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Human Technology and Terrorism: Implications for Aviation Security

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Abstract. This article describes common human vulnerabilities when using technology to minimize aviation security threat.

Human technology has two main significations. One is technology developed by humans. The other is technology employed by humans. The second signification suggests that technology will be effective based on an interaction between the physical properties of technology and the psychological properties of the human employer within a specific context. This interaction forms the basis of human factors as an applied scientific discipline.

The human factors discipline has made huge contributions in matters of what may be termed psychophysics. Based on biopsychological human functioning that undergirds sensation, perception, attention, cognition, and overarching acuity, human factors experts have been able to help design technology, make modifications in existing technology, and develop employer procedures contributing to technology effectiveness.

Why has human factors as a discipline focused so significantly on biopsychological functioning, technology modifications, and associated employer psychophysical procedures? Philosophers of science might well posit that this focus reflects a psychological and behavioral science bias to emulate a logical positivist conception of the physical and life sciences--a conception that contains logical fallacies and vulnerable ontological assumptions recognized by many of the very physical and life scientists that are aped in the quest for scientific respectability. A crude reflection of this bias is the common dichotomy between the "hard" and "soft" sciences--with physical and life sciences exemplifying the former and the social sciences (often comprising much of the psychological and behavioral) the latter. "Hard" sciences are often enough perceived as "real science," "soft" science as false, scientific, inferior, or second-class. In fact, many psychological and behavioral scientists--in self-defense--may actually assert that their work is not psychological or behavioral at all but physical- or life-science oriented.

One practical implication of the above is a relative ignoring of psychosocial and political psychological variables and phenomena that can significantly affect the effectiveness of technology. A case in point involves the security screening of airline passengers at checkpoints with technical detection devices.

Again, human factors analysis focuses on the physical capabilities of the technical device and their compatibilities with the sensory, perceptual, and cognitive capabilities of the human employer. Of lesser note, but of significance, are the following variables and phenomena that ultimately impact on the application of sensation, perception, and cognition to the overall effectiveness of the technology-human system within its larger social and political context.

First is the salary of security employees. Without special motivation created through training or intrinsically developed through a priori ideology, one can assume that the lower the salary--especially when approaching minimum wage--the lower motivation to employ technology in an optimal fashion. An exception might be the hiring of individuals for whom minimum wage would be a significant

International Bulletin of Political Psychology

economic step up. Another complexity is the choice to award salary based on performance, time "put into the job," pure seniority, or some combination.

Second is the training given to security employees. To maximize optimal sensation, perception, and cognition, employees need to receive training that is distributed not massed, deals with likely contingencies, is as close to the real-world environment as possible, changes correspondingly to real-world threats based on analyzed intelligence, occurs throughout the employee's career, and is "pitched" to be taken as seriously as the actual job.

Third is the creation and management of the immediate physical environment in which security employees work. Here, a "Goldilocks-and-the-Three-Bears" criterion seems to apply towards the human element of security system effectiveness. When it comes to noise, temperature, numbers of people within a circumscribed area, and quality of the relationships between and among members of the security team, the operative adage should be that too much and too little both may be noncontributory to optimal performance--in what would be a 21st century version of arousal mediation as described by the Yerkes-Dodson Law.

Fourth are the comprehensiveness and seriousness with which background investigations and other elements of screening are carried out on potential security employees. Both are positively correlated with optimal performance, as are the validity of investigative and screening criteria and the degree of which all have impact on ultimate hiring decisions.

Fifth is the quality of management. Firing decisions, promotions, lateral transfers, initial job placement, longevity, awards, formal and informal perquisites, and other means of positive and negative recognition, all need to be positively correlated with performance and system effectiveness.

However, security for airports in the United States (US) is largely under the control of the airlines and the airport operators. These, in turn, contract most security responsibilities out to commercial enterprises. Many of these enterprises compete for the awarding of contracts and do so by submitting the lowest bid that they believe is remotely possible and credible. In the quest for the lowest bid, much of what is needed for optimal performance and system effectiveness is jettisoned; finessed; or, at times, faked. The same applies to the ongoing management of the contract. In the name of profit--and, after all, contractors and their immediate overseers are in it for the money--aviation security takes a huge hit. And this hit occurs regardless of the human factors focus on psychophysics.

What's to be done? Some aviation security experts are advocating for the takeover of aviation security by government. The positive feature of this alternative is that a larger number of security and security-related employees might well possess and maintain the appropriate motivation for optimal performance and system effectiveness. Also, there might be the relatively consistent reinforcers--e.g., higher salaries and better training--supporting this hypothesized reality. The downside comprises the worst of government bureaucracy that can attenuate motivation; mystify accountability; and focus on turf battles, careerism, and internal politics.

In the wake of the September 11, 2001 terrorist attacks within the US, the psychosocial and political contributors to aviation security impacting on tasks like the screening of passengers and baggage for weapons must be better attended to. In the meantime, the ongoing bias against the so-called soft sciences remains to be exploited by those seeking to attack security systems and the people these systems are supposed to protect. (See Bargh, J.A., & Alvarez, J. (2001). The road to hell: Good

International Bulletin of Political Psychology

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