Using the Advanced Dental Admission Test (ADAT) for Admission Purposes: **A Guide for Advanced Dental Education Programs**

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September 2017

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PRT: 9/15/17

Overview

The American Dental Association's (ADA) Advanced Dental Admission Test (ADAT) is designed to provide dental education programs with a means to assess program applicants' potential for success.

The ADA's Department of Testing Services (DTS) implements the ADAT program under the auspices of the ADA's Council on Dental Education and Licensure (CDEL). The ADAT is administered at test centers operated by Pearson VUE.

The ADAT is composed of multiple-choice questions presented in the English language, and is developed according to established test specifications. The ADAT consists of three test sections covering the following areas: Biomedical Sciences; Clinical Sciences; and Data, Research Interpretation, & Evidence Based Dentistry.

This guide is intended to provide advanced dental education programs with information concerning the appropriate use and interpretation of ADAT results. Information is provided in the following areas:

- Utilization of ADAT Results in Admission Decisions
- Evidence Supporting Use of the ADAT
- ADAT Content and Scales
- Administration of the ADAT
- ADAT Results Reporting
- Interpretation of ADAT Results
- Additional Guidelines for Interpreting and Applying ADAT Results

Additional information concerning the ADAT program is available online at ADA.org/adat. The ADAT website contains the ADAT Examination Guide, which provides further details concerning administration of the ADAT Program, as well as a set of practice test questions.

Utilization of ADAT Results in Admission Decisions

Use of the ADAT takes place within the context of advanced dental education programs' standard admission procedures. Each program differs in how admission decisions are made, and the specific tools available to support those decisions. The following provides general considerations for using ADAT results in admission decisions.

- Each program must make its own decision concerning how to use ADAT results.
- In making decisions as to how to use admission tools, including ADAT results, programs should carefully consider the following:
    - Program and school requirements
    - The knowledge, skills, abilities, and other characteristics (KSAOs) necessary to succeed in the program. This should also include characteristics and behaviors that can derail students and lead to failure, such as poor study habits and maladaptive traits.
    - Available information to support admission decisions (i.e., admission tools).
    - o The strengths and weaknesses of each admission tool, including:
        - information the tool provides relative to program requirements and the identified KSAOs
        - quality and accuracy of the information provided
        - evidence that supports the use of the tool
        - the extent to which information provided by the tool might be affected by factors unrelated to the KSAOs of focal interest
        - the extent to which the tool provides a fair and unbiased evaluation of candidate qualifications
        - legal defensibility of using the tool
        - the extent to which the tool permits the program to meaningfully compare the program relevant skills of candidates with different backgrounds (educational training, etc.)
    - The strengths and weaknesses of the set of admission tools utilized, including:
        - how information from different admission tools is weighted in decision making
        - how redundancy in the information provided by different tools is handled (e.g., via weighting)
        - any deficiencies that might be present (e.g., helpful or necessary information that may be lacking from the set of tools)
- Programs will differ in how they choose to use the ADAT.
    - Some programs may—in recognition of current challenges in comparing applicants across dental programs—choose to supplement the information from existing admission tools with ADAT results, in making candidate admission decisions.
    - Programs may weight ADAT results in accordance with results from a local (i.e., program specific) validation study, or in accordance with other information available to the program concerning the relationship between ADAT scores and program performance.
    - Some programs may use ADAT results only in certain prescribed situations:
        - Situations where little additional information is available concerning candidate qualifications (e.g., no candidate information is available concerning GPA, class rank, or results from other standardized tests).
        - Situations where candidates are equally qualified, and there is a need to break a tie.
    - Some programs may simply collect data on ADAT performance without using it to inform individual admission decisions. Programs can then review the information, become comfortable with the insight provided, and then decide how best to use ADAT results in future years.

- Programs should not exclusively rely on ADAT results in making admission decisions. The ADAT should be used in conjunction with other admission tools that provide insight into candidate qualifications as they relate to core program requirements.
- Programs should decide on their approach, and then apply that approach consistently, in compliance with school and legal requirements.

Evidence Supporting Use of the ADAT

The ADA's decision to pursue development of advanced dental admission test was based on the expressed needs of communities of interest. Some of those needs were expressed in published articles (cf. Fagin, Howell, Da Silva, and Park, 2014; Fagin, Howell, and Park, 2015), while others were expressed directly to the ADA.

Many advanced dental education programs communicated they were left in a difficult position when the Joint Commission on National Dental Examinations (JCNDE) transitioned to pass/fail reporting in 2012. The JCNDE had made this decision for a variety of reasons. The NBDE had never been validated for admission purposes, and thus its use within this context was questionable and also posed a threat to NBDE test security. In the absence of NBDE scores, advanced dental education programs had little information available to compare the qualifications of candidates with differing educational backgrounds and experiences. The situation was exacerbated by the movement toward pass/fail grading within certain dental schools. For programs caught in this precarious situation, ADAT results can provide valuable insight into candidate skills to inform decision making.

The following evidence supports use of the ADAT. Programs should carefully consider this information—as well as information and evidence supporting other available admission tools—in determining how best to approach use of the ADAT for admission purposes.

- Use of the ADAT is supported based on content validity evidence. ADAT items were written by dental subject matter experts, and other subject matter experts whose qualifications matched needs dictated by the test specifications.
- Candidate performance data collected on the ADAT shows that the ADAT reliably distinguishes between candidates of varying skill levels.
- The areas to be measured within the ADAT were preliminarily identified through review and analysis of the findings of an Advanced Dental Admission Test Task Force Report submitted to the ADA House of Delegates in September 2010. This report included findings from a survey on the evaluation and selection of applicants for positions in advanced dental education programs. This survey was conducted as part of the ADEA Future of Advanced Dental Education Admissions (ADEA/FADEA) project.
- The test specifications for the ADAT are reviewed and approved by the Council on Dental Education and Licensure (CDEL) (November 2014). CDEL's Dental Admission Testing Committee closely scrutinizes ADAT performance on an annual basis.
- The ADAT test specifications concerning the Biomedical Sciences and Clinical Sciences test sections are based on the test specifications for the National Board Dental Examinations (NBDE) Parts I and II. As such, the ADAT relies on the content domain foundation established for these two examination programs (e.g., the practice analysis involving entry-level general dentists conducted for the NBDE Part II). ADAT content within the Biomedical and Clinical Sciences sections is proportionally reduced, relative to the NBDE specifications.
- ADAT test specifications for the Data, Research Interpretation, & Evidence Based Dentistry section were constructed based on TCC member input and guidance from the ADA Science Division and its Center for Evidence-Based Dentistry.
- All ADAT TCC members are reviewed and approved by CDEL.
- A substantial number of ADAT Test Construction Committee (TCC) members also write items for other high stakes examination programs (e.g., the National Board Dental Examinations).
- ADAT TCC members receive extensive training on how to develop valid and reliable items. This includes training on fairness and sensitivity considerations in item writing.
- ADAT administrations occur under standardized testing conditions that are monitored closely. Deviations from standardized testing conditions are reported to the ADA's Department of Testing Services by the test administration vendor (Pearson Vue). Candidates who violate rules and

regulations can receive severe penalties that include the voiding of scores and the imposition of mandatory wait periods.

- Window testing and delayed scoring/results reporting are employed, so that psychometric analyses can identify and address any detected issues with test questions and how the examination performs.
- The practice of employing window testing and delayed reporting of scores is an accepted and valid means of test development, and was in fact pursued by the Joint Commission for decades, prior to the Joint Commission's transition to computer based test administration.
- Through window testing and the delayed reporting of official scores, candidate data will be available on all test items administered before items are actually used in official scoring. Any non-performing items that are identified are eliminated prior to official scoring and reporting.
- ADAT test development, administration, and scoring are implemented by the ADA's Department of Testing Services (DTS), which employs a professionally trained staff that includes individuals with advanced degrees in Psychometrics, Educational Psychology, Industrial/Organizational psychology, and Leadership.
- DTS has implemented dental high stakes testing programs for decades, including the testing programs of the Joint Commission on National Dental Examinations.
- Due to their high stakes nature, the testing programs under the care of DTS have been subjected to and withstood intense scrutiny over time. All US dental boards currently accept the National Board Dental Examinations (NBDE) and the National Board Dental Hygiene Examination (NBDHE) as valid evidence that a candidate possesses the cognitive skills necessary to safely practice dentistry (NBDE) or dental hygiene (NBDHE).

The following sections provide additional information concerning ADAT content, administration, scoring, and reporting.

ADAT Content and Scales

The Department of Testing Services has introduced changes to the ADAT test specifications for 2017. The changes are outlined in the table below.

2016 ADAT Test Specifications	2017 ADAT Test Specifications
Biomedical Sciences [80 items; 90 minutes] Anatomic Science Biochemistry-Physiology Microbiology-Pathology Dental Anatomy and Occlusion	**Biomedical Sciences [80 items; 95 minutes]** Anatomic Science Biochemistry-Physiology Microbiology-Pathology Dental Anatomy and Occlusion
Clinical Sciences [60 items; 70 minutes] Endodontics Operative Dentistry Oral and Maxillofacial Surgery/Pain Control Oral Diagnosis Orthodontics/Pediatric Dentistry Periodontics Pharmacology Prosthodontics	**Clinical Sciences [80 items; 90 minutes]** Endodontics Operative Dentistry Oral and Maxillofacial Surgery/Pain Control Oral Diagnosis Orthodontics/Pediatric Dentistry Periodontics Pharmacology Prosthodontics Principles of Ethics Patient Management
Data, Research Interpretation, & Evidence Based Dentistry [30 items; 30 minutes] Study Design Data Analysis Result Interpretation Inference and Implication	**Data, Research Interpretation, & Evidence Based Dentistry [40 items; 45 minutes]** Study Design Data Analysis Result Interpretation Inference and Implication
Principles of Ethics & Patient Management [30 items; 30 minutes] Principles of Ethics Patient Management	

The changes to the ADAT test specifications (effective 2017) can be summarized as follows:

1. Principles of Ethics and Patient Management questions are directly incorporated into the Clinical Sciences scale. A separate, reported Principles of Ethics and Patient Management score is NOT provided in 2017. Principles of Ethics and Patient Management content instead appears within the Clinical Sciences section of the test. It is important to emphasize that patient management and ethics are still included in the ADAT, and are still measured by the ADAT. They are simply no longer reported as a separate scale.

