



Behavior and Detection

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Presented to:

Awareness and Localization of
Explosives-Related Threats (ALERT)

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Thanks: NSF; ONR/DARPA; DHS.

The Big Picture

- At the core of every terrorist attack:
A PERSON!



- People develop hatreds, then plan & execute attacks

The Big Picture

- It is an immutable fact that any integrated security program must address the human element.



- **Humans are a dynamic threat that requires a dynamic defense**

The GAO report(s) on Behavior Detection

- Argued against behavioral detection
- However, some issues...
 - Failure to comprehend:
 - What SPOT does
 - Ecological validity
 - Full cost of an attack (indirect & direct)
 - Whether one can test easily

What SPOT does not/ does do

- *“it is ridiculous to arrest someone for being nervous in an airport...who isn't nervous to fly?”*
- *E.g., GAO report ‘...SPOT conducted at a distance...’ or ‘officers...should elicit verbal responses...’ and ‘reading facial expressions...to identify suspicious passengers.’*
- Turns out these are only partially true.
- **SPOT involves observation, interview, referral**
- Based on Israeli model...sort of
 - No profiling
 - Lawyer-induced checklist
 - Scale (flights per day)

The GAO report(s) on Behavior Detection

- The issues...

- Failure to comprehend:

- What SPOT does

- **Ecological validity**

- Full cost of an attack (indirect & direct)

- Whether one can test easily

Ecological validity?

- Meta analytic approaches suggest we are not very good at spotting lies
- Most recent/comprehensive meta analysis (*Bond & DePaulo, 2006*) shows that we are typically about 54% accurate
 - (61% accuracy truths, 47% accuracy lies)

Ecological validity?

- Lens-model analysis suggests behavioral clues only weakly related to deception (*Hartwig & Bond, 2011*)
 - *“The common-sense notion that liars betray themselves through body language appears to be little more than a cultural fiction.”* M. Hartwig, **NY Times** March 25, 2014, p. D3

Example: Lab vs. Real world

- We can rank order research data for

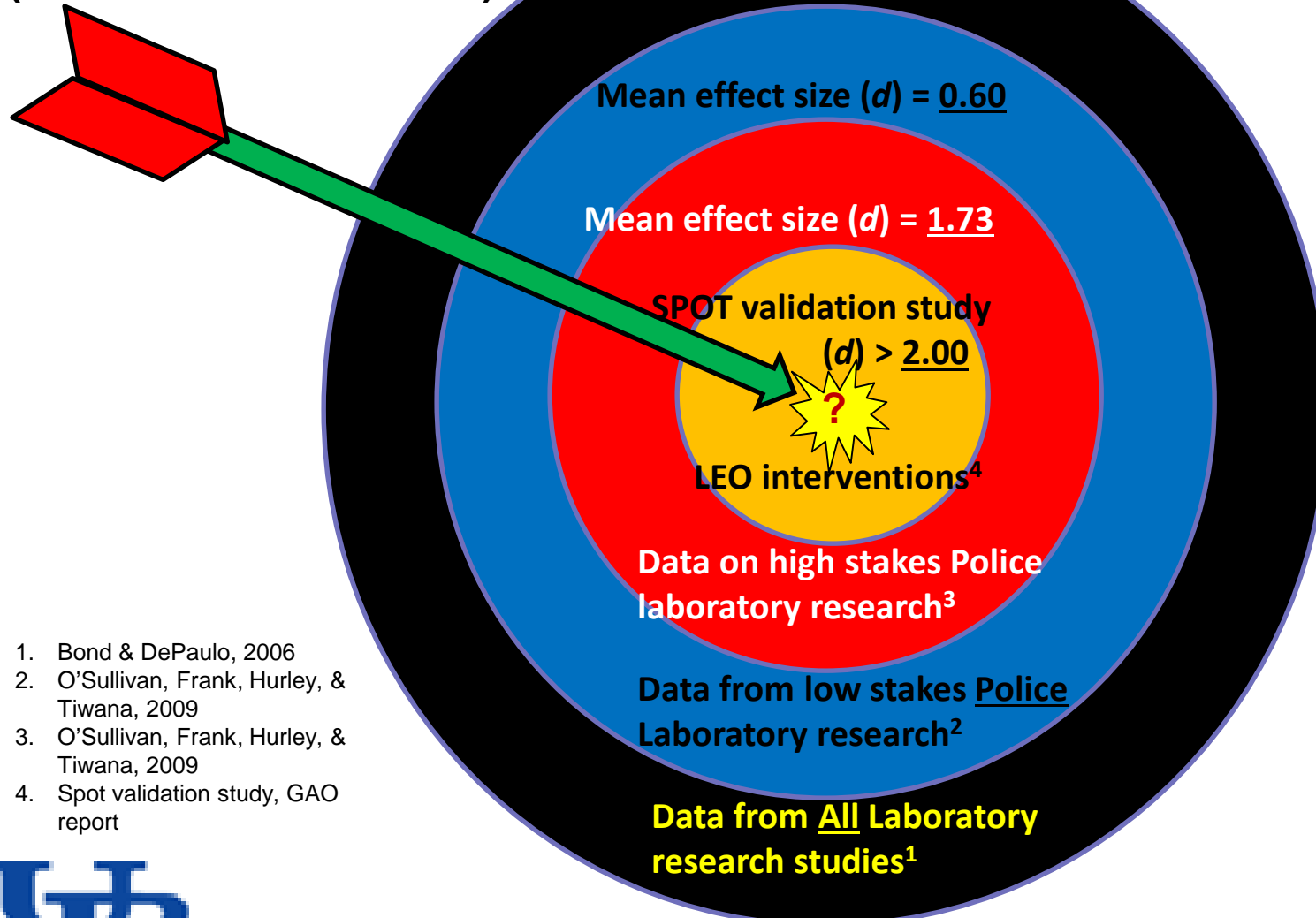
Relevance	Type	Evidence Source
1. Perfect	Actual Terrorists in airports	Doesn't really exist / Small
2. Very Good	Actual Criminals in airports	Validation study / 30k obs.
3. Good	Laboratory subjects: High stakes deception ONLY	Research literature
4. Moderate	Laboratory subjects: All studies on deception detection	Research literature

