



PILATES METHOD ALLIANCE CERTIFICATION COMMISSION PASSING STANDARD STUDY REPORT

**Castle Worldwide, Inc.
June 2014**

The Pilates Method Alliance Certification Commission (PMACC®) developed a new 150-item (125 scored, 25 unscored) version of the PMA-Certified Pilates Teacher (CPT®) examination in 2013. This examination was designed to assess minimally acceptable knowledge of the duties performed by Pilates teachers. PMACC established the recommended score needed to pass the examination using consequence data collected in early 2014 after a meeting held in June 2013. Castle Worldwide, Inc., a professional testing service company specializing in the development of licensure and certification examinations, provided leadership and statistical consultation for this decision. The method used to establish the recommended cut score was a modified Angoff technique (1971), a well-researched and widely used method for setting criterion-referenced cut scores (See Appendix A.).

PURPOSE

A high-quality examination must have a defensible passing score. That is, the cut-off score that separates passing examinees from failing examinees must be determined in a systematic and reasonable way. Generally, only criterion-referenced procedures are accepted in the standards for credentialing examinations because these methods define the minimally acceptable level of competence and evaluate each question in light of minimum competence (Cizek, 2001). Criterion-referenced procedures provide a demonstrable linkage between the passing standard and public protection.

This standard-setting project was designed to establish the score that accounts for minimally acceptable knowledge of the duties performed by Pilates teachers. To achieve this objective, the appointed examination reviewers selected by PMACC followed the accepted methods delineated by Castle and implemented a modified Angoff technique in a Delphi study.

METHOD

For the June 2013 meeting (See Appendix B.), PMACC appointed a panel of 12 expert Pilates teachers with extensive experience and three to eight years working as PMA-Certified Pilates Teachers (See Appendix C.). The panel was international in composition and included individuals whose careers and professional qualifications indicated strong knowledge of Pilates teaching and understanding of the role of the PMA-Certified Pilates Teacher.

After a discussion of the requisite security for a passing standard study (See Appendix D.), Castle provided the panelists with the multiple-choice questions included on the examination and an explanation of the modified Angoff technique for establishing a recommended passing score (See Appendix A.). The panelists took the exam and graded themselves, and then Castle led the panel in a discussion of the meaning of minimally acceptable knowledge by asking panelists to list the kinds of responsibilities required of Pilates teachers. Panelists were advised to recall their own abilities when they were minimally knowledgeable or to recall individuals they have known in their careers who fit the definition (See Appendix E.).

After this discussion, in which the panelists reached a shared understanding of minimally acceptable knowledge, Castle instructed the panel to estimate the percentage of minimally knowledgeable candidates who would answer each question correctly. Panelists were told that their estimates should account for the percentage of minimally knowledgeable candidates who would answer the question correctly, given that it would be unusual for more than 95% of the candidates to answer any question correctly and that it is reasonable to assume that at least 25% would answer any question correctly by guessing.

The panelists engaged the Delphi study and discussed their ratings of each question in detail. In doing so, the panelists refined their understanding of the critical definitions and tasks for the exercise. Panelists who disagreed by more than 40% (four expected standard deviations) were asked to discuss the reasons for their disagreement. In doing so, panelists further refined their understanding of minimal competence and candidate performance.

ANALYSIS

After collecting the data (See Appendix F.) from the 12 panelists, Castle calculated the minimally acceptable score. The panelists' estimates were averaged, and the number of questions that corresponded to the mean was determined. The reliability of these ratings was approximately 0.933 as indexed by Cronbach's alpha, which is the intraclass correlation for internal consistency (See Appendix G.). The grand mean of the panelists' data was 95.78 items, and the SEM was 0.5449 items, producing a 95% confidence interval ($t=2.201$) of [97.28, 94.28]. After a review of consequence data (See Appendix H.) from the 2014 administration to approximately 102 test takers, PMACC selected 94 items correct as the passing standard. Scores are reported using a scaled score with a range of 200 to 800 where 500 is passing (See Appendix I.).