2. The number of Clinical Sciences questions has been increased from 60 to 80, to help increase the reliability of this scale. The additional 20 questions are distributed through the following areas:
   - Clinical Sciences (i.e., additional questions added and distributed evenly across the existing subtopic areas)
   - Principles of Ethics

- Patient Management

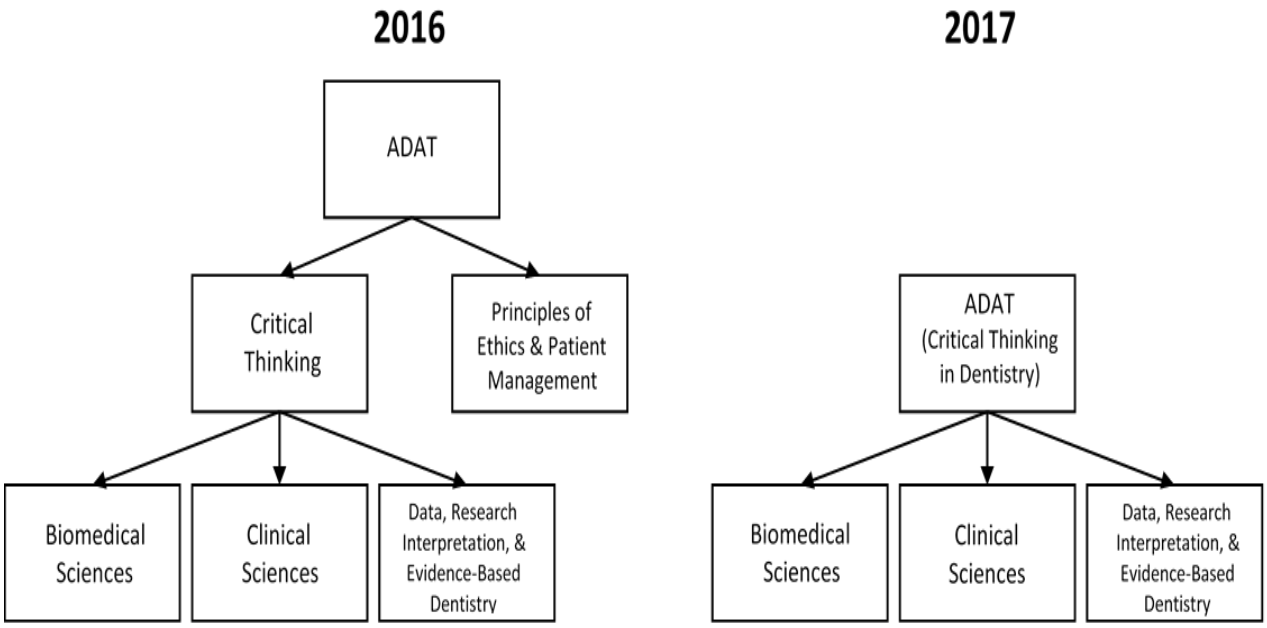
3. The number of Data, Research Interpretation, & Evidence Based Dentistry questions is increased from 30 to 40, to help increase the reliability of this scale. The additional 10 questions are distributed evenly across the existing subtopic areas.

The total number of items in the examination remains the same, as does the total administration time. Changes to within section administration times were informed by research conducted by DTS into item response times within each ADAT section.

The preceding modifications to the test specifications in turn necessitate changes to the ADAT score reporting structure. These are represented in Diagram 1.

Diagram 1

Changes to the ADAT Score Reporting Structure for 2017



Focusing on the lower left portion of Diagram 1 is helpful in understanding the updated structure. The ADAT 2016 Critical Thinking scale was a linear composite of the Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, and Evidence-Based Dentistry scales. With Principles of Ethics and Patient Management no longer present as a separate, reported scale, the corresponding box falls away, and there becomes no need to distinguish between an ADAT overall scale and the ADAT critical thinking scale (i.e., the information would be identical). Thus, the 2017 ADAT Overall score can appropriately be considered as critical thinking in dentistry, which is derived as a weighted average of the Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, and Evidence-Based Dentistry scale scores. This is depicted on the right side of Diagram 1.

Under the preceding test specifications and score reporting structure, ADAT candidates will receive the following scale scores:

- ADAT Overall (ADAT) (Critical Thinking in Dentistry)
- Biomedical Sciences (BIO)
- Clinical Sciences (CLI)
- Data, Research Interpretation, & Evidence Based Dentistry (DRI)

ADAT Overall Scale (Critical Thinking in Dentistry)
The ADAT overall scale provides an overall indication of how the candidate performed relative to all of the content areas presented in the ADAT. Descriptions of each of those content areas appears below.

Biomedical Sciences
This ADAT section focuses on cognitive skills involving the following subject areas:

BIOMEDICAL SCIENCES (80 items)
Anatomic Sciences (20 items)
Gross Anatomy
Histology
Oral Histology
Developmental Biology
Biochemistry and Physiology (20 items)
Biological Compounds
Metabolism
Molecular and Cellular Biology
Connective Tissue
Membranes
Nervous System
Muscle
Circulation
Respiration
Renal
Oral Physiology
Digestion
Endocrines
Microbiology and Pathology (20 items)
General Microbiology
Reactions of Tissue to Injury
Immunology and Immunopathology
Microbiology, Immunology, and Pathology of Specific Infectious Diseases

Systemic Pathology
Growth Disturbances
Dental Anatomy and Occlusion (20 items)
Tooth Morphology
Pulp Cavity Morphology
Calcification and Eruption
Principles of Occlusion and Function
Clinical Considerations – Tooth Morphology and Anomalies

Clinical Sciences
This section of the ADAT focuses on cognitive skills involving the following disciplines:

CLINICAL SCIENCES (80 standalone and case-based items)
Endodontics
Operative Dentistry
Oral and Maxillofacial Surgery and Pain Control
Oral Diagnosis
Orthodontics and Pediatric Dentistry
Periodontics
Pharmacology
Prosthodontics
Principles of Ethics
Patient Management

With respect to Principles of Ethics, it should be noted that these questions do NOT directly measure professional ethics, or indicate whether a person will behave ethically. Rather, these questions provide information concerning whether a candidate can, for example, recognize the ethical principles that apply to particular situations, and how those situations could be handled in accordance with those ethical principles.

Data, Research Interpretation, & Evidence Based Dentistry

This section of the ADAT focuses on concepts taught within the framework of Evidence Based Dentistry. Within this framework, clinicians must know how to critically and systematically review research findings, understand basic methodological issues, and use this information to apply research findings in decision making involving their practice and specific patients. Thus, the focus of this scale rests entirely on methodology, interpretation, and application of research, as opposed to referencing specific findings (e.g., the effectiveness of fluoride in preventing caries) that emerged from this research base. Specific findings would instead be referenced in the Biomedical and Clinical Sciences section of the ADAT.

The following are core concepts in Evidence-Based Dentistry:

- Asking precise, structured clinical questions
- Finding the best evidence using currently available electronic resources
- Reading and critically evaluating research information
- Understanding clinical trial design, such as therapy, diagnosis, and qualitative assessment
- Understanding and interpreting basic statistical information, such as descriptive statistics, odds ratios, risk reduction, and relative risk, to implement Evidence Based Dentistry appropriately in practice settings
- Using evidence based clinical guidelines, recommendations, and systematic reviews
- Implementing best evidence in clinical practice.

This section of the ADAT focuses on cognitive skills involving the following subject areas:

DATA, RESEARCH INTERPRETATION, & EVIDENCE BASED DENTISTRY (40 items)
Study Design
Data Analysis
Result Interpretation
Inference and Implication

Administration of the ADAT

Policies and procedures for administering the ADAT are presented in the ADAT Examination Guide, which is published on an annual basis. This guide is available at the following link: www.ada.org/adat.

ADAT Eligibility

Eligibility to take the ADAT is based on the candidates' training and their current status as a student or graduate.

Training	Status	Action Required
CODA Accredited Dental School	**Student**	School is responsible for approving the candidate's eligibility.
	Graduate	Candidate must send proof of graduation to DTS. Eligibility approved after receipt of reasonable proof.
Non-Accredited Dental School	**Student**	Candidate requests an Educational Credential Evaluators (ECE) electronic report to certify status as a current dental student.
	Graduate	Candidate requests an ECE electronic report to confirm dental degree.

ADAT Administration Vendor and Testing Schedule

The ADAT is administered at Pearson VUE test centers in the United States, its territories (including Guam, Puerto Rico and the Virgin Islands), and in Canada. Administration occurs during predefined testing dates indicated in the ADAT Examination Guide.

ADAT TESTING SCHEDULE	
Tutorial	15 minutes
Biomedical Sciences (80 items)	**95 minutes**
Break (optional)	10 minutes
Clinical Sciences (80 items)	**90 minutes**
Break (optional)	10 minutes
Data, Research Interpretation, and Evidence-Based Dentistry (40 items)	**45 minutes**
Post Test Survey (optional)	5 minutes
Total Time	**4 hours 30 minutes**

Time permitting, candidates are prompted to review their answers in each section before taking a break or moving on to the next section. Once a candidate has begun a break, he or she is not allowed to return to the previous section to view questions and change answers. Partial testing is not permitted. Applicants are required to take all three sections of the ADAT.

In taking the ADAT, candidates agree to adhere to examination rules and regulations, which are described in the ADAT Examination Guide. Candidate behavior is closely monitored during test administration to confirm that rules and regulations are respected. Candidates who violate examination regulations are subject to severe penalties that include the voiding of scores and the imposition of mandatory wait periods.

ADAT Results Reporting

Note: The ADAT testing window for 2017 is now closed. The following text concerning ADAT Results Reporting has been preserved in its original format as a reference. Beginning in 2018 official ADAT results will be released to candidates and programs three to four weeks after the candidate takes the examination. For example, if a candidate takes the ADAT on March 1, 2018, his or her official results will be released by April 1, 2018. Due to this change, preliminary ADAT results reporting will no longer be necessary in 2018.

Official ADAT Results

Official ADAT results for all 2017 testing dates are scheduled to be released September 14, 2017 to candidates and ADEA PASS (at ADEA.org/passapp).

Official results will be reported as ADAT scale scores. To assist with interpretation, the Score and Audit Information page at ADA.org/ADAT will be updated on September 14 with a final report indicating scale scores and corresponding percentiles with respect to the overall candidate pool.

Preliminary (Unofficial) ADAT Results

To assist candidates and programs, preliminary ADAT results are scheduled to be released on the following dates:

- June 15, 2017
- August 10, 2017

The Preliminary ADAT results shared on the above dates are considered unofficial and are intended to help ADAT candidates and programs understand candidate performance on the examination relative to others who have taken the test to date. Candidates and programs will receive information concerning candidates' percentile standing in each of the following areas:

- Overall ADAT (Critical Thinking in Dentistry)
- Biomedical Sciences
- Clinical Sciences
- Data, Research Interpretation, and Evidence-Based Dentistry

Percentiles describe how a candidate performed relative to other test-takers in a norm group. Percentiles can be interpreted as the percentage of test-takers in the norm group who scored at or below the candidate's score. **Candidates and programs should expect that candidates' percentile standing will change as more individuals complete the ADAT.** Similarly, the preliminary results reported to candidates and programs will also change at each of the dates indicated above. Candidates can monitor changes by reviewing the "My Account" area of their DENTPIN® accounts. This area will contain candidates' most recently reported results; any previous percentiles reported will be replaced with the newest information. When official results are reported, candidate scale scores will completely replace the preliminary percentiles reported in My Account. Programs will be provided with candidate percentile performance relative to the indicated norm group.

Example:

> ***On June 15, 2017***, preliminary ADAT percentile results will be released to candidates who tested between April 3 and May 31, 2017. For these percentiles, the norm group will consist of candidates taking the ADAT between April 3 and May 31. If a candidate has a percentile of 88 at this stage, for example, he or she performed as well as or better than 88% of candidates taking the ADAT between April 3 and May 31, 2017.

On August 10, 2017, percentile results will be released to candidates who tested between April 3 and July 31, 2017. For these percentiles, the norm group will consist of candidates taking the ADAT between April 3 and July 31. For example, candidates in the 80th percentile at this stage performed as well or better than 80% of candidates taking the ADAT between April 3 and July 31, 2017.

On September 14, 2017, final percentiles will be released as part of the official results released to candidates who tested between April 3 and August 31, 2017. For these percentiles, the norm group will consist of candidates taking the ADAT between April 3 and August 31. For example, a candidate in the 82nd percentile at this stage performed as well as or better than 82% of candidates taking the ADAT between April 3 and August 31, 2017. To obtain their final ADAT percentile, candidates can compare their achieved scale scores against normative tables that will be released on this date.

