



**ATP**  
**Innovations**  
**in Testing**  
**2015**  
**Palm Springs, CA**

# **If at First you Don't Succeed:** An Analysis and Interpretation of Candidate Retake Response Patterns

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# Overview

- Introduction to Retake Performance
- Background: retake research and policy
- Current investigation: questions and answers
- Impact of findings
- Summary and Implications

# Retake Performance

- Why do we care about retake performance?
- What do we know so far?



# NCARB



## Architect Registration Examination

### Programming Planning & Practice

- 85 MC Questions
- Site Zoning

### Structural Systems

- 125 MC Questions
- Structural Layout

### Site Planning & Design

- 65 MC Questions
- Site Grading
- Site Design

### Building Systems

- 95 MC Questions
- Mechanical & Electrical Plan

### Schematic Design

- Interior Layout
- Building Layout

### Construction Documents & Services

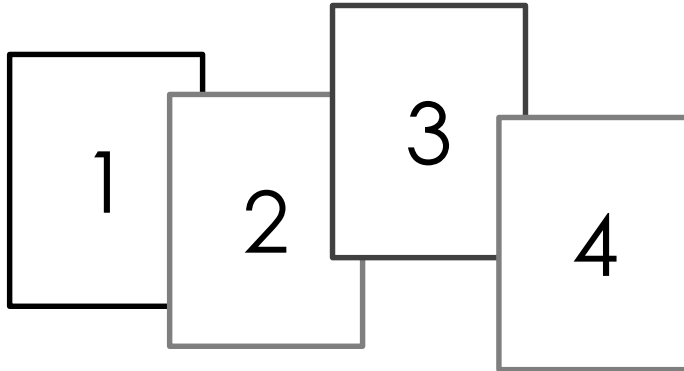
- 100 MC Questions
- Building Section

### Building Design & Construction Systems

- 85 MC Questions
- Accessibility/Ramp
- Stair Design
- Roof Plan



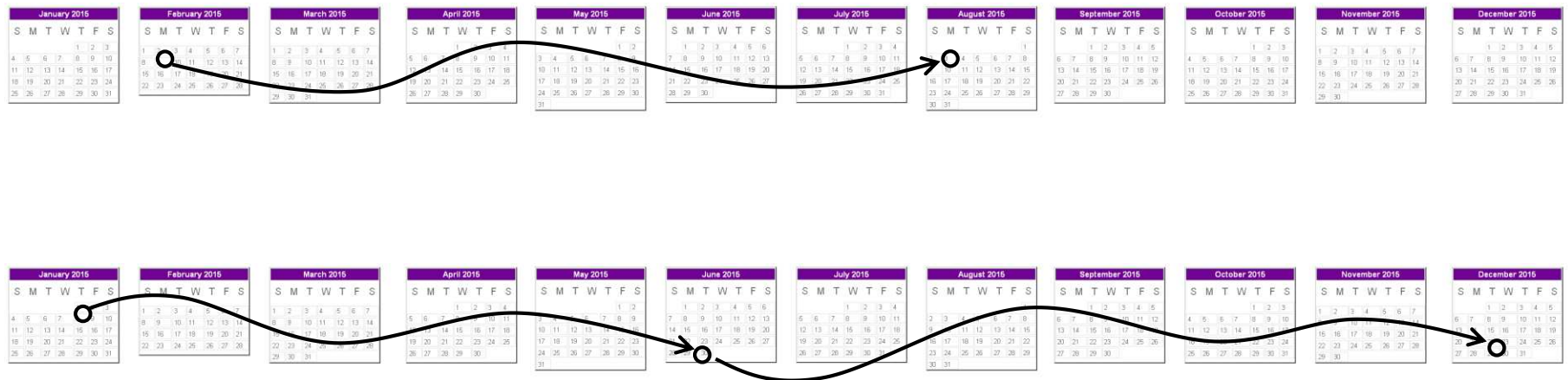
## Development & Delivery



| January 2015  | February 2015   | March 2015  | April 2015   | May 2015   | June 2015  | July 2015   | August 2015  | September 2015   | October 2015  | November 2015  | December 2015   |
|---|---|---|--|--|--|---|--|--|---|--|---|
| S M T W T F S   | S M T W T F S   | S M T W T F S   | S M T W T F S  | S M T W T F S  | S M T W T F S  | S M T W T F S   | S M T W T F S  | S M T W T F S  | S M T W T F S   | S M T W T F S  | S M T W T F S   |
| 1 2 3<br>4 5 6 7 8 9 10<br>11 12 13 14 15 16 17<br>18 19 20 21 22 23 24<br>25 26 27 28 29 30 31 | 1 2 3 4 5 6 7<br>8 9 10 11 12 13 14<br>15 16 17 18 19 20 21<br>22 23 24 25 26 27 28<br>29 30 31 | 1 2 3 4 5 6 7<br>8 9 10 11 12 13 14<br>15 16 17 18 19 20 21<br>22 23 24 25 26 27 28<br>29 30 31 | 1 2 3 4<br>5 6 7 8 9 10 11<br>12 13 14 15 16 17 18<br>19 20 21 22 23 24 25<br>26 27 28 29 30 | 1 2<br>3 4 5 6 7 8 9<br>10 11 12 13 14 15 16<br>17 18 19 20 21 22 23<br>24 25 26 27 28 29 30<br>31 | 1 2 3 4 5 6<br>7 8 9 10 11 12 13<br>14 15 16 17 18 19 20<br>21 22 23 24 25 26 27<br>28 29 30 | 1 2 3 4<br>5 6 7 8 9 10 11<br>12 13 14 15 16 17 18<br>19 20 21 22 23 24 25<br>26 27 28 29 30 31 | 1<br>2 3 4 5 6 7 8<br>9 10 11 12 13 14 15<br>16 17 18 19 20 21 22<br>23 24 25 26 27 28 29<br>30 31 | 1 2 3 4 5<br>6 7 8 9 10 11 12<br>13 14 15 16 17 18 19<br>20 21 22 23 24 25 26<br>27 28 29 30 | 1 2 3<br>4 5 6 7 8 9 10<br>11 12 13 14 15 16 17<br>18 19 20 21 22 23 24<br>25 26 27 28 29 30 31 | 1 2 3 4 5 6 7<br>8 9 10 11 12 13 14<br>15 16 17 18 19 20 21<br>22 23 24 25 26 27 28<br>29 30 | 1 2 3 4 5<br>6 7 8 9 10 11 12<br>13 14 15 16 17 18 19<br>20 21 22 23 24 25 26<br>27 28 29 30 31 |

## ARE Retake Policy

- Wait Period of 181 days (i.e. 6 months)





# NBEO





# Description of NBEO Examinations

Public protection through testing:

## ☐ Entry-level knowledge

- ☐ Part I ABS (Applied Basic Science)
- ☐ Part II PAM (Patient Assessment and Management)
- ☐ Part III CSE (Clinical Skills Examination)
- ☐ TMOD (Treatment and Management of Ocular Disease)

## ☐ Practice-level, continually updated knowledge

- ☐ CPDO (Continued Professional Development in Optometry)

## ☐ Specialty-level knowledge

- ☐ ACMO (Advanced Competence in Medical Optometry)

# Current Targeted Administrations

Part I – Applied Basic Science (paper-pencil):  
**March** of **3<sup>rd</sup>** professional year (retake in **August**)

Part II – Patient Assessment and Management:  