While Castle provided leadership for the passing-point determination and provided the required materials, instructions, and analysis necessary for a legally defensible passing point, PMACC is ultimately responsible for the final decision regarding the passing point. However, given that PMACC has adhered to the guidelines and standards set forth by a modified Angoff technique, Castle will support PMACC in any discussions regarding the selected passing point.

REFERENCES CITED

- Angoff, W. H. (1971). Scales, Norms, and Equivalent Scores. In Thorndike, R. L. (Ed.), *Educational Measurement*, 2nd Edition. Washington, DC: American Council on Education.
- Cizek, G. J. (2001). *Setting Performance Standards: Concepts, Methods, and Perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates.

APPENDIX A:
HOW IS THE PASSING POINT DETERMINED FOR THE
PMACC PMA-CERTIFIED PILATES TEACHER EXAMINATION?

The methodology to determine the cut score, or passing point, used in this examination is a criterion-referenced approach called a modified Angoff technique. This technique currently is considered by the testing profession to be one of the most defensible criterion-referenced methods available for setting passing points. It relies on the pooled judgments of content experts. For example, in this approach, a group of experts is asked to judge each item on the test. The criterion used to judge each item is formed into a question: “What is the probability that a ‘minimally acceptable’ candidate will answer this item correctly?” This question prompts the judges to consider a group of minimally acceptable candidates and what proportion of that group will answer each item correctly.

The average of the proportions, or probabilities, is multiplied by the total number of items on the test. The result then represents the “minimally acceptable” score. The final passing score for this examination is based on this pooled judgment and includes a statistical adjustment for testing error.

Pilates Method Alliance

Certified Pilates Teacher
Passing Standard Study

07 June 2013
Miami, FL

Hosts: Deborah Lessen
Chair at Pilates Method Alliance Certification Commission

Facilitator: James Penny, PhD
Senior Psychometrician
Castle Worldwide

Schedule: 8:00 a.m. To 5:00 p.m.

Sequence of events

1. Explanation of security
2. Take the current exam
 - a. We ask that discussion not occur until everyone is finished.
3. Score your exam
 - a. You do not have to share your score, and we will not record your score.
4. Discuss candidate qualifications and minimal competency
5. Estimate item difficulty
 - a. We will collect your data in a spreadsheet.
 - b. You may discuss each item with your colleagues in the room.
 - c. You will probably fine-tune your difficulty estimates a few times.
 - d. This process is called a modified Angoff Passing Standard Study.
6. Closing

Notes: Breaks are not scheduled. You may step out of the room when you need. Lunch will be at about noon.

Appendix C: Table of Panelists

Name	Location	Title	Employer	Years in field	Years PMA certified	Employer and academic and certification credentials PMA
Sally Anderson	Australia	Director, ITC-ITO	Self	22	8	International company registered in Australia
Gail Giovannello	New York	Owner	Self	23	4	Seasoned- studied with many high profile founders
Marissa Lins	Wisconsin	Owner	Self	9	4	1st Licensed Pilates school in Wisconsin
Ann McMillan	Canada	Owner	Self	21	8	Influence spreads in both English and French
Bernie Nelson	N. Florida	Owner	Self	10	6	Brings Fitness experience: certified ACE and APEX trainer
Nora St. John	California	Education Director	Balanced Body	14	7	Ed Director of one of the largest international, Pilates training programs.
Jolita Trahan	Italy	Director	Self	14	3	Graduate degree in education; internationally known Pilates Instructor
Jennifer Zumann	Chicago	Owner	Self	16	6	Broad understanding of various allied modalities.
Anna Alvarez	S. Florida	Owner	Self	22	6	Continuing Education Specialist for the PMA for 13 years; maintains a studio in Miami, and offers classes internationally.
Shelly Power	S. Florida	Co-Founder	Self	15	2	Combines training in Dance, Pilates, and Physical Therapy in a program that extends internationally.
Jackie Weiner	S. Florida	Owner	Self	18	3	Graduate degree in education, highly experienced in Pilates, and knowledgeable of the daily Studio dynamics.
Mark Trudeau	Washington DC	Owner	Self	14	6	Strong influence in Dance and fitness, two of the strongest influences to Pilates.

