



The New Biotechnological Frontier: The Exmogate Turnstile

Specific Aim

The Exmogate Turnstile is an ultra-secure, highly sensitive biotechnological device with both national and global security value implications. In a time when the ability to instantly measure anger or possible malevolence can save thousands of helpless lives, this unique and futuristic device cannot be ignored.

According to news reports, the number of raging airline passengers alone is increasing. Federal records indicate that the number of attacks on flight attendants has steadily increased from 296 reported incidents in 1994 to 921 in 1997 (Ken Kaye, Aug. 31, 1998).. Flight attendants have been physically and emotionally attacked, sometimes in brutal fashion.

Such incidents bring to mind the developing violence in our society. We have "sky rage," "road rage" and "children killing children"; thousands of people are on medication for depression; countless women and children are killed every year in cases of domestic violence; divorce rates remain high.

Public risk perception and risk communication are very important considerations when developing policies and management strategies for dealing with terrorism. For example, the allocation of scarce resources for protecting the public against terrorists depends on public perceptions as well as on the perceptions of policy makers and experts. The consequences of terrorist acts will be also be affected by the quality and effectiveness of communicating with the public. In addition, public perceptions will affect behavior after attacks, for example due to fear of flying after an attack on commercial aircraft. The economic impacts due to public perceptions are likely to go well beyond the attack's direct consequences. The damage and loss of life involved in those attacks are devastating.

Public schools are now the target of home-grown student terrorism. Our national embassies abroad are prime targets. Viral terrorism is now a very real possibility. Simply one individual carrying the Ebola virus entering our country can cause havoc to the medical national security system.

Project title: The New Biotechnological Frontier: The Exmogate Turnstile

Research Area: Biotechnology and human psychophysiological monitoring technology.

Broad Challenge

Animals ostracize weaker and burdensome members of their group in order to strengthen their own group. So do humans. But, whereas animals that are ostracized typically die, humans engage in counter-measures aimed at fortifying what ostracism thwarts: belonging, self-esteem, control, and recognition. Being ostracized—ignored and excluded—is initially experienced as pain. The same region of the brain that is activated when experiencing physical pain is activated during ostracism.

Ostracism hurts within minutes, regardless of who is doing it how it is done, or why it is happening. It increases both sadness, and anger. Ostracized individuals and groups embark on two general routes to rebound from the pain. The first route is aimed at fortifying belonging and self-esteem, and reducing sadness. Ostracized individuals are especially attentive to social information, engage in subtle non-conscious behaviors that endear themselves to others, are more likely to conform to others' incorrect perceptions, donate money to compliance professionals, and fall under the spell of authoritative influence, as long as being influenced by others implies acceptance. Ostracized individuals and groups are easy prey for con artists, extremists groups and cults, or anyone else who lavishes on them attention and praise. They are in need of positive attention, and consequently, will lower their acceptability thresholds of others which whom they choose to associate.

The second route is aimed at fortifying control and recognition, and satisfying anger. Many studies have observed anger and hostility following ostracism, exclusion, and rejection. These acts quickly bestow a sense of power and importance to the individuals and groups who were previously rendered powerless by being ignored and shunned. The more that ostracism thwarts a sense of control, the more likely aggression will follow. The diaries of thirteen of fifteen school shooters reveal that they were ostracized and rejected prior to the shooting.

Most of the research on ostracism, social exclusion, and rejection has focused on the individual. But groups are ostracized, too. In high schools, the majority ostracizes stigmatized groups; dominant societal groups ostracize minorities and immigrant groups; the global community ostracizes politically unpopular groups. How do groups, in comparison to individuals, respond to ostracism? Research suggests there is a “discontinuity” between individual-individual expectancies and reactions and group-group expectancies and reactions. Whereas individuals are more likely to trust other individuals and engage in cooperation, groups are more likely to distrust groups, and engage in competition and aggression. Furthermore, ostracized group members forge strong bonds among themselves. As in the Columbine High School shootings, it was this type of bond that killed innocent students.

