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Maximizing Organizational Performance Through Assessment-Based Selection Decisions

THE IMPACT OF EMERGING TECHNOLOGIES
(SELECTION INNOVATION)

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Based on

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- ▶ [in J. L. Farr, & N. T. Tippins (Eds), Handbook of Employee Selection, Revised Edition]

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Dennis Doverspike, Ph.D., ABPP, is a Full Professor of Psychology at the University of Akron, Senior Fellow of the Institute for Life-Span Development and Gerontology, and Director of the Center for Organizational Research. He is certified as a specialist in Industrial-Organizational Psychology and in Organizational and Business Consulting by the American Board of Professional Psychology (ABPP) and is a licensed psychologist in the State of Ohio. Dr. Doverspike has over 30 years of experience working with consulting. Services provided include individual assessments, statistical analysis, development of large scale assessment systems, job evaluation and job analysis, and expert witness services. He is the author of 2 books, 16 book chapters, over 150 other professional publications, and over 100 conference presentations.



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Winfred Arthur

Winfred Arthur, Jr., Ph.D., is a full professor of psychology and management at Texas A&M University. He is a fellow of the Society for Industrial and Organizational Psychology, the Association of Psychological Science, and the American Psychological Association. He is an Associate Editor of Human Performance, and a past Associate Editor of Journal of Applied Psychology. Winfred currently serves on the editorial boards of Journal of Applied Psychology, Personnel Psychology, and Industrial and Organizational Psychology: Perspectives on Science and Practice. He has been active in human resource consulting since 1984 and has been the principal of Winfred Arthur, Jr. Consulting since 1989. He has published extensively in the areas of personnel psychology, selection, testing, and individual and team training.



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Matt O'Connell

Matthew O'Connell, Ph.D. is co-founder and executive vice president of Select International, and from 1993 through 2013 he served as the director of research and development there, overseeing the design of selection and assessment systems that are used by almost a thousand organizations worldwide. He is also executive director at GetAbby, an artificial intelligence-based, virtual private assistant platform that provides customized solutions to a wide range of organizations.

Matt is active in applied research, is a frequent presenter at professional conferences, and is the author or co-author of more than 200 articles or book chapters on selection and assessment, safety, and leadership. He is a fellow of the Society for Industrial and Organizational Psychology.



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Ted Kinney

Ted is the Director of Research and Development for Select International. An Industrial/Organizational psychologist, Dr. Kinney leads a team of selection experts and developers in the creation and on-going research into the most efficient and effective selection methodologies and tools. He is a trusted advisor to many international companies across all industries. He has particular expertise in behavioral interviewing, turnover reduction, effective selection strategy, and executive assessment.

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Hot topics

- ▶ Games
- ▶ Facebook
- ▶ Big Data
- ▶ Algorithms

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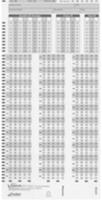
SIOP Top 10 Workplace Trends for 2015

4. Increasing Implications of Technology for How Work is Performed
2. Continued Use of HR Analytics and Big Data
1. Mobile Assessments

Fear of Technology

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- ▶ Opscan Sheets
- ▶ Fear of computers
- ▶ Unproctored testing
- ▶ Cannot use a smartphone

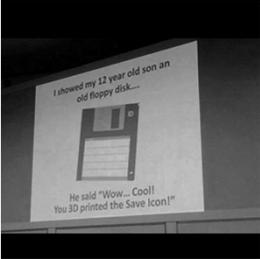


Introductions

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- ▶ Quick survey . . . person with the:
 - ▶ Largest number of devices
 - ▶ Oldest device

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Unproctored Internet-Based Testing

Other Terms:

- ▶ Technology Enhanced Assessment (TEA)
- ▶ Remotely Delivered Assessments (RDA)
- ▶ How many of you are using some type of unproctored internet-based testing?