Candidate demographic: The Pilates method is international, but follows strongly the method as defined by one founder. Candidates are usually familiar with other allied modalities including personal training, Dance, Physical Therapy, Massage Therapy, Movement Arts, and academic studies in physical education. **Panel representation:** The representation of the Panel addresses this international, knowledgeable method and adds some additional skills in Education and Business development.



**SECURITY AGREEMENT for
Passing Standard Study Participants
PMA**

I, _____, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

I understand that information obtained or knowledge gained during the examination development process, which is not public information, cannot be used at any time to assist individuals preparing for the examination. This includes, but is not limited to, the sharing of such information during private instruction, workshops, or training programs; and/or the development, modification, or enhancement of training programs, courses, or workshops based on this information. I agree that I will not allow my participation in the item writing process to be used to promote specific training programs, courses, or workshops.

Furthermore, I understand that if I violate any of these requirements, rules, or regulations, I will be subject to legal action.

Signature of Participant _____
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**SECURITY AGREEMENT for
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I, ANNA ALVAREZ, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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[Signature] 6/7/2013
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I, SALLY ANDERSON, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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**SECURITY AGREEMENT for
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I, Gail Giovanniello, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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**SECURITY AGREEMENT for
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I, DEBORAH LESSEN, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Deborah Lessen
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**SECURITY AGREEMENT for
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I, Marissa Lins, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Signature of Participant 6/7/13
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**SECURITY AGREEMENT for
Passing Standard Study Participants
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I, Bernard Nelson, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Bernard Nelson 6.7-13
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**SECURITY AGREEMENT for
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I, Shelly Power, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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**SECURITY AGREEMENT for
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Signature of Participant

June 7th, 2013

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**SECURITY AGREEMENT for
Passing Standard Study Participants
PMA**

I, Nora St John-Harrison, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Nora _____ 6-7-2013 _____
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**SECURITY AGREEMENT for
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PMA**

I, JOLITA TRAHAN, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Jolita Trahan 07 June '13
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**SECURITY AGREEMENT for
Passing Standard Study Participants
PMA**

I, MARK TRUDEAU, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Mark Trudeau
Signature of Participant

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Date

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**SECURITY AGREEMENT for
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I, Jacqueline Weiner, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Furthermore, I understand that if I violate any of these requirements, rules, or regulations, I will be subject to legal action.

Jacqueline Weiner 4/7/13
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**SECURITY AGREEMENT for
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I, Jennifer Zumann, hereby acknowledge that I have been fully informed about the need for complete security and confidentiality in the handling of all examination questions and related test materials, including all notes, draft questions, and other documents. I have not allowed any person other than authorized staff members of Castle Worldwide, Inc., individuals specifically authorized by Castle, to have access to, to look at, or to be informed about any materials for the examination. I affirm that I know of no past breach of confidentiality. I further agree that I will not allow any breach in security in the future and will report any breach that I witness or come to know about. I agree to destroy all notes used to draft questions for the examination and all copies that I have retained of those questions.

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Jennifer Zumann 6/7/2013
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Appendix E: Eligibility Requirements

Eligibility requirements

The exam is available to any Pilates teacher regardless of their Pilates training background who meets ONE of the following eligibility requirements:

1. Documented completion of a minimum 450-hour comprehensive Pilates teacher training program ; or,
2. Documented 720 hours of comprehensive Pilates employment within the last 12-months.

Definition of the certified Pilates Teacher

The PMA-Certified Pilates Teacher creates and implements safe and effective individualized programs or apparently healthy clients to improve health and fitness through exercise and physical activity. The goal of a PMA Certified Pilates Teacher is to impart the knowledge skill and confidence for clients to exercise for a lifetime. By awarding the title of Certified Pilates Teacher, PMA is formally recognizing the Pilates teacher who has provided evidence that he or she meets accepted professional standards.

