Caveon Webinar Series:

Key Security Lessons Learned at ATP’s “Innovations in Testing” 2013

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February 21, 2013
Upcoming Caveon Events

• National Council on Measurement in Education Conference, San Francisco, April 26-30

• United States Distance Education Association Conference, St. Louis, April 28 - May 1

• National Conference on Student Assessment, National Harbor, June 19-21
Caveon Online

• Caveon Security Insights Blog
  – http://www.caveon.com/blog/

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Agenda for today

- ATP Test Security Committee & Live Lab
- Truth & Consequences, Conducting Effective Test Security Investigations
- The Handbook of Test Security
- Data Forensics, Opening the Black Box
- The Game’s Afoot: Sleuths Match Wits
- Tell it to the Judge, Winning with Data Forensics Evidence in Court
- Balancing Test Security and Accessibility
But, before we get started…

Caveon is proud to announce we are celebrating 10 years in business in 2013!
Security Committee Briefing & Live Lab

Goals for the Year

• Security Survey
• Test Security Options
• Enforcement
• Candidate Rights and Responsibilities
• Newsletters
• Live Lab
Survey Activities

Activities Completed

- Three surveys designed by the ATPSC
- Survey review and feedback provided by the Institute for Credentialing Excellence (ICE)
- Survey Distributed, 117 respondents
  - 79 Certification/Licensure
  - 16 Education
  - 22 Vendor
- Initial analysis complete
Sneak Peak at the Data Trends

General Information

- Wider variety of respondents for 2012 survey
- Increased focus on security by all respondent organizations
- Large percentage of “Don’t Know” responses
Sneak Peak at the Data Trends (Cont.)

• Larger percentage of respondents with formal, *internal* security plans

• Significant gap in formal, *external* security processes

• Lack of standardization implementation

• Few audits
Additional ATPSC Activities

- Security Options Document
- DMCA Takedown Effort
- Candidate Rights and Responsibilities
Additional ATPSC Activities (Cont.)

Security Options Document
• Assessment Models
• Delivery Channels

Currently available at
www.testpublishers.org
Additional ATPSC Activities (Cont.)

DMCA Takedown Effort

• 6 ISP’s were Identified hosting 17 Infringing Websites
  – One ISP – all websites removed
  – Approximately 30% of the websites no longer exist and affiliate websites were also removed

Candidate Rights and Responsibilities

• 8 organizations participated
• Available May 2013
Truth & Consequences: Conducting Effective Test Security Investigations

Benjamin Mannes, CPP, SSI, CHS-III
Director, Test Security
American Board of Internal Medicine

Marc J. Weinstein, Esq.
Partner
Dillworth Paxson, LLP
Truth & Consequences: Conducting Effective Test Security Investigations (Cont.)

• The Proliferation of Risk

• Core Elements of Exam Integrity
  – Protect
  – Investigate
  – Enforce
Truth & Consequences: Conducting Effective Test Security Investigations (Cont.)

Identification and Vetting
- Strong web presence
- Ongoing review and analysis
- Vetting

Analyze
- Collusion
- Sharing
- Inappropriate Study Techniques
- Violations
- Proxy
Truth & Consequences: Conducting Effective Test Security Investigations (Cont.)

Investigation

- Gather
- Preserve
Truth & Consequences: Conducting Effective Test Security Investigations (Cont.)

Field Interviews

- Purpose
- Participants
- Nonverbal communication
Truth & Consequences:
Conducting Effective Test Security Investigations (Cont.)

Enforcement

• Options
• Organizational Goals
• Policy/Procedures, Laws/Regulations
• Civil versus Criminal

Join the conversation at:
@ExamIntegrity on twitter
LinkedIn Group: “Exam Integrity”
HANDBOOK OF TEST SECURITY

- Editors - James Wollack & John Fremer
- Participating Authors – Deborah Harris, William Hatherill, David Foster
- Slated for Publication – March 2013
- Preventing, Detecting, and Investigating Cheating
- Testing in Many Domains
  - Certification/Licensure
  - Clinical
  - Educational
  - Industrial/Organizational
HANDBOOK – PRIMARY AIMS

• Insights of Psychometricians and Policy-Makers
• Best Practices for Designing Secure Tests
• Analysis of Security Vulnerabilities
• Practical Strategies for Cheating Prevention and Detection
• Lessons Learned
  – Actual security violations
  – Security initiatives
HANDBOOK – FIVE TAKEAWAYS

• Security Vulnerabilities for All Genres of Testing
• Critical Importance of Security Planning
• Practical and Proven Prevention & Detection Strategies
• How Security Breaches Have Been Dealt With
• Lessons We Have Learned From Past Instances of Testing Misbehavior
HANDBOOK – FIVE PREDICTIONS

• In Many High Stakes Testing Programs
  – Cheating detection statistical analyses will be performed routinely
  – Computer-based testing will increasingly become the norm
  – Technology developments will be critically important to test security
  – Internationalization of testing programs will increase
  – “Test Security Manager” will become a recognized and valued position
DATA FORENSICS, OPENING THE BLACK BOX

- John Fremer
- Neal Kingston
- James Wollack
- Dennis Maynes
DATA FORENSICS,
OPENING THE BLACK BOX (cont.)

