



# **Screening for Attrition and Performance with Non-Cognitive Measures**

*Presented to:*

**Military Operations Research Society Workshop**

**Working Group 2 (WG2): Retaining Personnel**

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**Lead Researchers: Tonia Heffner, Len White, Robert Kilcullen**

*Presented by:*

**Dr. Michael Rumsey, [michael.rumsey1@us.army.mil](mailto:michael.rumsey1@us.army.mil), 703-602-7763;  
U.S. Army Research Institute for the Behavioral and Social Sciences**

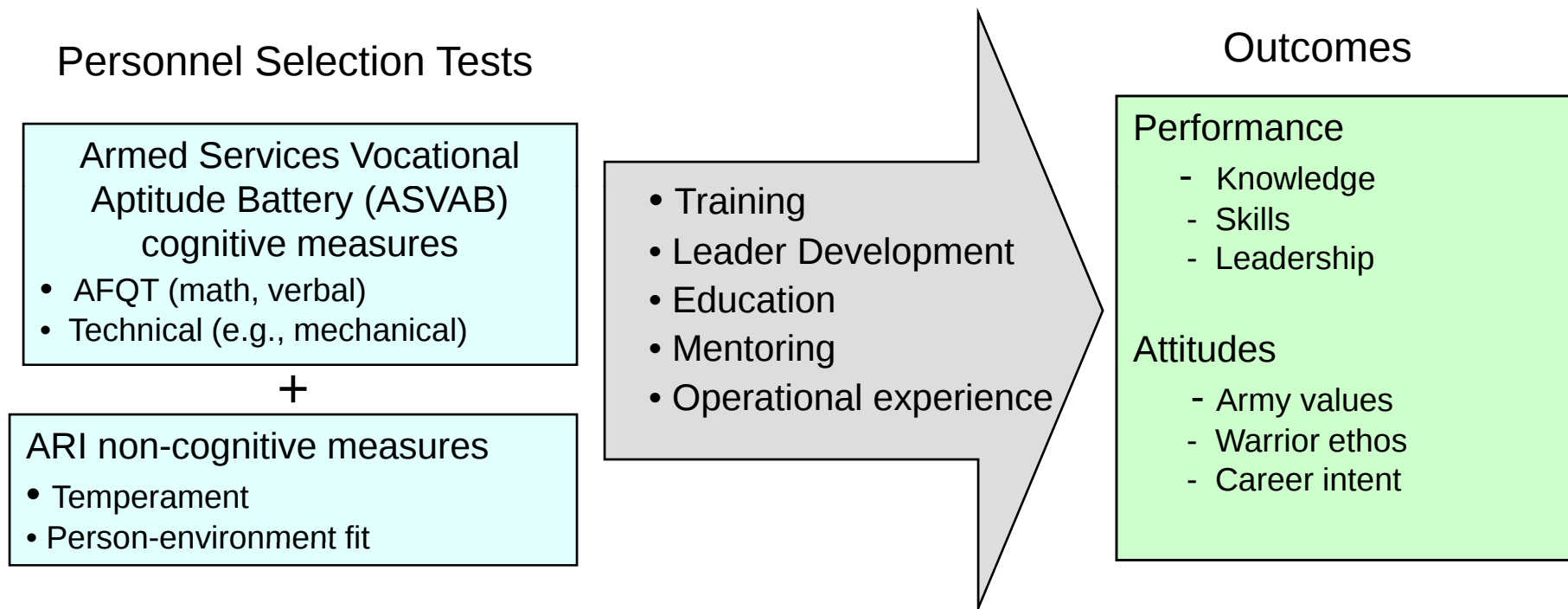
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# ARI Selection and Assignment Research



Goal: Develop and validate non-cognitive measures against performance/attitudinal outcomes to enhance selection and assignment



*Whole-person assessment = cognitive + non-cognitive measures*



# Organization of this Presentation

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- Non-cognitive measures for enlisted Soldiers
  - Tier Two Attrition Screen
  - TAPAS Screen and TOPS program
  - Way ahead
- Non-cognitive measures for officers