Note: While the preceding examples could be interpreted as referencing different candidates, the above could also describe the experience of a single candidate who tested in May 2017. The candidate's percentile standing could change from 88 to 80 and then to 82 across the three reporting periods. A candidate's percentile standing can shift up or down as the normative group changes.

Reporting Schedule and Practices

The following table summarizes the preceding schedule of reporting activity.

ADAT 2017 RESULTS REPORTING SCHEDULE		
Type of Results	Test Administration Period	Results Posted
Preliminary Results (Percentiles)	April 3 to May 31	June 15
	April 3 to July 31	August 10
Official Results (Scale Scores)	April 3 to August 31	September 14

In subsequent years, candidate percentiles will not be directly provided in the DTS Hub and My Account. This is due to the interpretational challenges associated with percentiles, as indicated above (i.e., their dependence on the sample tested, and their inability to provide a fixed skill interpretation). In lieu of this candidate specific information, the ADAT Program will provide overall normative tables that can serve as a reference in understanding the skills of those who tested in a given year, and how candidates compare to each other.

Results will be provided electronically to all programs selected by the candidate. Many advanced dental education programs participate in the ADEA Postdoctoral Application Support Service (ADEA PASS) and benefit from the corresponding services provided. If a candidate requests their results be sent to any advanced dental education program, their results will also be made available to the ADEA PASS for use within this service. It should be noted that ADEA PASS is separate and distinct from the American Dental Association's Department of Testing Services, and therefore operates independent of the ADAT Program. For information concerning ADEA PASS test reporting policies, please contact the ADEA PASS directly (http://www.adea.org).

When ADAT results are reported, the candidate's full testing history is reported (i.e., test results for all testing attempts). Once a candidate has taken any part of the ADAT, the scores cannot be voided at the candidate's request. In considering a candidate's performance across multiple testing attempts, all else

equal the Department of Testing Services advises programs to consider results from the most recent administration as providing the best insight into the candidate's current skills.

Interpretation of ADAT Results

ADAT Scale Scores

Official ADAT scores are calculated based on a candidate's correct responses to items. ADAT results are reported in terms of scale scores. These scale scores are not raw scores (number of correct answers). The conversion of raw scores to scale scores is accomplished using sophisticated equating procedures. Using scale scores, it is possible to meaningfully compare the performance of one applicant with the performance of all applicants. The ADAT program does not designate passing or failing scores.

ADAT scale scores range from 200 to 800. Higher scale scores in a specific area indicate higher cognitive skills in that area. A score of 200 is reported for any assigned test not taken. ADAT Scale Scores are presented in the following areas:

- Overall ADAT (Critical Thinking in Dentistry)
- Biomedical Sciences
- Clinical Sciences
- Data, Research Interpretation, and Evidence-Based Dentistry

Scoring Model and Equating Procedures

Scale scores for the four ADAT disciplines are calculated using item response theory (IRT) and the three-parameter logistic model (3-PL Model). In providing an estimate of candidate skills, the IRT 3-PL Model takes into account the following:

- The difficulty level of each test item
- The quality of each test item (item discrimination)
- The impact of guessing on item performance

The ADAT does not penalize candidates for guessing. However, it statistically adjusts scores based on an item's susceptibility to guessing. This practice increases the precision and accuracy of skill evaluation.

Each administered ADAT includes questions that enable the Department of Testing Services to place different forms of the test on a common measurement scale, thereby adjusting the forms for differences in difficulty level. Because of this adjustment, scores have the same meaning regardless of the test form that was administered. Some questions on the test are experimental and are not scored. The data collected on unscored questions is used in later test construction procedures.

Composite and Discipline Based Scales

The ADAT Overall scale is referred to as a composite scale, because it is calculated using scores from the discipline based scales. The ADAT Overall score is a weighted average of scale scores from the Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, & Evidence Based Dentistry scales. Weights are proportional to the number of items in each area, and the final score is rounded to the nearest ten.

The ADA's Department of Testing Services established the discipline based ADAT score scales so that they each had a mean of 500 and a standard deviation of 100 during the ADAT's first year of implementation. These scale properties (i.e., mean of 500 and standard deviation of 100) will be challenging to maintain over time, due to the fact that the population taking the ADAT could change substantially during the first few years of implementation. In short, as more and more advanced dental education programs use the ADAT, the level of skills of the overall candidate pool will shift based on the

skills of those included. Programs should anticipate that recalibration of the score scale may be necessary in future years, as the population taking the ADAT changes.[1]

Interpretation of composite scale scores is slightly different from interpretation of discipline based scale scores. It is important to note that scores on the ADAT Overall scale have a narrower range than scores on the three discipline scales. While higher scores (e.g., 750 to 800) are possible on the ADAT Overall scale, such scores are more difficult to achieve and were in fact not observed in the 2017 sample.

A complete listing of the percentiles associated with ADAT scale scores from 2017 appears in the *Normative Information* section of this guide.

Additional Guidelines for Interpreting and Applying ADAT Results

Note: The ADAT testing window for 2017 is now closed. Portions of the following text contain references to preliminary results reporting implemented in 2017. This text has been preserved in its original format as a reference. Beginning in 2018 official ADAT results will be released to candidates and programs three to four weeks after the candidate takes the examination. Due to this change, preliminary ADAT results reporting will no longer be necessary in 2018.

The following guidelines may be helpful for interpreting and applying ADAT results:

- Candidates may choose to take the examination more than once. Because the ADAT is a relatively new examination, and many candidates are experiencing it for the first time, it is recommended that programs reference the candidate's most recent results to best represent the candidate's skills.
- It is recommended that programs avoid employing cut scores with the ADAT during its first few years of use (e.g., admitting candidates with ADAT scores of "x" or above). Such a practice would be premature until programs have a stronger understanding of the cognitive skills associated with the various ADAT score levels.
- Until the preceding information becomes available, it is recommended that ADAT results be interpreted on a relative basis, as follows:
    - Candidates with higher scores on each scale have demonstrated stronger cognitive skills than candidates obtaining lower scores.
- Candidates with lower percentile standing on the ADAT may still be viable candidates for advanced dental education programs. If, for example, ADAT examinees are more highly skilled on average than those who do not take the ADAT, then their percentile standing within the general dental population may be considerably higher than one might think given their achieved ADAT percentile standing. This may be particularly true in the first years of ADAT availability, when less information is available to compare the pool of ADAT examinees with the total pool of advanced dental education candidates. In short, candidates with lower ADAT percentile standing should not be broadly interpreted as "poor candidates."
- When viewing preliminary results reporting that includes candidate percentiles, programs should be mindful of the fact that strictly speaking percentiles obtained across test administration periods (i.e., across norm groups) are NOT directly comparable. Comparison using percentiles within testing periods (within a given norm group) is useful and appropriate.
- Candidates' percentile standing can and will change across test administration periods, even though a given candidate's performance on the examination remains the same. This is also why ADAT official results are provided in scale scores, which do not change and have the potential to take on fixed interpretations (i.e., a score of 'x' signifies a specific level of cognitive skills with respect to a particular content area of interest).

[1] Recalibration re-centers the score scale and adjusts the score distribution so it takes on desirable properties. The examination's validity and reliability remains intact.

- When examining and comparing candidate performance, programs should use caution when interpreting differences in percentile standing. Differences in percentile standing communicate differences in candidate relative standing in the population tested, NOT the amount of difference between candidates in their underlying skills. For example, assuming the data are normally distributed, a five percent (5%) difference in percentile standing can correspond to a:
    - small difference in skills for candidates who fall in the middle of the distribution (e.g., 50th percentile).
    - large difference in skills for candidates scoring in the tails of a distribution (e.g., 95th percentile).
- Use percentiles to understand candidates' relative standing within the population tested.
- Use scale scores to understand candidate skill levels, as well as differences between candidates in their underlying skills.
- Comparison of candidates who tested in different years (2016 or 2017) is best made through comparisons of scale scores and percentiles (Appendix B2), which will be available for 2017 administrations on September 14, 2017.
    - In the interim period (i.e., while programs are waiting for official results), some programs may choose to compare candidate percentile standing across the two time periods to obtain a rough relative understanding of candidate skills. However, great caution should be exercised in so doing, for the reasons indicated above. The normative groups on which the two sets of percentiles are based are different. Such comparisons essentially rely on the assumption that the normative groups are roughly identical

- DTS recommends that programs focus their attention on the ADAT Overall scale. This scale contains larger numbers of items and is therefore more reliable than scales containing fewer items (e.g., Data, Research Interpretation, & Evidence Based Dentistry).
- Do NOT overemphasize small differences in test scores.
- Do NOT simply rank order candidates and make selection decisions based on a topdown approach. This approach may disadvantage certain applicant groups.
- As a reminder, in making admission decisions programs should carefully consider a) the full set of KSAOs required for success in a program, in relation to program, school, and legal requirements, and b) the qualifications of candidates.
- Programs should let the above perspective help inform their decisions with respect to individual candidates.

ADAT Score Reliability

Reliability coefficient estimates for 2017 ADAT scale scores are given in the table below[2]. Reliability coefficients can range from zero to one, with higher values indicating higher reliability.

Reliability coefficients for ADAT scale scores: 2017 (483 administrations)

ADAT Scale	Reliability
ADAT Overall (ADAT)	.91
Biomedical Sciences (BIO)	.78
Clinical Sciences (CLI)	.74
Data, Research Interpretation, & Evidence Based Dentistry (DRI)	.79

As noted previously, the Principles of Ethics & Patient Management scale has been eliminated as a separately reported scale in 2017, and additional questions have been added to the Clinical Sciences and Data, Research Interpretation, & Evidence Based Dentistry scales. The preceding actions resulted in increased reliability for the Clinical Sciences and Data, Research Interpretation, & Evidence Based Dentistry scales in 2017, as anticipated.

The Department of Testing Services recommends that candidates and programs focus their attention on the ADAT Overall scale. This scale is based on more items and is therefore more reliable than scales containing fewer items.

[2] The reliability coefficients are calculated from Item Response Theory (IRT) 3- Parameter Logistic (3PL) model estimates of candidate skill levels and their standard errors using the methods described by Sireci, Thissen and Wainer (1991) and Childs et al. (2004).

Normative Information

ADAT Scale Scores. Descriptive statistics for 2017 ADAT scale scores are provided in the table below. ADAT scale scores can range from 200 to 800.

Descriptive statistics for ADAT scale scores: 2017 (483 administrations)

Scale Type	Scale	Mean	SD	Min	Max
Composite	ADAT Overall (ADAT)	510.2	71.8	200	740
Discipline	Biomedical Sciences (BIO)	515.5	86.7	200	780
	Clinical Sciences (CLI)	508.0	80.9	200	770
	Data, Research Interpretation, & Evidence Based Dentistry (DRI)	504.6	93.8	200	800

Frequency distributions for the four ADAT scales from 2017 are presented in Appendix A. The vertical axis of each figure shows the number of times each scale score was observed, while the horizontal axis shows the scale score.

2017 ADAT Percentiles. Appendix B1 presents the percentiles associated with scores on each ADAT scale, based on the 483 ADAT administrations occurring in 2017. For each scale and scale score in Appendix A1, the corresponding scale score percentile can be interpreted as the percentage of ADAT 2017 candidates who achieved that scale score or less. If a given scale score corresponds to a percentile of 88, for example, then 88% of ADAT 2017 candidates achieved that scale score or less.

