is so inexpensive and plentiful that most of it ends up being remaindered and shredded, as if it is worthless garbage. The first great paradox of information glut is that we are becoming so information-rich that we take much of what we have for granted.

Still, the concept of *too much information* seems odd and vaguely inhuman. This is because, in evolutionary-historical terms, this weed in our information landscape has just sprouted—it is only about 50 years old. Until about 50 years ago, more information was almost always a good thing. For nearly 100,000 years leading up to this century, information technology has been an unambiguous virtue as a means of sustaining and developing culture. Information and communications have made us steadily healthier, wealthier, more tolerant. Because of information, we understand more about how to overcome the basic challenges of life. Food is more abundant. Our physical structures are sturdier, more reliable. Our societies are more stable, as we have learned how to make political systems function. Our citizens are freer, thanks to a wide dissemination of information that has empowered the individual. Dangerous superstitions and false notions have been washed away: Communicating quickly with people helps to overcome our fear of them and diminishes the likelihood of conflict.

Then, around the time of the first atomic bomb, something strange happened. We began to produce information much faster than we could process it. This had never happened before. For 100,000 years the three fundamental stages of the communications process—production, distribution, and processing—had been more or less in synch with one another. By and large, over our long history, people have been able to examine and consider information about as quickly as it could be created and circulated. This equipoise lasted through an astonishing range of communications media—the drum, smoke signal, cave painting, horse, town crier, carrier pigeon, newspaper, photograph, telegraph, telephone, radio, and film.

But in the mid-20th century this graceful synchrony was abruptly knocked off track with the introduction of computers, microwave transmissions, television, and satellites. These hyperproduction and hyperdistribution mechanisms surged ahead of human processing ability. In this way, in a very short span of natural history, we have vaulted from a state of information scarcity to one of information surplus—from drought to flood in the geological blink of an eye. In 1850, 4% of U.S. workers handled information for a living; now *most* do, and information processing (as opposed to material goods) now accounts for more than half of the U.S. gross national product. Data have become more plentiful, more speedy (computer processing speed has doubled every two years for the last 30 years), and more dense (from 1965 to 1995, the average network television advertisement decreased from 53.1 seconds to 25.4 seconds and the average television news soundbite decreased from 42.3 seconds to 8.3 seconds; meanwhile, over the same period, the number of ads per network television minute increased from 1.1 to 2.4).

Information has also become a lot cheaper—to produce, to manipulate, to disseminate. All of this has made us information-rich, empowering Americans with the blessings of applied knowledge. It has also, though, unleashed the potential of information gluttony. Just as fat has replaced starvation as this nation's number one dietary concern, information overload has replaced information scarcity as an important new emotional, social, and political problem. With virtually no effort and for relatively little cost, we can capture as much information as we want.

With information production not only increasing, but accelerating, there is no sign that processing will ever catch up. We have quite suddenly mutated into a radically different culture, a civilization that trades in and survives on stylized communication. We no longer hunt or gather; few of us farm or assemble. Instead, we negotiate, we network, we interface. And as we enjoy the many fruits of this burgeoning information civilization, we also have to learn to compensate for the new and permanent side effects of what sociologists, in an academic understatement, call a message-dense society.

Audio buffs have long been familiar with the phrase "signal-to-noise ratio," engineering parlance for measuring the quality of a sound system by comparing the amount of desired audio signal to the amount of unwanted noise leaking through. In the information age, signal-to-noise has also become a useful way to think about social health and stability. How much of the information in our midst is useful, and how much of it gets in the way? What is our signal-to-noise ratio? We

know that the ratio has diminished of late and that the character of information has changed: As we have accrued more and more of it, information has emerged not only as a currency, but also as a pollutant.

- In 1971 the average American was targeted by at least 560 daily advertising messages. Twenty years later, that number had risen sixfold, to 3000 messages per day.
- In the office, an average of 60% of each person's time is now spent processing documents.
- Paper consumption per capita in the United States tripled from 1940 to 1980 (from 200 to 600 pounds), and tripled *again* from 1980 to 1990 (to 1800 pounds).
- In the 1980s, third-class mail (used to send publications) grew 13 times faster than population growth.
- Two-thirds of business managers surveyed report tension with colleagues, loss of job satisfaction, and strained personal relationships as a result of information overload.
- More than 1000 telemarketing companies employ 4 million Americans and generate \$650 billion in annual sales.

I call this unexpected, unwelcome part of our atmosphere "data smog," an expression for the noxious muck and druck of the information age. Data smog gets in the way; it crowds out quiet moments and obstructs much-needed contemplation. It spoils conversation, literature, and even entertainment. It thwarts skepticism, rendering us less sophisticated as consumers and citizens. It stresses us out.