**December** (CBT) of **4<sup>th</sup>** professional year (retake in **April**)

Part III – Clinical Skills Examination:  
**August 1-April 30** of **4<sup>th</sup>** professional year (about every **6 weeks**, only once per month)





Click [HERE](#) or anywhere on the Part I Matrix for an enlarged view, discipline and condition item ranges, and views of the related content.

|  | PART I<br>Applied Basic Science<br>Format: MCQ<br>Items: 500<br>Sessions: 4 |                              |   |  |                 | PART II<br>Patient Assessment and Management<br>Format: Case-based, Image Intensive<br>Items: 350<br>Sessions: 2 |  |              |                           |   | PART III<br>Clinical Skills<br>Format: Performance Test<br>Items: ≥ 400<br>Skills: 20 |                     |                       |   |
|--|---|------------------------------|---|--|-----------------|--|--|--------------|---------------------------|---|---|---------------------|-----------------------|---|
|  | A. ANATOMY<br>(Gross, Neuroanatomy,<br>Histology, and Development)          | B. BIOCHEMISTRY / PHYSIOLOGY | C. IMMUNOLOGY / MICROBIOLOGY /<br>PATHOLOGY | D. OPTICS<br>(Geometrical, Physical,<br>Ophthalmic, and Physiological) | E. PHARMACOLOGY | F. CLINICAL PRESENTATION<br>(History, Signs, Symptoms)   | G. CLINICAL CORRELATION OF<br>BASIC SCIENCE PRINCIPLES | H. DIAGNOSIS | I. TREATMENT / MANAGEMENT | J. LEGAL ISSUES / ETHICS /<br>PUBLIC HEALTH | K. COMMUNICATION SKILLS   | L. AFFECTIVE SKILLS | M. PSYCHOMOTOR SKILLS | N. CLINICAL OBSERVATION &<br>REPORTING SKILLS |
| Conditions related to:   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| REFRACTIVE STATUS/ SENSORY PROCESSES /<br>OCULOMOTOR PROCESSES |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Ametropia  |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Ophthalmic Optics / Spectacles                                 |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Contact Lenses   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Low Vision   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Accommodation / Vergence / Oculomotor Function                 |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Amblyopia / Strabismus   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Perceptual Function / Color Vision                             |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Visual and Human Development                                   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| NORMAL HEALTH / DISEASE / TRAUMA                               |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Lids / Lashes / Lacrimal System / Ocular Adnexa / Orbit        |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Conjunctiva / Cornea / Refractive Surgery                      |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Lens / Cataract / IOL / Pre- and Post-Operative Care           |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Episclera / Sclera / Anterior Uvea                             |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Vitreous / Retina / Choroid                                    |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Optic Nerve / Neuro-Ophthalmic Pathways                        |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Glaucoma   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Emergencies / Trauma   |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |
| Systemic Health  |   |                              |   |  |                 |  |  |              |                           |   |   |                     |                       |   |

