



Passenger Prescreening: The Right Kind of Profiling

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Jacobson's research on aviation security has been supported
in part by the US National Science Foundation (CMMI-0900226)



Executive Summary

Prescreening is the single best strategy for balancing security and costs.

Identifying low cost / high value correlates with risk is critical.

All systems can be gamed; some more easily than others

- Overscreening versus underscreening.



My Background

Researched aviation security since 1996

Operations Research (Math, Comp. Sci., Economics)

Areas of Research

Optimal Security System Design & Analysis

Security device deployment and utilization

Cost-Benefit Analyses

100% checked baggage screening

Intelligence versus technology assessment

Risk Assessment and Mitigation

Real-time passenger security assignment



Motivating Research Questions

- What is aviation security?
- How should aviation security be measured?
- How should aviation security be implemented?
- How much should aviation security cost?
- Who should pay this cost?



Aviation Security Objectives

Minimize impact of willful human intent

Detect and terminate planned attacks (primary)

Deter potential attacks (secondary)

On-going assessment and readjustment of aviation security operations at airports



Passenger Screening

- Most visible aspect of aviation security
- Many changes in aviation security since 9/11
 - New technologies (AITs)
 - New prescreening strategies (PreCheck)
- Passenger prescreening tools
 - CAPPs, selectees, nonselectees
 - No fly list
- TSA committed to a risk-based paradigm



Uniform Screening vs. Selective Screening

- All passengers treated the same
 - Uniform security scrutiny for all passengers
 - Standardized screening procedures & limited privacy issues
 - Prohibitive cost to screen all passengers with all security devices
- More security for passengers perceived as higher-risk
 - Less security scrutiny for most passengers
 - System required for determining who is higher-risk
 - More cost-effective



Profiling: A Four Letter Word?

Taboo topic (in the United States)

Misunderstood

Taken out of context

Racial vs. behavioral vs. information



Passenger Prescreening

Profiling done the right way

Focuses on what is known and
NOT KNOWN about a passenger

Aligns security resources based on
the risk of the passengers



Example #1

Passenger A

Travels 1-2 times per year

Always checks her bag

Flies the same route, round trip

Not a member of a frequent flyer program

Requires assistance when boarding/deplaning

Tickets purchased with a credit card that is not in her name





Example #2

Passenger B

Travels 30-36 times per year

Rarely checks bag

Flies multiple routes

An elite member of several frequent flyer programs

Tickets purchased with a business credit card

Usually purchases refundable tickets

Often upgraded to first class

Many last minute changes to reservations





Example #3

Passenger C

Travels 3-5 times per year, sometimes just one way

Never checks bag

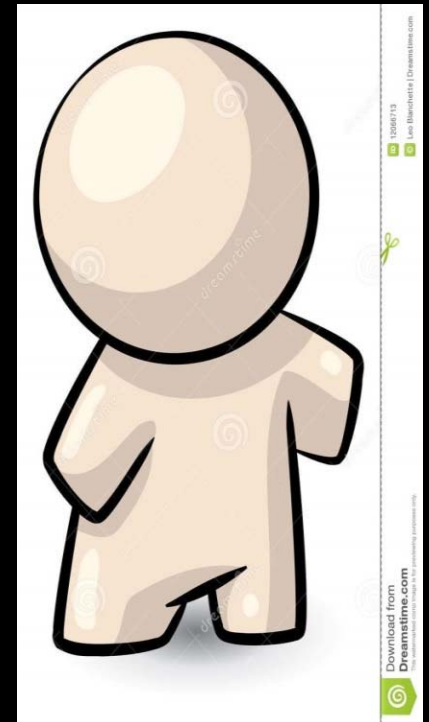
Flies multiple routes, typically long haul domestic

Not a member of any frequent flyer programs

Has been known to pay cash for one way tickets

Has missed flights due to arriving late to gate

Typically uses fully refundable tickets





Aviation Security Prescreening

Do all these passengers require the same security attention?

What are the costs, benefits, and risks of using different resources and procedures on these passengers?

Prescreening is a **measure of confidence** in what information accurately correlates with risk.



Aviation Security Prescreening

What information has high correlation with high risk or low risk behavior?

- Frequency of flying
- Frequent flyer status
- Method of payment
- Advance purchase
- Age
- Travel companion(s)
- ???



Aviation Security and Prescreening

Prescreening is about
information (strategic)
and how it is used to determine
aviation security
operations and procedures (tactical)



The Three I's

Items (threats)

Identity (passengers)

Intent (people)



The Reality

Most passengers pose no threat to the air system

Finding the few threats is akin to finding a few
“needles in a haystack”

Any information that moves passengers into
the *nonthreat* category is of enormous value
and benefit to the air system



Passenger Prescreening

Assumes that past events are predictive of future events

Information	*****
Behavioral	****
Racial	*



Passenger Prescreening

No one type is sufficient on its own

- * Information, Behavioral, Racial

Collectively, they can be used to put a sizeable portion of enplanements (60%-70%, maybe 80%) into the *non-threat* category

- * a single person can account for 200 enplanements per year



Advanced Imaging Technologies

If perfect correlates for risk and intent were available, then they (and all screening procedures) would be superfluous

Using AITs for primary screening creates a *false* sense of security

TSA PreCheck moves the use of AITs closer to the appropriate level



Observations

Strategic vs. tactical breakthroughs

Information prescreening trumps
technological advances

Align passenger risk footprint with security
procedure/technology footprint



Underscreening vs Overscreening

Underscreening: Use lower levels of screening procedures / technologies than the risk may warrant

Overscreening: Use higher levels of screening procedures / technologies than the risk may warrant



Practical Tendencies

Underscreening will tend to occur with medium risk passengers

* Works best in low risk environment

Overscreening will tend to occur with low and medium risk passengers

Rightscreening is the ideal



Underscreening

- May lead to more false clears (negligible)
- May underutilize resources
- + May provide greater flexibility when more security attention is needed
 - *In low risk environments, may provide some deterrence value



Overscreening

- May lead to more false alarms
- May overtaxes resources / limits flexibility
- May divert attention from and obfuscate true risks

Natural tendency is to overscreen (emotional response, lack of information)



Gaming

Decoys

- Low Risk (not a problem)
- High Risk (can lead to underscreening)

Timing

- Follow high risk passengers (similar to decoys)

Trial and Error

- Gains insight into passenger risk



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Thank you

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