Data smog is not just the pile of unsolicited catalogs and spam arriving daily in our home and electronic mailboxes. It is also information that we pay handsomely for, that we *crave*—the seductive, mesmerizing quick-cut television ads and the 24-hour up-to-the-minute news flashes. It is the faxes we request as well as the ones we do not; it is the misdialled numbers and drippy sales calls we get during dinnertime; but it is also the Web sites we eagerly visit before and after dinner, the pile of magazines we pore through every month, and the dozens of channels we flip through whenever we get a free moment.

The blank spaces and silent moments in life are fast disappearing. Mostly because we have asked for it, media are everywhere. Televisions, telephones, radios, message beepers, and an assortment of other modern communication and navigational aids are now as ubiquitous as roads and tennis shoes—anywhere humans can go, all forms of media now follow: onto trains, planes, and automobiles, into hotel bathrooms, along

jogging paths and mountain trails, on bikes and boats.

We have heard a lot lately about the moral decay evident in our entertainment packaging. But it is not so much the content of the messages that should worry us as much their ubiquity, and it is critical to realize that information does not have to be unwanted and unattractive to be harmful.

II. STRESS

Perhaps the greatest story of acquisition and regret is that of the mythical Greek god Prometheus, whose punishment for stealing fire and passing it down to human beings was to be chained naked to a pillar where each day a vulture tore out his liver. The liver was divinely replenished each night, and the vulture would return to eat it out again the following day. In his dialogue *Protagoras*, Plato puts this story in more contemporary perspective. It was not just fire that Prometheus took. It was *techne*, the knowledge of how to make things. The moral is that the price of technological know-how includes a pound of flesh.

Today, the vultures still feed, occasioning a billion-dollar market for antacids such as Tagamet and Pepcid AC. For all of our abundance, ours is also an age of unprecedented stress, strain, headaches, and digestive problems—so much so, in fact, that tension has become one of our most vibrant industries. Three out of four Americans complain of chronic stress. Two out of every three visits to the family doctor are thought to be stress related, and the three top-selling prescription drugs are for ulcers, depression, and hypertension. Stress is also partly to blame, psychologists say, for the startling 300% increase in depression over the course of the 20th century.

Stress can have many different sources, of course: financial strain, family pressures, medical problems, and so on. But in a society that has come to be so broadly defined by information technology, it is becoming increasingly clear that the information revolution sweeping us into a new realm of communication is also serving as one of our greatest stressors. Our fast-paced, high-stimulation society leaves many people complaining about being overwhelmed, while many others are becoming unhealthily addicted to the mania. "People seem to be developing a form of attention deficit disorder without inheriting it," says Dr. Theodore Gross, an expert on attention-span disorders. "The information explosion has something to do with it—all the faxes and e-mail and calls come in, and people cannot keep up with it."

Attention deficit disorder (ADD), an increasingly common brain imbalance, causes acute restlessness and a propensity toward boredom and distraction. Victims of ADD often find it extraordinarily difficult to concentrate on any one thing for more than a few moments. Their minds wander, and they frequently find themselves involved in several things at once. If these symptoms sound eerily familiar, it is because we may be on the verge of an ADD epidemic. While millions of Americans are thought to suffer from an inherited form of ADD, experts are now seeing a whole new manifestation of what they call culturally induced ADD.

No matter how creatively we name it, however, the effects of information overload do not add up to one single debilitating syndrome that we can easily highlight, recoil in horror from, and muster a simple defense against. A careful review of 30 years of psychological research reveals a wide variety of effects from information and stimulus overload, including, but not limited to increased cardiovascular stress, weakened vision, confusion, frustration, impaired judgment, decreased benevolence, and overconfidence coupled with decreased accuracy.

As data smog changes the scope of our daily lives, our escapist fantasies evolve. Instead of jaunting off to savor intense new experiences, we design vacations of pure void. An editor friend of mine has just returned from a luxurious Caribbean vacation where, he boasts, he had all the extravagances he desired: no television, no radio, no newspaper, no computers. "My idea of pure bliss," he says, "is no information at all."

III. THE PSYCHOLOGY OF OVERLOAD

How did we come to a point where our own tools of enlightenment would cause such distress? Ours is a culture of knowledge, an age of reason rooted in the 16th- and 17th-century scientific inquiry of Copernicus, Galileo, and Newton. Communications have been the lifeblood of civilization. But in our roaring technological prosperity, we have, so far, ignored the lesson Marshall McLuhan taught us decades ago: that every technology has service effects and disservice effects—positive and negative consequences for society.

Physically, we are what we are. So while we like to think of humans as adaptable creatures, the plain truth is that because of our complexity and longevity, we are not nearly as quick to physically adapt as are many other species. Our brains have remained structurally consistent for over 50,000 years, yet exposure to processed information in this century has increased by a factor of thousands (lately, the volume and speed of

information has been increasing as much as 100% each year). Something has to give. "Because technology can evolve much faster than we can," says psychologist Robert Cialdini, "our natural capacity to process information is likely to be increasingly inadequate to handle the surfeit of change, choice, and challenge that is characteristic of modern life."