# National Center of Clinical Testing in Optometry





# National Center of Clinical Testing in Optometry



- Why evaluate retake performance?
  - Forms equated
  - Cohort changes
  - First-time versus repeat takers

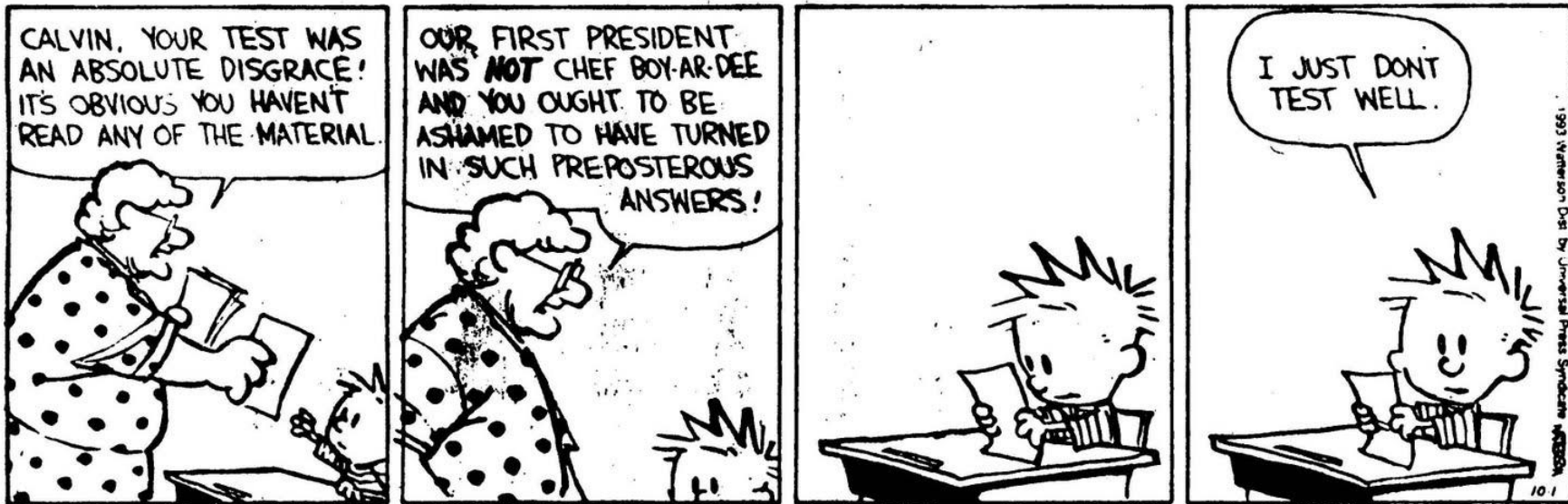


# On to the questions...





CALVIN & HOBBS  
BILL WATTERSON



If Calvin were to retake the test, do you think he would answer the question right or wrong?



What is the chance that a candidate will answer an item the same way on the first and second attempt (e.g., “A” both times)?

What happened between the attempts?

Same Candidate - Same Item

Attempt One



Attempt Two



# Who, if either, has an advantage?

## Candidate 1

Attempt Two

No Repeated Items From First Attempt



## Candidate 2

Attempt Two

25% Repeated Items From First Attempt



# Candidate Data

## ■ NCARB

- A.R.E. (6 divisions)  
(N = 4500 to 6000)
  - Four years of data
  - First and second attempts completed within same year