# Tier Two Attrition Screen (TTAS)



- Educational Tier 2 (mostly GEDs) enlistments have historically been capped at 10% because Tier 2 have about 50% higher first-term loss rates than Tier 1
- U.S. Army Research Institute developed the Tier Two Attrition Screen (TTAS) to identify Tier 2 with loss rates more similar to Tier 1
- TTAS combines predictors of first-term enlisted attrition for “whole-person” assessment
  - Cognitive: Subtests from Armed Services Vocational Aptitude Battery
  - Motivation: Assessment of Individual Motivation (AIM)
  - Physical : Gender-normed Body Mass Index

**Scores from these measures are combined into a TTAS score**

**Higher TTAS Score = Lower Likelihood of Attrition**



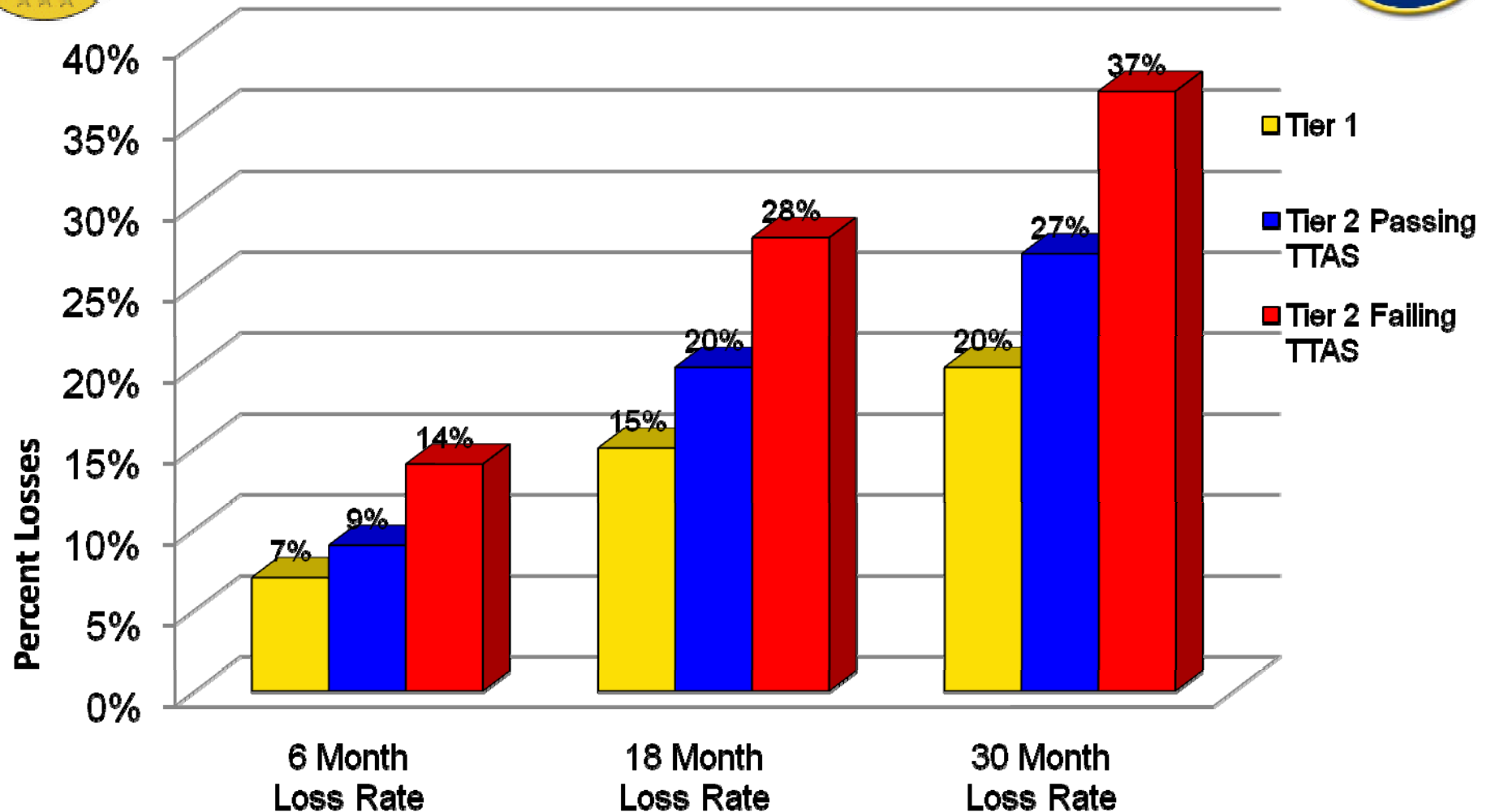
# Assessment of Individual Motivation (AIM)