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Unproctored Testing

- ▶ Has always been unproctored testing
- ▶ As old as school itself
 - ▶ Take-Home Tests
- ▶ Clinical days – gave them MMPI to take home
- ▶ Old days of individual assessment
 - ▶ Pay graduate student in that city to proctor assessment
 - ▶ Send assessment and let them take it unproctored

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Advantages

- ▶ Greater yield – make it easier for people to take your test and apply for your jobs
- ▶ More qualified applicants

Review of the Research

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- ▶ Unproctored Internet-Based Testing (UIT) research has shown no practical differences with regard to psychometric properties, construct validity, or candidate reactions especially if steps are taken to mitigate cheating on cognitive tests
 - ▶ It is no longer a question of should we do it, but how should we do it — legally, ethically, and practically speaking

UIT Lead to Mobile Device Testing

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- ▶ With UIT comes the potential for the use of mobile devices as a medium for assessment completion
- ▶ Like UIT, use seems to be here to stay?
- ▶ SIOP's #1 workplace trend for 2015 was Mobile Assessments
http://www.siop.org/siop_newsbriefs/2015/january/january/

MOBILEGEDDON

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Interesting Facts

- ▶ 75% of people have Smartphones
- ▶ Ages 13-44: 85% have Smartphones
- ▶ 11% of users would be unhappy without smartphones AND among top users – 21% are on phones nearly all the time including while at dinner with others
- ▶ Some tests – 90% of applicants use smartphones



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Mobile Device Comparison



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Review of the Research

- ▶ **Question . . .** Does the scientific empirical literature currently support this use; is the increasing use aligned with what we know from the extant lit?
 - ▶ Who is using mobile devices?
 - ▶ Measurement equivalence across mobile and non-mobile devices?
 - ▶ Mean differences?
 - ▶ adverse impact implications?
 - ▶ Device-type differential validity?
 - ▶ Applicant/test taker reactions and preferences?

Review of the Research

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- ▶ What is a "mobile device" (vs. a non-mobile device)?
- ▶ "Mobile" would imply/suggest untethered from the wall in terms of internet access → wireless
- ▶ However, probably best conceptualized/framed in terms of:
 - ▶ Screen size
 - ▶ resolution?
 - ▶ Interface (response)
 - ▶ finger swipes; voice
 - ▶ Permissibility (degrees of freedom in terms of locations where it can be used)

Review of the Research

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- ▶ Places devices on a continuum on the focal variables of interest



- ▶ Permits the integration of new technologies into the framework as they emerge
 - ▶ Wearable technologies
 - ▶ Google glasses
 - ▶ Watches

Summary of Research and Conclusions

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- ▶ Research primarily from SIOP conference presentations; only 3 published peer-reviewed articles
- ▶ Mostly operational data characterized by very large samples
- ▶ AA, Hispanics, women → higher mobile device usage
 - ▶ Generally aligned with smartphone ownership data
- ▶ Mixed age usage results/data

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Summary of Research and Conclusions

- ▶ Most studies → non-cognitive constructs
 - ▶ Only 2 presented data on prototypical cognitive ability constructs
- ▶ Wide range of test types/methods
 - ▶ self-report Likert items
 - ▶ biodata
 - ▶ Situational Judgment Test (SJT)
 - ▶ multiple-choice
 - ▶ multimedia/simulation (one study)
- ▶ No concerns about measurement equivalency → both cognitive and non-cognitive constructs
- ▶ No mean differences on non-cognitive constructs

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Summary of Research and Conclusions

- ▶ Cognitive constructs → limited research but indicative of substantial differences
- ▶ Cognitive differences may be reduced by app-based designs but does not eliminate

desktops ↔ laptops ↔ tablets ↔ phablets ↔ smartphones

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Summary of Research and Conclusions

- ▶ **Very** limited data but mobile device effect seems to be a main effect; does not interact with demography
 - ▶ Does not result in larger subgroup differences
 - ▶ Paradoxically appears to make them smaller (see Arthur, Edwards, and Barrett [2002] and Edwards and Arthur [2007]'s findings for similar results for constructed-response tests)
 - ▶ **However**, will likely exacerbate subgroup differences if historically lower performing demographic groups have a disproportionately and substantially higher representation in mobile device usage for assessment

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Summary of Research and Conclusions

- ▶ Criterion-related and differential validity
 - ▶ No research data (in progress)
 - ▶ Little theoretical or conceptual basis to expect differences
 - ▶ Similar if not identical measure intercorrelations

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Summary of Research and Conclusions

- ▶ Test taker reactions
 - ▶ Substantially lower preferences for and less favorable reactions to mobile devices
 - ▶ No advantages or positives over non-mobile devices

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Questions? Comments?



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Gamification, Enhanced Item Types, and Games

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Game-Thinking

- ▶ Gamification and serious games
- ▶ Gamification - the application of game mechanics, elements, and features to non-game environments.