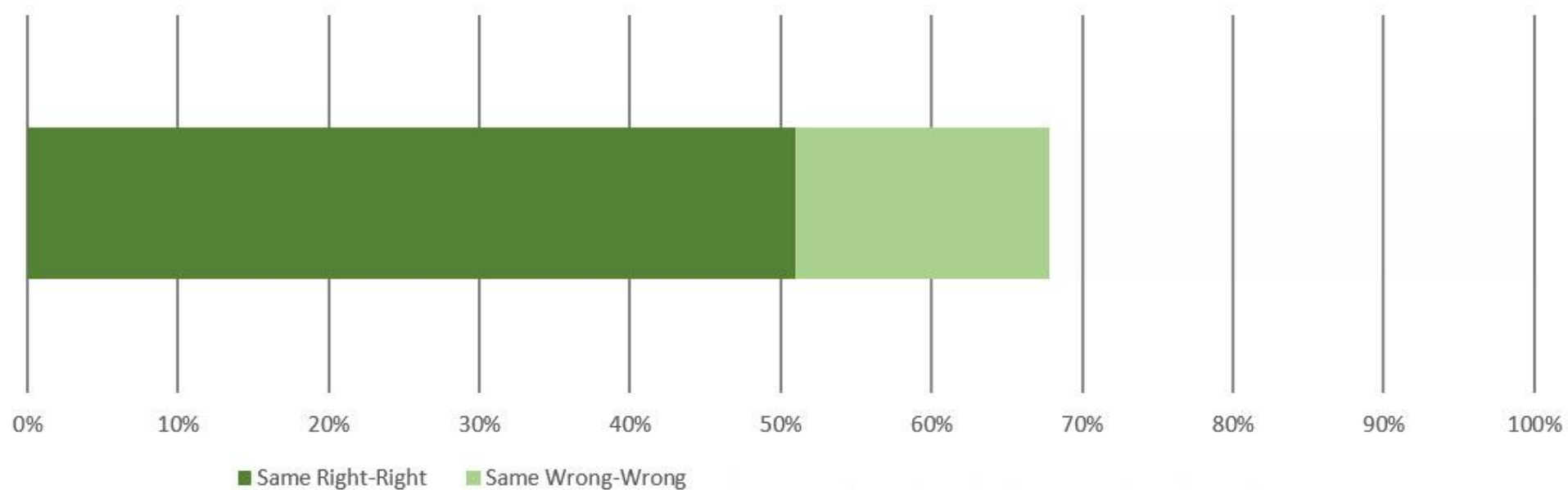
## ■ NBEO

- ABS and PAM Exams  
(N = 1500 to 2000)
  - 3.5 years of data
  - First and second attempts completed within six months



# Findings

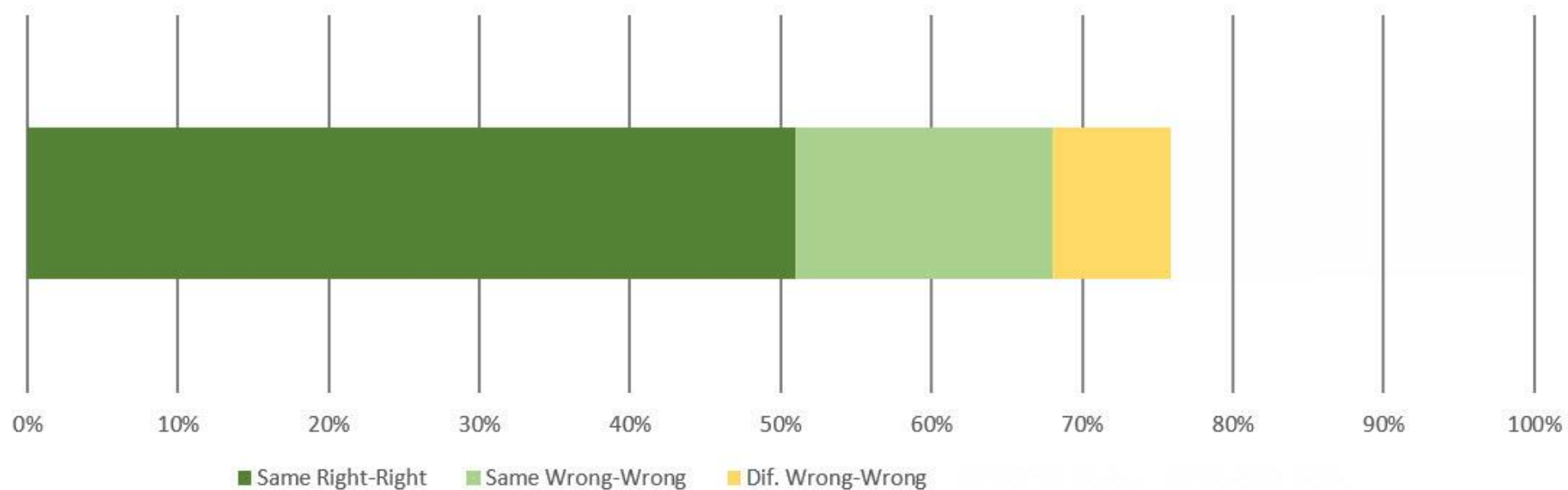
## First vs. Second Responses to Repeated Items



68% of Responses Remained the Same

# Findings

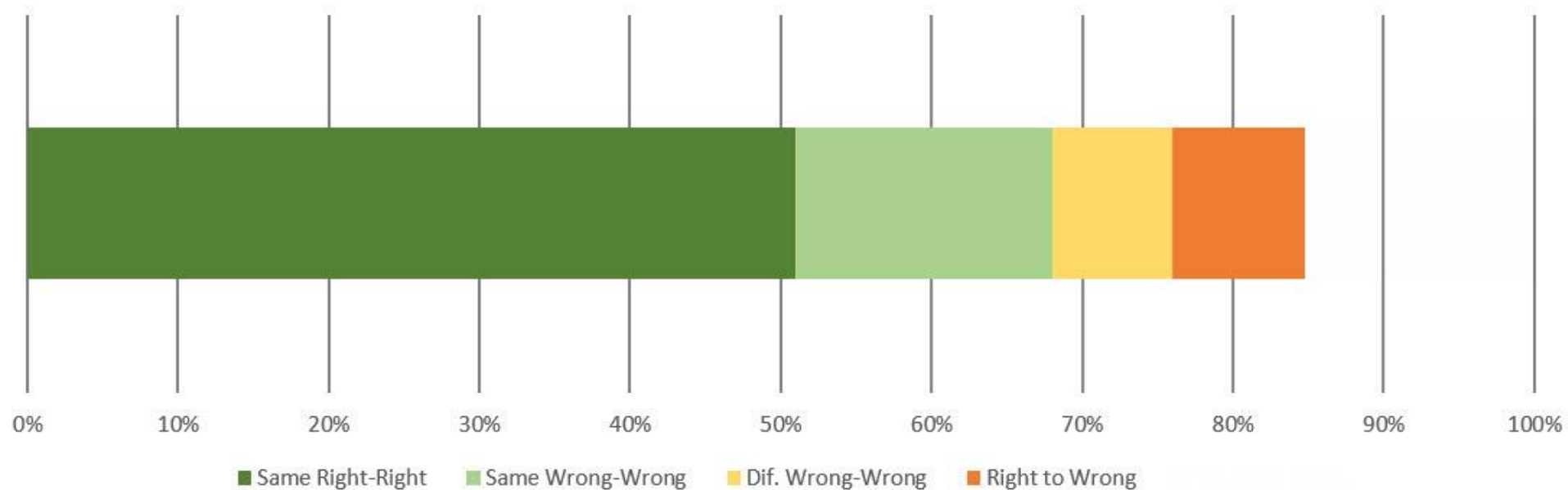
## First vs. Second Responses to Repeated Items