Psychological tests reveal a bevy of clinical responses to data smog—confusion, frustration, overconfidence, and so on. But what does information overload look like in the real world? For some more personal snapshots of overload experience, I sent out an electronic query on the Internet. The response was stunning. I heard from scores of people, from Denmark, Sweden, Germany, Britain, California, New Jersey, Minnesota, and Colorado:

- An accountant who files all of her forms on a computer without any difficulty, but who becomes frozen with indecision when confronted with the open-ended world of the Internet
- A lawyer whose progressive addiction to computers culminated in a terrifying nightmare about being trapped in an endless library
- A librarian who has been professionally trained to grapple with mountains of information but who has lately succumbed to the feeling that the information supply is finally getting out of control.

And a vast assortment of others with memory troubles, sore backs, blurry vision, headaches, and so on.

I have also noticed a problem with my own memory and have had countless conversations with others as they tried to recall in vain where they came across some specific piece of information. "We're exceptional at storing information," explains UCLA memory expert Robert Bjork. "But there are retrieval limitations. We get overloaded. We know the name of that high school friend. It is in our memory somewhere, but we can't quite get to it." The specific culprit involved in our increasingly spotty memories, he says, is "cue overload." Memory is stored according to specific cues—contexts within which the information is experienced.

The problem comes when the contexts begin to vanish in the sea of data. Perhaps, like me, you now read nearly everything off the same computer screen, in the same sitting position, in the same spot in the same room. Perhaps the majority of your conversations now take place over the same phone in the same chair. "When many different things get associated with the same situational cues," explains Bjork, "you're going to have a greater difficulty remembering any one of those

things. With information overload, retrieval becomes more difficult.”

This new surfeit of choice also threatens our identities, our spiritual selves. In *Zen and the Art of Motorcycle Maintenance*, Robert Pirsig offers a practical solution to the existential alienation people suffer in modern society: His prescription is for people to reattach themselves to the technologies that they depend on by learning how they work. As “sophisticated” as we are, he argues, we still need to feel connected to our world in a rudimentary way. But Pirsig’s ideas, as sound as they are, are becoming obsolete. As the sophistication of the machinery increases each year, his solution of reattachment is increasingly unavailable to us. Sadly, we are creating a world so complex that each of us will understand less and less about it.

IV. ANALYSIS PARALYSIS

Should you drink coffee? ... Hardly a month goes by without the release of yet another study linking coffee or caffeine to some undesirable health effect or absolving it of a suspected hazard. But almost without fail, such reports are soon followed by studies that fail to confirm either the risks or the benefits.

—Jane E. Brody, *The New York Times*

The proliferation of expert opinion has ushered in a virtual anarchy of expertise. To follow the news today is to have the surreal understanding that the earth is melting *and* the earth is cooling; that nuclear power is safe and nuclear power is not safe; that affirmative action works—or wait, no it does not. In the era of limitless data, there is always an opportunity to crunch some more numbers, spin them a bit, and prove the opposite. Would jobs have been gained or lost under Bill Clinton’s comprehensive health care plan? Is dioxin as dangerous as we once thought? Do vitamins prevent cancer? With the widening pool of elaborate studies and arguments on every side of every question, more expert knowledge has, paradoxically, led to less clarity.

The *New York Times* aptly calls this phenomenon “volleys of data.” Statistics and hard facts are one of the fundamental ingredients of a just and civil society; but as with other forms of information, it turns out that too much of a good thing can have unwelcome consequences. The dramatic reduction in the cost of information production and distribution has ushered in an era of seemingly endless argumentation. “Much of the Congressional battle about President Clinton’s economic package could come down to a duel

over algebra,” wrote the *Times*’ Steven Greenhouse in 1993.

Republican mathematicians attack the President’s plan as a tax-and-spend scheme, asserting that it includes \$1.75 to \$18 in tax increases for every dollar in spending cuts. Mr. Clinton’s number crunchers respond that it is a prudent, balanced plan, with one dollar in revenue tax increases for each dollar in spending cuts. Which is right in this battle of the calculators? The answer, in the never-never land of American politics, is that both sides are, depending on how one cuts the deck.

Journalists and news consumers alike are stymied by the modern tendency of statistics to argue in every direction. Anyone who has attempted to conscientiously research a medical or political issue has confronted this problem directly. The endless analysis is so overwhelming, it is difficult to know how and when to decide.

On National Public Radio’s *All Things Considered* one evening, reporter Chitra Ragavan is trying to make sense of the latest cancer study, which does not comport with previous studies. “If you don’t have some level of confusion about how to interpret this study,” the National Cancer Institute’s Philip Taylor tells Ragavan, “you should.”

Inconclusive results, Ragavan reports. More studies needed. “Other large studies now underway may help clear the confusion,” she suggests hopefully. But in her optimism, she is ignoring the source of contention. It is our tools that have gotten us into this mess in the first place. With a majority of U.S. workers now paid to churn out data, we have generated a morass of expert information that has started to undermine logical approaches to deliberation and problem solving. Responding to a report that there have been more than 100,000 studies conducted on depression, the University of Chicago’s Larry V. Hedges pleads, “Is this a sensible situation? Do we really need more data?”