- 27-item, non-cognitive test for measuring Dependability, Adjustment, Physical Conditioning, Leadership, Work Orientation, and Agreeableness
  - Special Army test at MEPCOM; 25 minutes
- 2 responses made for each 4-statement item: behaviors/preferences most and least like respondent
- Predicts attrition and “will do,” motivational aspects of performance (e.g., indiscipline, job effort)
- Scale scores have a low correlation with minority group status and gender



## How comparable are loss rates for Tier 2 passing TTAS and loss rates for Tier 1?



*Note:* Sample sizes, from left to right, are:

6-Month – 166055, 25325, 21524; 18-Month – 114272, 17445, 15146; 30-Month – 68010, 9552, 8353



## Way Ahead: Tier 2 Screening



- Computerized AIM Implementation on the ASVAB platform at all MEPS
  - Added mode will make it easier to accomplish AIM testing
- Improve TTAS Prediction of Attrition and Performance
  - Close gap between loss rates of Tier 2 passing TTAS and Tier 1
  - FY10 testing of Tier 2 applicants on Tailored Adaptive Personality Assessment System (TAPAS) and AIM and follow-up analyses of prediction of attrition and performance



# TAPAS: Tailored Adaptive Personality Assessment System



- 15 dimensions including:
  - Achievement
  - Non-delinquency
  - Even-tempered
  - Intellectual efficiency
  - Optimism
  - Physical conditioning
  - Attention seeking
- Computer-adaptive test delivered on the CAT-ASVAB platform at MEPS
- Paired forced-choice self-descriptors
- TAPAS provides two scores for each applicant
  - “Can do” predicts AIT grades, training graduation rates, job knowledge
  - “Will do” predicts APFT scores, job effort, indiscipline rate, attrition
- Females score slightly higher than males
- Blacks and Hispanics score slightly higher than Whites



**TAPAS**

*Which of these statements is most like you?*

- I like roller coasters.
- I enjoy parties.

Note: Forced choice measures provide no obvious best/worst answer options.



# AIM and TAPAS Constructs



## AIM CONSTRUCTS

Dependability

Adjustment

Physical Conditioning

Leadership

Work Orientation

Agreeableness



## TAPAS CONSTRUCTS

Non-delinquency

Optimism

Physical Conditioning

Dominance

Achievement

Even Tempered

Generosity

Excitement Seeking

Intellectual Efficiency

Orderliness

Tolerance

Cooperation

Sociability

TAPAS assesses  
these unique  
constructs



# Research Approach: Validating TAPAS



- Administered non-cognitive selection measures (TAPAS) to enlisted Soldiers from all components at Reception BNs (approx 11K in 2007)
- Tracked Soldiers to completion of AIT/OSUT
- Collected outcome data in Initial Entry Training (IET)
  - Attrition (RA only), AIT course grades (subset of MOS), graduation rates
  - For 6 targeted MOS (11B, 19K, 31B, 63B, 68W, 88M):
    - ⇒ Job knowledge test
    - ⇒ Self-report: APFT scores; Disciplinary rates; Career intent
    - ⇒ Job performance ratings from drill sergeants and peers
- Continuing to track through first term of enlistment