76% of Responses Resulted in No Performance Change

# Findings

## First vs. Second Responses to Repeated Items

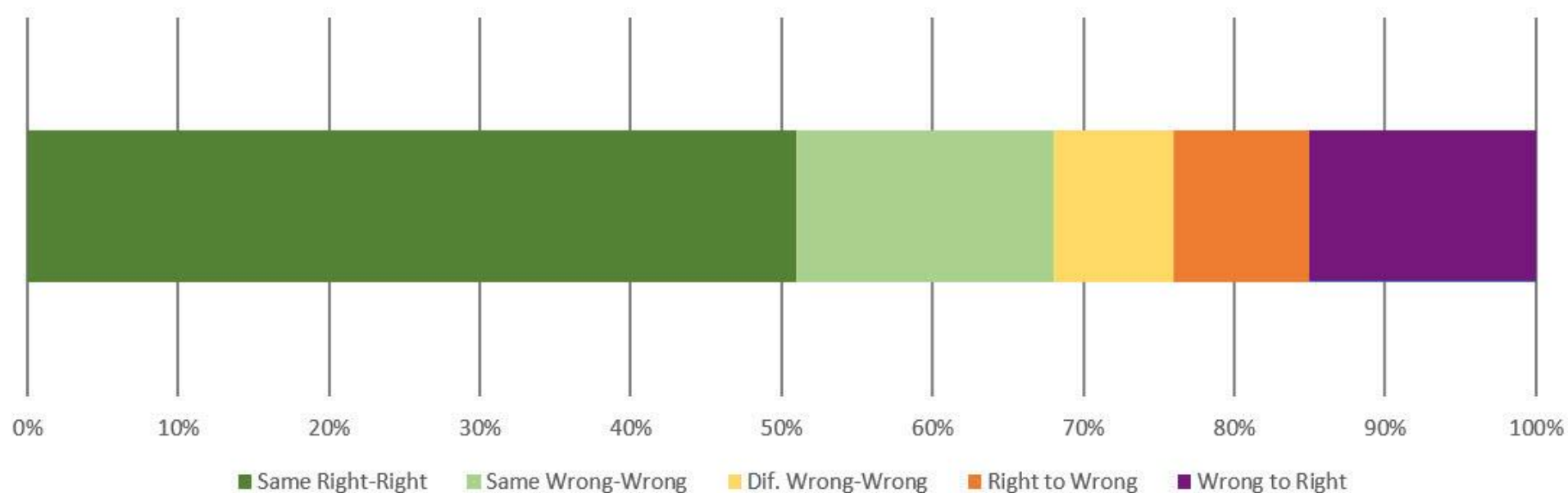


9% of Responses Resulted in Worse Performance



# Findings

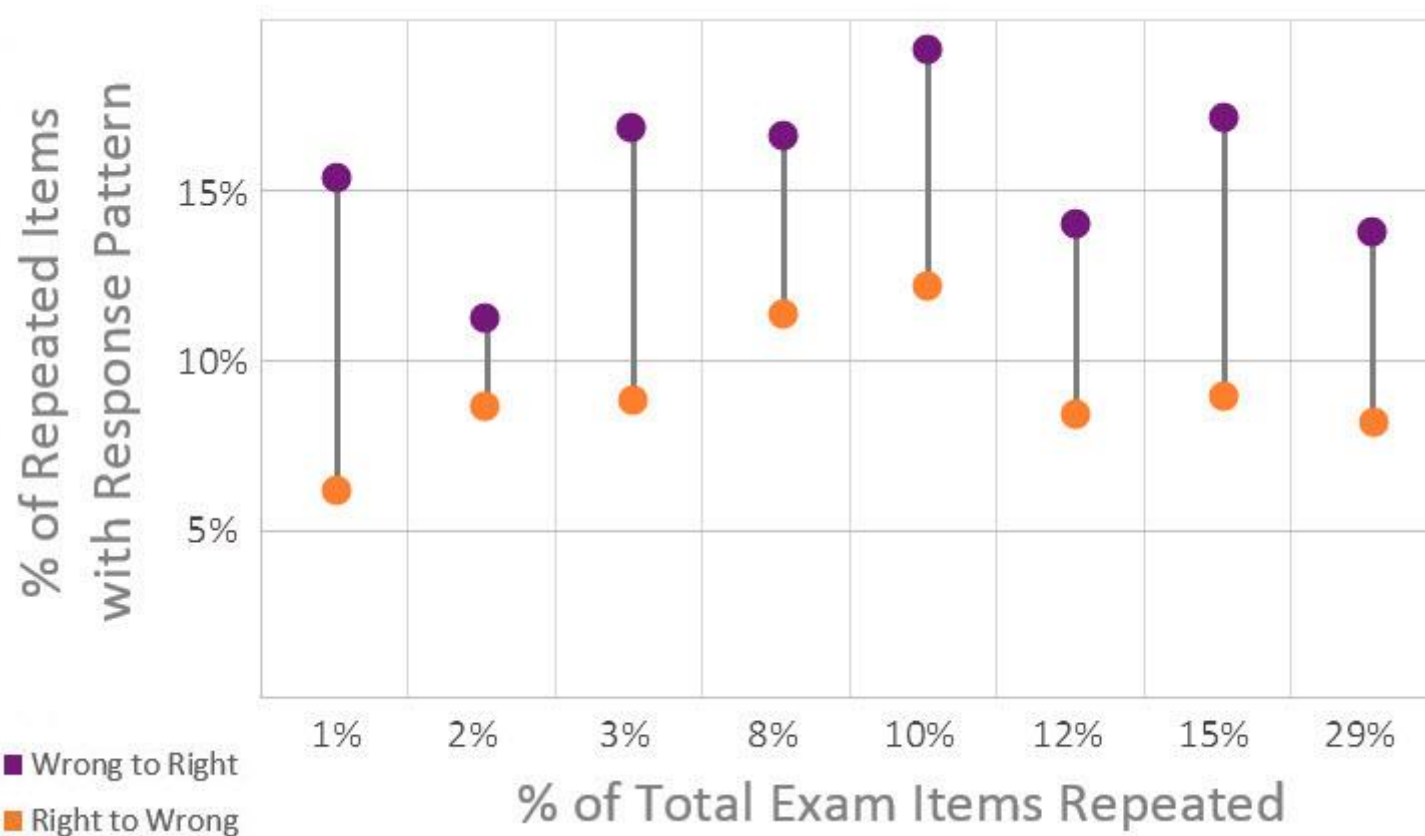
