Putting Theory To the Test

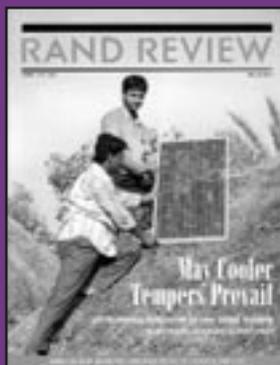## SYSTEMS OF "EDUCATIONAL ACCOUNTABILITY" SHOULD BE HELD ACCOUNTABLE

—By Brian M. Stecher and Laura S. Hamilton

Get the Big Picture

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Message from the Editor

Welcome to the newly expanded *RAND Review*.

The most significant change is a bigger news section, which captures a greater diversity of ideas and information about research related to timely policy debates. Some of the research is complete. Some of it is incomplete. Some of it consists primarily of provocative discussions and dialogues. But all of it demonstrates the dynamic interplay between policy research and policymaking.

Another addition is a commentary that appears near the back of the magazine. The commentary gives a leading researcher the chance to address a pressing policy problem that hasn't necessarily been exhaustively analyzed by research. In this inaugural commentary, Jim Quinlivan anticipates the upcoming general election, which America will conduct in a wartime environment, and offers suggestions for protecting democracy itself.

The primary focus of *RAND Review* remains its collection of feature articles that summarize and synthesize the completed and published works of RAND research. For the cover story of this issue, Brian Stecher and Laura Hamilton caution that the new national agenda of high-stakes testing in elementary and secondary schools may be more of an academic hindrance than a help—unless the 50 states take certain steps to avert the potentially negative consequences.

Richard Speier and Brian Chow review the record of economic sanctions that have been imposed to deter the proliferation of weapons of mass destruction and their associated missile systems. The authors propose that a combination of new procedures, new legislation, new staff, and new principles can make current and future sanctions work much more efficaciously.

Finally, Rick Eden charts a military success story in what many have dubbed extremely formidable terrain: the mammoth logistics system of the U.S. Army. The lessons of streamlining learned by the army during the 1990s have led not only to a leaner army logistics system but also to a stronger U.S. military capability as a whole during the recent U.S. deployments to Afghanistan.

The obvious lesson from the army logistics system is that bigger is not always better. Therefore, considerable effort has been made to ensure that each additional section of this magazine serves a larger purpose: to inform public opinion about policy debates in an accessible way. Fulfilling that purpose is one of the means by which a research institute can richly serve the public interest.

—John Godges

On the Cover

Fifth-graders Anthony Warner, left, Michael Pond, center, and Jennifer Wickham prepare for the Michigan Educational Assessment Program test during their class at Lewton Elementary School in Lansing on Jan. 18.
AP/WIDE WORLD PHOTOS/AL GOLDIS

Grades Still Pending on Vouchers and Charter Schools

Public debates and court rulings continue to weigh the merits and demerits of school vouchers and charter schools, but neither the hopes of supporters nor the fears of opponents can currently be confirmed regarding these programs.

In the most comprehensive examination of the nation's experience with these efforts to date, a RAND team has evaluated the evidence on vouchers and charters in terms of their effects on five major policy goals: academic achievement, choice, access, integration, and civic socialization.

In terms of academic achievement, voucher programs targeted to low-income students have shown benefits for African American children, but clear benefits have not been found for other children. Charter school achievement outcomes range from slight advantages to slight disadvantages when compared to conventional public schools.

It is unknown whether or how vouchers and charter schools will affect academic achievement among the large majority of students who remain in conventional public schools.

Parental satisfaction is generally high regarding the choices offered by vouchers and charter schools. The major unknown outcome is whether such programs can be scaled up to produce a range of desirable choices for large numbers of families.

With regard to access, some programs that were explicitly designed with income qualifications have succeeded in placing low-income, low-achieving, and minority students in voucher schools. Other programs that subsidize private-school tuition via income-tax benefits usually serve a disproportionate number of middle- and upper-income students.

In highly segregated communities, targeted voucher programs may modestly increase racial integration. However, evidence from other nations suggests that large-scale unregulated choice programs generally lead to greater stratification.

Next to nothing is known about whether voucher and charter programs help students to become responsible, tolerant, democratically active citizens.

The authors suggest that the policies to refine school choice programs depend on the goals.

If the goal is to promote academic achievement, then testing could be required of all students.

If the goal is to benefit those who remain in conventional public schools, then those schools should also be given the autonomy to perform in a competitive environment.

If the goal is to serve low-income and special-needs students, then the programs should be funded through direct grants rather than income-tax subsidies. ■

Navy Slows Down Plans for All-Electric Ships

Reconsidering its plans to build all-electric ships, the U.S. Navy has asked RAND for help in estimating the costs and benefits of the new technologies involved.

Potential benefits of electric-drive ships include improved fuel efficiency, greater flexibility of design, reduced internal volume, and reduced susceptibility to enemy radar. The British Royal Navy is already committed to an electric-drive ship for its next-generation destroyer.

Researchers will compile data on the average speeds and monthly fuel consumption of U.S. Navy destroyers to estimate their total energy requirements. Researchers will also analyze the most critical ship components needed for electric propulsion.

Some of the technologies under consideration include high-temperature superconducting electric motors, advanced gas turbine engines, fuel cell auxiliary power supplies, and podded propulsor technologies. ■

Conceptual rendering of a potentially all-electric destroyer.

UNITED DEFENSE, L.P.

Urgent Relief for Emergency Workers

On behalf of the National Institute for Occupational Safety and Health, RAND brought together more than 150 public safety professionals to review the lessons learned about protecting the life and health of emergency workers who respond to terrorist incidents.

The meeting, held in New York City, reviewed the responses to the 1995 attack at the Murrah Federal Building in Oklahoma City, the Sept. 11 attacks at the World Trade Center and the Pentagon, and the ensuing anthrax incidents.

Firefighters noted that they are equipped to fight structural fires but are poorly prepared to respond to large-scale terrorist incidents that involve multiple hazards, such as explosive devices, falling debris, rubble, and chemical and biological agents.

Many participants noted that emergency medical services, law enforcement, and construction workers now toil at the front line of terrorist incidents—yet have inadequate protective equipment or training.

Commonly, back-up supplies are sent to disaster sites where local personnel lack sufficient training either to use the equipment or to integrate it with existing equipment and training.

One policy recommendation was for the government to promote the standardization of personal protective equipment, such as respirators. ∎

For more information: *Protecting Emergency Responders* (RAND/CF-176-OSTP).

Gas and Oil Assessments "Miss the Point"

Recent studies of potential gas and oil resources in the Rocky Mountains have concluded that substantial amounts of the resources are off limits because of legally restricted access to federal lands, prompting calls for reduced access restrictions. However, a new RAND study contends that the focus on legal access misses the point.

The RAND study explains that traditional resource assessments quantify the "technically recoverable resource," or the amount of a resource that is recoverable given certain assumptions about technical capabilities. The key argument of the RAND study is that the "technically recoverable resource" does not account for other barriers to development and therefore provides an overly optimistic estimate of the amount of a resource that can be viably produced.

The RAND team defines a "viable" resource as that which can be economically extracted at the source, can be economically delivered to market via transportation infrastructures, and is environmentally acceptable to stakeholders and policymakers.

As it turns out, legal access restrictions may not be the pivotal factor in deterring oil and gas development in the Rocky Mountains. In fact, the economic factors alone could greatly reduce the amount of the resources that could likely be developed throughout the region. ∎

> **Legal access restrictions may not be the pivotal factor in deterring oil and gas development.**

For more information: *A New Approach to Assessing Gas and Oil Resources in the Intermountain West* (RAND/IP-225-WFHF).

Dutch Students Know How to Take a Free Ride

Ten years ago, the Dutch government provided free and unlimited use of public transportation to over half a million students—three percent of the entire population. The student passes were intended to help students get to and from school.

But the students were cleverer than that. They began taking more weekend and day trips to cities and towns that they had not previously visited. A study by RAND Europe also found that the use of urban public transportation by students doubled, while their use of bicycles (the traditional means of mobility among Dutch students) declined by 22 percent. In effect, many students set aside their bicycles in favor of urban transit.

In 1994, a second generation of student passes discriminated between commuters and those who lived away from home. Commuters received free passes that were valid only on weekdays. Students living away from home received free passes that were valid only from Friday evening through Sunday.

A subsequent study by RAND Europe found that the new policy caused a slight shift back to bicycles, as expected, but also a shift to cars. The reduction in train use occurred mainly on weekends. ∎

Fallout of Terrorism: Closer U.S. Ties to Pakistan, India, and China?

Virtually everyone agrees that U.S. relations with Pakistan have undergone a remarkable change for the better since the Sept. 11 terrorist attacks, but fewer observers have noted the potential for improved U.S. relations with the other two major South Asian powers, India and China.

Venu Rajamony, a political counselor at the Embassy of India in Beijing, visited RAND and argued that the United States and India both have security interests in addressing the problems of fun-damentalist militants in Pakistan. He claimed that the United States and India, working in coordination, could lead Pakistan away from militancy and terror.

He also asserted that India is not likely to set strict preconditions on negotiations with Pakistan over the disputed territory of Kashmir.

Rajamony pointed to three events that have altered the U.S.-Indian relationship. First, relations have steadily improved since the March 2000 visit of President Clinton to India. Second, the war on terrorism has shown India that the United States can play a positive role in the region. Third, the December 2001 attack on the Indian Parliament made the government realize it must take more action against terrorism.

The U.S.-China relationship has also changed noticeably since a year ago, when a hobbled U.S. reconnaissance plane was forced to land on Hainan Island, said James Mulvenon, deputy director of the RAND Center for Asia Pacific Policy. In a RAND seminar, he said that what China has not done in response to the war against terrorism is as significant as what it has done.

For example, China did not object to a United Nations Security Council resolution (as it had before Operation Desert Storm). Also, China has not vehemently opposed the use of U.S. military force in its "neighborhood." Finally, China did not object to the transformation of the fall Asia-Pacific Economic Cooperation meeting in Shanghai into a forum on terrorism. ■

> **What China has not done in response to the war against terrorism is as significant as what it has done.**

Researchers Seek to Fill a Prescription for the Future

As legislators debate proposals for prescription drug benefits for elderly Americans, a radical change is brewing in the nature of prescriptions themselves. The familiar prescription pad is being challenged by electronic prescribing systems that use handheld devices, the Internet, and wireless technology.