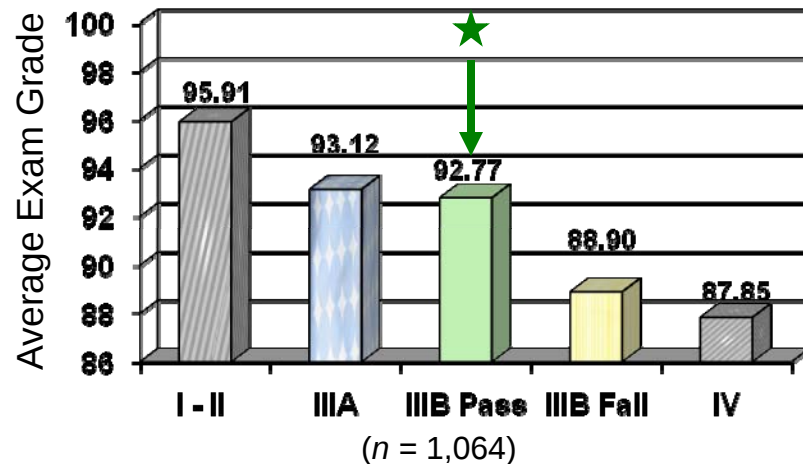


# TAPAS Related to Training Outcomes in Research Setting

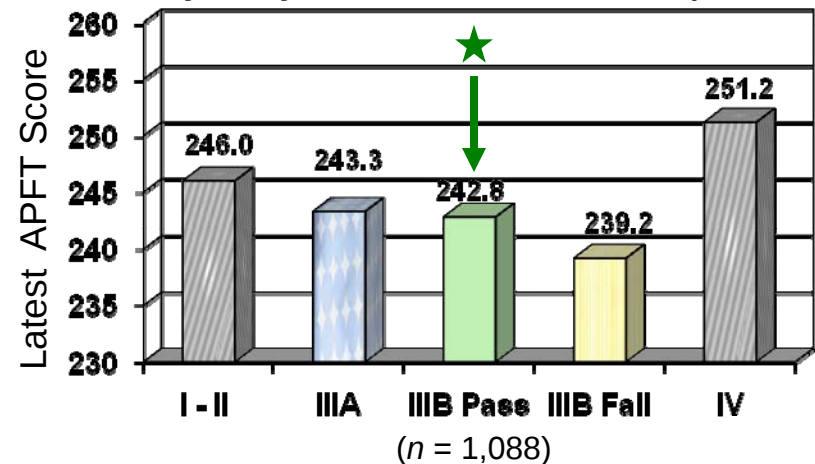


Tier 1 NPS CAT IIIB Soldiers passing TAPAS screen perform similar to or better than Soldiers in Higher AFQT Categories