## First vs. Second Responses to Repeated Items



15% of Responses Resulted in Improved Performance

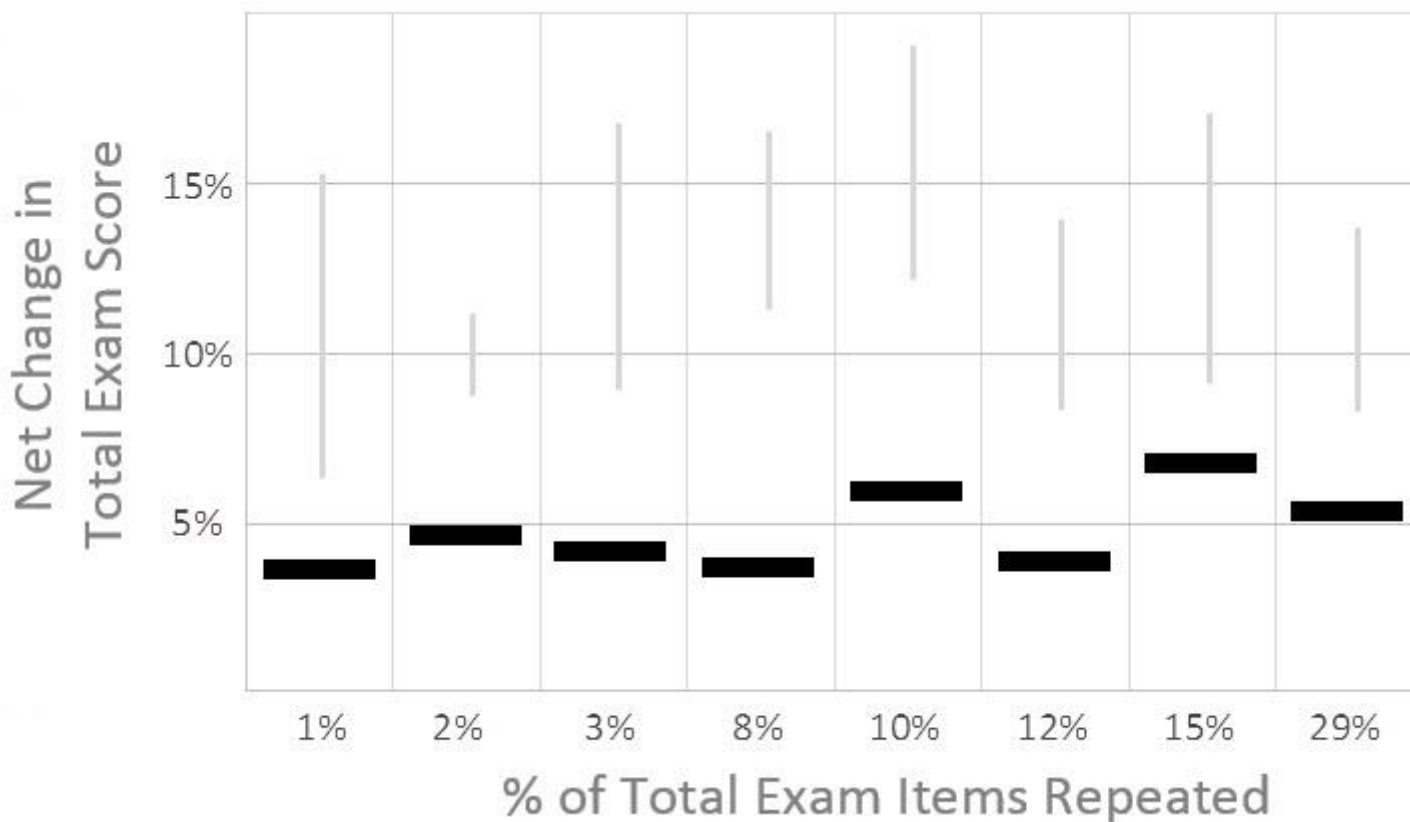
**Result** = Net Performance Increase of 6% on repeated items.