Early on, researchers at RAND recognized the need to assess this rapidly evolving new technology for prescribing. The team is currently reviewing various electronic prescribing products and is developing standards for evaluating such systems.

The technology would replace handwritten prescriptions with electronic prescriptions that can be directly transmitted to pharmacies and printed legibly for patients. More sophisticated systems alert doctors to drug interactions or allergies or even recommend drugs tailored to a patient.

The Institute of Medicine reports that errors involving prescription medications kill up to 7,000 Americans a year. Electronic prescribing could reduce such errors, improving the quality and effectiveness of care. Such systems can also be designed to reduce costs by promoting generic or less expensive drugs.

Depending on their design and implementation, electronic prescribing systems may vary widely in their effects on health care quality and efficiency. The Internet and handheld computers have also given rise to concerns about security.

"Today, health care providers have little information on which to select among competing systems," said Shan Cretin, a principal investigator for the RAND team. "Independent standards will allow health care organizations to weigh the impact of systems on patient outcomes, practice efficiency, and costs of care. [The standards] can also guide the development of more effective electronic prescribing systems."

The research is expected to be completed in the fall of 2003. ■

Medication errors often arise from hand-written prescriptions. Frequently, the underlying problem is the handwriting.
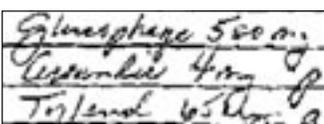
Turkish Ambassador Cites Common Goals

"Sept. 11 alerted us to many different problems as well as possibilities," said O. Faruk Logoglu, the Turkish Ambassador to the United States, at a recent RAND seminar.

He proposed that Turkey, with its constitutional democracy and secular government, could serve as a role model for other countries in the Islamic world.

"I'm not saying everyone should emulate Turkey. Each country must decide for itself," but Turkey can "make its experience relevant" to those Islamic countries with democratic aspirations.

Turkey is very concerned about the possibility of U.S. military engagement in Iraq, said Logoglu. "Saddam (Hussein) is a bad guy who must go, but our concern is the integrity of Iraq, not what happens to Saddam."

Logoglu warned that an attack on Iraq would cause convulsions inside Iraq, throughout the Arab world, and in the Mideast peace process. "It would change everything." ■

DIANE BALDWIN

Turkish Ambassador O. Faruk Logoglu said Turkey and the United States need each other to promote democracy and secularism.

Obesity Costs More Than Smoking, Drinking

Obesity leads to higher increases in health care and medication costs than do smoking or problem drinking, a RAND researcher reported in the March 12 issue of *Health Affairs*. The report found that obesity has roughly the same effect on health care costs as aging from 30 to 50.

Obesity is associated with a 36 percent increase in inpatient and outpatient costs and a 77 percent increase in medication costs over those incurred by people within a normal weight range.

Current smokers see cost increases of 21 percent for medical services and 28 percent for medications over those of nonsmokers. Problem drinkers see smaller cost increases than do smokers. Meanwhile, aging from 30 to 50 is associated with a 20 percent hike in costs for medical services and a 105 percent leap in costs for medications.

The author, Roland Sturm, noted that important outcomes other than costs fell outside the scope of his analysis. Smoking may still account for more premature deaths than obesity. And alcohol abuse is likely to account for more adverse events, such as drunk driving accidents.

Still, the study adds to growing concerns about how obesity in America may dramatically increase health care costs. One in five Americans is obese, while an additional one in three is overweight. That means that the majority of Americans are either obese or overweight.

Obesity has increased by 60 percent between 1991 and 2000, while smoking rates have been cut roughly in half since 1964. ■

The majority of Americans are either obese or overweight.

Research Pays Off for Injured Workers

For the third time in four years, a RAND report on workers' compensation benefits in California showed that the benefits were inadequate for those suffering from permanent partial disabilities.

The most recent report confirmed that the state benefits replaced less than half of the wages lost over a 10-year period, well below the standard of two-thirds replacement, which is generally accepted as adequate.

One week after the report was publicly released on Feb. 8, California Gov. Gray Davis signed a bill to significantly increase workers' compensation benefits in the state.

The situation for disabled workers in California improved somewhat between 1991 and 1997, mostly because of a separate 1993 increase in benefits and the fact that employers rehired many disabled workers under "return to work" policies, according to the report authored by Robert Reville, Robert Schoeni, and Craig Martin. ■

For more information: *Trends in Earnings Loss from Disabling Workplace Injuries in California* (RAND/MR-1457-ICJ).

Added Values
The Role of Moral Dialogues in Building a Global Community

TRANSNATIONAL PROBLEMS increasingly threaten to overload the current system of global governance, but the transnational challenges of today could also be propelling us toward a "world moral code" that will help us resolve the common problems of tomorrow.

That is the cautious hope of Amitai Etzioni, one of the world's foremost sociologists. A professor at The George Washington University and the author of 21 books, Etzioni recently spoke at a RAND seminar sponsored by the Frederick S. Pardee Center for Longer Range Global Policy and the Future Human Condition.

The future of the human condition depends on the human ability to build a new kind of community that extends beyond the traditional nation state, according to Etzioni. He argued that community is a basic human need. Likewise, he suggested that a global sense of community is fast becoming a need for human survival.

Why Community Is Important

Etzioni broached a philosophical debate about the nature of human beings. On the one hand, there appear to be "emotional loyalists" who are driven by civic or moral duty. On the other hand, there appear to be individualists who are driven entirely out of self-interest. Etzioni argued that individuals have both selfless and selfish qualities. He dismissed those experts, particularly economists, who fail to recognize one side of human nature or the other.

Two developing events could test the human capacity for global community.

"I have six papers that economists have written about why people leave tips at highway restaurants to which they have no intention of ever returning," said Etzioni, noting that economists continue to be mystified by the fact that people leave tips with no expectation of a payback. He also cited voting as an example of something that makes no economic sense to a purely self-interested individual. "Voting largely fills a civic duty," he said.

Energy conservation is another case in point. Etzioni cited a study showing that if people believe conservation is their duty, that it's good for their country, and that it's good for the environment, they'll do it. "Economists have developed enormous amounts of literature about people who do things out of loyalty, love, prayer, or anything that is not in their self-interest," he mused.

Where We've Been

Any sense of community depends on a set of shared values, said Etzioni. He illustrated the contemporary limits of community by pointing to examples in the United States and Europe.

"Most of us do not wake up in the morning and say, 'Mississippi and Alabama are paying less taxes than my state and get more government services. It's unfair!' Once in a while a journalist will come up with an index and there will be a fuss, but that's a fight in the family. People in New Jersey don't worry about the nuclear weapons that the New Yorkers have. We are Americans, and we don't make such calculations—that is the sense of community."

Another example of community is how the West Germans gave billions to rebuild East Germany. "They made a fuss about it, but they did it. If you asked them to give that money to the Poles, there would be no conversation. The European community gave Greece a billion dollars. If you asked them to give to a country that's not a member of the European community, it would be called foreign aid." He offered a simple test of a sense of community: "At the end of the day, when your country is insulted, you feel it in your guts."

The next step is to translate a sense of community into action. This process takes place when a nation debates a moral topic, engaging in a "moral dialogue." People talk, fight, argue, write letters to editors, and debate an issue on national talk shows. Then, years later, a new, shared moral understanding emerges on a national level and ultimately leads to changes in behavior.

"In the 1950s and 1960s, there was no sense of moral obligation to the environment, and nobody talked about it," said Etzioni. "Change often starts as a book, then there's drama, then come demonstrations. Out of that came a new shared moral understanding

toward Mother Earth. Certainly, people still strongly disagree at the margins, but nobody claims we should go back to the 1950s."

Where We're Going

Recent technology now allows similar debates to become transnational moral dialogues. "We have the beginning of transnational shared moral values," said Etzioni. "That's a hell of a claim, but if you look at certain issues—whales, ivory, sex slaves, pornography, child labor, human rights—we have them."

But solving such problems is a different question. "Look at the list of social problems we had 50 years ago," said Etzioni. "We still have poverty. We still have discrimination. But now, we have HIV. We don't solve problems. We cut them, we reduce them, we reshuffle them, we get on top of them, but that's about as far as the human capacity goes."

To get "on top" of global problems, a global response could take several forms. One development in the business community is international arbitration courts. "The business community wants to do business out of self-interest," said Etzioni. "So it created a court of arbitration that is not run by any nation. These courts are composed of arbitrators from different nations. It's written into the contract that, if there's a difference [of opinion], a transnational arbitration court will decide, and governments sign a commitment to enforce the decision of that court." Business can then proceed as usual.

But when it comes to the big problems that Etzioni calls "moral issues"—genocide, drug trafficking, humanitarian interventions—when they have enormous implications or call for major resource reallocations, when mitigating them imposes significant pain or sacrifice, something born of more than self-interest must begin to operate on a supranational level.

He pointed to two developing events that could test the contemporary human capacity for global community. The first is the push toward a true European Union (EU) with its own constitutional assembly and flag. One goal is to transfer national loyalties upward and create an emotional bond to the EU community. "The EU experiment is a complicated, cumbersome attempt to do that," said Etzioni. "You can have 15 states agree on issues such as traffic and so on, but when it comes to the point of causing pain, you have to

Amitai Etzioni is the director of the Institute for Communitarian Policy Studies at The George Washington University in Washington, D.C.

DIANE BALDWIN

move up to something similar to a nation. I'm not willing to predict that they will make it."

On the other hand, Etzioni foresees the emergence of a new vision of shared values on a global level. Currently, he said, the world's shared values are codified best in the United Nations Universal Declaration of Human Rights, which was drafted in 1948 by the Western powers that emerged victorious from World War II. Many today claim that the U.N. declaration, with its emphasis on human rights, reflects the philosophical proclivities and cultural bias of the West.

Today, however, a high-level effort is under way, involving former President Jimmy Carter and the former presidents and prime ministers of several other nations, to augment the U.N. document with a new one that emphasizes human responsibilities. Etzioni said the emphasis on responsibilities and obligations would balance Western cultural and religious priorities with Eastern cultural and religious priorities, including those of Islam.

"The world moral code," said Etzioni, "is going to arise out of taking this major body of ethics and combining the notion of rights and responsibilities to create a code—not in a legal sense, but in a moral, shared sense of values—to which many will feel committed. Then, one day, it could have ramifications for the building of [global] institutions." ∎

Related Reading

Political Unification Revisited: On Building Supranational Communities, Amitai Etzioni, Lexington Books, 2002 (paperback), ISBN 0-7391-0273-7, 2001 (hardcover), ISBN 0-7391-0272-9.

