



## 2007 Annual Conference

### “Innovations and Trends in Testing”

Roger Earle  
NSCA Certification Commission

*Promoting Regulatory Excellence*

### *NSCA Certification Commission*

- In 1985, the certification arm of the National Strength and Conditioning Association (NSCA) was established to create a certification program for those in the field of strength training and conditioning
- The Certified Strength and Conditioning Specialist (CSCS) is the only nationally-accredited certification that is for those who train athletes
- In 1993, the NSCA-Certified Personal Trainer (NSCA-CPT) credential was created
- The credentials are the first fitness-related programs to have earned accreditation from the National Commission for Certifying Agencies (NCCA)

### *NSCA Certification Commission*

- More than 87,000 people have taken the CSCS or the NSCA-CPT exams worldwide and over 34,000 have been certified – including professional and collegiate strength coaches, athletic trainers, personal trainers, physicians, researchers, and educators
- Over 10,000 people in 20 countries take the CSCS and NSCA-CPT exams each year
- In February 2007, the Commission added 150 computer-based testing sites to its existing 180 paper-pencil exam sites

### *Transition to CBT (with Video!)*

- Description of the NSCA Certification Commission's exams
  - Certified Strength and Conditioning Specialist® (CSCS®)
    - “Scientific Foundations” section: 90 items
    - “Practical/Applied” section: 120 items (40 on video)
  - NSCA-Certified Personal Trainer® (NSCA-CPT®)
    - 1 section: 150 items (35 on video)
- Use of video clips to assess practical KSAs

### *Client Decisions about CBT*

- Add CBT or replace paper-pencil exams?
- Can accept the cost versus the benefit?
  - CBT: Increased access
  - P-P: Maintain sites at colleges/universities
- Increase test length with the same time?
  - Adding pre-test items
- Keep the same sequence of the video clips?

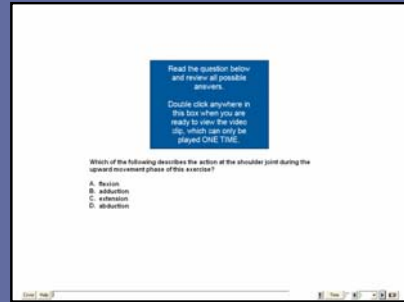
### *Client Decisions about CBT*

- Needs/requirements to make both exam experiences similar
  - Subject matter
    - Exercise technique
    - Fitness testing
  - Fixed clip length (~25 seconds)
  - Resolution/visual quality
    - Pixels: 320 x 240
    - Frame rate: 30 frames/second
    - Bit rate: 128 kbps
    - File size/clip: 600 kb

## Conversion of the Video Clips

- Needs/requirements to make both exam experiences similar (**more**)
  - Viewing the clips only once
    - Proprietary media player software
    - ADA exceptions for multiple viewings
      - Software permits a “**flag**” to be switched between one-time viewing and unlimited viewing
    - The “**flag**” is reset after candidate log-off to the default setting of one-time viewing

## Sample CBT Video Clip



## Sample CBT Video Clip



## Pilot Study about CBT

- Asked for volunteers in October, 2006 to take the CBT exam instead of a P-P exam
- Selected 68 CSCS and 40 NSCA-CPT exam volunteer candidates
  - Used “**matched samples**” from the P-P exam candidates based on available demographics (e.g., gender, age, geographic region)

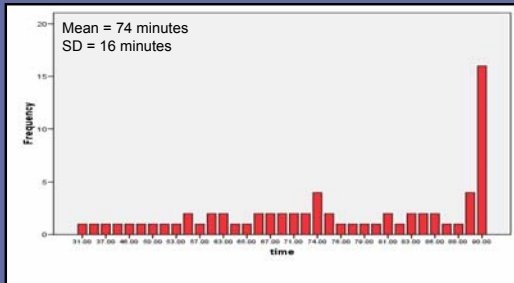
## Pilot Study about CBT

| Demographic       | CSCS       | NSCA-CPT   |
|-------------------|------------|------------|
| Female to Male    | 37% to 63% | 60% to 40% |
| Age               | 52% LT 25  | 46% LT 25  |
|                   | 36% 26-35  | 40% 26-35  |
| Geographic Region | 1: 16%     | 1: 25%     |
|                   | 2: 24%     | 2: 18%     |
|                   | 5: 18%     | 5: 15%     |
|                   | 9: 29%     | 9: 25%     |

