Bullets and Band-aids

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Professor Edward H. Kaplan is a round-faced man whose piercing gaze radiates from behind bespectacled eyes. His workspace is a caricature of a professor’s desk, piled with open books, family photos, loose papers, and legal pads with formulas scribbled in pencil. But this Yale School of Management (SOM) professor does not live and work in a world of abstract, academic theory. His work is nothing if not practical.

“We have to learn to think like terrorists,” Kaplan explained, when asked about the underlying focus of his recent work. “Which targets are terrorists most likely to go after? How can you estimate the size of a terror threat? What can you do to make it harder for the other side to succeed?”

A professor of management, engineering, and public health at Yale SOM, Kaplan has teamed up with Boaz Golany, dean of Industrial Engineering and Management at Israel’s Technion Institute. Brought together through a grant from real estate giant and philanthropist Daniel Rose, Kaplan and Golany are using mathematical models to analyze counterterrorism operations. Their research partnership is unique in its funding and its methodology. Many in academia and counterterrorism circles hope the results will play an unprecedented role in protecting key targets from the threat of attack.

Small Pox and Suicide Bombers

Mathematical modeling—using complex formulas to analyze a system—is familiar territory for Kaplan, whose breakthrough models for HIV prevention and smallpox vaccinations are widely acclaimed. Counterterrorism, on the other hand, is a relatively new area of expertise.

“I got into this [field] because I was asked to get into it,” recalled Kaplan. As the U.S. government scrambled to secure the nation after September 11, national security agencies took interest in Kaplan’s revolutionary models of the HIV epidemic. In 2002, he was invited to Washington to meet with several government agencies, including the National Institute of Health (NIH), the Central Intelligence Agency, the department of defense, and the President’s Council of Economic Advisors. The NIH asked him to create a mathematical model for the Center for disease Control’s proposed smallpox containment plan. The model proved the relative effectiveness of mass vaccination against a smallpox outbreak and led the federal government to increase the number of people vaccinated against smallpox from a few thousand to half a million. For Kaplan, this exercise in prevention was also the start of a new focus.

Since then, Kaplan has taken an original but effective approach to counterterrorism. “The majority of academic research on terrorism is either on the sociological or political economy side of it—the root causes of terrorism, the macro policy work, what things a given country is doing that are encouraging terrorism,” Kaplan explained. “We deal at the operational level. We want to prevent people from launching a successful attack.”

One of Kaplan’s recent models, for instance, evaluated the effectiveness of installing suicide bomber detection systems in public areas. Though these sensors were technologically feasible, Kaplan’s modeling deemed them wasteful. “By the time you detect the bomber, they’ll set off their bomb before you can catch them,” he concluded. Kaplan recommended that the money instead be spent improving preemptive intelligence collection capabilities.

The Catalyst

Kaplan’s work was indirectly propelled forward by an international dispute. In May 2007, the Palestinian Campaign for the Academic and Cultural Boycott of Israel persuaded the influential University and College Union to endorse a call for a boycott of Israeli academics and institutions. The boycott incensed Jewish-American real estate magnate Daniel Rose, as did the ensuing political battle among British academics. “To call for a closing down of academic exchanges was disheartening,” Rose lamented. “But the lack of widespread outrage in the British academic world was even more disheartening.”
Rose sought a way to show solidarity with Israelis and to demonstrate that the American academic community would not follow Britain’s behavior. In an interview with the Globalist, he explained the message he hoped to convey: “Not only are American institutions not closing down discourse, but they are ready to expand discourse with Israeli academics.”

Rose was not the only person enraged by the British decision, but the difference between Rose and other critics of the boycott, said Golany, Kaplan’s Israeli research partner, “is that Daniel Rose put his money where his mouth was.”

A Transatlantic Bond

In response to the boycott, Rose, an elderly Jewish man with connections to Yale University and Israel’s Technion Institute, decided to launch a program that would facilitate dialogue between the two renowned universities. Given Israel’s expertise in the field, Rose saw international terrorism as a logical focus.

Because he was familiar with the philosophies of both universities—he is a Yale alumnus, and an honorary lifetime member of the Technion board—Rose believed that collaboration between Yale SOM and Technion could yield “a very happy relationship.” He contacted the American Technion Society (ATS), an organization that facilitates American coordination with Technion, to see if any collaboration already existed between the two schools.

To Rose’s delight, ATS connected him with Kaplan, who had previously worked with Technion’s Golany on a project that modeled resource allocation in counterterrorism spending. The two were keen to further their partnership. Encouraged by their enthusiasm, Rose donated $1.3 million in May for three years of collaborative research with virtually no stipulations.

The project got off the ground quickly. Currently, Kaplan and Golany are conducting analytical research on terrorist networks. “What are their characteristics? How do they evolve?” Golany questioned. “And, more importantly, what can be done in order to make them as ineffective as possible? Leaking false information, separating certain nodes, and other interventions are all possible ways.”

The operational nature of these models means that if their results find their way to the right people, they may tangibly make the world a safer place. To that end, both Kaplan and Golany see the value in fostering connections with their respective governments. Kaplan hopes to share his findings with agencies like the FBI, the CIA, the department of defense, and various municipal police departments. He is encouraged by what he described as “terrific lines of communication going on with officials in the right places.” In Israel, Golany said he enjoys “close collaboration with defense agencies,” providing both unclassified and confidential information for their use.

To its top researchers, this project is about more than just specific findings. “Part of what we’re hoping to do here is to attract people to the field,” explained Kaplan. In addition to funding research, the Rose grant enables Yale SOM to hold seminars on counterterrorism analysis that bring researchers together to work on these problems. The seminars, which started in October, feature a lineup of speakers including the Israeli Police Force’s former head of intelligence.

The project is broadening in scope and has already brought in other individuals, including Yale economist Jonathan Feinstein, Technion chemical engineer Abraham Marmur, and Technion industrial engineer and operations researcher Uriel Rothblum.

Protection Today, Peace Tomorrow

Other universities have established centers to study counterterrorism, but the Rose grant is the only privately funded, cross-university counterterrorism research collaboration in the world. It is also the only program in the world to apply the mathematical models of operations research to counterterrorism.

Kaplan understands that his work is both unprecedented and controversial. Though counterterrorism operations can be highly effective in responding to terror threats, it is unlikely that smart operations alone will eliminate global terrorism. Counterterrorism operations simply do not present solutions to the underlying factors of ideology and politics provoking terrorists today.

“Generally, when topics like these get brought up, they get made political,” he said. “I’m interested in evaluating counterterrorist strategies themselves: how to make decisions when the threat is there. Some people call these tools band-aids, but until we can take away the reason why they’re attacking us, I’ll be perfectly happy if I can keep coming up with good band-aids, because that’s going to save lives.”

There are limits to looking at counterterrorism solely from an operations perspective, to be sure. But at their core, operational models of systems like airport security and port protection buy political leaders time to come up with bigger solutions. Implementing the Yale-Technion collaboration’s models in conjunction with viable political solutions holds real potential to address vulnerability in the short run and create lasting peace in the long run. And beyond the specific subject matter, the Yale-Technion project has provided another model, one of innovative, transnational collaboration that could inspire similar partnerships in all different fields.

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