Cry, the Derided Country
A Friendliness Index for a Lonely America

"WHY DO THEY HATE US SO MUCH?"

That's a question that many Americans have asked since the terrorist attacks of Sept. 11. Some respond that the terrorists and their supporters despise our freedoms. Others say that the reason is jealousy of our wealth. Still others blame our foreign policy, especially in the Middle East.

While anti-Americanism may have roots in all of these areas, it is best understood as a complex and dynamic ideology that is both appealing and powerful, according to Vladimir Shlapentokh, scholar of Soviet and Russian affairs and professor at Michigan State University. He asserts that social groups and foreign countries have hijacked this ideological hostility toward America to serve as a scapegoat and to fulfill a psychological need.

In his current research, Shlapentokh hopes to help the United States achieve a more realistic perception of itself within the world. He has embarked on a project to measure the international community's attitudes toward America.

DIANE BALDWIN

Vladimir Shlapentokh, of Michigan State University, hopes to inject a dose of analytical rigor into America's perception of itself in the world.

The forthcoming results, he said, could infuse America's self-understanding with a dose of analytical rigor and help America pursue sound foreign policies.

"It's nearly impossible to find a country in the world where anti-Americanism is not present," said Shlapentokh, who spoke during a recent seminar at RAND. "Few ideologies in any region can be so emotionally strong, attractive, and can carry so much weight with so many people as anti-Americanism." He argued that the anti-Americanism of today could compete in ferocity with the anti-Communism of the 1960s and 1970s.

Until recently, he said, the self-perception of the United States was almost narcissistic: If you didn't love America, you simply didn't know America. "This con-cept is extremely wrong and self-serving," said Shlapentokh.

The Power of the Negative

Whatever the true nature of America, Shlapentokh contended, the real issue is what drives anti-Americanism. A critical element is what he calls "negative values," which he believes are central to most world ideologies. For instance, he pointed to the Ten Commandments. "Of them, only two are positive values," he said. "Eight are negative values; for example, don't do this or don't do that."

Negative values, he said, compel human behavior and thinking far more than positive values. He called out a number of major political campaigns where themes were "anti-this or anti-that." Even the home-grown anti-Communist movement in America after World War II was negative to its core. "You can find negative values in almost any ideology, whether it's official or regional. But no ideology is so purely negative as anti-Americanism."

Russia's citizens have also been prone to negative values since the country's transition from Communism to democracy, he said. At first, negative values throughout Russia fueled an anti-Communist ideology. But by 1995, anti-Communist ideology had exhausted its potential, and anti-Americanism filled the void.

Other countries and groups have adapted anti-Americanism to suit their own needs, according to Shlapentokh. "It's difficult to find another ideology that offers a scapegoat as good as anti-Americanism," he said. "Scapegoating is a very important part of human psychology."

But there are many kinds of scapegoats. "To study anti-Americanism," he explained, "it's important to distinguish among three actors: the leader of the country, the political and intellectual elite, and the masses. The reaction among these actors is very different in different countries."

Shlapentokh is in the process of cataloging some 160 countries, classifying a country's leader, its elite, and

its masses as either "pro-American" or "anti-American." What emerges is a matrix of at least four types of countries. "If we take into account only the elite and the masses, European countries are pro-American—not always, but mostly." The Czech Republic and Lithuania are good examples of unity between elite and masses in terms of positive, or at least benign, attitudes toward the United States. On the other hand, he said that Pakistan, China, and Argentina have unity against the United States.

Russia is in the middle of the road. "The elite are very strongly anti-American, while the masses are relatively positive toward the United States," said Shlapentokh. "Russia is not a country that loves or hates the United States when compared to, say, Argentina."

Shlapentokh cited data from a recent international Gallup survey. Key indicators of anti-Americanism included the perceived deleterious effect of American foreign policy on a given country and the degree to which people support their country's involvement in the international war against terrorism.

Such indicators are helping Shlapentokh derive his index of friendliness toward the United States. "You see big differences" even in Europe, he said. "England is the most friendly. The Czech Republic is favorable. The most hostile are Greece and Spain. One of the most hostile East European countries is Ukraine." Outside of Europe, he ranked India as very favorable.

Russian Ambiguity

Shlapentokh discussed separate data from major polling organizations in Russia. "If you ask Russians in very general ways about Americans, Russians are more or less friendly toward the United States. Sixty-seven percent, or two-thirds, are friendly toward the United States. But this number is volatile and depends on the media. For example, during the Yugoslavian war, the number of Russians with positive attitudes toward America declined to about 20 percent."

The most interesting indicator of relatively positive attitudes toward America is the question of justice, said Shlapentokh. "The concept of justice is a core value for Russian nationalists, and Russian Communists always boast that Russians are people who yearn for justice. Surprisingly, 48 percent of Russians told interviewers that real justice is in the U.S., not in Rus-

sia. It is difficult to imagine a more eloquent indicator [of pro-Americanism] than the answers to these questions" about justice.

Attitudes of Russians about Sept. 11 were complex. "Half of Russians were directly compassionate for victims in New York and Washington, D.C. But when formally asked, 'Does America deserve this event?' half of Russians said yes," according to Shlapentokh. "Many American liberals say something close to this."

Nothing shocked Shlapentokh more than his own post–Sept. 11 observations of "deep-rooted animosity" toward the United States among Russian intellectuals and political elites. He attributed this animosity to the failure of Russian liberal reform. "The liberal elite did not do what it had promised to do for Russia: to create a liberal democratic society."

> "It's difficult to find another ideology that offers a scapegoat as good as anti-Americanism."

Although the Russian elite became wealthier with reform, they did not attain the levels of wealth of their American peers. "They felt that they should be equal to the American counterparts, and this made them crazy," said Shlapentokh. "In my opinion, they lost their [sense] of reality and started to berate America. Once again, they started to fall back to Russian nationalism, with its cultural and moral superiority. They don't want to be provincial; they want to be a great power."

Russian President Vladimir Putin falls in line more with the Russian populace than with the Russian elite. "He has joined the war against terror," noted Shlapentokh. "If you are given to historical parallels, it's like Julius Caesar or Napoleon Bonaparte, where you have a leader, the masses who support the leader, and an outwardly hostile elite." Putin's control remains firm, because resistance to his new policy directions is scarce, said Shlapentokh.

Nevertheless, the power of anti-Americanism cannot be underestimated. "Anti-Americanism will play an important role for several decades," said Shlapentokh. "The American government should be well aware of these attitudes toward the United States and understand how different these attitudes are in various countries around the world." ■

Precision-Guided Sanctions

How to Take the Profit Out of Proliferation

By Richard H. Speier and Brian G. Chow

Richard Speier, a RAND consultant, developed policies against proliferation during his two-decade career in the Arms Control and Disarmament Agency and the Office of the Secretary of Defense. Brian Chow, a senior physical scientist at RAND, has broad experience analyzing issues related to weapons of mass destruction and the missiles for their delivery.

The growing probability of terrorist acquisition of nuclear, biological, and chemical weapons compels us, more than ever before, to use international economic sanctions to counter the proliferation of these weapons around the world. Sanctions offer a middle ground between diplomacy and the use of military force. Unfortunately, sanctions have often failed. The proper response is to make them succeed. We believe that we can.

From 1974 to 1998, U.S. law imposed sanctions against proliferation in 24 instances. Of these, only seven sanctions had enough of an effect on the penalized party to lead to negotiations. In most cases, the sanctions were imposed on parties that did little business with the United States or against which the United States already had an embargo.

Worse yet, sanctions can cause collateral damage, both to other foreign policy goals and to domestic economic interests on which the trade or financial restrictions can fall. Unfortunately, current sanctions laws sometimes impose sanctions on a one-size-fits-all

basis, making collateral damage a real risk. Partly as a result of collateral damage, a backlash had developed against a broad range of unilateral U.S. economic sanctions by the mid-1990s.

Today, as more governments make it their policy to observe international nonproliferation restrictions, the profits *increase* for the few remaining parties willing to transfer items that add to proliferation. This trend makes ever more pertinent the succinct statement by former Sen. John Glenn about the goal of sanctions: "To take the profit out of proliferation."

To make sanctions work better, we can pursue two approaches in parallel. First, we can target and calibrate sanctions more precisely by introducing a combination of incremental and fundamental changes in procedures that have evolved over the years. Second, we can make sanctions far more effective, cohesive, and persuasive by redesigning them according to a couple of simple but new principles.

Hit the Target

The first approach (of targeting and calibrating sanctions) requires us to refine the existing procedures that lead to sanctions. Currently, the laws are passed unmethodically by Congress and applied unevenly by the president.

Several incremental changes are in order before any of the more critical, fundamental changes in procedures can be successfully and consistently applied. For instance, the sanctions laws should stipulate standard timetables for determining sanctionability and for conducting international negotiations before

imposing sanctions. Separately, the legal test for determining sanctionability should be merely a preponderance of evidence of bad behavior, thus preventing the process from becoming sidelined with an impossibly high standard of proof. The entire process should be more disciplined, with greater congressional involvement, including hearings and the possibility for congressionally legislated sanctions. Some of these steps may exacerbate clashes between the legislative and executive branches. But some of the steps, such as standard timetables, are what the executive branch is seeking.

Targeting and calibrating sanctions more precisely will then require some major departures from existing practice. For starters, the president should be given discretionary authority to make the punishment fit the crime—as long as he imposes sanctions that are at least as effective as the sanctions that are currently required by law. There should also be a specialized staff to design sanctions that are more precisely targeted to specific countries or individuals. The staff should monitor the sanctions to ensure that they take the profit out of proliferation. Ideally, the range of sanctions instruments should be expanded to include incentives (as well as penalties) and security measures (as well as economic measures). Combined, these steps would reduce the collateral damage to friendly parties and augment the intended damage to unfriendly parties. Specifically, we need:

- New legislation to give the president discretionary authority over the target, type, and severity of sanctions to be imposed—subject to the requirement that they serve U.S. objectives against proliferation in a manner "at least as effective" as the sanctions required by existing U.S. law. The legislation should also provide for notification of—and possible override by—Congress on the specific sanctions that the president chooses to impose.
- A new "incentives and sanctions analysis staff" in the executive branch. This staff would design targeted sanctions that meet the at-least-as-effective test, assess the economic and other effects of sanctions alternatives, analyze the sources of revenue that belong to the sanctioned parties, monitor the dynamic aspects of the sanctions process, and recommend modifications as the sanctions unfold.
- A minimum standard of punishment for trade and financial sanctions. For example, when a foreign party profits from proliferation, the sanction could be required to inflict losses on the party of at least, say, 10 times the gains—with a minimum loss of $10 million (which may lead to bankruptcy). In some instances, multilateral sanctions may be necessary to reach this standard.
- Additional sanctions instruments beyond trade and finance, particularly measures that reduce the security of a targeted nation.