- Let's examine their utility (effect sizes) as we get zero in on the target - the perfectly relevant data



Research Data Relevant to Terrorism

The unknown
(Actual terrorist attacks)



“DHS’s 2011 validation study compared the effectiveness of SPOT with a random selection of passengers and found that SPOT was between 4 and 52 times more likely to correctly identify a high-risk passenger than random selection, depending on which of the study’s outcome measures was used to define persons knowingly and intentionally trying to defeat the security process.” (GAO report GAO-14-159 p. 30)

1. Bond & DePaulo, 2006
2. O’Sullivan, Frank, Hurley, & Tiwana, 2009
3. O’Sullivan, Frank, Hurley, & Tiwana, 2009
4. Spot validation study, GAO report

Critique of the validation study

■ **PRO:**

- *Real behavior*
- *Real consequences*

■ **CON:**

- *BDO's knew who was random*
- *Random vs untrained officer choices?*

■ **UPSHOT:**

- *Premature to abandon behavioral detection*

The GAO report(s) on Behavior Detection

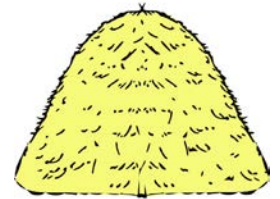
- The issues...

- Failure to comprehend:

- What SPOT does
 - Ecological validity
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Full cost of the event

*The Needle (terrorist) in the Haystack
(everyone else)*



Terrorism is a *rare* event...BUT
Terrorism is a *costly* event

**The cost of Sept 11: Almost 2 trillion
including indirect costs...**

The GAO report(s) on Behavior Detection

■ The issues...

