Chapter 6 of the *Standards* (AERA, APA, NCME, 2014) addresses test administration, scoring, reporting, and interpretation. The analysis of DET documentation focused on scoring, reporting, and interpretation is included in the validity and scoring/reliability chapters. The documentation in this chapter therefore focuses on test administration and security.
Section 1: Purpose of this Document

The purpose of the document is to report on our analysis of standards as they relate to test administration and security. This report is divided into two parts. The first part addresses questions related to test administration. The second part addresses questions related to security. We guided our analysis using the Standards for Educational and Psychological Testing (AERA, APA, and NCME, 2014) and DET’s documentation. In the review, we analyzed the following questions:

1. Does the DET provide sufficient information regarding test registration and preparation?

2. Does the DET provide sufficient information regarding test accommodations and the process for requesting and verifying accommodations?

3. Does the DET provide sufficient information regarding directions and rules test takers must follow?

4. Does the DET provide a secure, proctored test experience?

5. Do the DET systems provide adequate security to protect test and item data?

6. Do the DET systems provide adequate security to protect test takers’ personal identifiable information (PII) and test data (including score reports)?

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Section 2: Sources Reviewed

To address the aforementioned questions, we reviewed publicly available DET documentation (e.g., research papers, websites for test takers, and institutional reports), reviewed a few independently completed evaluations of the DET, and held semi-structured interviews with DET staff. The staff included assessment scientists and the chief of assessment. The published resources used in the development of this report are cited in the Reference section at the end of this document.
Section 3: Introduction

Standard 6.0: To support useful interpretations of score results, assessment instruments should have established procedures for test administration, scoring, reporting, and interpretation. Those responsible for administering, scoring, reporting, and interpreting should have sufficient training and supports to help them follow the established procedures. Adherence to the established procedures should be monitored, and any material errors should be documented and, if possible, corrected (AERA, APA, & NCME, 2014, p. 114).

Test Administration and Security includes procedures, processes, and policies involving

- test registration
- test preparation
- requesting and receiving appropriate accommodations
- taking and completing the test
- test and data security

Tests are referred to as standardized when all test takers adhere to a common set of directions, have similar testing conditions, and have responses analyzed through a common scoring model. These standardized conditions provide test takers and users with scores that are accurate, interpretable, and comparable. When effective standardized conditions are combined with strong security protocols, no individual or group of individuals should gain an unfair advantage. The goal therefore is to achieve fair, accurate, interpretable, and comparable testing. As the stakes of score-based decisions increase, the need for well-defined, enforceable standardization procedures becomes greater (AERA, APA, & NCME, 2014).

“In all such cases, the goal remains the same: to provide accurate, fair, and comparable measurement for everyone” (AERA, APA, & NCME, 2014, p. 111).
Section 4: Registration and Preparation

Question: Does the DET provide sufficient information regarding test registration and preparation?

Standard 6.5: Test takers should be provided appropriate instructions, practice, and other support necessary to reduce construct-irrelevant variance (AERA, APA, & NCME, 2014, p. 116).

Registration should provide test takers with instructions that are clear and procedures that are easy-to-follow. The registration process should be accessible to as many potential test takers as possible. Test developers must continuously strive to increase the accessibility of their registration process.

Similarly, test programs should provide prospective test takers with opportunities to practice answering items like those that they will encounter on the test. The program should provide descriptions/explanations of item formats, and it should provide a practice test so that test takers can become comfortable responding to the item formats within the time allotments. Having the opportunity to practice and become familiar with the item formats assists in ensuring that the test measures the defined construct(s) and construct-irrelevant variance is minimized.

DET Registration Process

The DET provides on its website an online registration process. The registration process is clear. After registering and paying for the test on the Duolingo English Test website, test takers are directed to download the Duolingo English Test desktop app, in which the actual test must be taken. The DET also provides an app, through which test takers can register through their mobile device.