These instruments could include both reduced arms-related sales to the sanctioned nation and *increased* arms sales and security assurances to regional adversaries. These instruments could also include the withdrawal of U.S. recognition of certain security guarantees.

Many of these steps have the great liability of being untried. Weak implementation could lead to substantial difficulties. But the tremendous advantage of these

Targeting and calibrating sanctions more precisely will require some major departures from existing practice.

Three brothers sit near their mud home in Rawalpindi, Pakistan, on Feb. 13, 2002. Since Sept. 11, the United States has dropped the severe economic sanctions imposed against Pakistan in 1998, committed up to $600 million in loans and aid, and encouraged the International Monetary Fund to loan Pakistan $135 million.

AP/WIDE WORLD PHOTOS/GREGORY BULL

steps is that they answer the repeated executive branch calls for "flexibility" and "proportionality" in sanctions—without sacrificing the objectives of sanctions. Effectively implemented, the steps could be terrifying to proliferators and financially devastating to their supplier organizations. The steps could undercut the security objectives of nations that are seeking nuclear, biological, and chemical weapons and missiles. The steps could minimize collateral damage to other foreign and domestic parties. Together, the steps could take the profit out of proliferation, whether profit is measured in dollars or security.

Make It Hurt, and Use Automatic Fire

With only the steps listed above, sanctions could continue to be just a patchwork of measures with unreliable effects. Therefore, we offer our second approach. We contend that the formulation of all sanctions should be guided by two new, unifying principles: (1) a "worse-off" criterion, and (2) automatic implementation.

First, the *worse-off criterion* would stipulate that any economic or security-related costs imposed on a target of sanctions exceed the benefits of the sanctionable activity. If U.S. sanctions policy can create a reliable expectation that aiding and abetting the proliferation of weapons of mass destruction will ultimately be a money-losing proposition, then there will be no economic motive for such commerce. (Only a case-by-case design of sanctions, performed by a specialized staff, can ensure that a weapons supplier ends up economically worse off.)

Many sanctionable actions are motivated not by economic gain but by security concerns. Here, again, the criterion for sanctions should be to make the target worse off. There is no way to quantify "worse off" when it comes to security, but sensible judgments can be made. A specialized staff can weigh many alternatives: reductions of various military assistance (such as munitions, dual-use supplies, training, technology, and financial assistance), reduced security commitments to the targeted entity, and increased military aid to its regional rivals. In some cases, as in North Korea today, the withholding of civilian trade, such as fuel shipments, could also make the target's security worse off.

The worse-off criterion implies a scale of sanctions to fit the offense and the offender. On the one hand, this criterion avoids predetermined sanctions that are

Iranian armed forces roll a Shahab-3 missile through Tehran in September 2000. The proliferation of this missile resulted in U.S. sanctions against various trading organizations, aerospace institutes, technical universities, and government agencies in Iran, North Korea, and Russia in the 1990s. However, the entities in Iran and North Korea had already been subject to sweeping U.S. embargoes against those countries.

موشک شهاب

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nothing more than a slap on the wrist. On the other hand, this criterion does not require the target to be made infinitely worse off. Taking the profit out of proliferation does not necessarily entail draconian measures that penalize entire governments or nations. A worse-off criterion also contains its own exit strategy. For finite triggering events, such as a one-time transfer of weapons material, there should be a finite sanction—and a beginning, middle, and end to the sanctions process.

A good example of a worse-off sanction is when the United States blocked China from launching satellites that were subject to U.S. export licenses. This sanction, used first in 1991 and briefly again in 1993, imposed substantial financial losses on the Chinese organization that had previously benefited from the exports of missile equipment to Pakistan. Under a worse-off criterion, the sanction would need to be imposed only on enough space launches to make the U.S. government confident that the Chinese organization had lost more money than it had gained from its exports of missile equipment.

Second, *automatic implementation* means that the sanctions, once they are scaled appropriately, should be imposed as automatically as the law can allow. There should be no waivers for any reason. Even friends of the United States, even nations and entities that agree to mend their ways, should understand that U.S. law automatically generates actions that will make any party worse off if it contributes to proliferation.

Historically, presidential determinations and waivers have been major points of ineffectiveness of sanctions. Consequently, a proliferator today has good reason to believe that he will not be subject to sanctions—much less to effective sanctions. It may be understandable that the executive branch has, in the words of former President Clinton, tended to "fudge" the process when the sanctions were so draconian as to undercut major elements of U.S. foreign policy.

Adhering to the first recommendation, which calls for a worse-off criterion to produce appropriately scaled sanctions, should reduce the incentive for presidents to wink at sanctions. Automatic implementation, then, would tighten up the presidential determination process, eliminate presidential waivers altogether, and require presidential certifications of improved behavior before Congress could lift sanctions.

It will always be possible for Congress to enact waivers, just as it did to ease the severe sanctions that followed the Indian and Pakistani nuclear tests of 1998. But a sanctions law tailored to a worse-off criterion should be discriminating enough in its effects to require such a congressional about-face only rarely.

The appropriateness of sanctions needs to be determined in the first stage of enacting a sanctions law. Because the sanctions would be automatic, there would be a greater incentive for lawmakers to prescribe appropriately scaled and targeted sanctions.

Countering the proliferation of weapons of mass destruction is vital for international security, and sanctions can be an effective force in this effort. Even critics of sanctions make exceptions for well-designed sanctions. The next step should not be to retreat from sanctions. Rather, it should be to improve and focus them. The world needs effective sanctions, because the world needs alternatives to inaction or war. ∎

Even friends of the United States should understand that U.S. law automatically generates actions to make any party worse off if it contributes to proliferation.

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Putting Theory To the Test

SYSTEMS OF "EDUCATIONAL ACCOUNTABILITY" SHOULD BE HELD ACCOUNTABLE

By Brian M. Stecher and Laura S. Hamilton

Brian Stecher, a senior social scientist at RAND, evaluates state testing programs and new forms of educational assessment. Laura Hamilton, a behavioral scientist at RAND, conducts research on the validity of scores and gains on high-stakes tests.

Now that the president has signed the No Child Left Behind Act, every state must develop a plan to begin testing all students in reading and math in grades 3 through 8 and in high school. Cash and other rewards could be conferred upon districts and schools with high scores, and tough sanctions will be imposed on the schools with persistently low scores. However, there is no guarantee that the strict accountability provisions of the new law will promote student achievement or improve poor schools. In fact, it is quite possible that the new accountability systems may produce some negative results. Therefore, it is important for states to design their accountability systems to prevent any unintended, negative results.

During the 1990s, a number of states adopted these kinds of "high-stakes" accountability systems—whereby schools, districts, students, teachers, and administrators were held accountable in various ways for the scores of students on achievement tests. Test-based accountability formed the cornerstone of the bipartisan No Child Left Behind Act, which Congress passed in December and the president signed in January.

Test-based accountability systems embody the belief that public education can be improved through a simple strategy: Test all students, and reward or sanction schools and districts based on the scores. Rewards can include formal public recognition and cash for teachers and schools. Sanctions can include progressively more severe interventions into school operations.

As stipulated in the new legislation, the interventions begin with external experts being assigned to meet with the administrators of schools and districts to help them improve. The interventions can escalate to include mandatory supplemental instruction for students and blanket permission for parents to enroll their children in other schools. If these interventions still fail to improve the test scores at a school, it can then be reconstituted (with the administrators being removed and the state taking over). Many state and federal policymakers have come to regard such test-based accountability as the most promising policy for improving education.

Nonetheless, the evidence has yet to justify the expectations. The initial evidence is, at best, mixed. On the plus side, students and teachers seem to respond to the incentives created by the accountability systems, and test scores generally rise. Yet how this occurs is puzzling. It could be the result of students working harder, of teachers adopting better strategies, and of everyone focusing on the desired subject matter. On the minus side, it is

Opposite: Lakeside Elementary School fourth-grader Kayla Calvin studies about land forms of the Southwest as her class receives a visit from Arkansas Gov. Mike Huckabee on Jan. 9. The governor, speaking with teacher Fay Smith, said that schools throughout the state need tougher standards to produce employable high school graduates.

It is unclear if test score gains reflect meaningful improvements in student learning.

unclear if the test score gains reflect meaningful improvements in student learning or, rather, artificial score inflation caused by excessive coaching or other kinds of narrow test preparation. If the test scores are indeed inflated, then they send misleading signals about student performance. The accountability systems can also lead to academically undesirable changes in curriculum and instruction, such as emphasizing some subjects or topics at the expense of others.

If the accountability systems have the power to change behavior, as the early evidence indicates, then we need to ensure that the systems change behavior in the correct ways. We can structure the accountability systems to maximize educational improvement and to minimize negative consequences, but a bit of pedagogical perspective is in order first.

Schools Are Not Factories

Much of the impetus for accountability in schools has come from beliefs about accountability that were nurtured outside the educational sphere—mostly in the business world. The business model of setting clear targets, attaching incentives to the attainment of those targets, and rewarding those responsible for reaching the targets has proven successful in a wide range of business enterprises. But there is no evidence that these accountability principles will work well in an educational context, and there are many reasons to doubt that the principles can be applied without significant adaptation.

In the industrial sector, production is easily quantified, and output can be translated into a single measure: profits. In education, there are multiple desired outcomes, and only a subset of them can be measured by tests. Schools are also expected to foster positive interpersonal relations, enhance citizenship, improve physical development, and promote general reasoning skills. Even in terms of achievement, where tests can measure output, we test only a portion of the subjects that are taught. Under the new law, the states will be required to test reading, math, and (eventually) science, but not writing, history, government, music, art, or other subjects.