Appendix F: Panelist Data

Panelist data

Item	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12
1	75	75	80	80	75	80	75	75	75	75	75	80
2	65	60	80	60	65	75	50	80	65	70	70	80
3	80	80	80	75	80	75	80	90	60	75	75	80
4	80	75	75	75	60	75	60	60	60	70	80	80
5	50	60	70	80	50	60	90	50	60	70	50	65
6	80	80	80	75	65	80	80	75	75	75	90	75
7	75	80	60	80	90	60	65	70	80	85	60	65
8	80	80	80	70	80	80	75	70	75	80	70	80
9	75	80	90	80	80	85	90	80	80	85	80	85
10	60	80	70	65	70	90	90	50	65	65	70	65
11	90	80	85	75	90	80	90	85	80	75	80	85
12	60	75	75	70	80	75	65	70	70	80	60	80
13	75	75	70	80	50	70	85	70	75	80	75	80
14	75	80	90	70	85	90	50	75	60	75	70	90
15	60	60	75	75	80	80	80	80	80	80	85	85
16	90	90	90	80	90	90	90	70	70	85	90	90
17	65	65	50	70	50	70	75	60	70	70	75	70
18	85	70	90	75	85	85	80	75	65	70	80	80
19	75	70	75	70	80	80	90	80	80	80	75	75
20	80	70	90	85	90	75	90	80	80	80	85	80
21	75	80	80	75	70	80	90	80	80	80	85	80
22	75	80	75	75	75	85	85	75	60	85	75	90
23	90	80	90	90	90	90	90	85	85	85	90	90
24	80	90	90	80	85	80	85	70	85	85	80	85
25	80	80	80	80	80	80	80	90	80	70	80	75
26	75	80	70	80	70	80	75	80	70	80	75	70
27	80	85	80	90	75	90	85	75	75	85	75	90
28	70	80	90	80	90	80	90	80	80	80	75	80
29	80	70	80	80	65	80	70	75	75	70	70	80
30	80	70	80	85	90	85	90	85	75	85	75	80
31	80	85	85	70	85	75	70	85	70	75	80	85
32	60	75	85	85	75	70	65	70	70	70	70	75
33	80	85	90	85	90	90	90	85	75	80	80	80
34	60	70	70	75	65	60	60	65	65	70	70	70
35	75	90	85	80	85	90	90	75	70	85	80	85
36	85	85	80	85	85	80	85	80	80	80	80	85
37	85	85	90	85	85	80	85	85	80	80	80	80
38	85	85	90	90	90	90	85	90	85	85	90	90
39	85	90	90	90	90	90	90	90	90	90	90	90
40	85	90	90	90	80	85	90	85	85	85	85	85
41	85	90	80	80	80	85	85	75	60	75	80	85
42	70	60	60	75	75	80	70	75	80	75	75	70
43	90	70	90	80	85	90	80	85	85	85	80	85
44	80	85	85	90	80	90	90	85	85	85	90	90
45	75	70	90	85	90	80	85	85	85	90	85	80