The studies pour in at such a rate, in fact, that a new field of statistics—“meta-analysis”—has suddenly emerged to make sense of the glut. Meta-analysis, the study of studies, is a method of combining pools of statistics from a wide range of studies and making a comprehensive analysis based on the whole. Data from hundreds of different examinations into whether caffeine causes breast cancer will be pooled together into one giant study. Though the approach dates back to 1904, when English statistician Karl Pearson used data from a range of vaccinations to conclude that they were ineffective, meta-analysis was all but forgotten until the 1980s, when frustrated researchers began to turn to it

as a way out of their statistical confusion. By 1992, meta-analysis was so common it was formally endorsed by the National Research Council.

Does it work? We may never know. The modern confusion created by the glut of statistics also plagues this would-be solution. Meta-analysis, sums up the journal *Science*, is a "controversial method that has provoked dispute in every field to which it has been applied. . . . [Despite this,] proponents of the method argue that whatever problems there are in the technique will have to be dealt with, because there is no other way to handle the explosion of data."

The statistical anarchy freezes us in our cerebral tracks. The psychological reaction to such an overabundance of information and competing expert opinions is to simply avoid coming to conclusions. "You can't choose any one study, any one voice, any one spokesperson for a point of view," explains psychologist Robert Cialdini. "So what do you do? It turns out that the answer is, you don't do anything. *You reserve judgment*. You wait and see what the predominance of opinion evolves to be." "But," Cialdini continues, confronting the paradox, "I don't know that we have the luxury to wait that long, in modern life."

As the amount of information and competing claims stretches toward infinity, the concern is that we may be on the verge of a whole new wave of indecisiveness: paralysis by analysis. In this way, technology brings with it yet another internal contradiction: as it speeds up our world in the name of efficiency and productivity, it also constricts rational thinking.

Civilization has thrived on an increasing diet of science and other reliable statistics. Applied data have answered millions of important questions about how to live a better life. But with today's runaway pace of information, we may have come upon too much of a good thing. Information may want to be free, but that freedom in and of itself is not enough to support humanity. We also depend on information's integrity, and not a little discipline.

BOB EDWARDS: It sounds like it's constructed so that all of you, from both branches of government and in both parties, can make whatever claim you care to make.

FORMER CONGRESSMAN TOM DOWNEY: That's exactly right.

FORMER CONGRESSMAN VIN WEBER: If you're skillful. . . . It depends on what you measure and when you measure it.

— From National Public Radio's *Morning Edition*

Because nearly any argument imaginable can now be supported with an impressive data set, the big winner

is . . . argumentation itself. Journalist Michael Kinsley calls this "Stat Wars." Factionalism gets a big boost from the volleys of data, while dialogue and consensus—the marrow of democracy—run thinner and thinner every year. "Facts can have the same stupefying effect as images of flag factories and furloughed felons," writes Daniel Pink, who, as a 1992 campaign strategist for Senator Bob Kerrey, used a computer to toy with the numbers in Bill Clinton's economic proposals in order to speciously argue that Clinton planned to cut \$7.5 billion from Social Security. "Facts," Pink says from experience, "can manipulate and mislead." Nowhere are the stat wars more heated than in Washington, D.C. From CNN's *Crossfire*:

PAT BUCHANAN, Co-Host: Arkansas was fourth highest in teen pregnancy when [Dr. Joycelyn Elders] took over. Now, it's second or first. Under her program of condom distribution and the rest, STD's, sexually transmitted diseases, the incidence of them have soared. . . .

DR. WALTER FAGGETT, National Medical Association: You take it out of context, Pat. That's the problem. Again, the teenage pregnancy rate in Arkansas—the rate of increase has decreased.

MICHAEL KINSLEY, Co-Host: And the rate of increase in Arkansas is lower than the rate of increase in the rest of the country.

RALPH REED, The Christian Coalition: No, it isn't. Between 1987 and 1992, teen pregnancy increased in Arkansas by fifteen percent, at the time that it was increasing at five percent at the national average. It's gotten a lot worse.

MICHAEL KINSLEY: The statistic I saw was seventeen percent in Arkansas, but it was eighteen percent in the country.

In our nation's capital, supplying grist for endless policy debates has become a vital industry over the past several decades. Public relations agencies profit handsomely for fanning debates, and television shows such as *Crossfire* are specifically designed to exploit the entertainment value of the stat war phenomenon. The charges come flying back and forth across the table as furiously as a ping pong ball. But there is no referee and no official scoring; the show always ends before viewers have time to gauge the accuracy of the shots. Stay tuned for tomorrow night, when a new volley of stats will be on view—supplied at no charge by D.C.'s stat war munitions factories. To stock up on data, lobbyists and *Crossfire* producers need only flip through a local phone book.