2016-2017 ADAT Percentiles. Appendix B2 presents the percentiles associated with scores on each ADAT scale, based on all 945 ADAT administrations occurring from 2016 through 2017. These percentiles are interpreted in a similar manner to the 2017 percentiles, except they rely on a broader normative group.[3]

Normative Information, by Specialty. At the time of application to complete the ADAT, candidates indicate the programs to which they would like to send their results. Based on the programs selected, candidates can be classified into one or more specialty groups. Candidates who select programs from multiple specialties are classified into multiple specialty groups. In 2017, most candidates (approximately two-thirds) applied to just a single specialty program.

Appendix C1 contains descriptive statistics for 2017 ADAT scale scores, by specialty. Appendix C2 contains descriptive statistics for 2016 and 2017 ADAT scale scores (combined), by specialty. Specialties are shown if they were selected by 25 or more candidates.

Appendix D1 contains frequency distributions for the 2017 ADAT Overall scale, by specialty, for those specialties selected by 80 or more candidates. Appendix D2 contains frequency distributions for the 2016 and 2017 ADAT Overall scale, by specialty, for those specialties selected by 80 or more candidates. The

[3] It should be noted that some differences were present between the 2016 and 2017 ADAT scales. Most notably, the 2017 DRI and CLI scales contained greater numbers of items as compared to the 2016 versions of these scales, due to the elimination in 2017 of the Principles of Ethics & Patient Management (PEPM) scale as a separately reported scale. Twenty (20) of the thirty (30) items in the 2016 PEPM scale were made available for use and incorporated into the CLI scale, while the remaining ten (10) items were made available for use in the DRI scale. These changes in turn translate into minor differences between the 2016 and 2017 ADAT Overall scale. While these changes must be noted, the essential meaning of the core 2017 ADAT scales remained intact, and thus it was regarded as reasonable and appropriate to provide a combined 2016-2017 normative group that reflected the full population of ADAT examinees on these core scales.

vertical axis of each figure shows the number of times each scale score was observed, while the horizontal axis shows the scale score.

As the ADAT program grows and additional candidates complete the examination, additional normative breakdown groups will satisfy the criteria indicated above (N≥25 for descriptive statistics, N≥80 for frequency distributions) and will thus be able to be presented.

Concluding Comments

The American Dental Association is pleased to provide the Advanced Dental Admission Test for consideration by advanced dental education programs and communities of interest. For additional information concerning this examination program, please visit the ADAT website (www.ada.org/adat).

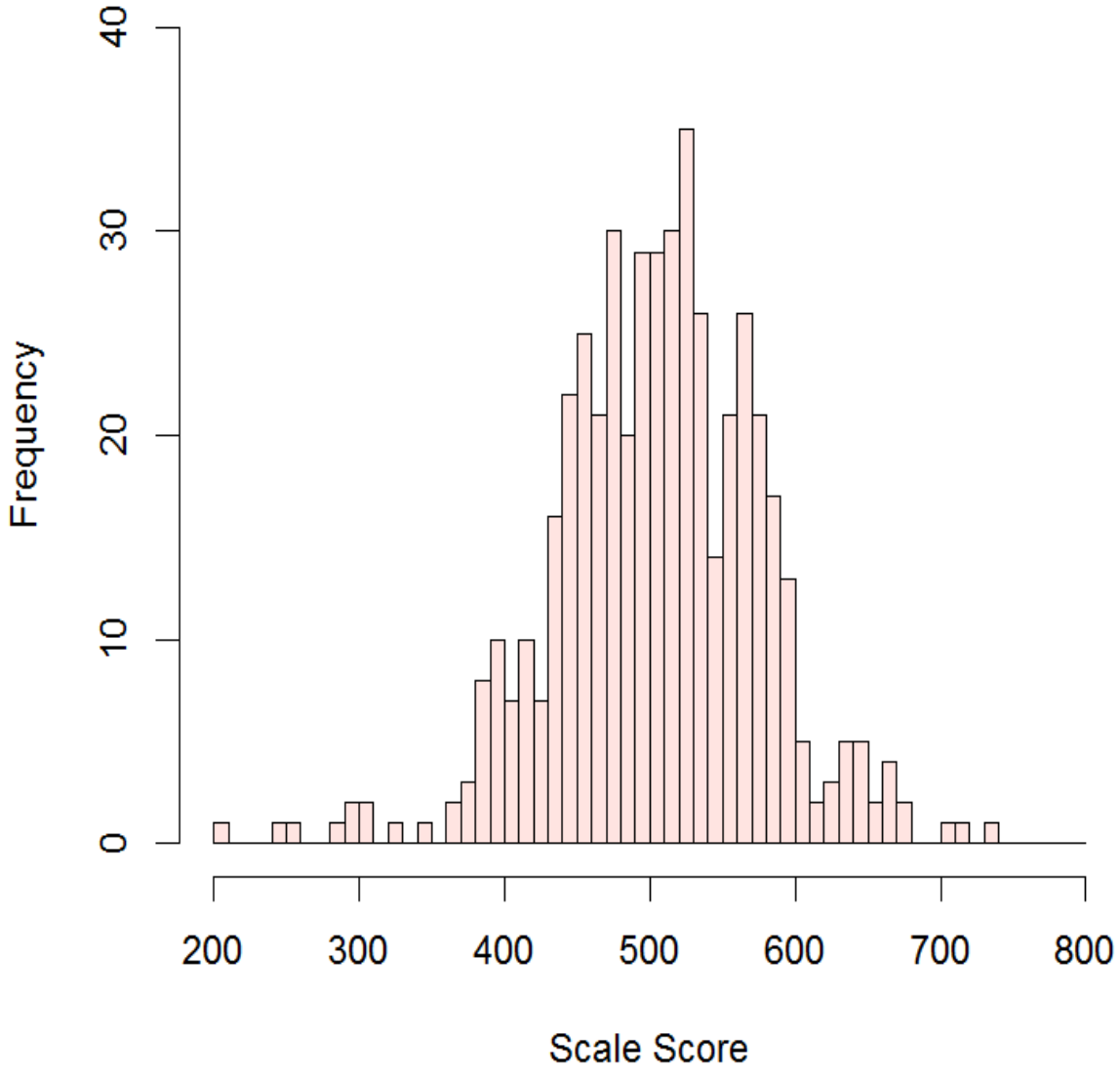
References

Childs, R.A., Elgie, S., Gadalla, T., Traub, R., & Jaciw, A.P. (2004). Irt-linked standard errors of weighted composites. *Practical Assessment, Research & Evaluation, 9*. Retrieved September 7, 2016 from http://PAREonline.net/getvn.asp?v=9&n=13

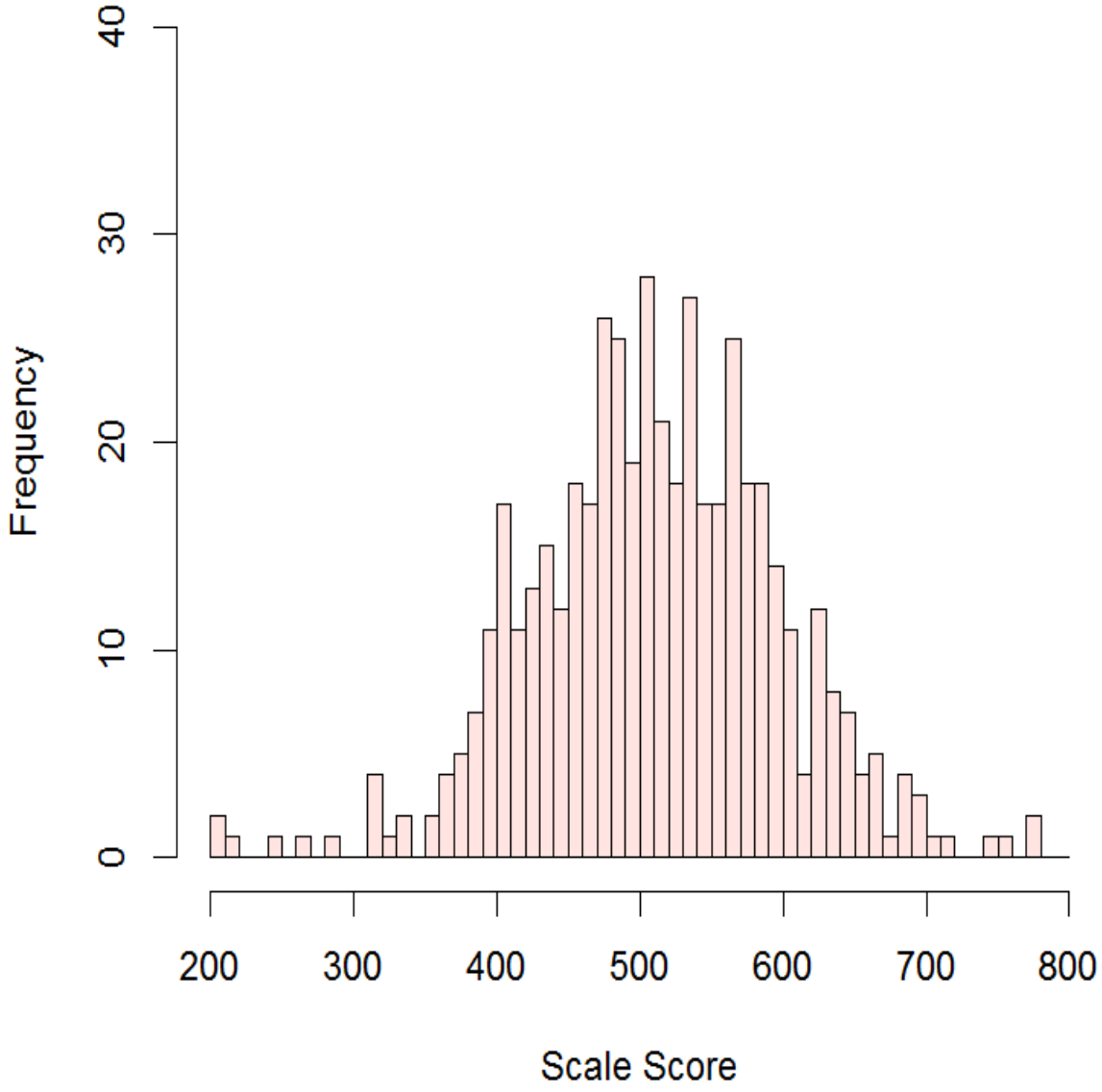
Sireci, S.G., Thissen, D., & Wainer, H. (1991). On the reliability of testlet-based tests. *Journal of Educational Measurement, 28,* 237-247.