Appendix F: Panelist Data

Item	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12
46	70	70	75	75	75	80	80	65	70	70	70	65
47	80	90	75	90	80	85	85	75	75	80	75	80
48	70	80	75	80	70	80	75	70	75	75	85	85
49	75	85	80	85	65	80	65	75	70	80	70	80
50	70	80	75	75	75	70	80	60	75	75	70	70
52	85	85	80	85	85	85	90	85	85	85	85	90
53	80	90	70	90	90	80	70	75	85	75	90	85
54	65	70	70	75	70	80	65	75	70	65	65	65
55	75	75	65	70	70	85	75	70	85	80	75	70
56	80	85	90	90	90	85	85	90	85	85	80	90
57	80	90	90	90	85	75	85	90	70	80	85	85
58	80	80	90	90	80	80	90	85	85	80	80	85
59	80	75	85	85	75	75	80	70	70	75	75	80
60	90	70	80	85	85	90	90	90	80	75	85	90
61	75	85	70	85	80	80	80	70	75	80	80	75
62	85	85	85	80	85	75	75	70	80	75	75	80
63	75	70	50	80	65	80	85	70	75	70	80	60
64	50	50	50	50	50	50	50	50	50	50	50	50
65	85	85	80	85	75	80	85	80	80	80	85	85
66	90	80	90	90	90	75	90	85	70	80	80	90
67	85	85	80	90	85	85	90	80	80	80	85	80
68	85	80	90	85	90	85	90	80	70	85	85	80
69	85	85	80	85	85	80	80	80	80	80	80	80
70	70	80	85	80	75	85	75	85	70	85	75	85
71	85	80	85	85	70	80	80	80	80	75	80	85
72	75	85	80	75	85	85	85	80	80	80	85	80
73	50	60	90	80	75	75	80	60	50	70	65	65
74	75	80	90	75	75	70	80	75	70	80	75	70
75	80	65	60	65	65	70	65	70	70	65	75	75
76	80	75	90	85	85	80	80	85	85	85	85	85
77	70	75	75	80	80	80	60	70	65	70	80	70
78	90	90	80	75	90	85	85	75	80	85	80	90
79	60	50	35	70	50	70	30	65	60	60	65	60
80	75	80	85	85	80	80	85	80	80	75	85	75
81	70	80	90	85	80	80	80	80	65	75	75	80
82	70	85	70	80	85	80	80	70	70	85	80	80
83	75	80	70	85	75	80	80	80	70	75	75	75
84	60	75	70	65	70	75	65	65	65	65	70	70
85	75	70	60	75	80	85	85	70	75	80	85	75
86	80	80	85	80	90	80	90	80	80	80	85	85
87	75	80	75	85	80	90	85	80	60	85	75	90
88	80	80	80	75	70	85	65	70	75	75	80	75
89	50	50	60	60	40	50	35	40	60	50	50	50
90	60	70	70	80	75	80	70	70	60	75	80	80
91	80	80	75	75	75	85	50	70	75	75	75	80
92	75	60	70	80	80	70	60	60	50	65	75	75
93	80	80	70	75	80	85	85	70	70	85	75	80

Appendix F: Panelist Data

Item	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12
94	75	70	70	75	75	75	60	85	60	75	75	70
95	75	60	60	65	60	80	55	70	65	70	65	75
96	85	60	90	90	90	90	85	80	80	90	85	85
97	75	80	80	70	65	80	65	70	70	80	75	80
98	90	90	80	80	90	85	90	80	90	80	80	80
99	85	80	90	85	80	90	85	85	75	85	80	75
100	75	80	80	50	75	80	50	50	55	65	75	80
101	75	70	90	75	65	80	50	75	65	60	80	75
102	85	80	80	85	85	85	85	80	80	80	80	80
103	75	80	60	85	80	85	70	65	65	70	80	75
104	70	80	90	85	70	85	85	75	75	80	75	85
105	80	80	80	80	70	90	70	80	60	75	85	80
106	60	75	85	70	60	80	50	50	60	70	60	60
107	65	80	75	70	70	90	80	70	70	75	75	80
108	60	70	60	75	60	75	65	65	65	70	65	70
109	70	80	60	75	70	80	70	70	65	70	70	75
110	75	75	90	85	85	85	85	80	80	75	80	80
111	75	75	85	85	70	85	65	70	70	80	70	85
112	70	75	85	75	75	80	80	85	75	70	80	85
113	85	85	90	80	90	85	75	85	80	90	85	90
114	75	85	90	65	85	85	70	85	75	85	75	85
115	50	60	60	70	70	80	70	60	60	70	65	60
116	80	80	60	70	75	80	60	65	80	80	75	75
117	60	85	80	80	80	70	60	70	75	80	75	65
118	70	70	70	65	70	80	70	70	60	80	70	80
119	65	65	65	65	55	50	60	65	70	60	60	65
120	75	80	75	70	80	80	85	70	80	75	65	85
121	70	60	60	70	65	75	80	50	75	60	50	75
122	80	80	80	80	80	85	85	80	80	80	90	85
123	60	65	75	70	70	70	85	60	65	65	65	60
124	70	70	80	70	70	80	80	70	70	65	70	75
125	80	80	80	75	80	80	75	80	80	75	80	80
126	75	80	80	70	85	85	80	75	80	70	80	80

Note: The enumeration skips 51 because of a clerical error. The number of items remains unchanged at 125.

