

Correlation between Advanced Dental Admission Test Performance and Dental MATCH Success

Joseph Deek, DMD, MSD^a; David A. Albright DDS, MSD^b; Vanchit John, DDS, MSD^c,
Qing Tang, MS^d, Kelton T. Stewart, DDS, MS^e

^a Resident, Department of Orthodontic and Oral Facial Genetics, Indiana University School of Dentistry, IN, USA

^b Clinical Assistant Professor, Department of Orthodontics and Oral Facial Genetics, Indiana University School of Dentistry, Indianapolis, IN, USA

^c Professor, Chair, Department of Periodontology, Indiana University School of Dentistry, Indianapolis, IN, USA

^d Biostatistician, Department of Biostatistics, Indiana University School of Medicine, Indianapolis, IN, USA

^e Associate Professor, Chair & Program Director, Department of Orthodontics and Oral Facial Genetics, Indiana University School of Dentistry, Indianapolis, IN, USA

Corresponding author: Kelton T. Stewart, Associate Professor, Chair & Program Director, Department of Orthodontics and Oral Facial Genetics, Indiana University School of Dentistry.
Mailing address: 1121 W. Michigan St, Room 206, Indianapolis, IN 46202
Phone: 317-278-1087
Fax: 317-278-1438
Email: keltstew@iu.edu

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Abstract

Purpose/Objectives: The Advanced Dental Admissions Test was developed in 2016 to aid residency programs evaluate qualified applicants. Since its conception, however, there have been no studies seeking to evaluate the usefulness of the exam regarding an applicants' ability to match with a residency program through the Postdoctoral Dental Matching Program. The aim of this study was to evaluate the impact of the Advanced Dental Admission Test performance on student MATCH success into a post-doctoral pediatric residency program.

Methods: This retrospective study evaluated the academic records of pediatric residency applicants using the ADEA PASS and MATCH program between 2017 and 2019. Five scholastic and seven demographic variables were extracted from student ADEA PASS applications. Applicant MATCH status and preference was obtained from the Postdoctoral Dental Matching Program. Descriptive statistics for each application cycle was calculated and used to evaluate applicant demographic and scholastic data. Correlation coefficients assessed for associations between scholastic/demographic factors and MATCH status/preference. Logistic regression models estimated the probability of MATCH status/preference. Significance was set at 5%.

Results: An association was found between ADAT scores and MATCH status, but the influence was minimal (OR: 1.004, 95% CI: 1.001-1.008). Applicant age ($P < 0.0216$) and dental schools that ranked students ($P < 0.0002$) were the most significant factors for MATCH status and preference, respectively.

Conclusion: ADAT scores played a minimal role in applicants matching to pediatric residency programs. Applicant age and schools that provide class ranks were found to be significant predictors when considering MATCH status and preference to pediatric residency programs.

Keywords: ADAT, MATCH, pediatric residency, graduate dental education, pediatric dentistry

INTRODUCTION

Dental residency programs seek to identify highly qualified individuals who will perform successfully in their advanced training programs and then support the profession after their entry into the workforce. For many programs, this task has become increasingly more difficult due to changes that have occurred in dental academia over the past decade. Previous research has shown that the National Board Dental Examination (NBDE) served as a key marker of dental school achievement.¹ In 2012, the NBDE was converted into a pass/fail format and this useful marker became unavailable to residency admission committees during their applicant evaluation process.² Fagin et al. conducted a survey study that showed that 71% of postgraduate program directors participating in ADEA PASS found it more difficult to select interview candidates without NBDE scores.³ Moreover, their research also noted that 76% of program directors expressed a desire for a standardized, numerically scored examination to assist in the admissions process.³ The work by Fagin et al. also noted that students from dental schools that do not report GPA and class ranks were perceived to be at a disadvantage during the residency admissions process.