Education differs from the manufacturing sector in other important ways. To begin with, schools have little control over the "inputs." In other words, students

The playground equipment at Tulip Grove Elementary School in Nashville, Tenn., sits unoccupied on Nov. 8, 2001. Students at the school are taking a recess from monkey bars, slides, and swing sets to spend more time in class to reverse lagging test scores. The decision reflects a national quandary over whether to push for academic accountability or address concerns about physical inactivity among the nation's youth.

AP/WIDE WORLD PHOTOS/THE TENNESSEAN/BRADLY J. BONER

enter school with widely diverse skills and experiences. Test scores are further influenced by factors that prevail outside of school, and we have been unable to accurately adjust for these factors in estimating school effectiveness. Schools themselves differ greatly in their capacity to effect change. They cannot be "retooled" as easily as a factory. These differences suggest that the industrial model of accountability may not work equally well for education.

An additional impetus for the accountability systems has come from the well-publicized experiences of a few states (e.g., Florida, Kentucky, Maryland, and Texas) where test scores rose when rewards and sanctions were attached to state-administered achievement tests. Proponents of accountability attribute the improved scores in these states to clearer expectations, greater motivation on the part of the students and teachers, a focused curriculum, and more-effective instruction. However, there is little or no research to substantiate these positive changes or their effects on scores.

Meanwhile, there is moderate evidence of some negative changes, such as reduced attention to nontested curriculum, excessive narrow test preparation, and occasional cheating on the part of school personnel. Some schools have reassigned "better" teachers to the accountability grades or hired commercial test preparation companies. Some of these changes may ultimately prove *harmful* to overall student achievement. At the same time, inflated scores can create an illusion of progress that may identify the wrong programs as effective.

Likely Effects of the Law

The new federal legislation requires that each state create a test-based accountability system. To a limited extent, each state may customize its system to be responsive to local conditions, but the systems will generally be used to help make the following important decisions:

- whether recognition and cash bonuses will be awarded to teachers, administrators, or schools
- which schools enter and exit from mandatory school-improvement programs
- whether parents can transfer students from their home school to another school.

The lack of strong evidence regarding the design and effectiveness of accountability systems hampers policymaking at a critical juncture. Under the new federal law, states will have to select tests, set performance standards, and implement reward systems that have

"teeth." Yet the states at the forefront of the accountability movement are just beginning to observe the unintended consequences of score inflation and curriculum narrowing that often accompany high-stakes testing. Based on the evidence now emerging from California, Florida, Kentucky, Texas, Vermont, and other states, we can predict what will likely happen as the remaining states implement their new, tougher testing policies.

First, we can expect average test scores to rise each year for the first three or four years. Teachers and administrators at both low-scoring and high-scoring schools will shift their instruction in ways that will produce higher scores. Every state that has implemented test-based accountability has seen its scores rise. In some cases, the rises have been dramatic.

Second, we know that, to some extent, the initial large gains in test scores may not be indicative of real gains in the knowledge and skills that the tests were designed to measure. There is extensive evidence that the scores on high-stakes tests rise faster than the scores on other standardized tests that are given to the same students at the same time to measure aptitude in the same subjects. It appears that students do not know as much as we think they know based on only the high-stakes test scores. Therefore, another ironic but likely result of the accountability systems is that the test scores themselves will be less accurate than they were prior to the attachment of high stakes.
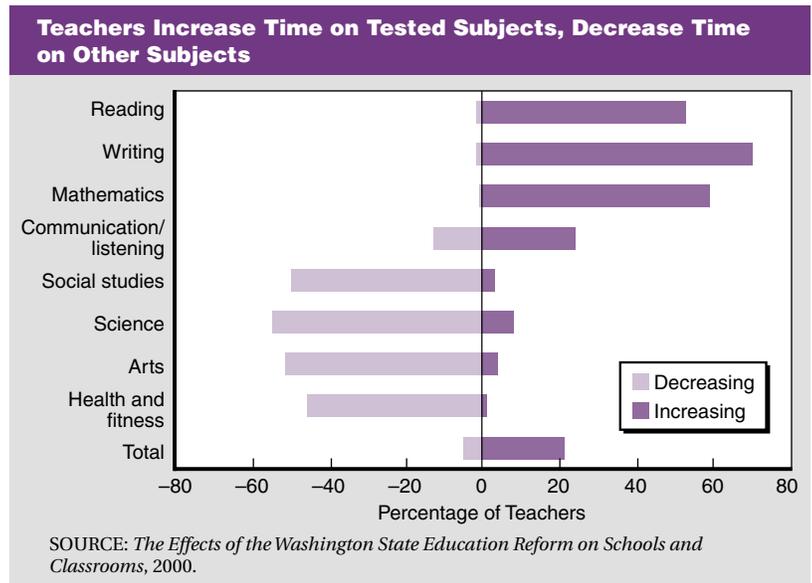
The most common way to detect score inflation is to compare the scores of the same students on two separate tests. The logic of this approach is that valid gains on a high-stakes test ought to be reflected in similar gains on other tests of similar subjects. In Kentucky, we found that the gains in mathematics during the 1990s on a statewide high-stakes achievement test were nearly four times as large as the gains registered by the state's students on a national achievement test. The latter test, known as the National Assessment of Educational Progress (NAEP), was designed solely with a monitoring role in mind and carries no rewards or punishments. In 2000, we found similarly divergent results in Texas, a state with an accountability system that is often considered a model for other states to follow. As in Kentucky, though, the gains on the statewide Texas Assessment of Academic Skills (TAAS) were much larger than the gains on the NAEP.

Third, we are likely to see more emphasis on tested subjects and less emphasis on nontested subjects. Our research has clearly demonstrated that teachers shift classroom time toward the subjects that are tested at the expense of those that are not.

One of the earliest studies on the effects of testing (conducted in two Arizona schools in the late 1980s) showed that teachers reduced their emphasis on important, nontested material. Teachers neglected subjects—such as science, social studies, and writing—that were not part of the mandated testing program. Similar declines in instructional time for nontested subjects have also been observed in Kentucky, Maryland, and Washington. The figure below shows the shifts in instructional emphasis reported by fourth grade teachers in Washington. Although state educational standards cover all eight of the subjects shown, the high-stakes testing was conducted only in the top four subjects.

Fourth, there is likely to be an increase in undesirable test-related behaviors. These behaviors include narrowly focused test-preparation activities that take further time away from normal instruction. Our research has clearly demonstrated that teachers change their instructional emphasis to mimic the for-

Teachers Increase Time on Tested Subjects, Decrease Time on Other Subjects

SOURCE: *The Effects of the Washington State Education Reform on Schools and Classrooms*, 2000.

mats used in the state tests. For instance, if states adopt multiple-choice tests (which are the most economical among the alternatives), less attention will likely be paid to the elements of math and reading that do not lend themselves to multiple-choice questions. On rare but well-publicized occasions, the undesirable behaviors have also included instances of cheating.

Fifth, we can expect large annual fluctuations in the scores for many schools. Some schools that make the greatest gains one year will see the gains evaporate the next year. Schools whose teachers earn large bonuses one year may have stagnant scores the next, as has occurred in California. This volatility in scores results from a variety of factors, such as student mobility, different cohorts of students taking the tests, measurement error, and other transitory conditions.

Sixth, the sanctions imposed on low-performing schools will not ensure that the students in those schools are not "left behind." Sanctions often include external consultants and ultimately staff reassignment and school takeover. The record of success of such sanctions is mixed, and there is no guarantee that they will result in improved educational environments for students.

The table on the next page provides a partial list of the potentially positive and negative impacts of high-stakes tests on students, teachers, administrators, and policymakers. More research is needed to understand the prevalence (and balance) of these positive and negative effects.

What the States Can Do

There are a number of steps that states can take to maximize the benefits and minimize the harm of test-based accountability systems. The following recommendations are not exhaustive, but they address the major concerns raised above.

First, *states should monitor the extent of score inflation.* The amount of inflation is likely to depend on the specific features of each state's testing program, such as whether the same test items are used year after year. Fortunately, states are required to participate in the NAEP nationwide testing of grades 4 and 8 every other year. The NAEP tests provide a good starting point for examining score inflation. Each state needs to establish a plan for comparing the NAEP results to the state results. Each state should then consider supplementing the NAEP scores with other comparative measures in other subjects and other grade levels.

Teachers neglected subjects that were not part of the mandated testing program.

High-Stakes Testing Could Potentially Have Positive and Negative Effects

POSITIVE	NEGATIVE
Effects on Students	
Provide students with better information about their own knowledge and skills	Frustrate students and discourage them from trying
Motivate students to work harder in school	Make students more competitive
Send clearer signals to students about what to study	Cause students to devalue grades and school assessments
Help students associate personal effort with rewards	
Effects on Teachers	
Support better diagnosis of individual student needs	Encourage teachers to focus on specific test content more than curriculum standards
Help teachers identify areas of strength and weakness in their curriculum	Lead teachers to engage in inappropriate test preparation
Help teachers identify content not mastered by students and redirect instruction	Devalue teachers' sense of professional worth
Motivate teachers to work harder and smarter	Entice teachers to cheat when preparing or administering tests
Lead teachers to align instruction with standards	
Encourage teachers to participate in professional development to improve instruction	
Effects on Administrators	
Cause administrators to examine school policies related to curriculum and instruction	Lead administrators to enact policies to increase test scores but not necessarily increase learning
Help administrators judge the quality of their programs	Cause administrators to reallocate resources to tested subjects at the expense of other subjects
Lead administrators to change school policies to improve curriculum or instruction	Lead administrators to waste resources on test preparation
Help administrators make better resource allocation decisions, e.g., provide professional development	Distract administrators from other school needs and problems
Effects on Policymakers	
Help policymakers judge the effectiveness of educational policies	Provide misleading information that leads policymakers to make suboptimum decisions
Improve policymakers' ability to monitor school system performance	Foster a "blame the victims" spirit among policymakers
Foster better allocation of state educational resources	Encourage a simplistic view of education and the goals of education

Second, *states should consider expanding "what counts" in their accountability systems to include more than just reading and math*. Other subjects could be tested without overburdening the system. The overall testing burden could be limited by varying the subjects and grade levels over time and by using sampling approaches that do not require every student to take every test or answer every question. States should also consider measuring what is taught and how it is taught. Gathering this information could reveal shifts in instructional practices while also sending the signal that all subjects are important. (Unfortunately, it is not yet clear whether the No Child Left Behind Act will encourage or discourage the expansion of "what counts" at the state level. There could be disincentives to adopt this approach, depending on how the specific guidelines for implementing the federal law are written.)