## Pilot Study about CBT

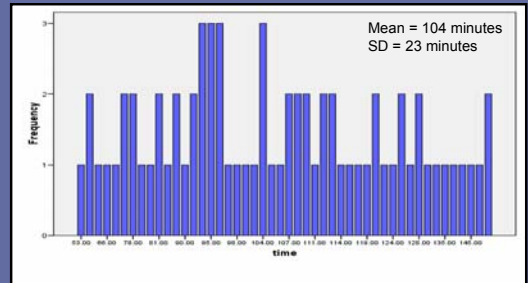
- Comparable pass rates between P-P and CBT for the CSCS exam
- Slightly higher pass rates for the CBT version of the NSCA-CPT exam
  - Data not available to compare format definitively
- Time did **not** appear to be a factor for CBT (**next 3 slides**)
- Because of the small initial sample size, more evaluations were needed (**later**)

## CSCS: Scientific Foundations



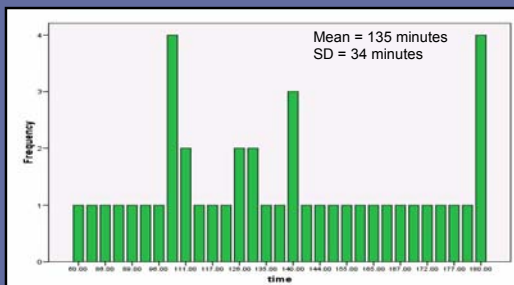
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## CSCS: Practical/Applied



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## NSCA-Certified Personal Trainer



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## Recent Test Analysis Report (TAR)

- Comparison of the two formats (~8 months)

| Exam            | P&P         |              | CBT        |              |
|-----------------|-------------|--------------|------------|--------------|
|                 | N           | % Pass       | N          | % Pass       |
| <b>CSCS: SF</b> | <b>3614</b> | <b>77.14</b> | <b>225</b> | <b>80.44</b> |
| <b>CSCS: PA</b> | <b>3614</b> | <b>67.32</b> | <b>225</b> | <b>72.89</b> |
| <b>NSCA-CPT</b> | <b>2219</b> | <b>67.55</b> | <b>241</b> | <b>76.35</b> |

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## Speaker Contact Information



**THANK YOU!**



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**NSCA CERTIFICATION COMMISSION**  
The Certifying Agency for the National Strength and Conditioning Association

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## CSCS: Scientific Foundations

(All are "Nor-Video" Questions)

| Question    | P+          | CBT                    |             |
|-------------|-------------|------------------------|-------------|
|             |             | Response Time          | P&P         |
| 1           | 0.85        | 43.8 seconds           | 0.69        |
| 2           | 0.69        | 51.0 seconds           | 0.72        |
| 3           | 0.76        | 45.0 seconds           | 0.79        |
| 4           | 0.88        | 39.6 seconds           | 0.88        |
| 5           | 0.28        | 46.8 seconds           | 0.30        |
| 6           | 0.69        | 45.6 seconds           | 0.60        |
| 7           | 0.78        | 49.2 seconds           | 0.72        |
| 8           | 0.78        | 27.6 seconds           | 0.82        |
| 9           | 0.66        | 1 minute, 18.0 seconds | 0.63        |
| 10          | 0.68        | 1 minute, 10.8 seconds | 0.68        |
| 11          | 0.71        | 40.2 seconds           | 0.58        |
| 12          | 0.78        | 45.0 seconds           | 0.85        |
| 13          | 0.65        | 54.6 seconds           | 0.52        |
| 14          | 0.62        | 35.4 seconds           | 0.58        |
| <b>Mean</b> | <b>0.70</b> | <b>48.0 seconds</b>    | <b>0.67</b> |

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# CSCS: Practical/Applied

Video Questions

H L

| Video Question | CBT         |                         | P&P         |
|----------------|-------------|-------------------------|-------------|
|                | P+          | Response Time           | P+          |
| 1              | 0.74        | 2 minutes, 48.0 seconds | 0.74        |
| 2              | 0.40        | 1 minute, 9.6 seconds   | 0.52        |
| 3              | 0.35        | 1 minute, 18.0 seconds  | 0.34        |
| 4              | 0.79        | 54.0 seconds            | 0.78        |
| 5              | 0.66        | 54.0 seconds            | 0.68        |
| 6              | 0.82        | 42.6 seconds            | 0.88        |
| 7              | 0.76        | 36.3 seconds            | 0.82        |
| 8              | 0.82        | 22.2 seconds            | 0.88        |
| 9              | 0.78        | 1 minute, 13.2 seconds  | 0.76        |
| 10             | 0.84        | 54.0 seconds            | 0.82        |
| 11             | 0.49        | 1 minute, 0.6 seconds   | 0.54        |
| 12             | 0.88        | 42.0 seconds            | 0.91        |
| 13             | 0.51        | 49.8 seconds            | 0.55        |
| 14             | 0.74        | 54.0 seconds            | 0.74        |
| <b>Mean</b>    | <b>0.70</b> | <b>51.6 seconds</b>     | <b>0.73</b> |