Limited attention has been paid to the intersection of emotions and the etiology of terrorism. Instead, research priorities have tended to focus on the structural (e.g., poverty; weak and failing states), sociopolitical (e.g., U.S. foreign policy; a “clash of civilizations”), or codal (e.g., madrassas; Wahhabism). The aim here is to outline an agenda which transitions discourse related to the “body” of the terrorist (i.e., his/her historical and social positioning) to one focused on intrapsychic and interpersonal emotional processes. As such, it's predictive and explanatory capacities will be heightened if one adopts a perspective grounded in the emotions of terrorists and their source communities, particularly for those phenomena that suggest a fluidity of movement of actors across a continuum of zealotry intent on harming United States citizens.

An unusual national experiment on American emotions conducted by Carnegie Mellon University scientists reveals a national psyche deeply influenced in opposite ways by anger and fear and enormously impacted by media coverage of events post 9-11.

The scientists, all experts in studying the way people think and behave, were able to quickly pull together an experiment that studied the emotions and perceptions of the risks of terrorism of nearly 1,000 American women, men and teens following the terrorist attacks on America.

The results have been presented to NATO officials assessing the carryover impact of terrorism and are in press with the journal Psychological Science. The experiment results may have implications for better understanding of consumer behavior, the role of the media, and public support for the war on terrorism.

Jennifer Lerner, an assistant professor of Social and Decision Sciences at Carnegie Mellon and lead author of the paper, commented that the emotional responses of Americans "clearly influence everything from future support for military action to decisions to travel."

The Carnegie Mellon team drew four major conclusions from the study:

- 1) Americans who experience anger are more optimistic about the future, less likely to take precautionary actions, and more likely to favor aggressive policy responses than those who experience fear.
- 2) Individuals see themselves as less vulnerable than the "average American," while still perceiving strikingly high personal risk in the wake of September 11.
- 3) Men experience more anger about terrorism than women, leading them to be more optimistic than women.
- 4) Media portrayals of the terrorist attacks strongly influence emotional responses, producing anger in some instances and fear in others.

The experiment involving nearly 1,000 American men and women ages 13 to 88, suggests that heightened emotions of fear and anger affect responses to the threat of terror currently facing the nation, with anger promoting greater optimism and more aggressive policies.

Organizational researchers have taken advantage of the speed with which computers can process numerical data for quite some time. In contrast, analyses involving textual data have more often been considered as a time-consuming, labor-intensive undertaking less suitable for computer processing. The complexity and volume that characterize textual data have often been recognized as presenting special challenges to research analysts. Recently however, the emergence of specialized text processing software and more powerful computers has renewed interest in research possibilities associated with the examination and interpretation of textual data in measuring malevolence. It is now possible, using a specific set range of algorithms, to accurately predict potential terrorist threats. This same technology also measures vital signs which can alert staff of any potential harmful medical anomalies.

Specific Challenge

The Exmogate Turnstile is designed to look and perform like a normal subway or building turnstile. It has standard turnstile functionality, including the ability to count how many people pass through it. Unlike other turnstiles, the Exmogate is locked by default, and only a wireless command can allow its hydraulic arm to open. The Exmogate Turnstile is a wirelessly controlled ultra-secure turnstile. Built with embedded GSR, skin temperature, pressure and auto-diagnostic sensors, as well as a video camera, the Exmogate Turnstile can gather and process physiological data almost instantaneously to help security screeners to detect hostility and malevolence.

The Exmogate is entirely battery operated. Its weight can be increased or decreased by adding water to an internal bladder. A float sensor in the bladder and a mercury switch indicating tilt will alert the local Exmogate Control Center if Exmogate is fractured or inoperable (as the result of a gunshot or explosion, for example). Exmogate will come with a built-in PC for transmitting and receiving data securely over a local wireless network. A computer operated by the security screener will control all the Exmogate Turnstile in a certain facility or location.

Challenge and Potential Impact

The potential impact in increasing safety of not only our international borders (many are within airports), but public safety in schools, mass-transit stations, universities, and more cannot be ignored. This device literally reads emotions by gathering human vital signs combined with other variable data and applies that to built-in algorithms of empirically confirmed conditional psychosocial states. That data (not information: Data) is then transferred to a trained monitor who can take the timely and appropriate action.

Because this technology also measures vital signs, a secondary affect is the ability to alert a screener to a potential pathogenic risk.