With purposefully vague and formidable names such as Institute for Responsive Government and the

National Center for Policy Analysis, hundreds of so-called think tanks have popped up in our nation's capital since the late 1960s. Staffed with some of the most skilled polemicists and statisticians in the land and generously supported by U.S. corporations with specific political agendas, their task is to produce mountains of data to support partisan policy objectives. In the stat war environment, bulk is often as critical as quality. "In the Washington swirl, where few people have the time actually to read the reports they debate," explains Gregg Easterbrook in a definitive report on the think tank culture for the *Atlantic Monthly*, "respectability is often proportional to tonnage. The more studies someone tosses on the table, the more likely he is to win his point."

These institutions are masters of contention. A good many of them are expressly uninterested in an earnest pursuit of the truth. "We're not here to be some kind of Ph.D. committee giving equal time," says Burton Pines, a leader of the right-wing Heritage Foundation. "Our role is to provide conservative public-policy makers with arguments to bolster our side. We're not troubled over this. There are plenty of think tanks on the other side."

As a matter of fact, though, since the late 1970s, the think tank field has been heavily dominated by corporate money and conservative political philosophy. With dozens of corporatist, free-enterprise institutions (Cato, Manhattan, and Hudson Institutes; the Reason Foundation; the Ethics and Public Policy Center, etc.) pushing for lower taxes and less regulation, "conservative commentators have their liberal counterparts outgunned by a wide margin," writes Easterbrook.

The American Enterprise Institute (AEI) is one of the oldest and most influential pro-business think tanks in town. Established in 1943 by industrialist Lewis Brown, it caught the conservative tide in the early 1980s, more than tripling in size. A substantial portion of its multimillion dollar budget comes from defense contractors, pharmaceutical companies, and banks. The institute's mission, explains Vincent Sollitto, AEI's director of media relations, "is to do substantive research on public policy issues, to make sure that Congress is aware of all the possible options... especially the ones that reflect our own personal core beliefs—free market, limited government, free and fair trade, competitive enterprise, personal property rights, individual responsibility, and a strong and vibrant national defense."

Shaping the mood of Washington begins with expert press play, and every think tank has a point person to coordinate the constant flow. "I probably have four to five thousand journalists on my system," estimates

Sollitto. "That's just about every journalist in the world. They are cross-referenced in a tier form—national media, regional media, trade press, foreign press, and then cross-referenced by interest code—people interested in the environment, in economics, in other topics." With an incessant stream of articles, books, surveys, and statistical analyses, AEI's 45 scholars are constantly churning out material. "Everyone is expected to produce," Sollitto explains. "There isn't a policy issue that we're not somehow working on."

Think tanks are not the only institutions to have become information hyperproducers. As information technology has made research, word processing, and publishing all dramatically cheaper, tens of millions of us have become our own think tanks—putting our ideas onto paper or disk and seeking an audience for our thoughts and opinions. Web homepages and neighborhood 'zines have turned millions of citizens into *glutizens*—reporters, publishers, and broadcasters. The media are us. We are not just splashing around in the information glut. We are also creating it.

V. THE TWO-BY-FOUR EFFECT

In a glutted environment, the most difficult task is not getting one's message out, but finding a receptive audience. As psychologist Stanley Milgram explained in 1970, individuals adapt to stimulus overload by allocating less time to each input, blocking reception whenever possible, and installing filtering devices to keep the number of inputs down to a manageable level. Metaphorically speaking, we plug up our ears, pinch our noses, cover our eyes with dark sunglasses, and step into a body suit lined with protective padding.

But this is not the end of the story. Inevitably, someone wishes to attract the attention of our overloaded, well-protected subject. Intuitively, the communicator responds to these new barriers with barrier-piercing countermeasures. In order to make contact with the person wearing earplugs, he raises his voice. To catch the eye of the person with sunglasses, he uses brighter lights. To make an impression on someone wearing a lot of protective padding, he gives that person a whack on the head. The predicament has become so common that there's already a popular U.S. expression for it: "I had to hit him in the head with a two-by-four to get his attention."

And so it is that our glutted society is victimized by what we might call the "two-by-four effect." The two-by-four effect provides humanity with a way to keep communication alive in a glutted environment. But in so doing, it extracts a hefty price: Society, as we all

know from experience, is becoming inexorably more crass. We are witnessing the new reign of trash television, hate radio, shock jocks, tort litigation, publicity stunts, and excessively violent and sarcastic rhetoric.

Historically, discourteousness and vulgarity have always signified a lack of sophistication; garishness was considered tasteless and degrading. In today's attention-deficit society, however, people have learned that churlish behavior is the key to headlines, profit, and power. Outrageous behavior by individuals is rewarded with wealth and influence.

Information technology has transformed the general public into a giant lay media, and in so doing, it has also bestowed upon us glutizens the quintessential media burden: to grab an audience. Everyone wants to be heard (or read or watched). If the media are now us, then we all have the same problem of seeking to get attention in a world full of glutted, distracted people. Since we are at once victims of the glut and glutizens who contribute to it, we are simultaneously casualties of the two-by-four effect and its patrons.