Scale: Panel Angoff data

Case Processing Summary

		N	%
Cases	Valid	125	100.0
	Excluded ^a	0	.0
	Total	125	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.933	12

Intraclass Correlation Coefficient

	Intraclass Correlation ^a	95% Confidence Interval		F Test with True Value 0	
		Lower Bound	Upper Bound	Value	df1
Single Measures	.538 ^b	.471	.609	14.971	124
Average Measures	.933 ^c	.915	.949	14.971	124

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance is excluded from the denominator variance.
- b. The estimator is the same, whether the interaction effect is present or not.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Intraclass Correlation Coefficient

	F Test with True Value 0	
	df2	Sig
Single Measures	1364	.000
Average Measures	1364	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

Appendix H: Consequence Data

EXAMINATION_ID	FORM_ID	SCORE	COUNT	CUMULATIVE	%
430	126	119	2	2	1.96%
430	126	117	3	5	4.90%
430	126	116	1	6	5.88%
430	126	115	3	9	8.82%
430	126	114	2	11	10.78%
430	126	113	1	12	11.76%
430	126	112	8	20	19.61%
430	126	111	2	22	21.57%
430	126	110	5	27	26.47%
430	126	109	10	37	36.27%
430	126	108	2	39	38.24%
430	126	107	6	45	44.12%
430	126	106	7	52	50.98%
430	126	105	5	57	55.88%
430	126	104	5	62	60.78%
430	126	103	4	66	64.71%
430	126	102	2	68	66.67%
430	126	101	5	73	71.57%
430	126	100	2	75	73.53%
430	126	99	4	79	77.45%
430	126	98	3	82	80.39%
430	126	96	2	84	82.35%
430	126	94	2	86	84.31%
430	126	93	1	87	85.29%
430	126	91	2	89	87.25%
430	126	90	1	90	88.24%
430	126	89	2	92	90.20%
430	126	88	2	94	92.16%
430	126	86	1	95	93.14%
430	126	83	1	96	94.12%
430	126	81	1	97	95.10%
430	126	78	1	98	96.08%
430	126	74	1	99	97.06%
430	126	72	1	100	98.04%
430	126	70	1	101	99.02%
430	126	51	1	102	100.00%

Appendix I: Raw Score to Scaled Score Conversion

Raw to scaled score transformation

Raw score	Reported Scaled Score
0	200
1	200
2	200
3	200
4	200
5	200
6	200
7	200
8	200
9	200
10	200
11	200
12	200
13	200
14	200
15	200
16	200
17	200
18	200
19	200
20	200
21	200
22	200
23	200
24	200
25	200
26	200
27	200
28	200
29	200
30	200
31	200
32	200
33	200
34	200
35	200
36	200
37	200
38	200
39	200
40	200

Appendix I: Raw Score to Scaled Score Conversion

Raw score	Reported Scaled Score
41	200
42	200
43	200
44	200
45	200
46	200
47	200
48	205
49	212
50	218
51	224
52	231
53	237
54	244
55	250
56	256
57	263
58	269
59	276
60	282
61	288
62	295
63	301
64	308
65	314
66	320
67	327
68	333
69	340
70	346
71	352
72	359
73	365
74	372
75	378
76	384
77	391
78	397
79	404
80	410
81	416
82	423
83	429
84	436
85	442

Appendix I: Raw Score to Scaled Score Conversion

Raw score	Reported Scaled Score
86	448
87	455
88	461
89	468
90	474
91	480
92	487
93	493
94	500
95	506
96	512
97	519
98	525
99	532
100	538
101	544
102	551
103	557
104	564
105	570
106	576
107	583
108	589
109	596
110	602
111	608
112	615
113	621
114	628
115	634
116	640
117	647
118	653
119	660
120	666
121	672
122	679
123	685
124	692
125	698