In an attempt to address the lack of a standardized, objective assessment tool, the American Dental Association (ADA) developed the Advanced Dental Admission Test (ADAT), as a substitute for the now pass/fail NBDE examination.⁴ The initial ADAT pilot examination occurred in the spring/summer of 2016 and has since been administered on an annual basis.⁵ The exam is comprised of three thematic sections including Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, and Evidence Based Dentistry.⁵ The ADAT categories are similar to those found in the NBDE and are promoted as a potentially useful tool to evaluate the scholastic abilities of individuals applying for dental specialty programs.⁵ In a study by Grillo et al., it was noted that programs were using an array of assessment markers to evaluate residency

applicants, in an attempt to overcome the loss of NBDE scores as a screening tool.⁶ Many specialty programs have adopted the GRE exam as another standardized examination tool to assist in the stratification of applicants. While the GRE does provide programs with a means of objectively assessing applicants, it is seen by some to be a suboptimal assessment tool. When evaluating the connection between GRE scores and student accomplishment, Grillo et al. found that the GRE did not offer an accurate prediction of performance in orthodontic residency programs.⁶

Acquiring additional objective knowledge on the utility of the ADAT could support residency programs in their applicant selection process, especially as the number of applicants applying to dental residency programs continues to increase.⁷ The ADAT has been administered for three consecutive years, and during this period there has been a slowly growing body of literature seeking to evaluate the preliminary performance of the exam. However, due to the lack of sufficient evidence regarding the exam, many residency programs have been reluctant to adopt requiring the ADAT as a part of their admissions process.⁵ Likewise, there is a gap in available knowledge on how the ADAT might influence an applicant's ability to MATCH to a residency program.

The Postdoctoral Dental Matching Program (MATCH) is an algorithmic based mechanism used by many dental specialties as means to fill candidate positions into residency programs.⁸ The program requires that candidates and programs rank each other after the interview process. An algorithm is then used to determine the "best fit" between applicants and residency programs with available positions. Recent trends have shown an increase in the number of dental programs utilizing the MATCH to fill positions.⁸ Additionally, the MATCH has been shown to be an effective and unbiased way for programs to fill seats.⁸ Trends in MATCH results, combined with other pertinent application data, can be used to study how

programs are filling their available positions. Furthermore, this trend information provides a useful platform to further evaluate the usefulness of the ADAT as an objective, scholastic selection tool. A preliminary study of the validity of the ADAT showed that the exam had several significant correlations with other scholastic metrics.⁹ This study; however, was limited in scope, as it had a relatively small sample size and only evaluated student data from a single dental institution.⁹ Furthermore, the work by DeSantis et al. did not assess the impact of the ADAT on student MATCH performance.

Along with the changes to standardized examinations within dentistry, there have been modifications to some traditional markers of academic ability within dental schools. Many dental institutions have elected to employ a pass/fail curricular format for student assessment and no longer provide GPAs or class ranks. These combined changes can create a significant scholastic void in an applicant's academic portfolio. Is the ADAT the standardized assessment solution that will help alleviate the challenges facing both residency programs and applicants? Similarly, is there a connection between the ADAT and MATCH outcomes? There is currently insufficient evidence to clearly answer either question. Thus, the aim of the study was to evaluate the impact of the Advanced Dental Admission Test on student MATCH success into post-doctoral pediatric residency programs. The hypothesis of the investigation proposed that an association would exist between applicant ADAT performance and their MATCH acceptance into a pediatric residency program.

METHODS

This retrospective study was deemed exempt by the Indiana Institutional Review Board (#2001074803). The sample population included pediatric residency applicants who completed a PASS application and participated in the dental MATCH between 2017 and 2019. The ADEA

PASS database was used to collect five scholastic parameters and seven demographic markers for each applicant. MATCH results (status) and program MATCH rankings (preference) were obtained from the Postdoctoral Dental Matching Program.

The following demographic and scholastic data were acquired from the selected applications in the ADEA/PASS and MATCH portals:

Demographic Data

- Age at the time of applicant submission
 - (21-24, 25-29, 30-34, 35-39, 40 and older)
- Gender
 - (males, females, not disclosed)
- Ethnicity
 - (not Hispanic/Latino or did not disclose, Hispanic/Latino)
- Race
 - (African Americans, American Indian, Asian, Hawaiian/Pacific Islander, White, Other, Not disclosed)
- Country of citizenship
 - (United States, other [Permanent resident, Foreign citizen, Eligible non-citizen])
- Dental school district
 - (ADA school districts [1-12], or international/not disclosed)
- Advanced specialty of interest
 - (pediatric dentistry as first choice, or other)

Scholastic Data

- MATCH outcome
 - (not matched, matched to a program, unknown status)

- MATCH outcome rank order
 - (did not match to first choice, matched to 1st ranked school)
- ADAT score
 - Numerical score- overall and category scores (Biomedical sciences, Clinical sciences, Data, Research interpretation and Evidence based dentistry)
- Dental School GPA
 - Numeral GPA if provided
- Dental School Class ranked
 - (class is not ranked/undisclosed, or class is ranked)

The data provided by these organizations was de-identified and a randomly generated identification number was assigned to each applicant. The same identification number was used to pair the information from the PASS and MATCH databases. All data was integrated into a Microsoft Excel spreadsheet and stored in an online, password protected database. Access to the information was only possible through a dual authentication process. To facilitate statistical analyses, each demographic and scholastic parameter was assigned numerical values.