As such a desensitizer, the two-by-four effect may also freeze out some of our best minds from the mainstream of public debate. If one has to be sensational and dramatic to gain attention, what does that portend for the insightful, brilliant minds whose ideas do not lend themselves to MTV videos or flashy Web pages? If our attention naturally gravitates toward the Madonnas and Howard Sterns of the world, who gets left behind in the dust? Ironically, the two-by-four effect suppresses those individuals whom we most desperately need in our complex times—the people who are willing to confront life's ambiguities.

VI. VILLAGE OF BABEL

A. The Stretching and Splintering of Culture

The global village has arrived. In this shrunken electronic world, CNN, MTV, and the *Wall Street Journal* want you, whether you happen to be in Taipei or Greenwich Village. Telephones, televisions, satellites, and computers have made great physical distances obsolete by allowing instant communication between virtually anyone, and that has led to some nearly universal cultural phenomena. National Basketball Association games are seen in more than 100 different countries. Toyota cars can be purchased in 151 different countries. Coca-Cola can be consumed in 185 different countries—seven more countries than there are members of the United Nations. The blossoming of the World Wide Web, functioning as a global electronic

library equally accessible by all who are connected, only enhances the sensation. Web pages are as varied as humanity itself and yet they are all connected to one another. With the Web, it is a small world after all—between 12 and 20 inches diagonally, depending on the size of one's computer screen.

But the global village is only one side of the coin. Among Stanley Milgram's list of human responses to stimulus overload was this observation: "Specialized institutions are created to absorb inputs that would otherwise swamp the individual." Indeed, the informationized world has also followed this prophecy, as can be heard with a simple glide down any U.S. radio dial. Here we are confronted by the sounds of a severe new cultural fragmentation: from hip-hop to cool jazz to death metal to fusion to classic 1960s hits to swing to grunge to public radio news to shock talk—no two stations sound even remotely alike. "It's all getting nichier and nichier now, more and more fragmented," says Lee Abrams, managing director of the ABC Satellite Radio Network. Dozens of these narrowly tailored radio formats have sprung up in the past few decades.

Channel surfing on any cable-TV system is a similarly disjuncting experience, as is browsing a newsstand that features hundreds of niche magazines—from *Backpacker* to *Cigar Aficionado* to *Home Office Computing*, one or more for every vocation and avocation known to humankind. As society becomes more and more virtual, the fragmentation and political polarization will only increase. In 1994, the first major political survey of Internet politics revealed, not surprisingly, a virtual world in a state of hyperfragmentation. "Virtual communities," researchers reported, "resemble the semi-private spaces of modern health clubs more than the public spaces of agoras.... Instead of meeting to discuss and debate issues of common concern to the society, members of these virtual communities meet largely to promote their own interests and to reinforce their own like-mindedness. They tend to exclude anyone who disagrees. As a consequence, however, they also reinforce the fragmentation and factionalism of modern society."

From this vantage point, it appears that rather than our world becoming a cozy village, we are instead retreating into an electronic Tower of Babel, a global skyscraper. Rather than based around a town square, the new information technology clusters us into social cubicles. There are fewer central spaces and not even a common channel. In 1978, three television networks—ABC, CBS, and NBC—captured 90% of the U.S. prime-time television viewing audience. Over the following decade, that figure dipped to 64%. From 1980 to 1990, while circulation dropped at general

interest magazines such as *Reader's Digest*, *Time*, and *Life*, there were nearly 3000 new magazine startups, most of them extremely narrow in their scope. "There's really no mass media left," an ad buyer told *Forbes* magazine in 1990.

That is a gross exaggeration. Obviously, mass media still exist and, in terms of global reach, are more massive than ever before. But in practical terms, people spend more and more of their lives in narrow, specialized fields of communication. Massification of culture began in earnest with the 15th century printing press and got an enormous boost from the 19th century penny press. Since the late 1960s, though, the process has been in full reverse, a communications transformation to a specialized, niche culture.

Unfolding before us, therefore, are two parallel and seemingly contradictory universes. Much of the world is indeed now tied into one massive electronic infrastructure, but the wired planet is also becoming increasingly fragmented within that wholeness. In fact, this makes perfect sense. Just as a large cocktail party breaks up into a string of small conversations—and the larger the party is, the more conversations there are—follow the people of earth when they are thrown together into one virtual village. In order to maintain intimate communication, and in order to keep up with our own sophistication, we fragment into tiny clusters within our global skyscraper.

We specialize. In medicine, law, finance, real estate, engineering, education, and every other profession imaginable. Workers have specialized their tasks to cope with the explosion of information. Specialization is how we apply our vast knowledge to many trying challenges of the human race, how we go about improving our quality of life. By narrowing our range of interest, we are able to delve further into crucial details of an issue. As a result, we develop more effective treatments for disease, more durable materials and building designs, more comfortable and lighter weight fabrics, and so on.