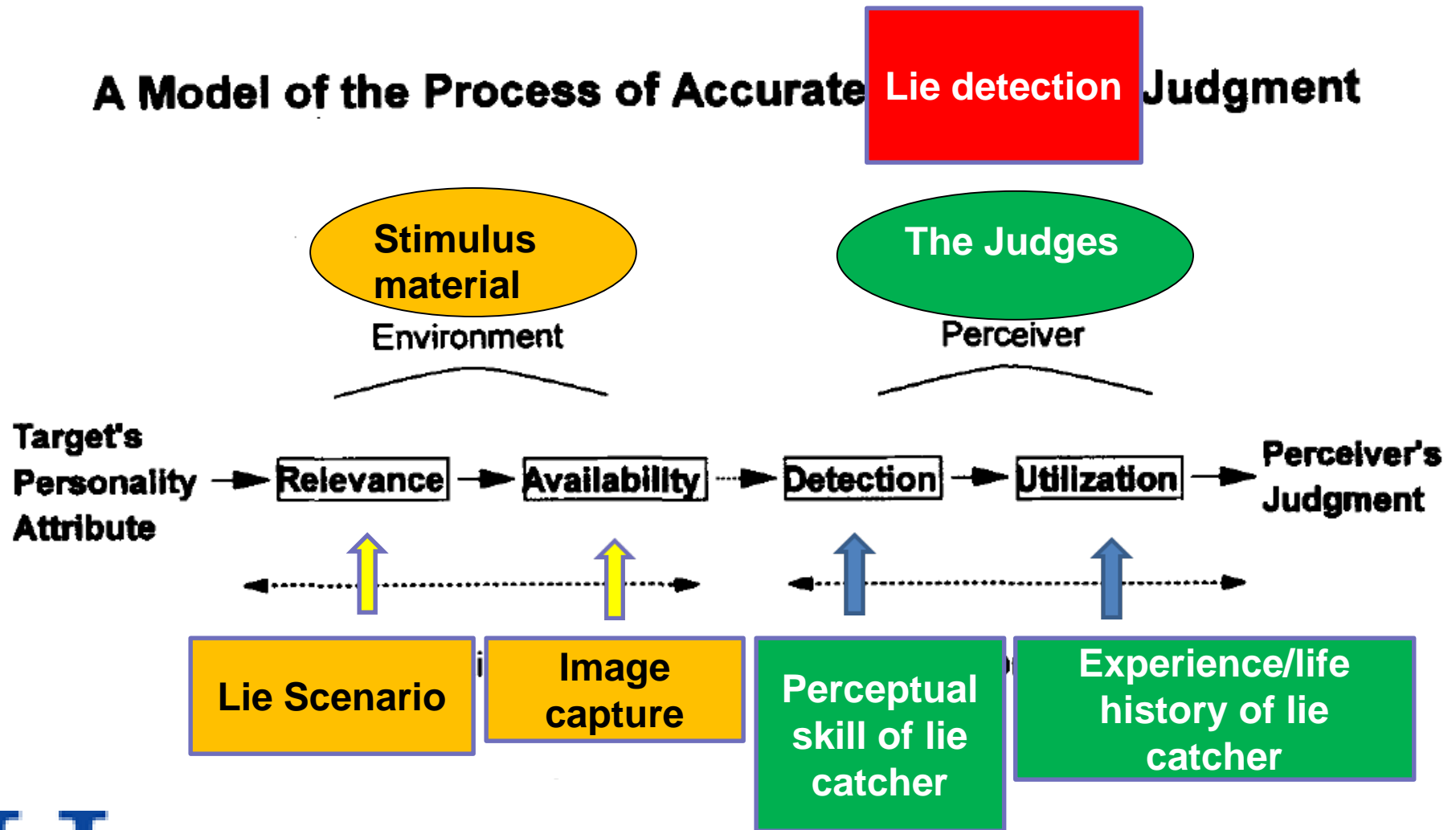
□ Failure to comprehend:

- What SPOT does
- Ecological validity
- Full cost of an attack (indirect & direct)
- **Whether one can test easily**
 - *Lab studies?*

Realistic Accuracy Model (RAM; Funder, 1995)

(borrowed by O'Sullivan, Frank, Hurley, & Tiwana, 2009)