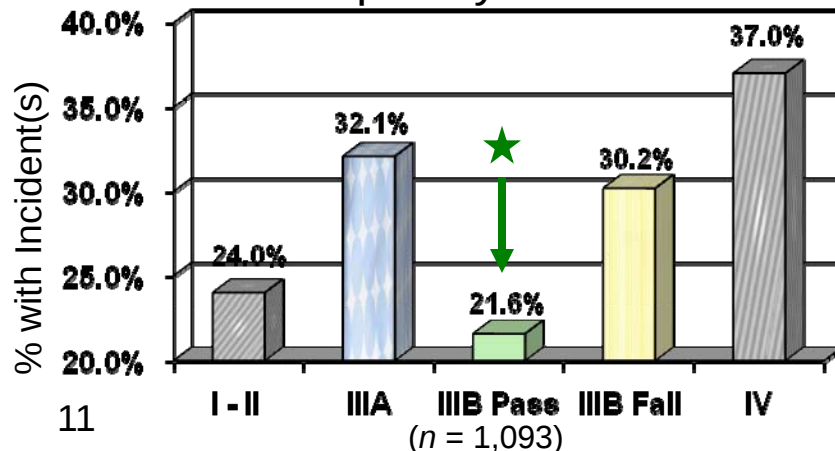
AIT Exam Grades



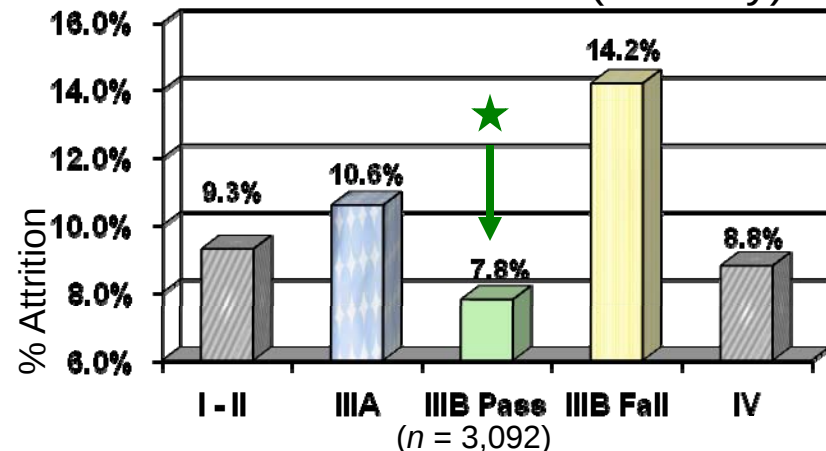
Army Physical Fitness Test (APFT)



Disciplinary Incidents



6-Month Attrition (RA only)



Outcome Data Collection: Oct07 - May08



# IOT&E: Tier 1 Performance Screen (TOPS)



## Testing and Screening Process

- Administer TAPAS in MEPS to Army and Air Force applicants; phased in May-Aug 09
  - All Tier 1 (high school diploma graduates) NPS applicants
    - Exception: CAT I-III B applicants arriving at MEPS with valid ASVAB score
  - All Tier 2 (non high school diploma graduates) NPS applicants starting Mar 10
- Use TAPAS to screen out a small number of low motivated CAT IV Army applicants (no screening for Air Force)
- Screen at the 10<sup>th</sup> percentile; ~ bottom 13% are ineligible

IOT&E concept endorsed by Secretary of the Army, 6 Jan 09

Implementation plan approved by Army G-1, 11 Mar 09

Supported by CG, USAAC, 24 Mar 09

Implementation memo signed by DMPM, 3 Apr 09



# IOT&E: Tier 1 Performance Screen (TOPS)



## Testing and Evaluation Process

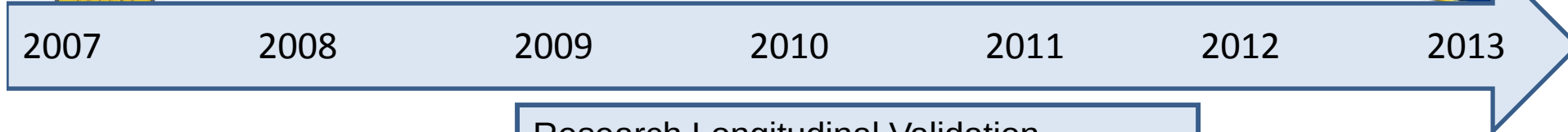
- Administer TAPAS in 7 MEPS (began 4 May 09)
  - All Tier 1 (high school diploma graduates) NPS applicants
    - Exception: CAT I-IIIB Soldiers arriving at MEPS with valid ASVAB score
  - Phased implementation of TAPAS testing will have reached all MEPS by 17 July
- Track Soldiers to completion of Initial Entry Training (IET) and evaluate performance outcomes across AFQT categories
  - Attrition (AC only), AIT grades (as available), graduation rates
  - For 8 targeted MOS (11B, 19K, 25U, 31B, 42A, 63B, 68W, 88M):
    - ⇒ Job knowledge test
    - ⇒ Self report: APFT scores; disciplinary rates; career intent
    - ⇒ Job performance ratings from drill sergeants
- Review at 6 month intervals for evaluation/modification

IOT&E concept endorsed by Secretary of the Army, 6 Jan 09



## Way Ahead:

# Non-cognitive Measures for Enlisted Personnel

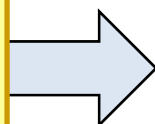


### Research Longitudinal Validation

- Track Soldiers; assess at 18 and 36 m. TIS
- Validate non-cognitive measures for selection against first term performance

### Research Training Validation

- Identified/administered non-cognitive measures to new Soldiers in a research setting
- Validated non-cognitive measures for training criteria
- Validated TAPAS as potential screening tool

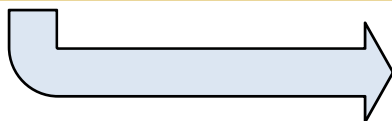


### In-service Validation

- Validate TAPAS to select NCOs for special assignments (recruiter, drill sergeant)