It is not just limited to our careers. Our consumer lives have also become much more specialized, allowing us to climb more deeply into obscure hobbies and acquire exotic foods. What marketers call "nichification" is, in fact, an important part of our improving quality of life. But there is also a big price paid. In a word, it is *separation*. "[As] the role of each medical practitioner logically narrows," one doctor writes in the *Journal of the American Medical Association*, "[there is a] tendency for compartmentalizing of patient needs, and for failure of sensitive dialogue with each patient." This, in a nutshell, is the paradox of specialization: it fuels progress, but also increases isolation.

A scientist was examining the leeches in a marsh when Zarathustra, the prophet, approached him and asked if he was a specialist in the ways of the leech. "O, Zarathustra, . . . that would be something immense; how could I presume to do so! . . . That, however, of which I am master and knower, is the brain of the leech; that is my world! . . . For the sake of this did I cast everything else aside, for the sake of this did everything else become indifferent to me . . ."

—Friedrich Nietzsche, *Thus Spake Zarathustra*

"For the sake of this did everything else become indifferent to me." This is our post-modern refrain. Professional specialization and consumer nichification encroach upon our common culture. Rather than a healthy swirl of communication among citizens of different backgrounds and perspectives, we are left with a hyperefficient communications infrastructure that not only highlights social distinctions, it fortifies them.

Andy Warhol had it only partly right. In the future, we will all be famous for 15 minutes—but only within our extremely specialized communities. Surveys tend to bear this out, revealing not ignorance, per se, but a severe crisis in common information. Like minds stay in touch with one another, but not with the community at large, as nichification supplies more *insulation* than communication. "There is so much information," laments pollster Andrew Kohut, "that in some sense, people throw their hands up and say, 'Well, I'm going to focus on this very narrow part of the world.' People who used to read *Life* and *Look* magazine in the '50s now are great experts at motorcycles and spend a lot of time reading *Motorcycle World*. And what happens on the cover of *Life* and *Look* comparably is missed."

This does not mean things are getting worse for democracy. But it does mean that our contemporary social goal of achieving a truly just society has a surprising impediment built right in. This helps explain the stagnation in U.S. political knowledge over the past 50 years, even as Americans were formally educated to an unprecedented degree. We face a paradox of abundance-induced amnesia. The more information we come upon, the more we narrow our focus. The more we know, the less we know. The vicious spiral drives a growing wedge between people within different spheres of knowledge. We are, as Earl Shorris says, "a nation of lonely molecules."

Specialization makes sleepwalkers of us all; the global village predicted by the seers of the 1960's is being replaced by electronic cottages populated by isolated dreamers. We do not know our neighbors. If we are financial experts, we are speechless in the presence of

research chemists; if we are scholars, we cannot make out the grimaces of merchants. We are a nation of lonely molecules.

—Earl Shorris, *A Nation of Salesmen*

With the Internet, this trend is exaggerated. Three hundred million Web pages (and counting) bring us more information than ever before and, because of this, less information is *shared*. Like niche radio and cable TV, the Net encourages a cultural splintering that can render physical communities much less relevant and free people from having to climb outside their own biases, assumptions, and inherited ways of thought. This is perhaps best evidenced by the ominous emergence of so-called “smart agents,” which automatically filter out information deemed irrelevant to the customer. IBM’s “InfoSage,” for example, boasts that it “brings only the news and information you want to read right to your desktop.... Based on a personal profile you create, our sophisticated search technology probes over 2,200 sources and delivers articles related only to your topics.”

While filtering mechanisms are an increasingly necessary life component in the information society, automated smart agents like InfoSage pose a great danger, precisely because they are so effective at weeding out unwanted information. Imagine having a butler who was under strict instructions to turn away all phone callers and visitors whose names were not on his screening list. You would succeed in limiting your contacts with people, but at the cost of never making any new acquaintances. In similar fashion, smart agents manage the information glut by eliminating serendipitous information from our lives. Accidentally stumbling onto entirely new and interesting subject matter in the manner that is common in a conventional library becomes much less likely in a customized-information environment. (Nicholas Negroponte insists that smart agents can and should include an adjustable “serendipity dial,” but one cannot automate spontaneity.) This severely limits much of what it means to be human in a free, liberal society in which shared ideas and experience are vital. Such a restriction is tantamount to constructing one’s own information prison. We must make an effort to avoid filters like InfoSage that all-too-neatly apportion us into sealed information cubicles. Instead of delegating filtering to automatic smart agents, we should make our own decisions and act as our own filters.

Unless we do, technology will lead us in the other direction, toward narrower worlds where information is tailored to our specific professional, cultural, political, and leisurely interests. We will spend even less time

watching the nightly news or reading the big city paper. We will spend even less time interacting with people outside our range of interests. Indeed, even those forums that appear to be projecting an image of ubiquity may be more of a global village mirage than the real thing. *Reader’s Digest*, for example—the epitome of the general interest magazine—is also quietly going niche. They have commissioned Claritas to develop the means to distribute *different* editions to each of PRIZM’s 62 different lifestyle segments.