Appendix A: Frequency Distributions for ADAT Scale Scores: 2017

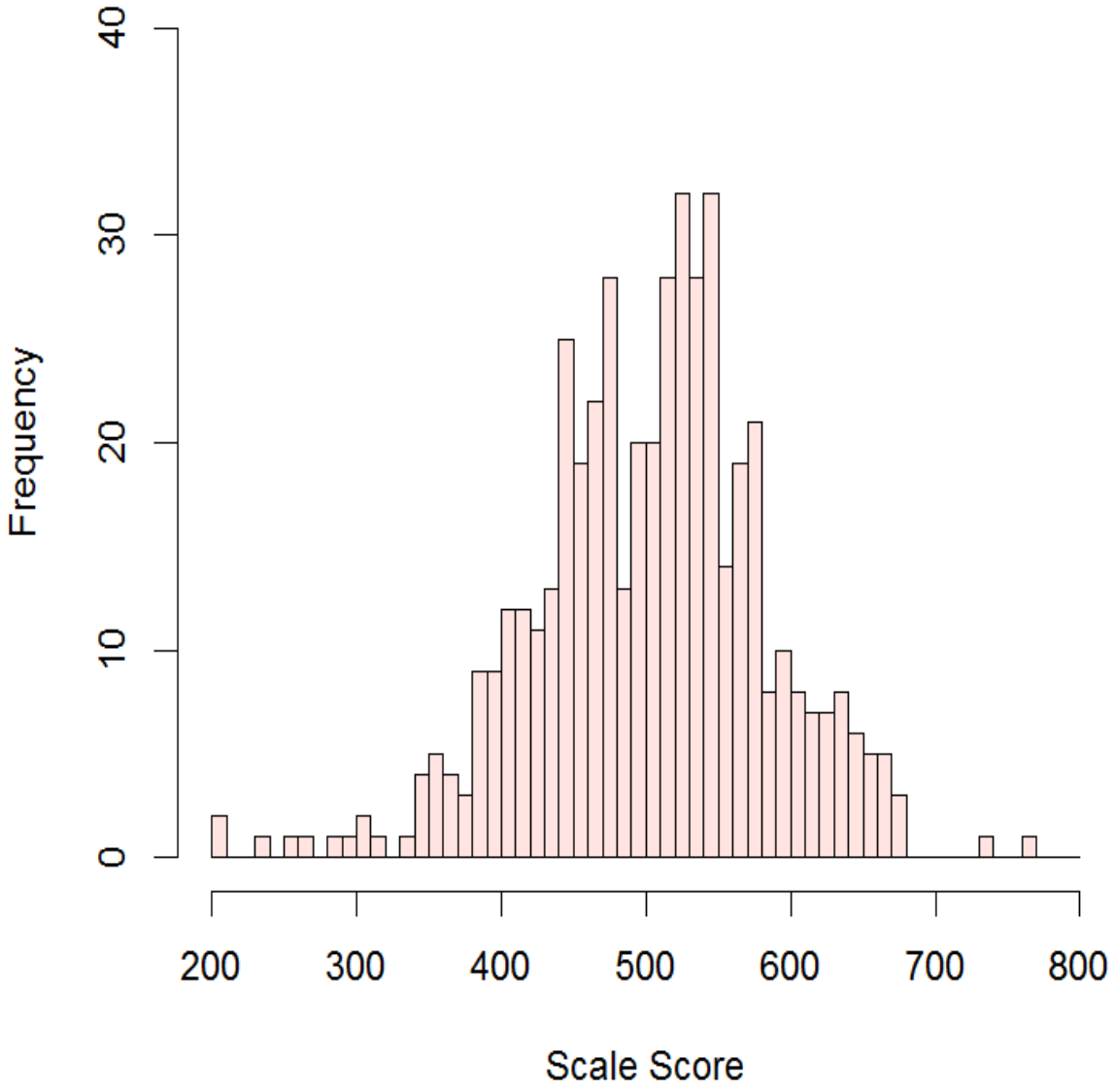
Frequency distribution for the ADAT Overall scale: 2017
(483 administrations)



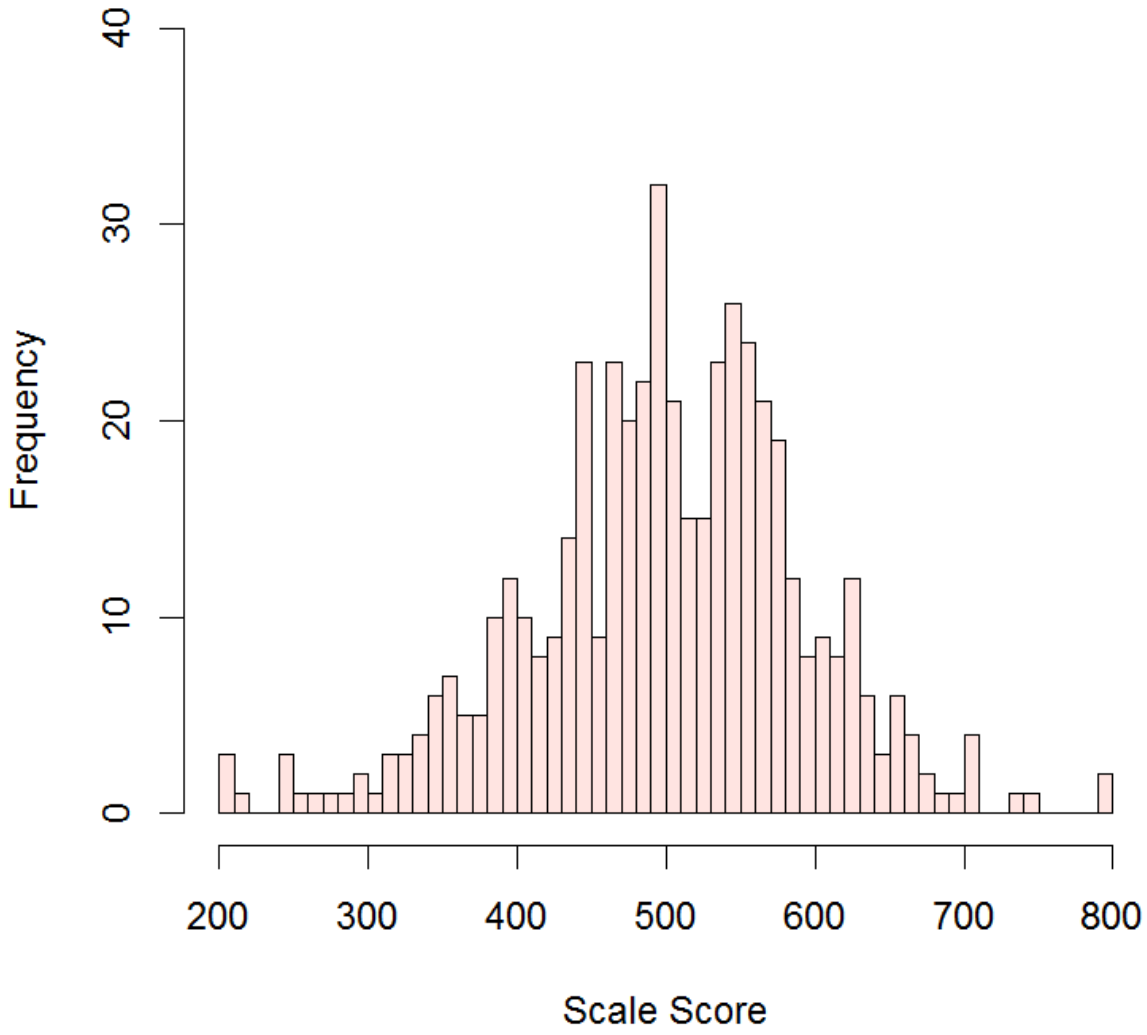
Frequency distribution for the Biomedical Sciences scale: 2017
(483 administrations)



Frequency distribution for the Clinical Sciences scale: 2017
(483 administrations)



Frequency distribution for the Data, Research Interpretation, & Evidence Based Dentistry scale: 2017 (483 administrations)



Appendix B1: Percentiles Associated with ADAT Scale Scores: 2017 (483 administrations)

ADAT=ADAT Overall; BIO=Biomedical Sciences; CLI=Clinical Sciences; DRI=Data, Research Interpretation, & Evidence Based Dentistry;

Score	ADAT	BIO	CLI	DRI
800				99
790				99
780		99		99
770		99	99	99
760		99	99	99
750		99	99	99
740	99	99	99	99
730	99	99	99	99
720	99	99	99	99
710	99	99	99	99
700	99	99	99	98
690	99	98	99	98
680	99	97	99	98
670	99	97	99	98
660	98	96	98	97
650	98	95	97	95
640	97	94	96	95
630	96	92	94	94
620	95	90	93	91
610	95	89	91	89
600	94	87	89	88
590	91	84	87	86
580	87	80	86	83
570	83	76	81	80
560	78	71	77	75
550	73	67	75	70
540	70	64	68	65
530	65	58	62	60
520	58	55	55	57
510	52	50	50	54
500	46	45	46	49
490	40	41	41	43
480	35	35	39	38
470	29	30	33	34
460	25	27	28	29
450	20	23	24	28

Score	ADAT	BIO	CLI	DRI
440	15	20	19	23
430	12	17	17	20
420	10	14	14	18
410	8	12	12	16
400	7	9	9	14
390	5	6	7	12
380	3	5	6	10
370	2	4	5	9
360	2	3	4	8
350	2	3	3	6
340	2	3	2	5
330	2	2	2	4
320	2	2	2	4
310	2	1	2	3
300	1	1	1	3
290	1	1	1	2
280	1	1	1	2
270	1	1	1	2
260	1	1	1	2
250	1	1	1	1
240	1	1	1	1
230	1	1	1	1
220	1	1	1	1
210	1	1	1	1
200	1	1	1	1

Appendix B2: Percentiles Associated with ADAT Scale Scores: 2016-2017 (945 administrations)

ADAT=ADAT Overall; BIO=Biomedical Sciences; CLI=Clinical Sciences
DRI=Data, Research Interpretation, & Evidence Based Dentistry

Score	ADAT	BIO	CLI	DRI
800				99
790				99
780		99		99
770		99	99	99
760		99	99	99
750		99	99	99
740	99	99	99	99
730	99	99	99	99
720	99	99	99	99
710	99	99	99	99
700	99	98	99	98
690	99	97	99	98
680	99	97	98	98
670	99	96	98	97
660	99	95	97	97
650	98	94	95	95
640	97	93	94	94
630	96	92	93	93
620	95	90	92	91
610	94	89	90	90
600	93	87	88	88
590	91	84	86	86
580	88	81	84	83
570	85	77	80	80
560	80	73	77	76
550	76	70	73	72
540	72	66	67	67
530	67	61	63	63
520	61	58	57	58
510	54	53	53	54
500	47	48	48	50
490	41	45	44	45
480	37	40	41	40
470	32	35	36	36
460	28	31	32	32
450	23	28	28	28

Score	ADAT	BIO	CLI	DRI
440	19	24	24	24
430	16	21	21	22
420	13	18	18	19
410	10	15	16	18
400	8	12	13	15
390	6	10	10	12
380	4	8	8	10
370	3	6	7	9
360	3	5	6	8
350	2	4	5	7
340	2	4	4	6
330	2	4	3	5
320	1	3	3	4
310	1	2	3	3
300	1	2	2	3
290	1	1	2	2
280	1	1	1	2
270	1	1	1	1
260	1	1	1	1
250	1	1	1	1
240	1	1	1	1
230	1	1	1	1
220	1	1	1	1
210	1	1	1	1
200	1	1	1	1

Appendix C1: Descriptive Statistics for ADAT Scale Scores, by Specialty: 2017

	Specialty	N†	ADAT		BIO		CLI		DRI	
			MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
1	**Advanced Education in General Dentistry, 12 Months**	79	514.8	72.1	531.9	83.1	502.4	84.6	506.8	103.6
2	**Advanced Education in General Dentistry, 24 Months**	53	495.3	85.9	533.6	93.2	469.2	94.8	474.0	123.8
3	**Endodontics**	107	503.3	68.8	509.3	78.2	498.5	86.7	501.8	95.6
4	**General Practice Residency, 12 Months**	69	521.6	71.5	535.5	81.9	507.4	83.2	525.1	106.0
5	**General Practice Residency, 24 Months**	40	510.8	85.9	540.0	95.7	489.0	95.9	497.8	116.1
6	**Orthodontics and Dentofacial Orthopedics**	150	530.2	68.2	538.0	90.3	529.0	73.3	518.3	85.7
7	**Orthodontics/Periodontics**	48	531.5	68.7	563.8	86.7	515.2	73.4	502.1	106.4
8	**Pediatric Dentistry**	137	501.8	65.9	508.5	87.0	498.5	73.5	496.0	79.2
9	**Periodontics**	46	492.4	74.3	517.2	88.2	481.1	85.3	466.5	105.0
10	**Prosthodontics**	38	473.4	81.6	505.8	101.7	457.1	87.9	442.6	114.6

Note. ADAT=ADAT Overall, BIO=Biomedical Sciences; CLI=Clinical Sciences, DRI=Data, Research Interpretation, & Evidence Based Dentistry; Norms are presented only for specialties selected by 25 or more candidates.