• Features of “Mature” Forensics Approaches
  – Explicit standards
  – One or more associations
  – Formal training programs
  – Regular conferences
  – One or more journals
  – Body of published literature
  – Regular positions in many agencies and companies
DATA FORENSICS, OPENING THE BLACK BOX (cont.)

• Useful Statistics
  – Similarity – Unusual number of same answers
  – Aberrance – Answering hard questions correctly while missing easy ones
  – Gains (or drops) Atypical score changes over time
  – Erasures – Unusual patterns such as almost always wrong to right
  – Fast Responding – Much faster than others – superhuman?
  – Shared Information – Biometrics or personal information – Email or home addresses, photos, etc.
THE GAME’S AFOOT: SLEUTHS MATCH WITS

- Kim Brunnert – Elsevier
- Joy Matthews-Lopez and Paul Jones – National Association of Boards of Pharmacy
- Lawrence Rudner – Graduate Management Admissions Council
- Dennis Maynes – Caveon Test Security
THE GAME’S AFOOT (cont.)

• Overview of Problem
• In 2010, a test preparation course
  – Harvested items
  – Imputed a key
  – Distributed the content and key
• Test Program Manager Reviewed Score Results
• Many Scores at 95 %
THE GAME’S AFOOT (cont.)

- Live Data Set
- Three Teams
- Illustration of Problem
  - 32 identical tests with a score of 95%
  - Probability of occurrence = 1 in 4 trillion
- 100 Item Test
- 387 Test Takers
• Similarities of Team Approaches
  – Examination of test scores and histograms
  – Estimation of imputed key
  – Inspection of item performance
  – Filtering and splitting of test takers and items

• Differences among Team Approaches
  – Types of classification rules and models
  – Degree of confidence in the number of test takers involved
  – Use of IRT models –may not apply when disclosed test content involved
THE GAME’S AFOOT (cont.)

• Summary of Project
  – Optimal solution is not obvious
  – Several models can and were used
  – Problem is harder
    • Only some items and keys are compromised
    • Imputed answer keys are the actual keys
  – More research is needed
    • Detection of imputed answer keys
    • Bayes classifiers (need probability models given disclosure)
  – Harvesting and disclosure one of most damaging security breaches
TELL IT TO THE JUDGE
Winning With Data Forensics Evidence in Court

• Aimee Hobby Rhodes, JD
• James Wollack, Ph.D.
• Rachel Schoenig, JD
• Jennifer Ancona Semko, JD
• Steve Addicott
TELL IT TO THE JUDGE (cont.)

• Global Financial Certification Program
• Newly Using Data Forensics
• Strange Results Observed
• Test Program Manager Investigates
• Ethics Board Votes to “De-certify”
• Candidate Takes Case to Court
TELL IT TO THE JUDGE (cont.)

1. Use an Expert who is truly an Expert
2. Use a Trusted and Tried Methodology
3. Report Fairly
4. Set Up Procedures Properly
5. Be Objective
6. Be Reasonable in What You are Concluding
TELL IT TO THE JUDGE (cont.)

7. Use Your Expert as a Teacher – Explaining what was done and Why the Evidence is Compelling
8. Ensure that your Expert has all the Facts
9. Take into Consideration all Reasonably Available Evidence
10. Apply the Terms of your Candidate Agreement Reasonably and in Good Faith
Balancing Security and Accessibility

Sheryl Lazarus
Martha Thurlow
National Center on Educational Outcomes (NCEO)
University of Minnesota
Accessibility Issues

- Paper-Based
- Computer-Based

Students can unintentionally be denied meaningful access to examinations.
Balancing Test Security and Accessibility (Cont.)

Typical Accommodation Options

• Test Administrator Access
• Visual Cues
• Teacher Highlighting
• Accessibility Software
Balancing Test Security and Accessibility (Cont.)

Best Practices

• Test Security Guidelines Addressing Accommodations
• Test Security Agreements Addressing Accommodations
• Consideration of Student IEP, 504, or LEP
• Security Training
• Protocols for Access to Testing Materials
• Protocols for Distribution of Testing Materials
Balancing Test Security and Accessibility (Cont.)

References

Standards for Educational and Psychological Testing
(APA/AERA/NCME, 1999)

Testing and Data Integrity in the Assessment of Student Achievement (NCME) – Draft document

Operational Best Practices for Statewide Large-Scale Assessment Programs (ATP/CCSSO, 2010)
RESOURCES

- CCSSO/ATP – Operational Best Practices
- ATP Security Committee
- Caveon Test Security
  - Blog
  - Webinars
- (Just released) NCME Guidelines
- (Just released) TILSA Guidebook for State Assessment Directors on Data Forensics
CAVEON’S 10 YEAR ANNIVERSARY VIDEO
Take a look and celebrate with us!

http://lnkd.in/XFBKR7
THANK YOU!

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