Registration instructions are available in 17 different languages, assisting with language accessibility. Prospective test takers, after creating a DET account, may proceed to registration. In the process of test registration, test takers provide demographic information (i.e., gender, date of birth, country of origin, and first language), and they agree to the terms and conditions of testing. The procedures also require test takers to check specific functions on their computer (i.e., camera and microphone) to ensure that they are properly working for testing.
Test Preparation

In the process of online registration, test takers have several opportunities to click on a site called “Practice Test.” The site encourages potential test takers to take a practice test that allows test takers to:

- See what the test is like
- Take a 15-minute long practice test
- Get an unofficial score estimate

By going to the practice test, test takers avail themselves of the opportunity to respond to a large set of items like those on the actual DET. The practice test includes practice items for the five different objective-response formats. After working through these item formats, test takers move to the extended-response formats. In the extended-response formats, test takers make a verbal presentation on one of two topics. Following the presentation, they are required to write a short essay on one of three topics.

By working through the practice test, prospective test takers become familiar with each of the item types and the pacing of the test. All items include a time limit, and the interface includes a small clock counting down the minutes and seconds. The items selected for the practice test are written at various levels of difficulty, which assist test takers to better understand the requirements for achieving a high score. When the test taker has completed the practice test, the system provides an approximate score. The approximate score is a range of scores, from which test takers can evaluate their preparedness.

In addition to assisting test takers with content familiarity, the practice test allows test takers to familiarize themselves with the DET’s interface. To this end, test takers are provided with opportunities to maneuver the same keystrokes and mouse clicks that they would during testing.

Overall, the practice test provides test takers with a realistic experience, including opportunities to familiarize themselves with the different item formats, levels of difficulty, and the screen’s interface. The fidelity of the practice test to the actual DET testing experience appears to be extremely good.

DET supplies other materials whereby test takers can gain a greater understanding of item formats. The DET technical manual provides an explanation of each format along with an example (screenshot) of each type (LaFlair & Settles, 2020). For each format, the technical
manual provides a description and citations to research papers supporting the use of the item type for measuring second language proficiency.

The DET website further provides a video that allows test takers to preview the testing process. The video “Test Walkthrough” runs through the registration process, computer requirements, and each item format (see: https://englishtest.duolingo.com/resources)

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Section 5: DET Accommodations

“Different modes of presenting the test or its instructions, or of responding, may be suitable for specific individuals, such as persons with some kinds of disability,... in order to provide appropriate access and to reduce construct-irrelevant variance” (AERA, APA, & NCME, 2014, p. 111).

Question: Does the DET provide sufficient information regarding test accommodations and the process for requesting and verifying accommodations?

Standard 6.2: When formal procedures have been established for requesting and receiving accommodations, test takers should be informed of these procedures in advance of testing (AERA, APA, & NCME, 2014, p. 115).

Comment

Test accommodations should be implemented to enable all test takers to demonstrate their knowledge, skills, and abilities of the defined construct. To that end, changes to the standard test administration practices are organized into three classes.

1. **Universal Tools** – tools or modifications that are available to all test takers and require no special documentation (e.g., screen size, color contrast, keyboard navigation, computer volume). Generally, test takers can manipulate these accommodations on their own, and they require no special authorization. Universal tools have no effect on the measured construct.

2. **Accommodations** – tools used to supplement the standardized procedures that are available to some test takers upon special request, documentation, and approval. Accommodations enable test takers to demonstrate their ability on the measured construct despite their disability. Accommodations need to be: (a) requested in advance of testing, (b) justified with documentation produced by a professional, and (c) approved by the testing organization. Examples of accommodations include extra time, a screen reader, large print, closed captioning, and a scribe/recorder. Accommodations ensure fair measurement of the construct and score comparability.

3. **Modifications** – adaptations to the test format or standardized process that change the meaning of the construct to make the test accessible for designated individuals while
retaining as much of the original construct as possible. Modifications result in scores that differ in meaning and interpretability. Examples of modification include reading a passage to a test taker when the construct being measured is reading comprehension or translating a portion of the test to the test taker’s first language when the construct being measured is second language proficiency. In educational settings, modifications are used in special cases to provide designated individuals with access to testing. When a test is administered with a modification, the modification should be stated on the score report with a caveat about score use and comparability.

With these three concepts of test administration, this review focuses on the second classification – accommodations. In these cases, the test taker must (a) request the accommodation, (b) complete the necessary documentation, and (c) have a professional submit the documentation demonstrating the need for accommodation. Then, DET must (a) review the documentation and determine whether an accommodation is warranted, (b) maintain a record of the request and corresponding decision, (c) administer the test with the approved accommodation, and (d) issue a standard score report.