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Gamification

- ▶ Joe beat John's score on the IQ test
- ▶ 5th highest score – Try Again
- ▶ Colors (Think Candy Crush)
- ▶ Songs
- ▶ Points
- ▶ Discussion
 - ▶ I answered Q1 "B" – how did you answer
 - ▶ The "correct" answer is wrong, I think, here is why
- ▶ Avatars and build into other activities



Gamification

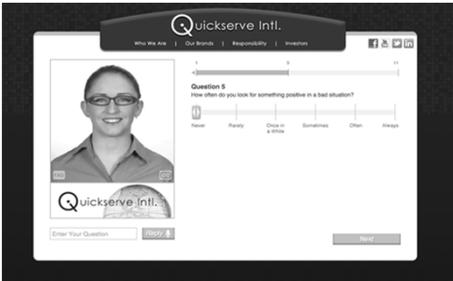
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- ▶ Some traditional activities (e.g., assessments, surveys) in organizations are built leveraging technology that is not particularly eye-catching or engaging, whereas games are designed to be fun.
- ▶ Basic concept of gamification - apply the elements that make games interesting to non-games



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Gamification Leads To (The Theory)

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- ▶ In theory, largely untested, gamification leads to (very little research on gamification in general):
- ▶ Motivation
- ▶ Engagement
- ▶ Perseverance
- ▶ Branding

Gamification

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- ▶ Also can lead to branding
- ▶ Can be important in public sector



Games

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Games and Serious Games

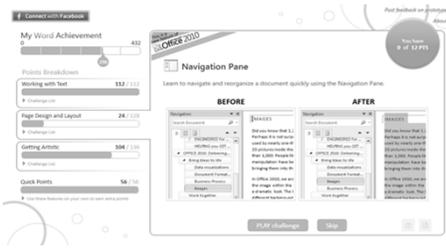
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- ▶ Type of simulation
- ▶ Game - engaging activity with:
 - ▶ Rules
 - ▶ Starting points and ending points
 - ▶ Game play sections
 - ▶ Winning a possibility
 - ▶ Participants know it is a game
 - ▶ Structure or content
- ▶ Serious Games
 - ▶ Use for non-trivial purposes, selection or training game

Microsoft Word Training - copyright

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Games

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- ▶ Type of simulation
- ▶ Deeper, richer performance
- ▶ Use of big data
- ▶ Substantial cost and time

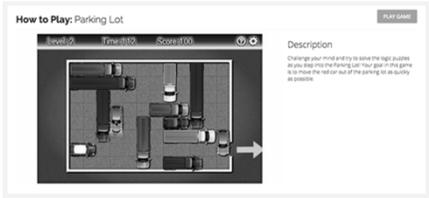


A Simple Game

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Luminosity?



Army Games

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Army Games

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► <http://www.goarmy.com/downloads/games.html>

Army Games 46 

Questions on Games 47 

- ▶ Reliability
- ▶ Generalizability
 - ▶ Problem – examinees try to maximize score rather than act as they would in the real world
- ▶ Comparability – Equivalence
 - ▶ Is game or simulation performance situation specific?
 - ▶ May not matter with 100% fidelity
 - ▶ But in other cases can be significant

Big Data 48 

- ▶ Just collect a lot of data
- ▶ Use empirical methods to extract constructs
- ▶ Or skip constructs and use empirical methods to predict behaviors or desired outcome directly

Other Emerging Technologies

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- ▶ The mining of Facebook in order to extract personality and other data
- ▶ Automated scoring of essays and written material
- ▶ Applications of machine learning
- ▶ The use of avatars
- ▶ Virtual badges
- ▶ Seamless and virtual testing

Virtual Badges

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- ▶ Certificates and Certification
- ▶ Licensing
- ▶ Virtual Badges
 - ▶ a symbol or indicator of an accomplishment, skill, quality or interest
 - ▶ set goals, motivate behaviors, represent achievements and communicate success in many contexts



Question

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- ▶ Why require that teachers be licensed?
- ▶ Coaches?
- ▶ HR?
- ▶ Public Sector HR?
 - ▶ How many of you have some type of HR certification – SHRM or IPMA-HR

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Lessons Learned and Best Practices

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Professional Issues

- ▶ As psychologists and assessment professionals, what are our responsibilities?
 - ▶ Determine and apply traditional test development professional standards, including tracking post-implementation, to mobile device optimization requirements
 - ▶ AERA et al. (2014) Standards – no discussion of mobile device assessments
 - ▶ APA ethical standards
 - ▶ International standards (e.g., ITC, ISO)
 - ▶ Telepsychology standards
 - ▶ SIOP (2003) Principles – did they even envision smartphone based testing

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Best Practices

- ▶ Traditional principles of reliability and validity still apply
 - ▶ Uniform Guidelines still apply
- ▶ Job analysis remains important
 - ▶ Maybe even more important in trying to achieve fidelity
 - ▶ Psychological as well as physical fidelity
- ▶ Have to ask questions of what KSAPCs do we want to assess?
 - ▶ What behaviors reveals these KSAPCs?
 - ▶ What tasks and situations elicit these behaviors?
 - ▶ How can I create tasks and situations on a test that elicit the behaviors that reflect the KSAPCs?