# Consistency of Findings



Performance Increase Consistent Across Higher Repeated Item Count

# Consistency of Findings



More repeated items DO NOT lead to a significant improvement in score.



# Question Answered!

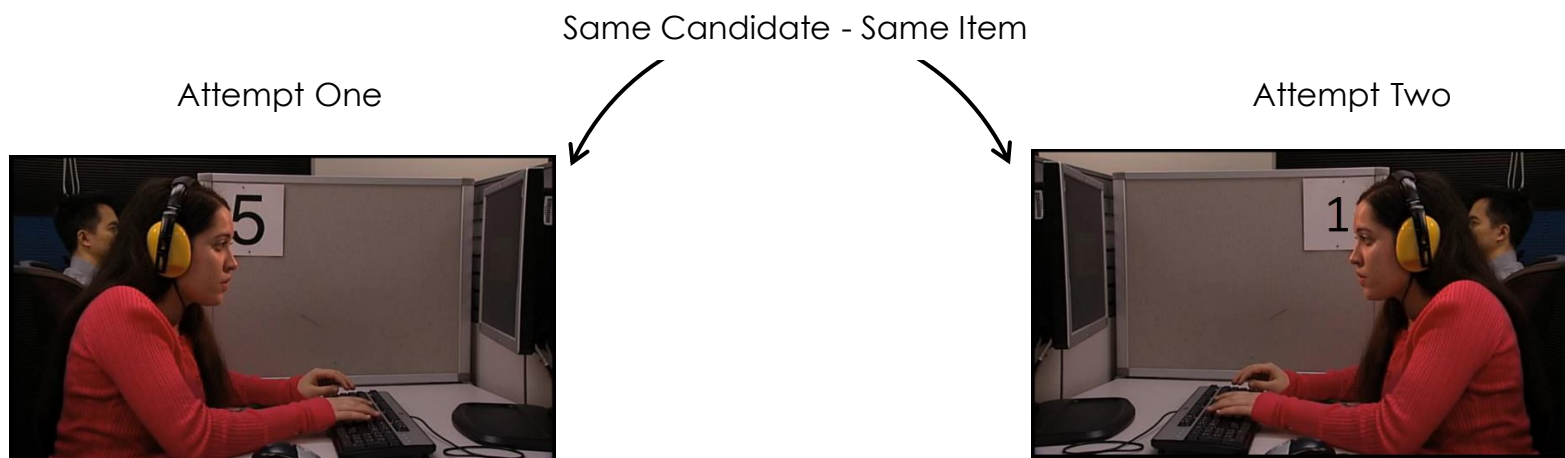
- Do repeated items significantly help candidates?

No



- Net improvement on repeated items is  $\approx 6\%$  regardless of test length and number of repeated items

What is the chance that a candidate will answer an item the same way on the first and second attempt (e.g., “A” both times)?