†Represents the number of ADAT administrations. In most cases, the number of administrations is slightly greater than the number of candidates (a small number of candidates took the ADAT more than once).

Appendix C2: Descriptive Statistics for ADAT Scale Scores, by Specialty: 2016-2017

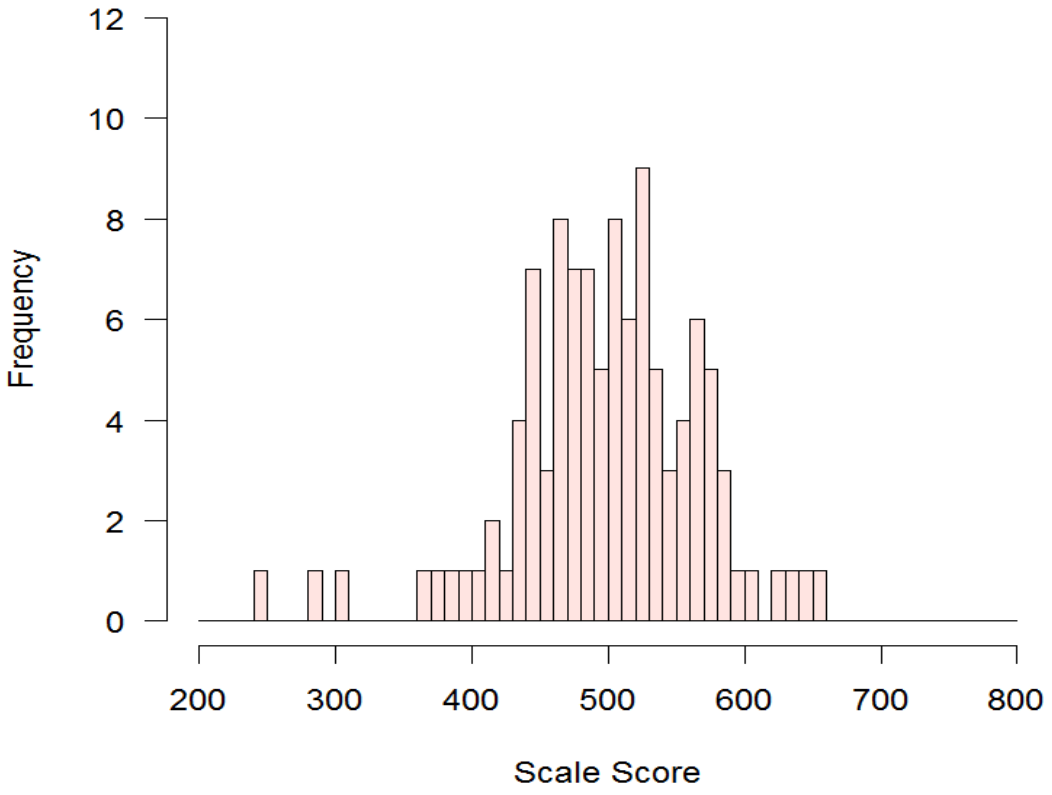
	SPECIALTY	N†	ADAT		BIO		CLI		DRI	
			MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
1	**Advanced Education in General Dentistry, 12 Months**	159	502.6	78.3	517.4	99.3	497.0	93.3	490.2	107.1
2	**Advanced Education in General Dentistry, 24 Months**	87	488.0	91.0	528.5	104.5	466.4	109.7	456.8	121.5
3	**Dental Public Health**	28	460.7	83.4	508.6	125.2	429.3	104.5	431.4	88.9
4	**Endodontics**	191	501.3	75.3	504.3	97.0	498.7	94.4	502.2	98.6
5	**General Practice Residency, 12 Months**	168	508.0	78.3	521.4	99.9	497.1	96.1	503.4	110.1
6	**General Practice Residency, 24 Months**	75	497.3	92.9	531.9	108.3	477.2	110.7	470.7	117.1
7	**Oral and Maxillofacial Surgery**	45	496.0	84.1	530.9	113.4	471.1	106.2	474.2	111.3
8	**Oral Medicine**	25	474.8	82.1	528.0	113.3	444.4	97.0	431.2	94.4
9	**Clinical Fellowship in Craniofacial and Special Care Orthodontics**	26	497.3	87.6	555.0	122.3	466.9	98.5	447.7	96.3
10	**Orthodontics and Dentofacial Orthopedics**	283	522.5	71.0	529.9	94.9	520.7	84.0	515.8	94.8
11	**Orthodontics/Periodontics**	95	520.6	75.7	551.7	102.2	502.2	87.2	495.6	110.1
12	**Pediatric Dentistry**	317	496.1	67.5	497.8	93.8	492.6	86.8	491.5	79.9
13	**Periodontics**	68	492.1	78.5	525.3	106.4	475.1	94.7	459.9	102.5
14	**Prosthodontics**	54	478.0	87.9	504.3	113.5	470.2	102.8	447.4	107.7

Note. ADAT=ADAT Overall, BIO=Biomedical Sciences; CLI=Clinical Sciences, DRI=Data, Research Interpretation, & Evidence Based Dentistry; Norms are presented only for specialties selected by 25 or more candidates.
†Represents the number of ADAT administrations. In most cases, the number of administrations is slightly greater than the number of candidates (a small number of candidates took the ADAT more than once).

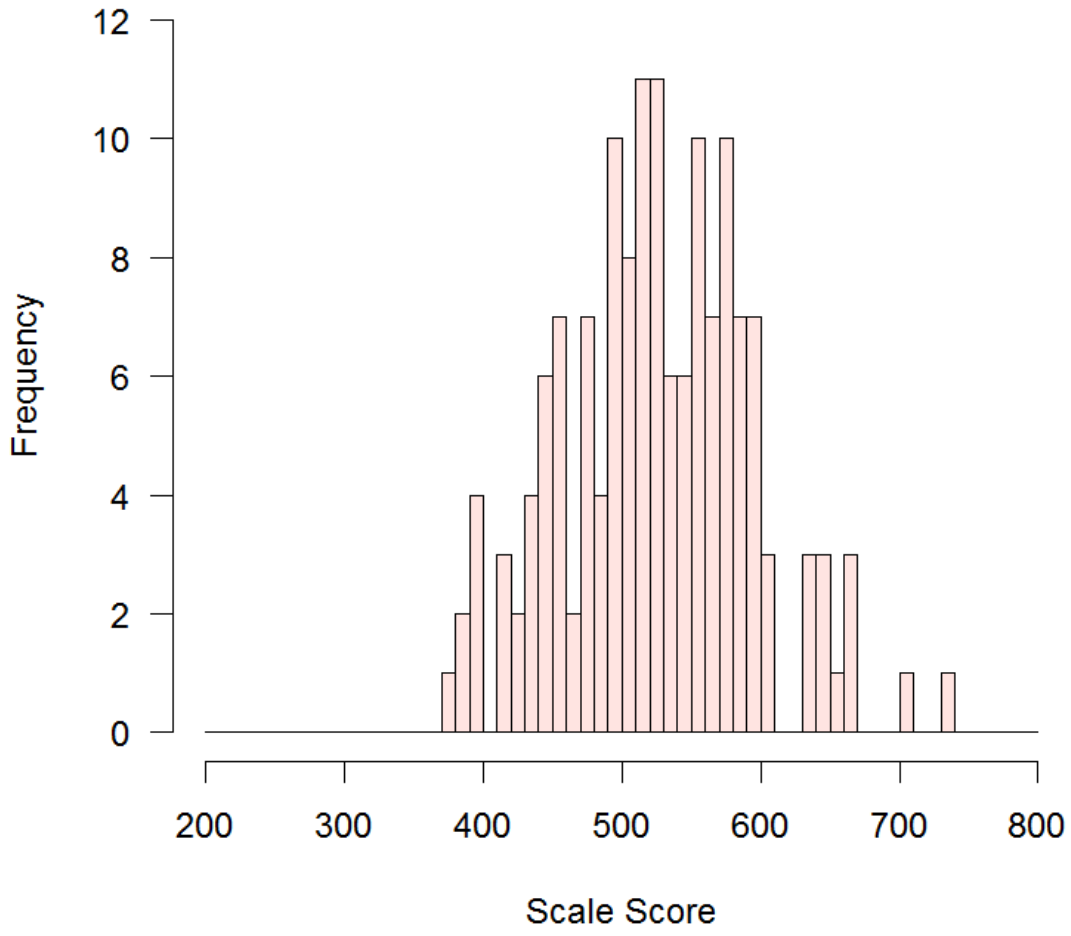
Appendix D1: Frequency Distributions for ADAT Overall Scales, by Specialty: 2017

Note: Frequency distributions are provided for specialties selected by 80 or more candidates.

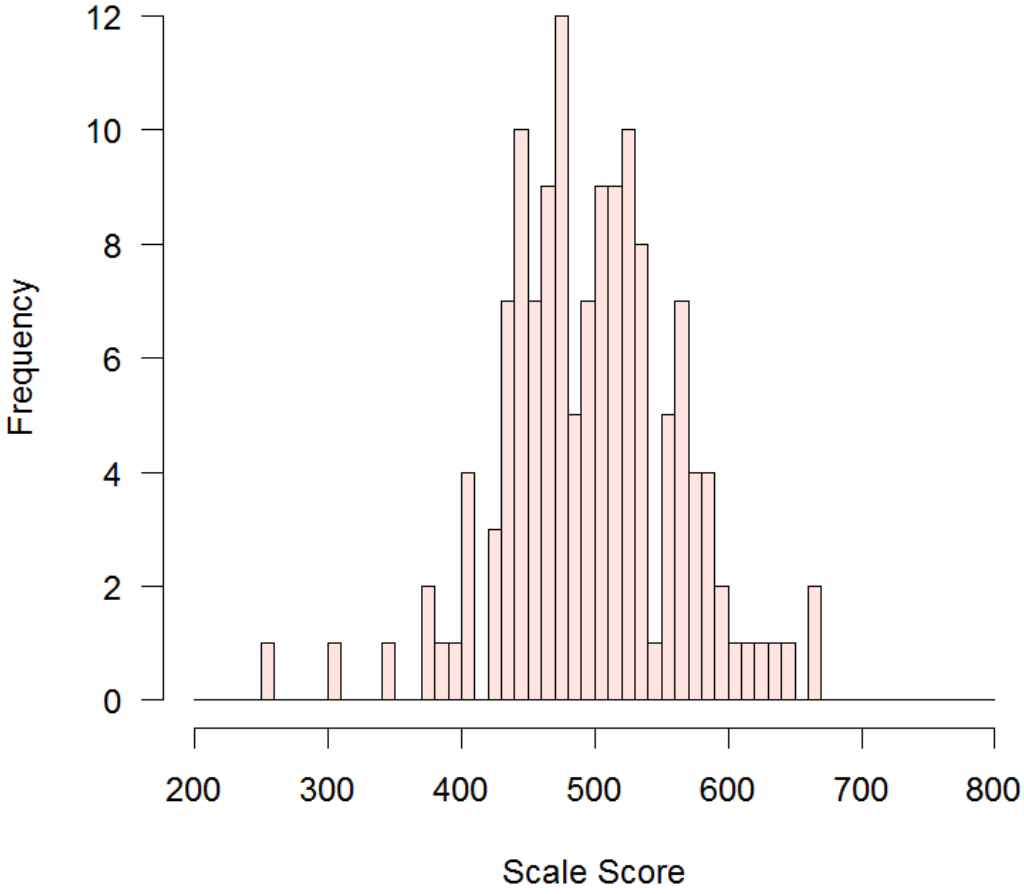
Frequency distribution for the ADAT Overall scale: 2017
Endodontics
(107 administrations)