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Best Practices

- ▶ Specify/communicate conditions under which assessment should be taken
 - ▶ Quiet space
 - ▶ Uninterrupted time
 - ▶ Large enough screen size

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Best Practices

- ▶ Provide warning → taking assessment under less than optimal/desirable conditions will negatively impact test score
 - ▶ Especially for cognitively loaded assessments
- ▶ Collect and review device-type data
- ▶ Develop/design assessments for minimum conditions (worst/less than optimal" conditions)

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Lessons Learned – Questions to Think About

- ▶ Test taker reactions
- ▶ ADAAA issues – Universal Design
- ▶ Test timing and delivery
- ▶ Legal Defensibility
- ▶ Civic Service Rules
- ▶ Costs can vary greatly
 - ▶ Video can be cheap
 - ▶ Until you move to scripts and professional actors

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Lessons Learned – Pitfalls to Avoid

- ▶ Make sure you communicate with IT
- ▶ Overloaded servers or communications?
- ▶ Security
 - ▶ Pharmacy had to suspend exam
 - ▶ Harvesting items
 - ▶ People seem to believe they have a right to cheat

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How does this impact public sector

- ▶ Have to find ways to incorporate new technologies and development
- ▶ May see greater use of tests during:
 - ▶ Developmental - training
 - ▶ Return to work
 - ▶ Annual testing

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Avatars

- ▶ http://www.getabby.com/about_abby

Some Pie (in the sky) For You

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Questions? Comments?

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The End

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Seamless and Virtual Testing

- ▶ Seamless testing
 - ▶ No difference between test, training, and job
- ▶ Virtual testing
 - ▶ Testing without telling people it is a test
 - ▶ Organization puts game with a prize online
 - ▶ Is it ethical to test without people knowing?

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Theme or Thesis

- ▶ As we move to Future testing, especially games, our testing will be more
- ▶ Fun and Engaging
- ▶ Include more Social Context
- ▶ Include more Social Cues.
- ▶ This will Increase the likelihood that our Future Tests will be challenged based on being
- ▶ Culturally Dependent
- ▶ Insensitive.

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Possible Issues

- ▶ With video presentations – (for example SJTs for police, or a police or military game)
- ▶ Does showing or viewing someone committing a crime have more of an emotional impact than reading about them committing a crime?
 - ▶ Does this impact vary as a function of protected group status?
 - ▶ Especially for women

Possible Issues 67 

- ▶ If we show an "Officer Jones" does the sex of Officer Jones matter?
 - ▶ Should it match the sex of the respondent?
- ▶ If the target person is a specific gender will the target identify with them?
 - ▶ We could always make avatars match the person – but is this an answer?

Increased Use of Visual Stimuli 68 

- ▶ Should demographics be balanced when the workforce is not balanced?
 - ▶ Some of the recruitment literature suggests this may be problematic

Games 69 

- ▶ In a game or in a situational judgment test, for example, does changing the reference person change the response?
 - ▶ Would a short versus tall police officer respond the same?
 - ▶ Would a female versus male police officer respond the same?
 - ▶ Would a Japanese business person respond the same as an American business person?

SJTs 70 

- ▶ Joe (Jane) has to chase a suspected murderer. Should Joe (Jane):
 - ▶ Call for backup?
 - ▶ Jump over a fence?
 - ▶ Run around the fence?

Conclusion 71 

- ▶ We will need to conduct more research into the impact of social context and cues on psychological fidelity and physical fidelity, and on criterion related and construct validity.

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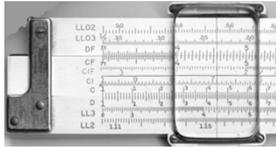
HISTORY
A PERSONAL STORY

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SLIDERULE

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PUNCH CARD

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PUNCH CARD READER

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PDP 11-10 Minicomputer

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PDP 11-10 Minicomputer

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KAYPRO PORTABLE

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