STATISTICAL ANALYSIS

Descriptive statistics for each application cycle was calculated and used to evaluate applicant demographic and scholastic data. Descriptive statistics were also calculated for the applicants who had ADAT scores. To ensure applicant and institutional confidentiality, data has been reported in aggregate. Correlation coefficients were determined to assess for associations between scholastic performance, demographic markers, and MATCH status/preference.

Correlation coefficients were also determined to assess relationships between demographic markers and MATCH status/preference. Logistic regression models (univariate and multivariate)

were conducted to estimate the probability of MATCH status/preference. A significance level of 5% was used for all tests.

RESULTS

Data from a total of 2,502 pediatric applicants were collected and included in the study. Table 1 displays descriptive statistics for the sample and is reported in aggregate. The largest concentration of pediatric residency applicants was in the 25-29-year-old range, and this group constituted 54.7% of the sample. Nearly three quarters (70.7%) of the applicants identified as female. Most applicants were non-Hispanic/Latino (89.2%), White (51.6%), and U.S. citizens (76.5%). The applicants were divided among the twelve ADA districts, with 13.1% of applicants coming from District 2 and only 1.8% from District 12. Considering that some residency applicants will apply to programs with different dental specialty areas, most applicants (91.9%) in our sample ranked pediatric programs as their first choice in the MATCH. Of all applicants, 53.2% matched to a program and 58.6% of those matched to their first program choice. Of the applicants who took the ADAT, 59.2% matched to a program, 58.4% matched to their first program choice (Table 2).

Statistically significant correlations between scholastic markers and matching to a program were observed for several parameters including: the ADAT clinical sciences score and total score, all GRE scores, and having a dental school GPA reported (Table 3). There were no statistically significant correlations between scholastic markers and matching to an applicant's first program choice (Table 3). When evaluating correlations between demographic markers and matching to a program, statistically significant associations were found with age, gender, country of citizenship, dental school district, and the ranking of a pediatric program first (Table 4). The statistically significant correlations observed between demographic markers and matching to an

applicant's first choice program included: country of citizenship, dental school district, and attending a school that provided class ranks (Table 4).

Logistic regression analyses were used to estimate the probability of MATCH status and preference. Using a univariate logistic regression model, a statistically significant probability of matching in a program was observed with: ADAT clinical science score, ADAT total score, all GRE scores, dental school GPA, applicant age, gender (identifying as male), citizenship (being a U.S. citizen), and residency program choice (applying to a pediatric program as a first choice). The factors exhibiting the largest probability of matching to a program included being in the 21-24-year-old age range vs the 40 years-old and over age range (OR: 6.138, 95% CI: 3.667-10.273; $P < 0.0001$) and applying to a pediatric program as first choice (OR: 6.620, 95% CI: 4.437-9.878; $P < 0.0001$) (Table 5). A statistically significant probability increase for matching to an applicant's first choice program was noted with: U.S. citizen status (OR: 1.675, 95% CI: and attending a ranked dental school (Table 5). Variables from the univariate regression model that were found to significantly increase the probability of an applicant's MATCH status and preference were included in a multivariate logistic regression analysis (Table 6). The only predictor of MATCH status identified was an applicants' age, with individuals between 25-29-years-old having a larger probability of securing a residency position (OR: 5.360, 95% CI: 1.280-22.448). When assessing factors that predict an applicant's MATCH preference, the only statistically significant variable identified was a dental school's ability to provide a class rank (OR: 1.764, 95% CI: 1.311-2.369).

DISCUSSION

Significant correlations existed between having ADAT clinical science scores/ ADAT total scores and matching to a program among other scholastic markers, however, this relationship was found to be weak when the odds ratio was calculated. The presence of ADAT

scores only yielded a 1.004 odds ratio for successful matching to a program. Previous work, on the ADAT, by DeSantis et al. demonstrated that the ADAT possessed significant associations to scholastic markers.⁹ This could suggest that the ADAT compliment's an applicant's academic record, yet only slightly increases the probability of matching to a program. Interestingly, recent work by Justema et al. noted that pediatric dentistry program directors viewed the ADAT as one of the least important aspects of an applicant's application.¹⁰ The authors speculate that this general view of the ADAT is due, in part, to the relative novelty of the exam and a general reluctance of many specialty groups to require applicants to take the exam because of insufficient evidence of its usefulness.