Frequency distribution for the ADAT Overall scale: 2017
Orthodontics and Dentofacial Orthopedics
(150 administrations)



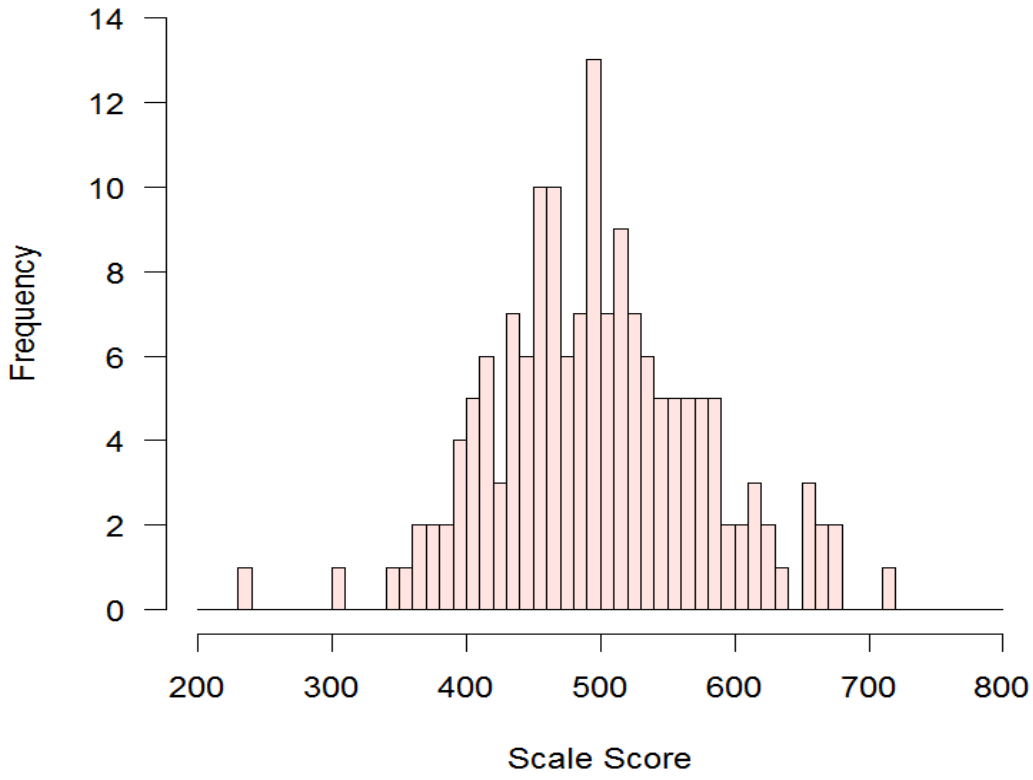
Frequency distribution for the ADAT Overall scale: 2017
Pediatric Dentistry
(137 administrations)



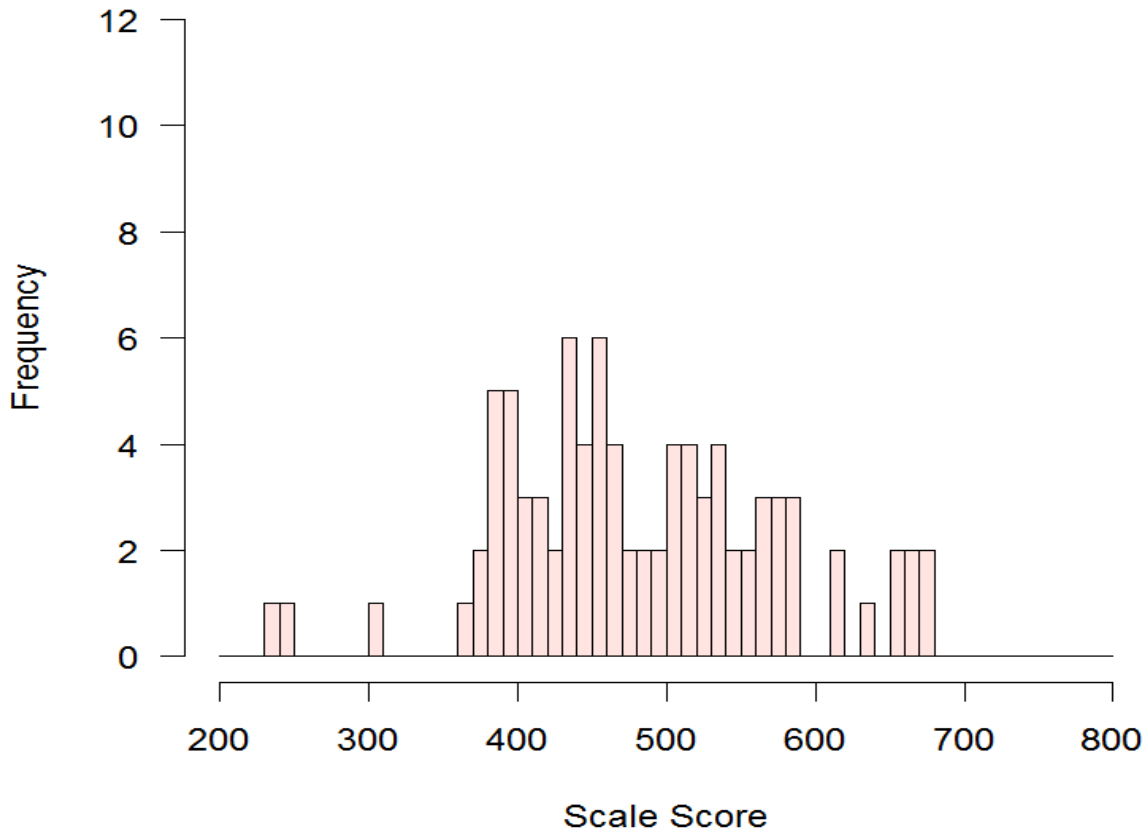
Appendix D2: Frequency Distributions for ADAT Overall Scales, by Specialty: 2016-2017

Note: Frequency distributions are provided for specialties selected by 80 or more candidates.

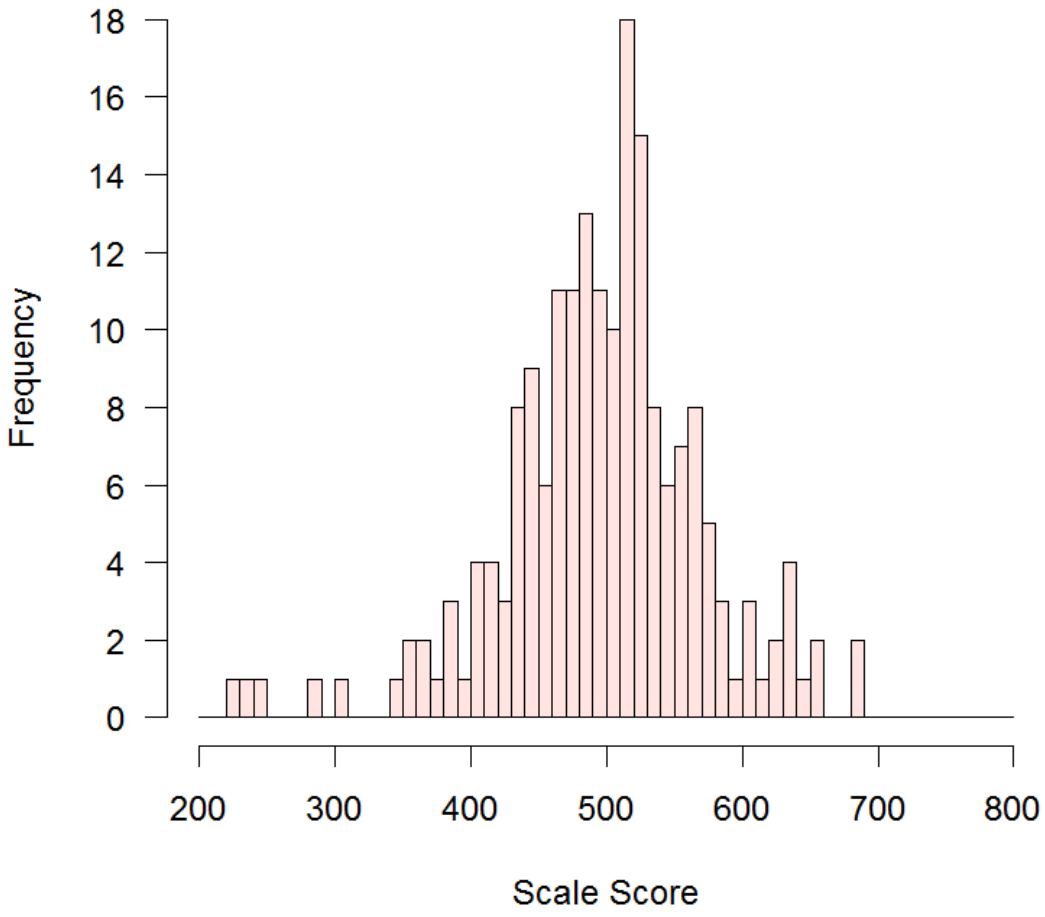
Frequency distribution for the ADAT Overall scale: 2016-2017
Advanced Education in General Dentistry, 12 Months
(159 administrations)