# CSCS: Practical/Applied

Non-Video Questions

H L

| Non-Video Question | CBT         |                        | P&P         |
|--------------------|-------------|------------------------|-------------|
|                    | P+          | Response Time          | P+          |
| 41                 | 0.84        | 30.6 seconds           | 0.84        |
| 42                 | 0.81        | 32.4 seconds           | 0.78        |
| 43                 | 0.90        | 27.6 seconds           | 0.86        |
| 44                 | 0.71        | 1 minute, 12.0 seconds | 0.64        |
| 45                 | 0.84        | 55.8 seconds           | 0.79        |
| 46                 | 0.79        | 1 minute, 1.2 seconds  | 0.78        |
| 47                 | 0.68        | 1 minute, 48.6 seconds | 0.65        |
| 48                 | 0.71        | 36.0 seconds           | 0.58        |
| 49                 | 0.81        | 49.8 seconds           | 0.71        |
| 50                 | 0.68        | 36.6 seconds           | 0.59        |
| 51                 | 0.62        | 51.0 seconds           | 0.65        |
| 52                 | 0.85        | 39.0 seconds           | 0.84        |
| <b>Mean</b>        | <b>0.77</b> | <b>49.8 seconds</b>    | <b>0.73</b> |



# NSCA-Certified Personal Trainer

Video Questions

H L

| Video Question | CBT         |                        | P&P         |
|----------------|-------------|------------------------|-------------|
|                | P+          | Response Time          | P+          |
| 1              | 0.85        | 2 minutes, 48 seconds  | 0.84        |
| 2              | 0.74        | 58.8 seconds           | 0.67        |
| 3              | 0.97        | 40.8 seconds           | 0.88        |
| 4              | 0.97        | 36.6 seconds           | 0.99        |
| 5              | 0.51        | 1 minute, 15.6 seconds | 0.51        |
| 6              | 0.79        | 46.8 seconds           | 0.80        |
| 7              | 0.90        | 42.0 seconds           | 0.93        |
| 8              | 0.67        | 46.8 seconds           | 0.81        |
| 9              | 1.00        | 46.2 seconds           | 0.91        |
| 10             | 0.79        | 34.2 seconds           | 0.81        |
| 11             | 0.69        | 1 minute, 8.4 seconds  | 0.80        |
| 12             | 0.67        | 50.4 seconds           | 0.66        |
| <b>Mean</b>    | <b>0.80</b> | <b>59.4 seconds</b>    | <b>0.80</b> |



# NSCA-Certified Personal Trainer

Non-Video Questions

H L

| Non-Video Question | CBT         |                        | P&P         |
|--------------------|-------------|------------------------|-------------|
|                    | P+          | Response Time          | P+          |
| 41                 | 0.97        | 24.0 seconds           | 0.73        |
| 42                 | 0.67        | 1 minute, 4.2 seconds  | 0.47        |
| 43                 | 0.41        | 51.0 seconds           | 0.37        |
| 44                 | 0.41        | 1 minute, 1.2 seconds  | 0.44        |
| 45                 | 0.87        | 1 minute, 3.6 seconds  | 0.76        |
| 46                 | 0.72        | 57.0 seconds           | 0.62        |
| 47                 | 0.38        | 1 minute, 6.6 seconds  | 0.29        |
| 48                 | 1.00        | 40.2 seconds           | 1.00        |
| 49                 | 0.46        | 1 minute, 31.2 seconds | 0.33        |
| 50                 | 0.44        | 1 minute, 13.8 seconds | 0.56        |
| 51                 | 0.90        | 28.2 seconds           | 0.89        |
| 52                 | 0.56        | 53.4 seconds           | 0.50        |
| <b>Mean</b>        | <b>0.65</b> | <b>56.4 seconds</b>    | <b>0.58</b> |