Third, *states should create student information systems to track the test scores of individual students over time*. Such data can allow the states to monitor the progress of individuals, whether they remain in the same schools or transfer to different schools. This approach has two important strengths. It can help identify which teachers are effective, and it can correct for the effects of student background characteristics that are beyond the control of the schools. The data can also be used to understand what happens to students in low-performing schools.

Fourth, *states should base their rewards and sanctions on changes in multiyear averages of scores rather than on single-year fluctuations*. This change would help ensure that rewards and sanctions reflect real changes in student achievement.

Fifth, *states should monitor the progress of schools that are subject to such interventions as mandatory external consultants, supplemental instructional service, or parent transfer rights*. By monitoring the changes that occur in these schools, the states can help to make sure that the sanctions will result in better learning environments for the students.

The new federal law has many attractive features, but it contains inadequate provisions for review and improvement to help it perform as intended. Fifty states will be struggling with the new federal requirements and with very little guidance about how to pro-ceed. To make sure that no child is left behind and to make the accountability systems work better, the systems themselves need to be monitored for failure or success.

One of the good features of the new law is the requirement that states promote scientifically based instructional methods—that is, methods that have been evaluated and have produced strong evidence of success. We believe that this same emphasis on scientific legitimacy should also be applied to the provisions of the law itself. Test-based accountability systems will work better *if* we acknowledge how little we know about them, *if* the federal government devotes appropriate resources to studying them, and *if* the states make ongoing efforts to improve them. ■

> **The accountability systems themselves need to be monitored for failure or success.**

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Faster, Better, Cheaper

U.S. Army Manages a Logistics Revolution

By Rick Eden

Rick Eden is an associate director of the Arroyo Center Military Logistics Program at RAND.

Late in 1999, when the new U.S. Army Chief of Staff, General Eric Shinseki, outlined his vision for the army, he spoke of the need to "revolutionize the manner in which we transport and sustain our people and materiel." Such logistical details are rarely considered the stuff of revolution. But Shinseki went even further, promising that a revolution of this kind would lead to "a comprehensive transformation of the army" itself.

> **The revolution in logistics of the 1990s has helped transform the way the army fights today.**

Shinseki could speak so boldly because of the success that the army had already achieved in reforming its logistics system. By dramatically improving key parts of the system during the 1990s, the army had quietly laid the groundwork for the "comprehensive transformation" that Shinseki was talking about. Indeed, the revolution in logistics of the 1990s would help transform the way the army deploys and fights today.

For decades, the quality of military logistics had fallen progressively behind that of the best commercial practices. The performance gap became a source of frustration, cost, and risk. Some army leaders even referred to army logistics as a "burden" to army operations.

But since the early 1990s, the army has ramped up its logistics performance to world-class standards. For example, today it takes less time for an army repair depot to get a spare part from an army supply depot than from a commercial vendor. The army's streamlined system now delivers spare parts in half the time it took to deliver them just a few years ago. The improved delivery system, in turn, contributes directly to improved equipment readiness. The faster, better system has also become cheaper.

Much of the credit for improvement lies in a new way of thinking about army logistics. Called "velocity management," the new paradigm emphasizes velocity over mass, quality over quantity—and costs less. RAND has worked with the army to design, implement, and refine the tools of velocity management. With these tools, the army has unexpectedly demonstrated a remarkable capability for achieving quick, dramatic, and lasting change.

Senior officials throughout the defense department have been duly impressed. The U.S. Marine Corps, U.S. Navy, Defense Logistics Agency, and U.S. Transportation Command have asked RAND to apply the lessons of velocity management to their own operations. Currently, RAND analysts are attempting the unprecedented: to help streamline the distribution system throughout the entire defense department, including all branches of the military services, other defense agencies, and private defense contractors (see sidebar).

Once a Lumbering Beast

At the outset of the 1990s, the people who depended on the army's logistics system could justifiably complain about its performance. The system was huge, moving massive amounts of supplies and materials and employing thousands of army personnel and outside contractors. It was also unreliable, inefficient, expensive, and unresponsive to changing needs. The problems persisted despite repeated attempts to fix them. It became clear that reforming the logistics system would require a fundamental shift in how the army thought about logistics.

When it was first being implemented in 1995, velocity management promised a new way of doing business. As the term implies, "velocity management" seeks to improve both the speed and the accuracy with which materials and information flow from providers to users. The improved speed and accuracy reduce the need for massive stockpiles of resources. Velocity management was created precisely to replace the army's traditional reliance on mass with the modern business concept of high-velocity processes tailored to meet evolving customer needs.

Under the army's traditional approach to logistics, vast quantities of supplies—spare parts, fuel tanks, extra vehicles, ammunition, and so on—are kept on hand "just in case" they are needed. But massive stockpiles do not guarantee that combat forces will get what they need when they need it. Massive stockpiles do guarantee a great deal of diverted manpower, money, and resources to manage the stockpiles. Mass-based logistics also pose tremendous physical risks to army personnel in terms of footprint and mobility.

Since 1995, velocity management has succeeded beyond all expectations on three key levels of performance: time, quality, and cost. Accelerated deliveries of spare parts have accelerated the repairs of equipment. Improved inventory management has provided customers with ready access to a broader array of items. Financial management systems are also becoming less cumbersome. The army has replicated these improvements at its facilities and installations throughout the United States and around the world.

Replacing Mass with Velocity

Velocity management views the logistics system as a set of interlinked processes—a supply chain—that delivers products and services to customers. To enhance performance along the supply chain, the army has

Enhanced Efficiency for Enduring Freedom

The principles of velocity management that have been applied by the U.S. Army during peacetime have also proved valuable for the U.S. military as a whole during the war in Afghanistan.

When logistics generals familiar with velocity management rotated to leadership positions in the U.S. Transportation Command (TRANSCOM) and the Defense Logistics Agency (DLA) in the late 1990s, the generals saw opportunities to apply the same process improvement approach on a joint level to benefit the entire U.S. Department of Defense. As a result, TRANSCOM and DLA created the Strategic Distribution Management Initiative (SDMI) to improve the effectiveness and efficiency of distribution processes throughout the defense department.

In 2000, SDMI planners laid the groundwork for major change. Drawing on the lessons of velocity management, the planners set up a coalition of leaders, created a realistic new vision for the defense distribution system, and developed measurement tools (databases and metrics) to diagnose problems and monitor improvements. The planners then formed multiorganizational teams to guide progress in three areas:

- Defense department inventories are being consolidated to make overall distribution more efficient.
- Distribution—especially intermodal moves by land, sea, and air—is being increasingly synchronized.
- New financial tools are beginning to simplify billing and to make costs transparent to customers.

Throughout 2001, SDMI underwent a rolling implementation that almost immediately began to improve the speed, responsiveness, and reliability of service to major military customers both within the continental United States and abroad.

After Sept. 11, Operation Enduring Freedom became a critical test of SDMI. Would its improvements stand up in time of war? Final data are still being gathered, but early indications show that the distribution system is performing very well. It continues to deliver fast, responsive, and reliable support to engaged forces in locations as far away as the system can reach: Diego Garcia, the Persian Gulf, and Uzbekistan. Moreover, the metrics tracked by RAND show that the lines of support to Operation Enduring Freedom were established and sustained without disrupting the improved service to other military customers worldwide.

Massive stockpiles guarantee a great deal of diverted manpower, money, and resources.

instituted an improvement method consisting of three steps: Define the process, measure the process, improve the process.

The first step, "define," identifies the customers and their needs. The logistics process is then broken down into segments or subprocesses. Experts representing each segment of the process pool their collective knowledge and walk through the steps of the process together to understand it better.

Whereas the first step improves knowledge about *how* a process is done, the second step, "measure," gauges *how well* it is done. Metrics are developed to measure performance in terms of time, quality, and cost—thus reflecting customer needs and values. The metrics are used to isolate performance problems, monitor the effects of changes made to rectify the problems, and give feedback to the people implementing the changes.

The third step, "improve," capitalizes on the expertise gained during the first two steps. Armed with deeper knowledge of the process, of customer needs, and of performance measures, the experts specify goals for improvement that are realistic yet challenging. As performance improves, the define-measure-improve cycle begins anew, with a remapping of the improved process, continued measurement, and further improvements.

Because of the complexity of army logistics processes and the many people and organizations involved, the army recognized the need for a high-level commitment and a strong management structure to ensure success. Therefore, the efforts are guided and sustained by a coalition of senior leaders called the Velocity Management Board of Directors (or simply the Velocity Group). Leading the group are three senior army officers: the deputy chief of staff for logistics, the deputy commanding general of the Army Materiel Command, and the commanding general of the Combined Arms Support Command.

Two types of teams implement velocity management. Process improvement teams are composed of technical experts representing all segments of an army logistics process, plus RAND analysts. These teams establish detailed definitions of armywide processes, develop metrics and performance reports, analyze current performance, and recommend process changes.

Site improvement teams are installation-level teams of local technical experts and managers. They apply the same improvement method to local processes and also help to implement armywide improvements.

A particularly useful metric now used by the army and the defense department measures "customer wait time" (CWT). CWT captures the time from when a customer orders an item until it is delivered. CWT provides an aggregate measure of the performance of a variety of logistics processes. The measurement depends on what is stocked locally, what is stocked elsewhere, how long it takes to repair or procure items not in stock, how long it takes to ship material, and how long it takes to receive shipments. CWT is a high-level metric that can be used to drive improvements throughout the supply chain.

Expediting Deliveries

In the army's experience with velocity management, improvements began with the order fulfillment process, as measured by CWT. It is critically important that spare parts for damaged weapon systems be delivered quickly and reliably. However, prior to velocity management, the process was very slow and highly variable. Some orders for spare parts took weeks or even months to fill.

A process improvement team walked through each step of the order fulfillment process at several major army installations, including Fort Bragg, N.C.; Fort Campbell, Ky.; Fort Hood, Tex.; and Fort Irwin, Calif. RAND analysts then used army data to establish a baseline for tracking improvements. The process improvement team recommended a new suite of metrics to measure CWT in terms of the number of days required to fill 50 percent, 75 percent, and 95 percent of requisitions. These metrics were thus capable of depicting both typical (median) performance as well as performance variability.

Improvements appeared throughout the order fulfillment process. Some quick fixes were made at the local level with no added costs. For instance, participating installations simplified some rules, reduced review processes, strengthened oversight, improved the use of new requisitioning and receipting technologies, and streamlined on-post deliveries.