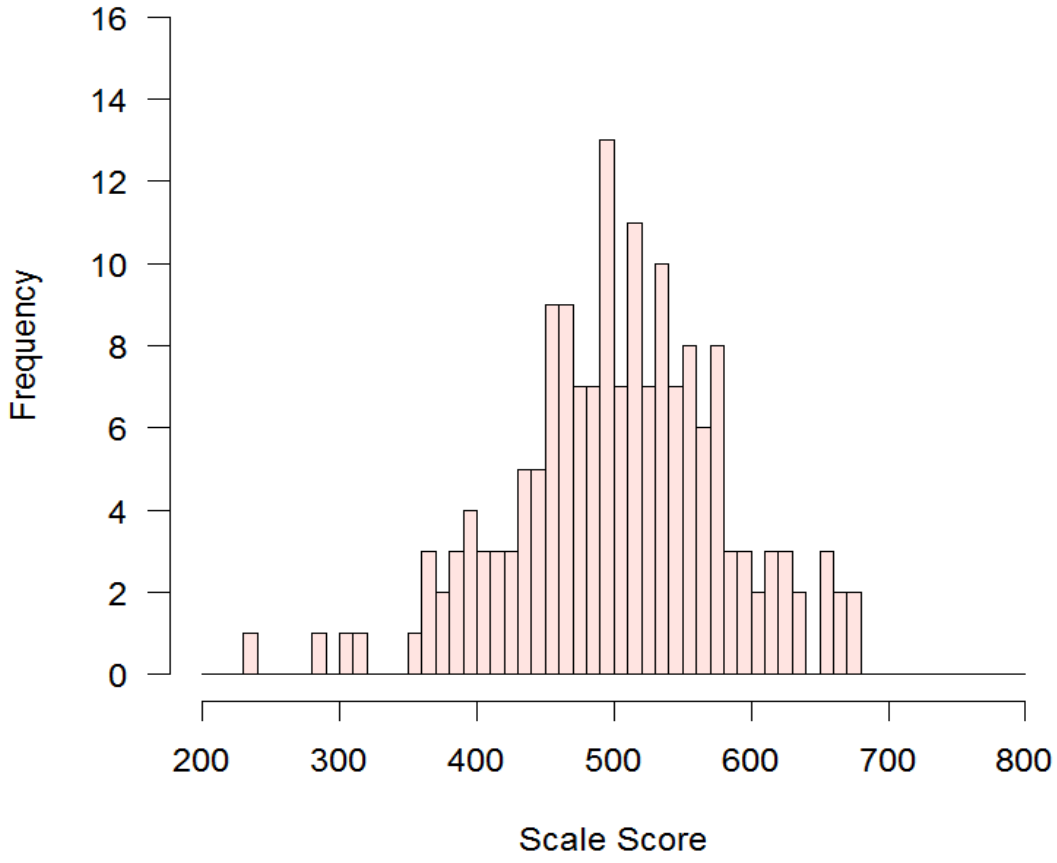
Frequency distribution for the ADAT Overall scale: 2016-2017:
Advanced Education in General Dentistry, 24 Months
(87 administrations)



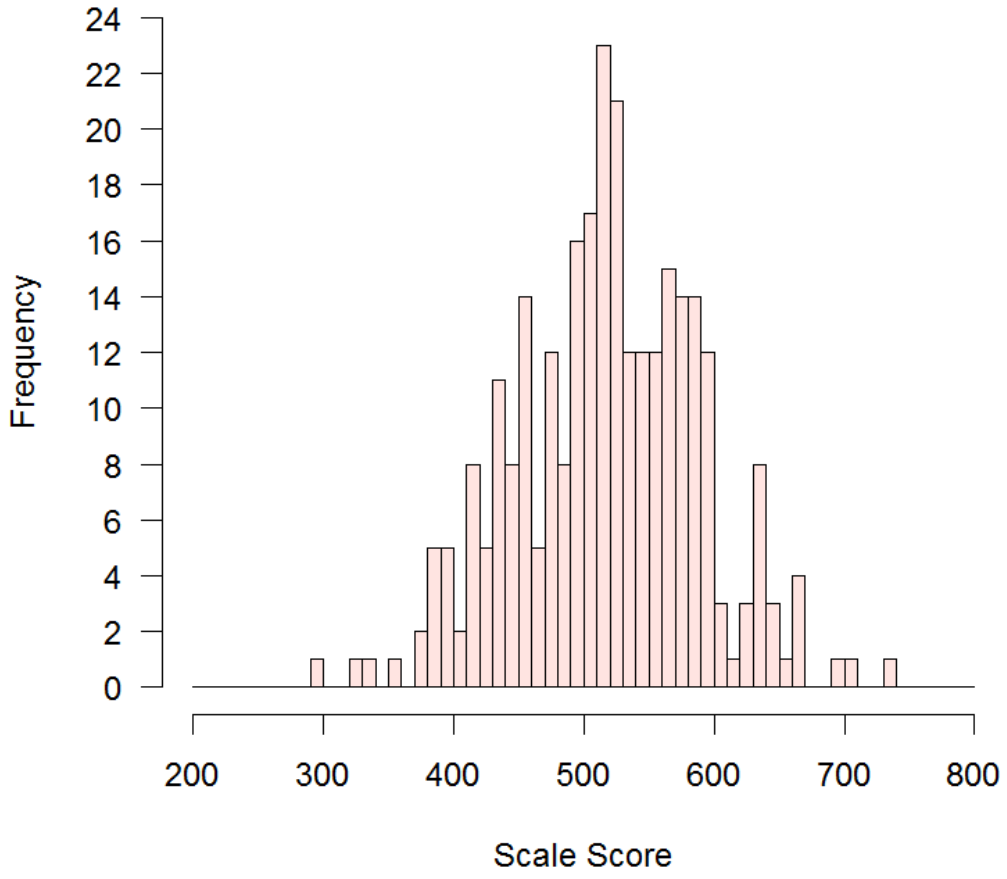
Frequency distribution for the ADAT Overall scale: 2016-2017
Endodontics
(191 administrations)



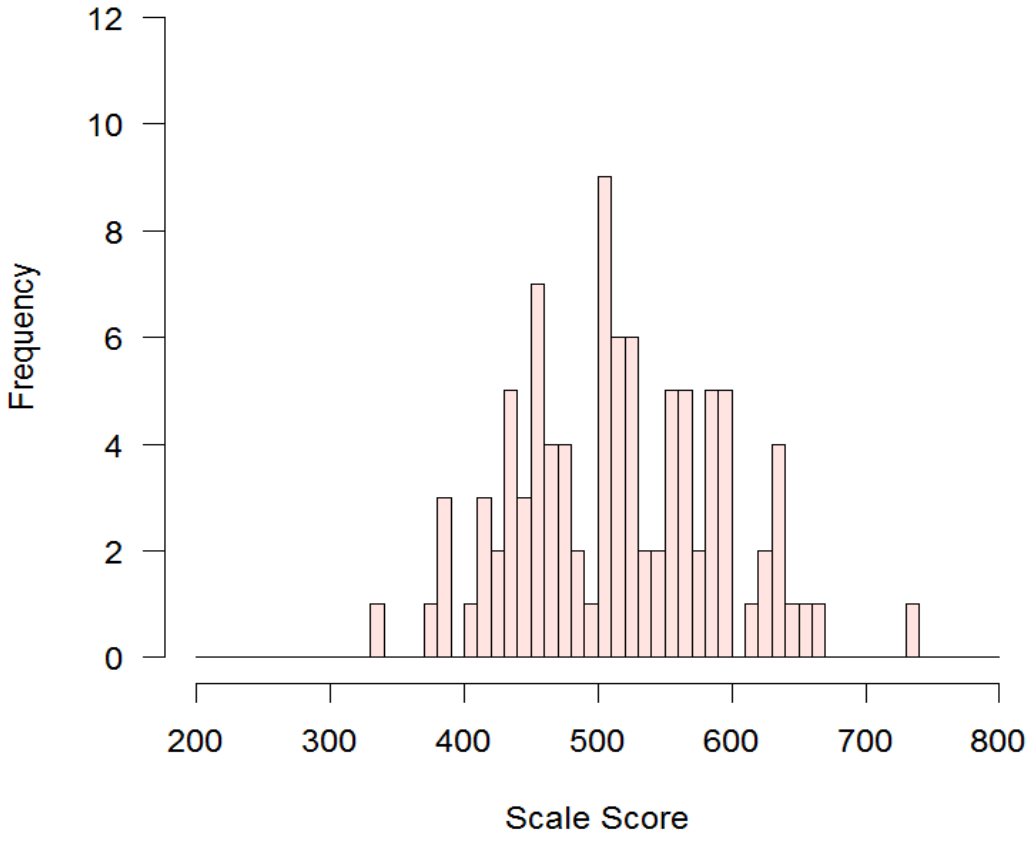
Frequency distribution for the ADAT Overall scale: 2016-2017
General Practice Residency, 12 Months
(168 administrations)



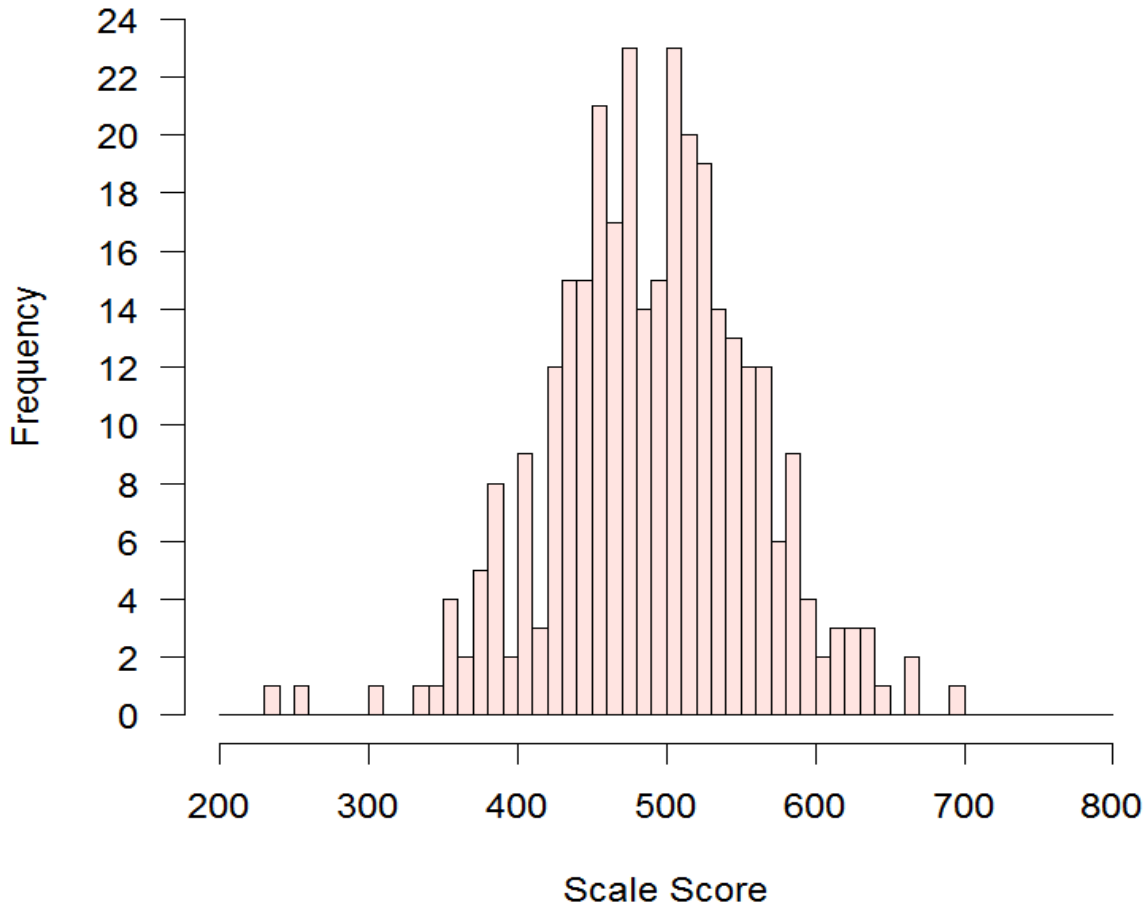
Frequency distribution for the ADAT Overall scale: 2016-2017
Orthodontics and Dentofacial Orthopedics
(283 administrations)



Frequency distribution for the ADAT Overall scale: 2016-2017
Orthodontics/Periodontics
(95 administrations)



Frequency distribution for the ADAT Overall scale: 2016-2017
Pediatric Dentistry
(317 administrations)



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