### Classification Validation

- Validate non-cognitives for MOS classification



### Tier One Performance Screen (TOPS) Longitudinal Evaluation

- Administer TAPAS at MEPS
- Track Soldiers; Assess at end of training, 18 m., and 36 m. TIS
- Validate operational TAPAS for selection against first term performance

Completed Research

Research evaluation

Operational evaluation

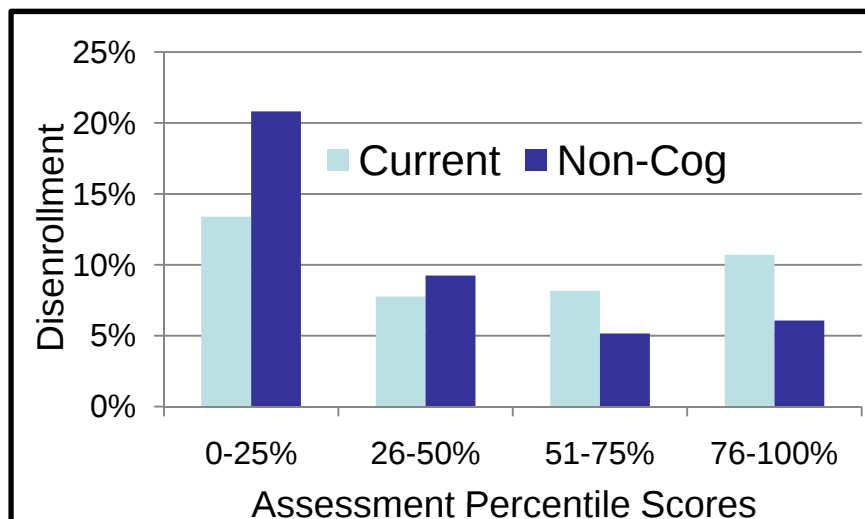


# ARI Research: Non-cognitive Measures for Officers

Research goal: Develop/refine and validate non-cognitive measures to predict attitudinal and performance outcomes: Career continuance, Junior officer performance, and Senior leader potential.

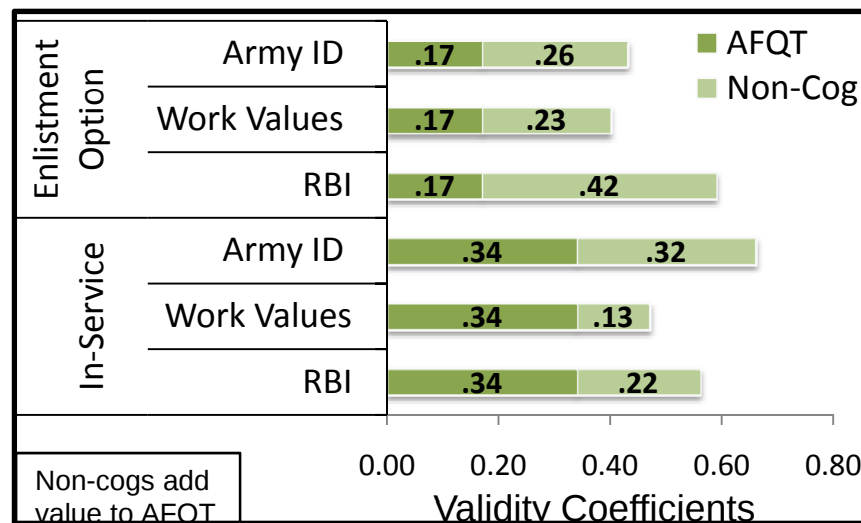
Initial research findings: *ARI non-cognitive measures increase prediction of ROTC continuation and OCS career intentions, beyond traditional screening measures.*

## Predictors of ROTC Continuation



Current System: Overall Whole Person Score  
Non-Cog Measure: Cadet Background Evaluation Form

## Predictors of Career Intentions in OCS



Army ID: Strength, ability and depth of Army identification  
Work Values: Work-related desires and priorities  
RBI (Rational Biodata Inventory): Job-related temperaments



