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CAPPSII: Caveats on Progress

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Abstract. This article identifies potential security shortfalls even in the context of improvements in counterterrorist profiling.

Many aviation security authorities are attributing an improvement in profiling individuals more likely to engage in aviation terrorism and/or other violations of security to the development and eventual full-scale fielding of the Computer Assisted Passenger Prescreening System 2 (CAPPSS2). The common assumption is that CAPPSS2 will be more statistically powerful—i.e., more likely to contribute to identifying terrorists and other security violators than other pre-existing, prescreening and profiling systems.

However, the construct of being more powerful does not exist in a vacuum. Instead, the power of a profiling technique is dependent on at least four other statistical parameters. One is sample size: the number of people evaluated in the process of leading up to a statement about the power of a profiling system. Another parameter is effect size: the salience of the profiling contribution in the environment in which profiling is to be used. The third parameter is that of alpha level: the odds that an observed contribution of a profiling technique is due to chance. The fourth parameter is that of efficiency: the most profiling contribution for the least amount of expended profiling resources that has cost-effectiveness implications among others.

A combination of sample size, effect size, and alpha level will yield a statistical power statement for a profiling system. In other words, the power of the profiling system is not something intrinsic to that system but something that depends on how it was researched and, then, on how it is actually being employed when fielded at an airport or other locus of aviation. This last conclusion brings us to caveats on employing improved profiling systems (as demonstrated through research).

For example, both security policymakers and aviation security officials might well posit that an improved system would bring cost savings. Cost savings could occur if fewer people were identified as high risk, because fewer people would then have to go through a more rigorous security applied to high risk individuals. The rationale for identifying fewer people as high risk with an improved profiling system would be that the assumed error rate of wrongly identifying high risk people would be lower so that one would identify a lesser number with a higher rate of accuracy. The problem with this rationale is that as the identification rate decreased, some point would be reached beyond which terrorists and other security violators would not be identified at a higher rate in some population of terrorist and security violators.

Cost savings might also occur if less stringent security procedures would be applied to people identified as low risk individuals. After all, as one is more likely to know who is not a risk, why not apply fewer resources to such people? However, if stringency would decrease enough, one would pass some point beyond which a terrorist or other security violator erroneously identified as low risk could then have a greater opportunity to be successful in violating security.

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In conclusion, CAPPS2 and all succeeding CAPPS applications may be more successful not just based on better applied research but on how the research is applied. (See Heller, D., Levin, I. P., & Goransson, M. (2002). Selection of strategies for narrowing choice options: Antecedents and consequences. *Organizational Behavior & Human Decision Processes*, 89, 1194-1213; Levin, I. P., Prosansky, C. M., Heller, D., & Brunick, B. M. (2001). Prescreening of choice options in 'positive' and 'negative' decision-making tasks. *Journal of Behavioral Decision Making*, 14, 279-293; Peterson, J. B., Driver-Linn, E., & DeYoung, C. G. (2002). Self-deception and impaired categorization of anomaly. *Personality & Individual Differences*, 33, 327-340; Subcommittee on Aviation Hearing on Aviation Security with a Focus on Passenger Profiling. (February 27, 2002). <http://www.house.gov/transportation/aviation.>) (Keywords: Aviation Security, CAPPS2, Prescreening, Profiling)