Other changes involved coordination among multiple organizations within and outside the army. The introduction of regularly scheduled trucks (rather than waiting for full truckloads) reduced delays and vari-

ability in shipping times. Installations also switched to automated sorting and receipting systems. Some supply depots repositioned their stocks, allowing orders to be processed more efficiently. Many installations redesigned their delivery routes, work schedules, and distribution systems. These changes made the delivery of spare parts much faster and more reliable.

Figure 1 displays the dramatic reductions in customer wait times for major installations both inside and outside the continental United States. Importantly, improvements have not been confined to a limited set of customers. The army has reduced CWT for all units within the United States as well as for those stationed and deployed abroad.

Shortening Repair Times

The expedited deliveries of spare parts helped army mechanics shorten their repair times. Velocity management helped reduce repair times in other ways as well. The "define" step was critical in this regard. A process improvement team of experts looking at the repair cycle redefined it as extending from the time an item is broken until it is fixed—as opposed to the army's traditional definition, which covered only the hands-on repair time in the shop. The new definition made it easier to identify non–shop-related delays that could be eliminated, such as administrative procedures, repetitive inspections, and unnecessary cleanings. These changes reduced repair times and reserved manpower for other repairs.

Figure 2 illustrates four years of repair cycle times at Fort Campbell, including a baseline year and three subsequent years. In 1996, the army's vice chief of staff set a goal of slashing the repair time in half for 75 percent of all repairs (the 75th percentile). By 1998, Fort Campbell had already reduced the time for those repairs by 38 percent, well on the way toward the goal of 50 percent. The improvements are particularly remarkable at the 95th percentile, indicating that the process had become much more reliable across the board. These improvements were achieved without added expense.

Stocking Smarter Inventories

Success builds on success. The velocity management methodology has also been applied to the army's inventory management process. This process determines which items and how many items an installation should stock at its local warehouses.

A process improvement team of inventory experts visited army warehouses to define the inventory management process. Opportunities for improvement quickly became apparent, such as repositioning stocks and upgrading technologies for receipting systems. Metrics were then developed to measure how well the inventories met customer needs. RAND analysts also developed new algorithms to determine optimum stockage levels, which allowed more low-cost, high-demand items to be stocked.

Introducing regularly scheduled trucks (rather than waiting for full truckloads) reduced delays and variability in shipping times.

Figure 1—Customer Wait Times Have Fallen Both Inside and Outside the Continental United States
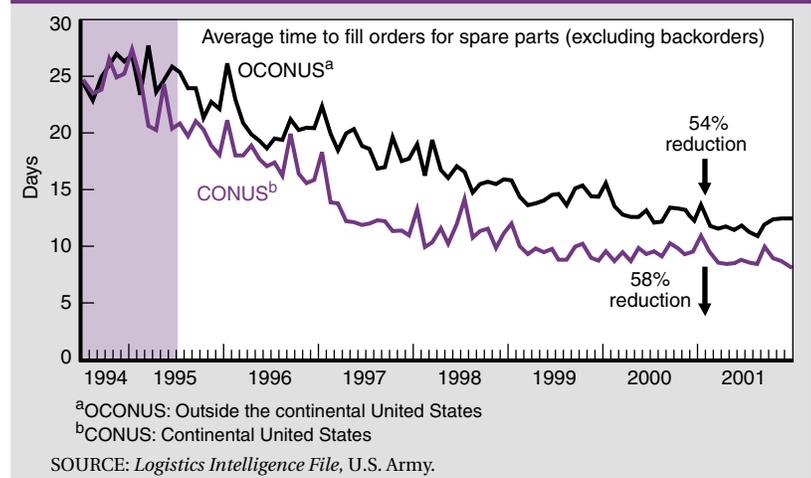
Average time to fill orders for spare parts (excluding backorders)

OCONUS[a]

CONUS[b]

54% reduction

58% reduction

[a]OCONUS: Outside the continental United States
[b]CONUS: Continental United States
SOURCE: *Logistics Intelligence File*, U.S. Army.

Figure 2—Since 1996, Fort Campbell Has Slashed Repair Times Almost in Half for 75 Percent of Repairs

Army goal: 50 percent reduction at 75th percentile

- 95th percentile
- 75th percentile
- 50th percentile
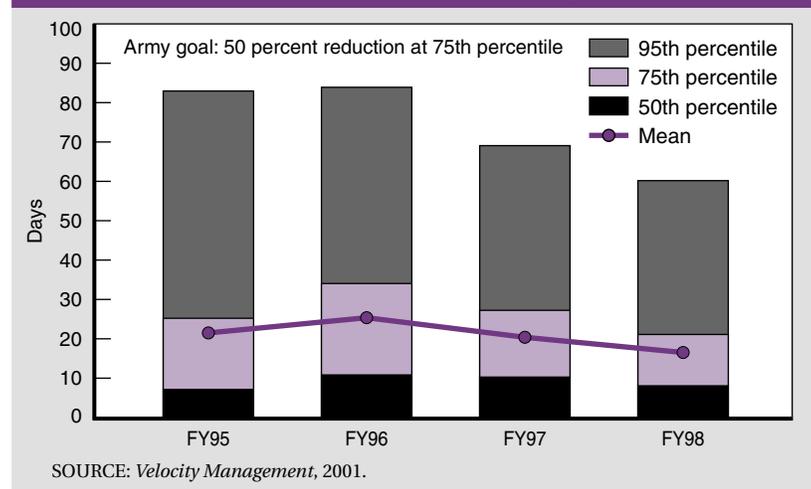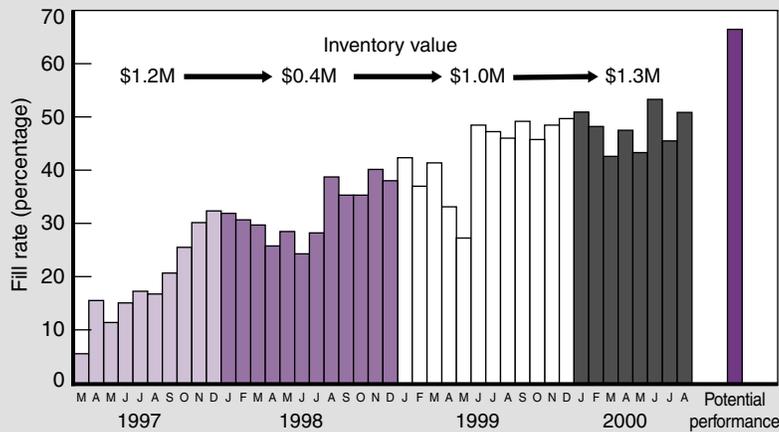- Mean

SOURCE: *Velocity Management*, 2001.

Figure 3—Smarter Inventories Have Yielded Better Fill Rates at the Same Cost

SOURCE: *Velocity Management*, 2001.

These changes spurred immediate and dramatic improvements in performance. Figure 3 tracks the percentage of orders filled from stocks on hand (the fill rate) at one local supply warehouse at Fort Campbell. After the implementation of velocity management, the fill rate there rose from about 5 percent to about 50 percent.

This improvement was achieved without a large additional investment. Before the implementation of the new algorithms, this supply warehouse held about $1.2 million in inventory. Unneeded items were returned to inventory. Some of the credit was used to stock other items. As funds became available, the breadth of inventory was expanded further, and the investment level rose modestly to $1.3 million.

Enhancing Financial Information

Velocity management can also improve financial management. Logisticians depend on the army's financial management process for timely, reliable, and accurate data about current prices, recent credits, and other financial facts. Price and credit information is of particular concern, because many logistics decisions depend on knowing exactly how much money a unit must and can spend at a given time.

Walkthroughs of the financial management process revealed that improvements are needed in both the timeliness and the quality of financial information. Changes are being sought in several areas:

> **Once a "burden" on operations, the logistics system is becoming a strategic asset.**

reducing uncertainties in prices and credits, reducing the time required to publicize information (in catalogs and budget updates), and improving access to information. These changes may require investments in automated systems, expanded networks, and additional staff. Many of these investments require policy decisions at the Headquarters Department of the Army or the Office of the Secretary of Defense.

Linking Improvements to Increased Readiness

As velocity management made army logistics processes faster, better, and cheaper, the next step was to assess the effect of these improvements on equipment readiness. To this end, RAND developed a relational database, called the Equipment Downtime Analyzer (EDA), to integrate the data collected by various army information systems.

These data track the daily history of supply and maintenance activities that are related to every piece of major army equipment found to be "not mission capable," or unavailable when needed. The EDA can thus determine how much each process and organization in the entire logistics system contributes to equipment downtime.

From the daily history, the EDA creates a huge hierarchy of linked metrics (see Figure 4). This hierarchy literally adds up the delays that occur at each step of the lengthy "broke-to-fix" process. By revealing the underlying causes of equipment failures, the EDA can suggest where improvements would make the most difference in equipment readiness. The EDA can also measure the frequency with which workarounds occur (e.g., when a repair is made by removing a needed part from another piece of equipment). And it can identify multiple ordering cycles (e.g., because of changed diagnoses).

The EDA can differentiate the levels of performance among different maintenance units and different levels of maintenance. For instance, the EDA can identify operating shortfalls, inform recapitalization decisions, and highlight the need for more reliable equipment design. Army organizations have already found several ways to exploit these insights. The ultimate promise of the EDA is an enhanced capability to focus constrained resources where they will have the greatest effect on keeping equipment ready to fight, whether by reducing repair times or by improving equipment reliability.
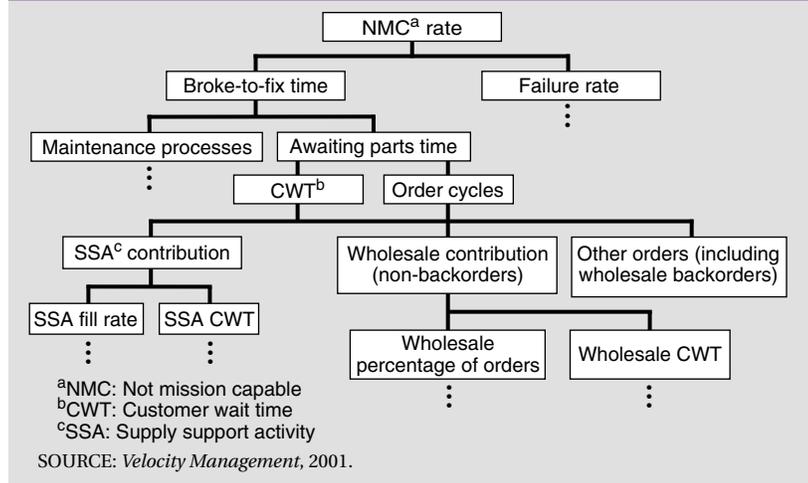
Sustaining Continuous Improvement

Velocity management has given the army a new way to think about logistics processes and to make them more efficient and effective. Several factors have enabled the army to sustain the momentum and to ensure that progress is not limited to a single budget cycle or a single officer's tenure.