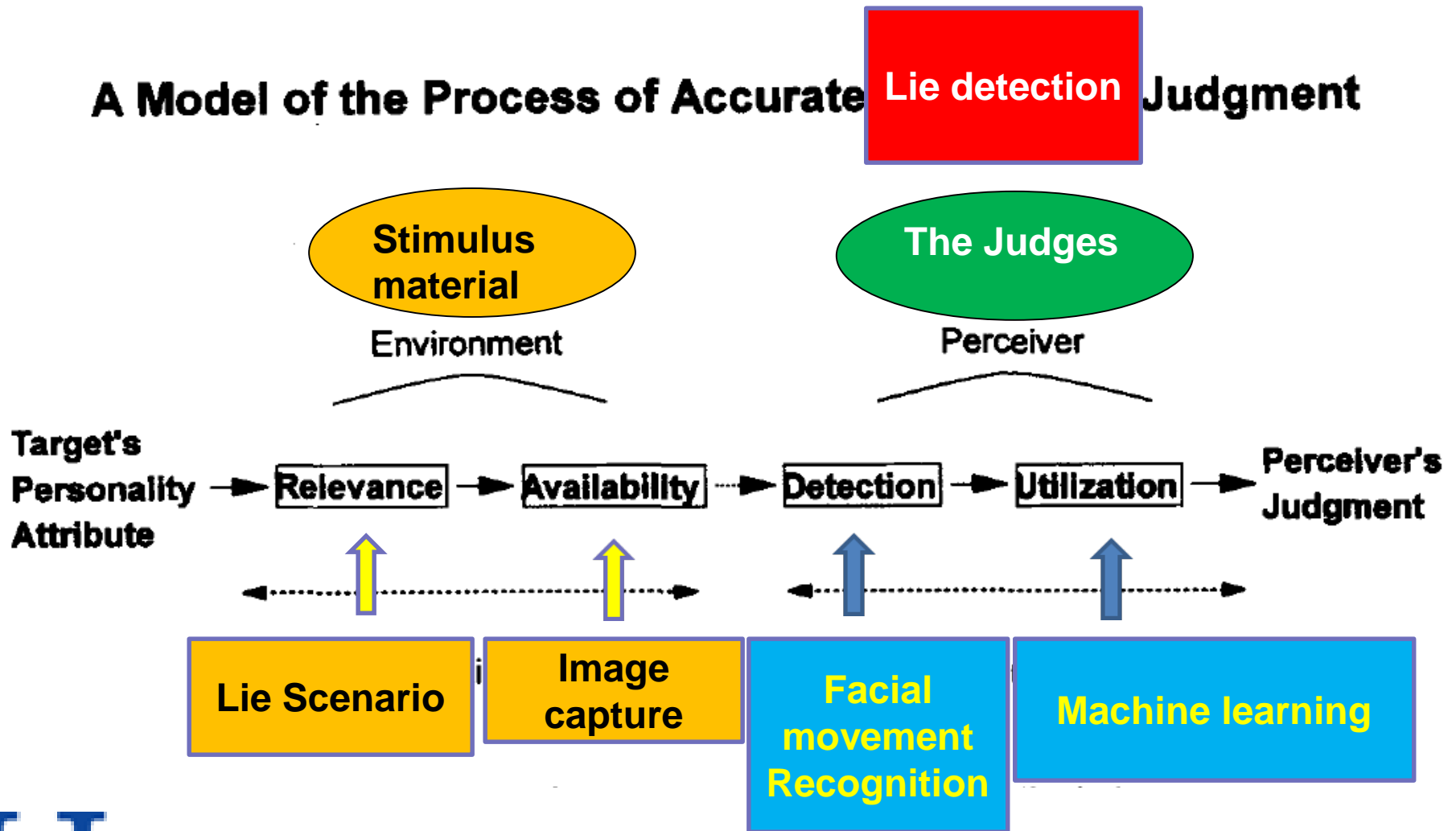
A Model of the Process of Accurate Lie detection Judgment



Realistic Accuracy Model (RAM; Funder, 1995)

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A Model of the Process of Accurate Lie detection Judgment



Ultimate applications?

- Each security layer does not need to be perfect
- The ultimate goal is more **modest** than assumed
 - First : Keep the terrorist away from the airport
 - Second: **If they arrive, make sure techniques put them in secondary screening**
 - A certain number of screens per hour
- *Playing the odds*: What should be the criteria for making judgments?
 - Ethnic? **NO**
 - Random? **Maybe**
 - Behavioral science - **YES!!**
 - IT UNDERPINS ALL ASPECTS OF TERRORISM



Summary & Future Issues

■ Diagnostic behaviors exist

- Universal, not ethnic, not perfect, can be trained
- Fear the human...integrate & improve the technology?
- Costs associated with detection
 - *30-90 seconds interview; better criteria for secondary; scale issues*

■ What constitutes evidence for accuracy?

- Arrest? Tale of the Creeps...
- Only terrorists, and when active? (*verb v noun*)

■ Training vs. selection?

- Training for detection effective
- *Who* are the good people? Find more...
- What about deterrence value? \$\$?



QUESTIONS?

Thank you!

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How much did the September 11 terrorist attack cost America?

Counting the value of lives lost as well as property damage and lost production of goods and services, losses already exceed \$100 billion. Including the loss in stock market wealth – the market's own estimate arising from expectations of lower corporate profits and higher discount rates for economic volatility – the price tag approaches \$2 trillion.

Among the big-ticket items:

The loss of four civilian aircraft valued at \$385 million.

The destruction of major buildings in the World Trade Center with a replacement cost of from \$3 billion to \$4.5 billion.

Damage to a portion of the Pentagon: up to \$1 billion.

Cleanup costs: \$1.3 billion.

Property and infrastructure damage: \$10 billion to \$13 billion.

Federal emergency funds (heightened airport security, sky marshals, government takeover of airport security, retrofitting aircraft with anti-terrorist devices, cost of operations in Afghanistan): \$40 billion.

Direct job losses amounted to 83,000, with \$17 billion in lost wages.