**Review of DET Accommodations Materials and Guidelines**

Currently, the DET has a limited number of accommodations available to test takers upon request. As outlined in the document *Duolingo English Test: Security, Proctoring, and Accommodations* (Duolingo English Test, 2020), the available accommodations are

- Headphones
- Screen magnifier
- Hearing aids/devices
- Any type of ergonomic mouse or keyboard

To request an accommodation, test takers are asked to contact the DET at englishtest-support@duolingo.com with the subject: ‘Accommodation Request.’ Then, a supervisor replies to the test taker within 24 hours.

DET is striving to offer a greater range of accommodations, and they are working on developing processes to allow test takers to have

- Additional time
- Dyslexic friendly fonts
- Magnified screen option (Duolingo English Test, 2020)
Comment: The process for applying for an accommodation as well as the review process is not well defined in the registration materials. The DET Help Center (a document with a series of questions and answers regarding the test) has the question - Can I request an accommodation for a disability? The answer to the question is “Please contact englishtest-support@duolingo.com with subject: ‘Accommodation Request’ detailing your request. A supervisor will reply within 24 hours.” Beyond one item on the Help Center Q&A, information on requesting accommodations is difficult to find.

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Section 6: Administration and Instructions

Question: Does the DET provide sufficient information regarding directions and rules test takers must follow while testing?

"Standardized directions help ensure that all test takers have a common understanding of the mechanics of test taking (AERA, APA, & NCME, 2014, pp. 111-112).

Standard 6.6: Reasonable efforts should be made to ensure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent or deceptive means (AERA, APA, & NCME, 2014, p.116)

DET Administration and Security Protocols

DET’s administration and security protocols begin with the onboarding process and continue until after the test session has been reviewed and certified.

During the onboarding process, test takers must demonstrate that they

- will be accessing the test via one of the supported browsers
- have disabled all plug-ins (if a plug-in is detected, the test system forces the test taker to disable it)
- have a working webcam and a microphone
- will not be wearing headphones during testing
- have a government-issued photo identification

The onboarding process utilizes facial recognition software to match the identity of the person at the computer to the photo in the government-issued identification. Acceptable forms of identification are passports, driver’s licenses, and national identifications. The identification must be valid at the time of testing, and the photo cannot be mutilated or altered in any way. The DET testing system captures photos of the person at the computer and evaluates these photos as to their match to the photo identification (Duolingo English Test, 2020).

Following identity verification, the system presents the test rules in the test takers’ chosen user-interface language. The security rules are

1. Ensure you are always fully visible to your webcam
2. Do not leave the camera preview
3. Do not look away from the screen
4. Keep your ears visible and uncovered
5. Do not leave your web browser. If your cursor leaves the window or you exit full screen mode, your test will not be certified.
6. Do not speak unless instructed
7. Do not communicate with another person at any point
8. Do not allow others in the room with you
9. Do not use any outside reference material
10. Do not use a phone or other device
11. Do not write or read notes
12. Always keep your microphone and camera enabled (Duolingo English Test, 2020)

After test takers have had an opportunity to study the testing rules, they must agree and accept the conditions. Along with attesting that they have understood and will adhere to the rules, test takers must verify that they are the person who registered. With this, test takers attest that they understand that violation of any testing rules will result in scores not being certified (Duolingo English Test, 2020).
Section 7: Test Administration and Proctoring

Question: Does the DET provide a secure, proctored test experience?

The DET interface functions to deter potential cheating by disabling specific keyboard actions, context menus, and browser features (e.g., spell check) that potentially provide an unfair advantage. It additionally disables browser plugin features. The system further limits suspicious actions (e.g., moving the mouse offscreen, switching tabs, reactivation and use of plugins), and it automatically ends a testing session if these actions occur (Duolingo English Test, 2020).

DET proctoring is conducted through a combination of artificial intelligence (AI) and human proctoring. Within 48 hours of completing and uploading the test, the session is reviewed for potential rule violations and, if no violation is found, scores are certified and issued (Duolingo English Test, 2020).