First, velocity management has been implemented with the participation of a determined coalition of army leaders having sufficient scope and authority to make systemwide change. The army's formation of the Velocity Group will also help sustain an initiative that, by its nature, must outlast the tenure of any given general officer or even any cohort of officers.

Second, the army has institutionalized the "define-measure-improve" method. Of particular importance is the "measure" step, which requires the development and use of metrics, such as customer wait time, that reflect key customer needs and values and span the full logistics process. These metrics have become the lingua franca by which all the players in a process communicate with one another about the status of their improvement efforts.

Third, the quick pace of implementation has helped to jumpstart the velocity management initiative despite its emphasis on improvement as a continuous goal, not a one-time transition. Fourth, the initiative

has been systematically expanded to new processes and sites. These expansions continually renew interest in the initiative. Fifth, the initiative has yielded improvements within the constraints of existing, if not declining, resources.

With velocity management, the army continues to transform its logistics system. Once decried as a "burden" on operations, the logistics system is becoming a strategic asset that can support revolutionary ways of deploying and fighting. ■

Figure 4—A Hierarchy of Metrics Pinpoints the Causes of Delays

aNMC: Not mission capable
bCWT: Customer wait time
cSSA: Supply support activity

SOURCE: *Velocity Management*, 2001.

Related Reading

Accelerated Logistics: Streamlining the Army's Supply Chain, Mark Y.D. Wang, James A. Champy, RAND/MR-1140-A, 2000, 64 pp., ISBN 0-8330-2785-9, $20.00.

Define-Measure-Improve: The Change Methodology That Has Propelled the Army's Successful Velocity Management Initiative, RAND/RB-3020, 2000, 4 pp., no charge.

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Commentary

Secure the Vote
Now We Must Literally Protect Democracy

By James T. Quinlivan

Large-scale, scheduled public events—like the recent Winter Olympics—make for tempting terrorist targets. One upcoming event is extraordinarily significant from a terrorism perspective: the next general election.

While the presidency will not be at stake, the entire House of Representatives, one-third of the Senate, and many state and local offices will be. Of course, even more is at stake than just the results of one election. Changes in government occur only at scheduled elections, and the country has an enduring commitment to keep that schedule—to conduct democratic elections in what is likely to remain an uncertain and threatening climate.

> **We need to shape electoral laws that set the conditions for new elections if disruptions prevent the full exercise of the vote.**

If a terrorist attack forces the elections to be rescheduled or, in a more likely scenario, manages to keep many Americans from going to the polls, then the attack will produce fundamental damage. Make no mistake: The number of Americans who cast their ballots in the next election will be watched—and scored—by viewers across the globe, just like the recent Winter Olympics in Salt Lake City.

Protecting against such an attack promises to be very challenging. Unlike localized events like the Winter Olympics, the general election is national. Voting will take place at the polls in every neighborhood, community, city, and state and over extended periods of time across time zones. One of the lessons of the last election is that a disruption in one part of one state can throw the electoral process into chaos—or influence its outcome.

Beyond heightening physical security, what can legislatures, election officials, and security officials do to ensure that the election comes off as scheduled? One thing to emerge from the problems of the last election was a succession of panels and commissions that recommended changes in how we conduct our elections. One of the more frequently mentioned ideas—Internet voting—seemed attractive, but the panels generally agreed that the technology is not yet mature enough.

Another idea—voting over a weekend or a period of several days—is more promising. While this would require security officials to protect polling places over a longer time period, each location would probably have fewer citizens exposed at any time, with reduced individual waiting times for every voter. Also, election officials could respond to situations or problems revealed in early voting to ensure that people have adequate access to polling places throughout the remainder of the voting period, despite problems that might occur.

Another way to reduce electoral vulnerability to terrorism would be to expand the use of provisional ballots at polling places nationwide. Provisional ballots would enable election officials to resolve questions of voter eligibility at a later time. Such ballots would reduce the time anyone has to spend in a polling place and would allow polling places other than a voter's designated polling place to take over if a primary polling place had to be closed because of an incident or threat.

Typically, provisional ballots would be used by eligible voters whose identities are temporarily unconfirmed. To deter terrorists from anonymously using provisional ballots to introduce dangerous substances into polling places, the thumbprints or even photographs of provisional voters could be taken and then placed on the envelopes of the provisional ballots.

Finally, as outrageous as it may seem, we need to shape electoral laws that not only punish those who disrupt elections but also set the conditions for new elections if disruptions prevent the full exercise of the vote.

In the last decade, we have seen citizens of many foreign nations line up to vote in the face of guerrilla violence, government repression, or criminal disruption. Each such situation has inspired American editorials praising the courage of common people and their attachment to their new right to vote. Unexpectedly, we, too, now face such a test of our own attachment to the right to vote. ■

James Quinlivan is an analyst at RAND.
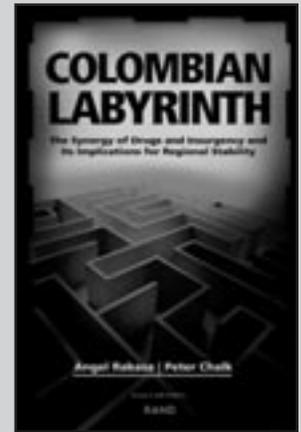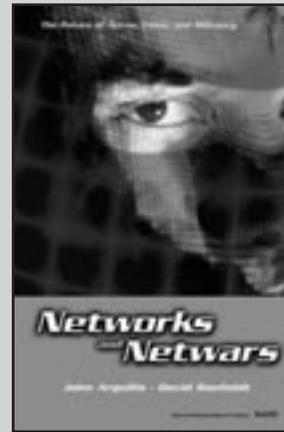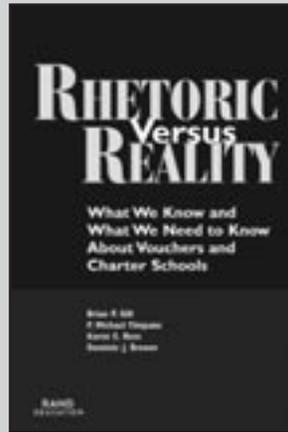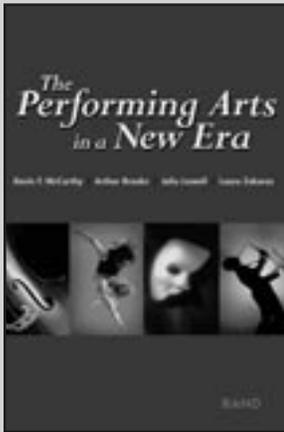
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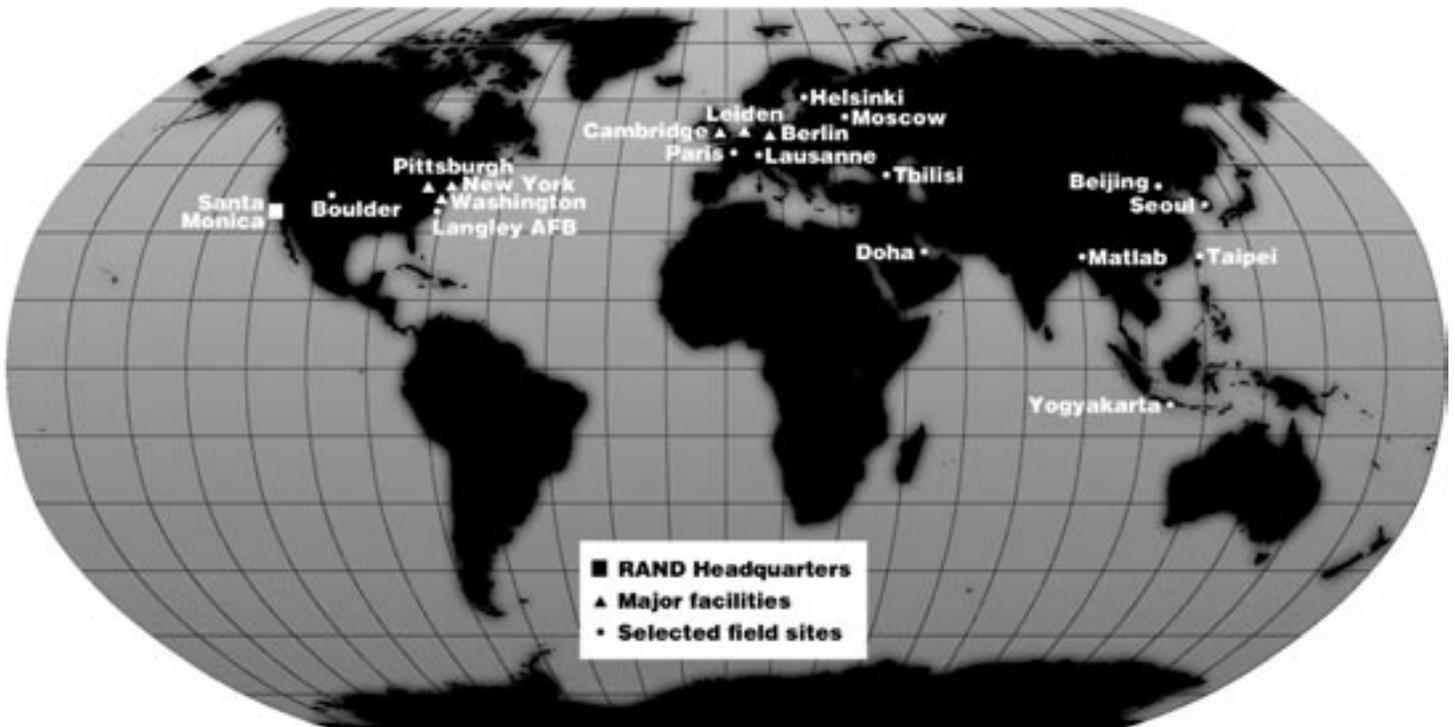
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