Aside from the weak ADAT correlations, applicant age seemed to play a significant role for applicants matching to a program. A clear trend was seen in the data, with younger applicants having a greater likelihood of matching to a program. Similar results have been reported in medical school match results to otolaryngology programs.¹¹ While older applicants may possess additional clinical experience, it is possible that programs find it more difficult to instruct older individuals. Additionally, younger applicants are typically individuals who have been continually engaged in the education process. As such, these applicants may be viewed as being more accustomed to academic settings, open to receiving instruction by faculty, and slightly easier to guide during residency training.

Applicants with GRE scores also demonstrated increased odds of matching to a program. Applicants with GRE scores, especially analytical GRE scores, were shown to be 3.917 times more likely to match in a program. Due to the low number of individuals in our sample that completed the GRE, this scholastic variable was not incorporated into the multivariate logistic analysis. The observed trend suggests that this standardized exam could play a role in the identification of qualified applicants. However, research by Grillo et al. conflicts with this

notion, as they failed to detect an association between GRE scores and an applicant's performance in an orthodontic residency program.⁶ The results provided by the current study relative to the ADAT, combined with the conflicting evidence regarding the GRE, call into question the true usefulness of these forms of high-stakes assessment tools in the applicant evaluation process. While helpful in filtering applicants during a residency screening process, there continues to be a lack of evidence supporting their ability to predict how applicants will perform in a residency program and as independent providers upon graduation.

Our study found that males had an increased probability of matching to a pediatric program. Similarly, Hauser et al. found a predilection for males to match in otolaryngology medical programs.¹¹ This finding was particularly interesting, since the majority of applicants were female. The authors could not offer a clear reason as to why pediatric programs would prefer to accept male over female applicants. Additional investigations are warranted to better understand this observation.

It is important to note that this study did not consider qualitative applicant factors, such as an applicant's work ethic, communication skills, and/or coachability, with respect to MATCH status or preference. Many times, these factors are evaluated during formal interviews. Additionally, letters of recommendation and personal statements can reveal intangible personality traits that help programs assess candidates in a more holistic manner. It was shown in our study that applicants who ranked pediatric programs as their first choice were approximately 2.5 times more likely to match to a program than those who did not list a pediatric program as their first choice. It is possible that the candidate's desire to pursue a career in pediatric dentistry becomes more apparent through some of these qualitative application components.

When considering all identified variables, the only statistically significant factor that increased the probability of MATCH preference was attending a dental school that ranked its

students. Dental school ranking has been shown in a previous study to be a strong scholastic predictor of residency performance.⁶ Unlike a single, high-stakes examination, it is possible that program directors value the class rank metric because it represents a longitudinal assessment of a student's academic history.

The authors acknowledge that the study possessed a few limitations. While many pediatric programs participate in the ADEA PASS application and MATCH processes, this study did not encompass all applicants to pediatric programs during the studied time period. Additionally, the data collected for the study represents information after the MATCH process had occurred. Thus, the study was unable to address whether the completion of the ADAT and/or the associated ADAT score influenced an applicant's ability to secure an interview with pediatric residency program. It is believed that this point would be of interest to many programs and applicants alike, and future studies that investigate the role of the ADAT on applicant interview selection is warranted. Due to the nature of the study, the assessment of qualitative applicant characteristics on MATCH status and/or preference were not possible. Additional research that explores the influence of these attributes, in conjunction with more objective and quantifiable parameters, could help clarify what components of an individual's application are most impactful. Lastly, the power of this study was lower than desired because less than 10% of all the examined applicants took the ADAT. While the relative number of applicants with ADAT scores was lower, we are confident that our sample population encompassed the majority of applicants who took the exam.

CONCLUSION

The results of our study demonstrated that a significant, positive association was observed between ADAT scores and matching to a pediatric residency program. The

practical influence of ADAT scores on MATCH status and/or preference; however, was minimal. Demographic variables including applicant age and attending a school that provides class ranks were found to be significant predictors when considering MATCH status and preference to a pediatric residency program.