AI–assisted proctoring is conducted using algorithms to evaluate test performance characteristics and detect (flag) potential indicators of rule-breaking or suspicious behavior. Natural language processing algorithms are used to examine responses to verbal production questions. Statistical procedures are used to analyze response patterns. The algorithms raise flags and produce an indicator of the confidence in those flags, which are reviewed by human proctors for a final decision.

Expert human proctoring is used to proctor the DET in a blind, anonymous, multi-round review process using fluent English speakers. Later rounds are performed by certified English as a Second Language educators. Tests are randomly and anonymously assigned to proctors at each round of proctoring. Proctors are anonymous to each other, which eliminates possibilities that proctors will trust certain proctors more than others. Test-taker characteristics such as region, test completion time, or institution are also unavailable to proctors. If proctors do not agree with each other at any time during the proctoring rounds, senior proctors make a final decision.

For each section of the test, proctors use artificial intelligence tools to analyze over 80 different behaviors organized around severity categories. The first behavior category analyzed for inconsistencies is ID verification (e.g., name, birthday, type of ID, expiration date, and ID photo). Following ID verification, proctors analyze the entire test for minor, major, and malicious rule infractions. An example of a minor infraction is the presence of background noise, which may
be unintentional; these infractions are reviewed to determine if they provided an unfair advantage. Examples of major infractions include the test taker wearing headphones or looking away from the screen for too long, which results in a “rules broken” certification decision. Malicious infractions are intentional major infractions. An example may include receiving outside help, and verification of a malicious infraction results in a “malicious behavior” ruling and a ban from the DET (Duolingo English Test, 2020).

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Section 8: Test Security

Question: Do the DET systems provide adequate security to protect test and item data?

Standard 6.6: Reasonable efforts should be made to ensure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent or deceptive means (AERA, APA, & NCME, 2014, p 116).

Comment
When consequential decisions are made based in part on test scores, programs have a responsibility to take proactive steps to prevent fraud and other nefarious activities (AERA, APA, & NCME, 2014).

DET Item Security
The DET is a computer-adaptive test (CAT). Five of the ten item formats are administered using CAT. To limit item exposure and protect the integrity of scores, CAT necessitates the development of large item banks (Wainer, 2000).

The DET item bank consists of over 25,000 unique items for the five item types used in the CAT (Settles, LaFlair, & Hagiwara, 2020). The large item bank enables DET to have some of the lowest item exposure rates and test overlap rates in the industry (Settles et al., 2020). CAT item exposure refers to the percentage of tests in which an item is likely to be administered (Way, 1998). CAT overlap refers to the percentage of items that are shared between any two randomly selected CAT administrations (Chen, Ankenmann, & Spray, 2003).
Section 9: Data Security and Protection of Test Takers’ Personal Identifiable Information

Question: Do the DET systems provide adequate security to protect test takers’ personal identifiable information (PII) and test data (including score reports)?

Standard 6.14: Organizations that maintain individually identifiable test score information should develop a clear set of policy guidelines on the duration of retention of an individual’s records and on the availability and use over time of such data for research or other purposes. The policy should be documented and available to the test taker. Test users should maintain appropriate data security, which should include administrative, technical, and physical protections (AERA, APA, & NCME, 2014, p. 120).

Standard 6.16: Transmission of individually identifiable test scores to authorized individuals or institutions should be done in a manner that protects the confidential nature of the scores and pertinent ancillary information (AERA, APA, & NCME, 2014, p. 121).

The DET and Personally Identifiable Information

During the registration process, DET collects personally identifiable information (PII). The PII includes

- Photo from passports or other government-issued IDs
- Legal name
- Date of birth
- IP address and location
- Video of the test taker’s screen and face while testing

DET complies with the regulations of the European Union’s General Data Protection Regulation. Of the PII, ID photos are retained for only four days in encrypted storage, and, after four days, they are moved to a more secure digital location where only a select group of employees have access. Credit card information is collected for the payment process, but it is not retained. It is forwarded directly to credit card processors, who are certified and compliant with the European Union’s General Data Protection Regulation. DET test scores and score reports are encrypted and retained.
Within 48 hours of test completion, score reports are issued when no behavior violations are found during the proctor review stage. Test takers may then request that the DET forward their score reports to institutions. DET sends secure electronic score reports to identified institutions. Test takers can share their scores with an unlimited number of institutions.
References


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