To be fair, a world of tribes, subcultures, and clans can be invigorating, and nichification has been a great gift to many people. Previously disenfranchised societies are empowered by new technologies allowing them to communicate cheaply and without geographic limitation. Gays and lesbians, for example, who are inherently dispersed throughout society, have benefited tremendously from online forums that provide them with the opportunity to share their intimate thoughts about what it means to be gay, practical considerations about living a healthy, happy life, and practical ways to band together and force politicians to take them seriously as a group of citizens with important interests. The same can be said of the opportunities afforded to linguists, Latinos, teenagers, environmentalists, ethicists, folklorists, engineers, documentarians, therapists, movie buffs, studio musicians, plumbers, and freelance writers. Being able to share one’s personal thoughts, ambitions, accomplishments, trials, and tribulations with other like-minded people is part of the joy of being human.

Nichification also has less vital but still meaningful benefits. The general population enjoys a much wider variety of foods, music, theater, film, and other crafts than in any time in our history. We are richer for widening our experience. But there is a great danger here of mistaking cultural tribalism for real, shared understanding. It is one thing to dine in Morocco, or in a surrogate Morocco in Greenwich Village, and quite another to share with Moroccans the responsibility of maintaining a democratic community. A pluralistic democracy requires a certain amount of tolerance and consensus, rooted in the ability to understand a wide variety of perspectives and agree on common questions. In the United States, we increasingly speak very different languages and different dialects of the same language. We share fewer metaphors, icons, historical interests, and current news events. Bill Gates’s celebrated “asynchrony” is but an eloquent way of saying that in our new electronic world of endless communication options, we are “out of synch” with one another.

The Net helps exclusive groups come together to form an even tighter bond. Communities tend

to be naturally inclusive. In so doing, it fosters not communities, as many like to claim, but far more limited microcultures. Some proponents of the World Wide Web strongly take issue with this interpretation, arguing that the Web, with its hyperlinking structure, actually encourages interdisciplinary thought and broad, multicultural communication. After all, any Web surfer can go from the Contract with America to Ansel Adams photographs to World War II history in a matter of a few clicks of a mouse. While it is true that Web browsing allows for an extremely diverse information experience, the end result is still very much a situation of extreme nichification in which Web surfers are encouraged to explore their personal range of interests and are rewarded with highly specific information on those interests—as well as electronic interactions with people who share those interests.

In this way, nichification and asynchrony are underlying reasons for the troubling level of social polarization plaguing the United States in modern times, the nasty disagreements and seeming inability of people to come together to form consensus on important issues. “When was the last time you talked about race with someone of a different race?” Bill Bradley is fond of asking civic groups in his speeches. “If the answer is never, you’re part of the problem.” His implication, that we’re losing touch with one another, and that it is driving our pluralistic society into the ground, is partly a function of information technology. *Can’t we all get along?* Under such fragmented conditions, without a *lingua franca*, maybe not.

The anxiety caused by this cultural balkanization has led to a natural yearning for someone to ride into the White House on a white horse and make us whole again. We desperately want to belong to something larger than our families, local communities, and vocational clubs. We viscerally need to belong to a nation. And when we feel detached, as many do now, it is upsetting. The 1996 groundswell for Colin Powell was rooted in the faith that the general’s moral convictions, sharp decisiveness, and quiet decency would inspire a sweeping coalition of divergent interests. “I see him as one of the last chances we have to try and unite our country again and stop all this polarization and splintering and fracturing,” declared Ernest Watson, leader of Draft Colin Powell’s North Carolina chapter.

Other presidential contenders spoke during the 1996 campaign of the importance of unity. President Clinton declared that “we can’t restore the American dream unless we can find some way to bring the American people closer together.” Bob Dole adopted an English-first plank on the grounds that “we need the glue of language to help hold us together.” But any leader is going to find cohesiveness an increasingly difficult challenge. The fragmentation of consumer culture has co-opted our political culture. “Leadership is harder in an age of decentralized media,” opines Robert Wright. “In the old days a President could give a prime-time talk on all three networks and know that he had everyone’s attention. But this sort of forum is disappearing as conservatives watch National Empowerment Television, nature buffs watch the Discovery Channel, sports fans watch ESPN.”

After two centuries of vigilance, it is almost surreal to imagine that the republic will suffer mortal blows from cable TV. But the power of this splintering technology should not be underestimated. The “geo waste” that niche marketing helps marketers avoid is also another word for shared discourse, something we desperately need to support our pluralistic culture. Somewhere along the line, we seem to have inadvertently constructed an information economy that works directly against crucial democratic tenets.

See Also the Following Articles

CELLULAR TELEPHONY • COMPUTER NETWORKS • ELECTRONIC COMMERCE • ELECTRONIC MAIL • HEALTH AND MEDICAL REPORTING • INFORMATION SOCIETY • INTERNET • NEW MEDIA

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