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Table 1: Descriptive statistics for each cycle and aggregate for applicants

| Variables | Category | 2017 | 2018 | 2019 | Total | P value |
|--|--|----------------|----------------|----------------|----------------|---------|
| Age | 21-24 | 58 (6.7%) | 57 (6.9%) | 51 (6.3%) | 166 (6.6%) | 0.9759 |
| | 25-29 | 481 (55.3%) | 458 (55.7%) | 430 (53.2%) | 1369 (54.7%) | |
| | 30-34 | 208 (23.9%) | 192 (23.3%) | 209 (25.8%) | 609 (24.3%) | |
| | 35-39 | 72 (8.3%) | 70 (8.5%) | 71 (8.8%) | 213 (8.5%) | |
| | 40 and older | 51 (5.9%) | 46 (5.6%) | 48 (5.9%) | 145 (5.8%) | |
| Gender | Males | 264 (30.9%) | 225 (27.7%) | 234 (29.3%) | 723 (29.3%) | 0.3559 |
| | Females | 589 (69.1%) | 586 (72.3%) | 566 (70.8%) | 1741 (70.7%) | |
| Ethnicity | Not Hispanic/Latino or did not disclose | 777 (89.3%) | 737 (89.6%) | 718 (88.8%) | 2232 (89.2%) | 0.8673 |
| | Hispanic/Latino | 93 (10.7%) | 86 (10.4%) | 91 (11.2%) | 270 (10.8%) | |
| Race | African Americans | 65 (8.3%) | 69 (9.1%) | 78 (10.5%) | 212 (9.3%) | 0.4718 |
| | American Indians | 2 (0.3%) | 2 (0.3%) | 2 (0.3%) | 6 (0.3%) | |
| | Asian | 261 (33.2%) | 272 (35.8%) | 275 (37.1%) | 808 (35.3%) | |
| | White | 429 (54.6%) | 393 (51.8%) | 358 (48.2%) | 1180 (51.6%) | |
| | More than one race | 28 (3.6%) | 23 (3.0%) | 29 (3.9%) | 80 (3.5%) | |
| Citizenship | United States | 673 (77.4%) | 621 (75.5%) | 619 (76.5%) | 1913 (76.5%) | 0.6535 |
| | other (Permanent resident, Foreign citizen, Eligible non- citizen) | 197 (22.6%) | 202 (24.5%) | 190 (23.5%) | 589 (23.5%) | |
| Dental School District | International/not disclosed | 155 (17.8%) | 146 (17.7%) | 121 (15.0%) | 422 (16.9%) | 0.8703 |
| | District 1 | 58 (6.7%) | 71 (8.6%) | 64 (7.9%) | 193 (7.7%) | |
| | District 2 | 113 (13.0%) | 107 (13.0%) | 109 (13.5%) | 329 (13.1%) | |
| | District 3 | 104 (12.0%) | 87 (10.6%) | 85 (10.5%) | 276 (11.0%) | |
| | District 4 | 70 (8.0%) | 69 (8.4%) | 66 (8.2%) | 205 (8.2%) | |
| | District 5 | 58 (6.7%) | 56 (6.8%) | 51 (6.3%) | 165 (6.6%) | |
| | District 6 | 47 (5.4%) | 28 (3.4%) | 44 (5.4%) | 119 (4.8%) | |
| | District 7 | 53 (6.1%) | 42 (5.1%) | 42 (5.2%) | 137 (5.5%) | |
| | District 8 | 37 (4.3%) | 41 (5.0%) | 42 (5.2%) | 120 (4.8%) | |
| | District 9 | 48 (5.5%) | 44 (5.3%) | 40 (4.9%) | 132 (5.3%) | |
| | District 10 | 38 (4.4%) | 36 (4.4%) | 44 (5.4%) | 118 (4.7%) | |
| | District 11 | 75 (8.6%) | 80 (9.7%) | 87 (10.8%) | 242 (9.7%) | |
| | District 12 | 14 (1.6%) | 16 (1.9%) | 14 (1.7%) | 44 (1.8%) | |
| Advanced Specialty of Interest | Pediatric Dentistry 1st choice | 790 (90.8%) | 759 (92.2%) | 751 (92.8%) | 2300 (91.9%) | 0.2916 |
| | Pediatric Dentistry not 1st choice | 80 (9.2%) | 64 (7.8%) | 58 (7.2%) | 202 (8.1%) | |
| MATCH Outcome | Not matched to a program | 405 (49.4%) | 360 (46.5%) | 341 (44.3%) | 1106 (46.8%) | 0.1280 |
| | Matched to a program | 415 (50.6%) | 415 (53.5%) | 428 (55.7%) | 1258 (53.2%) | |
| MATCH Outcome Rank Order | Did not match to 1st choice | 169 (40.7%) | 173 (41.7%) | 179 (41.8%) | 521 (41.4%) | 0.9400 |
| | Matched to 1st choice | 246 (59.3%) | 242 (58.3%) | 249 (58.2%) | 737 (58.6%) | |
| ADAT Biomedical Science | | 493.5 (± 95.2) | 503.5 (± 92.9) | 494.8 (± 92.4) | 497.5 (± 93.7) | 0.6600 |
| ADAT Clinical Sciences | | 501.8 (± 94.1) | 499.6 (± 77.1) | 484.1 (± 85.0) | 497.7 (± 86.3) | 0.3854 |
| ADAT Data Research Interpretation and Evidence based dentistry | | 500.9 (± 75.1) | 499.3 (± 76.7) | 505.9 (± 80.3) | 501.2 (± 76.5) | 0.8563 |
| ADAT Total | | 500.8 (± 65.3) | 501.1 (± 68.0) | 492.8 (± 73.2) | 499.5 (± 67.7) | 0.6963 |
| GRE Quantitative | | 153.1 (± 7.6) | 151.1 (± 6.8) | 152.5 (± 6.3) | 152.4 (± 7.0) | 0.4238 |
| GRE Verbal | | 151.6 (± 8.7) | 150.5 (± 8.4) | 150.4 (± 8.4) | 150.9 (± 8.5) | 0.7567 |
| GRE Analytical | | 3.4 (± 1.1) | 3.6 (± 0.9) | 3.6 (± 0.7) | 3.5 (± 0.9) | 0.4378 |
| Dental School GPA | | 3.4 (± 0.3) | 3.4 (± 0.4) | 3.4 (± 0.3) | 3.4 (± 0.4) | 0.0035 |
| Dental School Ranked | Class is not ranked or undisclosed | 453 (52.1%) | 409 (49.7%) | 401 (49.6%) | 1263 (50.5%) | 0.5090 |
| | Class is ranked | 417 (47.9%) | 414 (50.3%) | 408 (50.4%) | 1239 (49.5%) | |