- A. 33%
- B. 50%
- C. 67%
- D. 84%

# Who, if either, has an advantage?

## Candidate 1

Attempt Two

No Repeated Items From First Attempt



## Candidate 2

Attempt Two

25% Repeated Items From First Attempt



# Neither

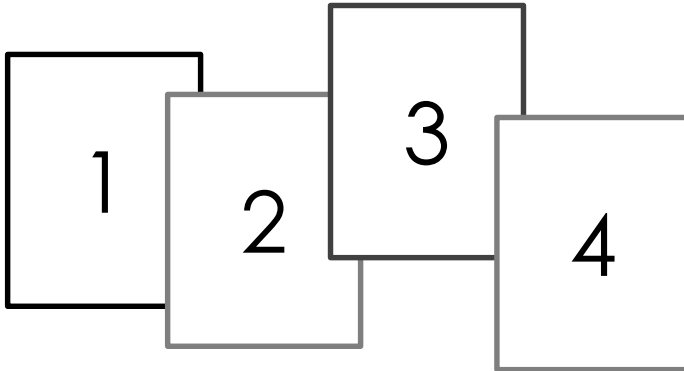


# NCARB – Why we care





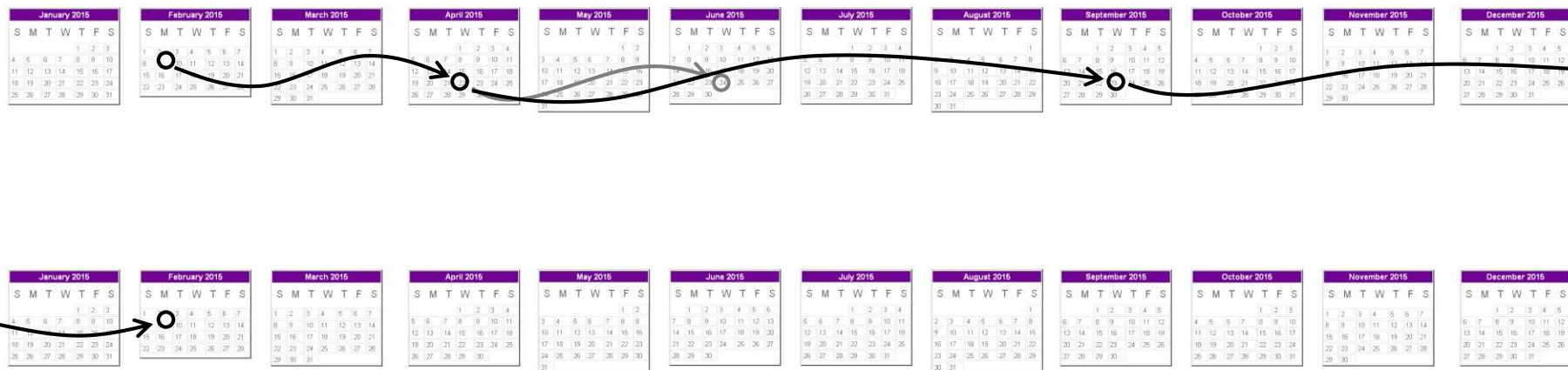
## Impact of Findings



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## Change to the Retest Policy

- **Waiting Period Must Be a Period of 181 days (i.e. 6 months)**
- Can only attempt the same division 3 times in a 12-month period





# NBEO – Why we care



# NBEO

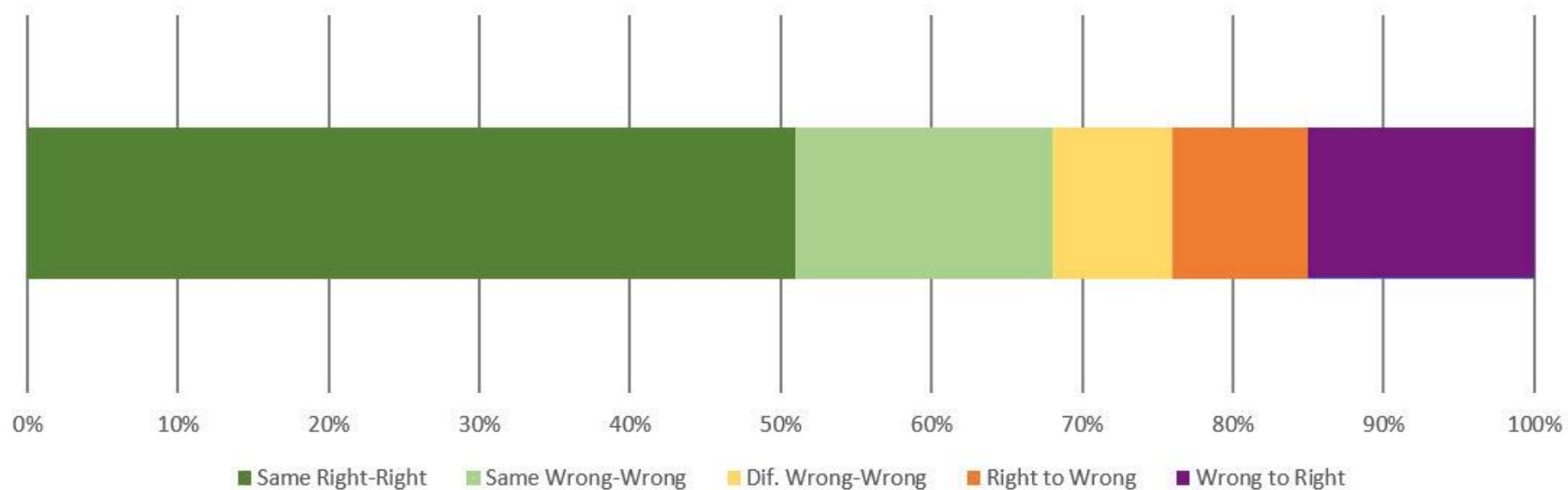
- The reuse of items allows for reusing more items in building more Part I ABS and Part II PAM forms
- Allows for the use of equator items on successive exams.
- Potentially could allow for an “emergent” form to be developed from a recently used form.



# Summary and Implications



## First vs. Second Responses to Repeated Items



Net Performance Increase of 6% on repeated items

# Recommendations

## ■ Policy Setting

- Item bank health
- Candidate perception
- Candidate behavior/performance

## ■ Forms Construction

- Reasonable overlap
- Avoid overexposure
- Different forms for short-term retakes

## ■ Monitor item and candidate performance



# Thank you!

## ■ Questions?

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