# Way Ahead: Non-cognitive Measures for Officer Screening

2009

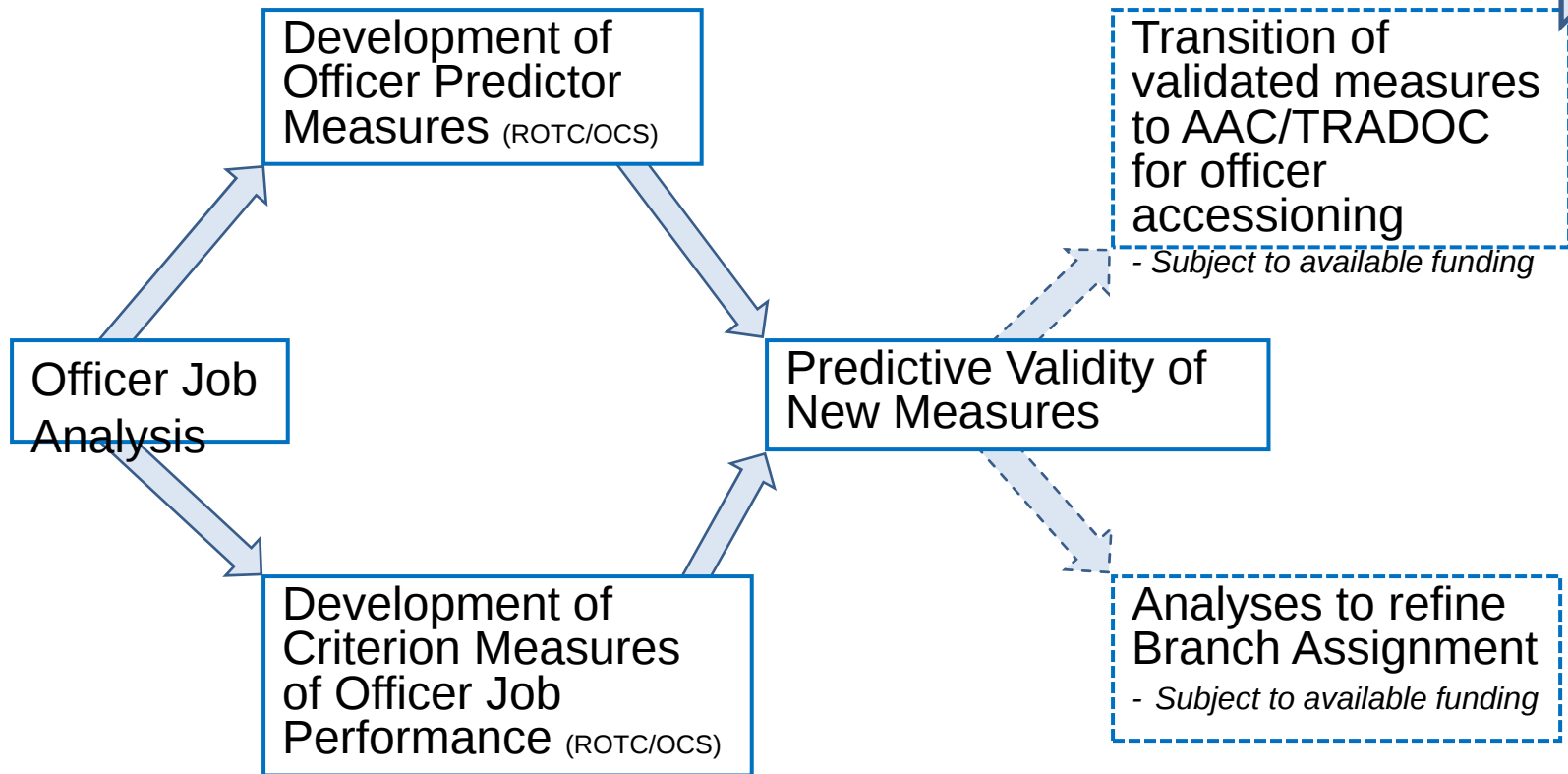
2010

2011

2012

2013

2014



## *Final Products*

- *Specification of officer performance requirements across rank & branch*
- *Validated tests for officer candidate selection and branch assignment*