Table 2: Descriptive statistics for each cycle and aggregate for applicants with ADAT scores

| Variables | Category | 2017 | 2018 | 2019 | Total | P value |
|--|--|----------------|----------------|----------------|----------------|---------|
| Age | 21-24 | 16 (11.0%) | 10 (7.9%) | 4 (6.6%) | 30 (9.0%) | 0.0817 |
| | 25-29 | 92 (63.0%) | 78 (61.9%) | 36 (59.0%) | 206 (61.9%) | |
| | 30-34 | 21 (14.4%) | 30 (23.8%) | 8 (13.1%) | 59 (17.7%) | |
| | 35-39 | 9 (6.2%) | 5 (4.0%) | 8 (13.1%) | 22 (6.6%) | |
| | 40 and older | 8 (5.5%) | 3 (2.4%) | 5 (8.2%) | 16 (4.8%) | |
| Gender | Males | 54 (37.0%) | 34 (27.4%) | 15 (25.0%) | 103 (31.2%) | 0.1239 |
| | Females | 92 (63.0%) | 90 (72.6%) | 45 (75.0%) | 227 (68.8%) | |
| Ethnicity | Not Hispanic/Latino or did not disclose | 131 (89.7%) | 115 (91.3%) | 52 (85.2%) | 298 (89.5%) | 0.4491 |
| | Hispanic/Latino | 15 (10.3%) | 11 (8.7%) | 9 (14.8%) | 35 (10.5%) | |
| Race | African Americans | 7 (5.1%) | 3 (2.5%) | 3 (5.4%) | 13 (4.2%) | 0.4945 |
| | American Indians | 1 (0.7%) | 0 | 0 | 1 (0.3%) | |
| | Asian | 36 (26.1%) | 41 (34.7%) | 21 (37.5%) | 98 (31.4%) | |
| | White | 90 (65.2%) | 73 (61.9%) | 30 (53.6%) | 193 (61.9%) | |
| | More than one race | 4 (2.9%) | 1 (0.8%) | 2 (3.6%) | 7 (2.2%) | |
| Citizenship | United States | 129 (88.4%) | 109 (86.5%) | 47 (77.0%) | 285 (85.6%) | 0.1003 |
| | Other (Permanent resident, Foreign citizen, Eligible non- citizen) | 17 (11.6%) | 17 (13.5%) | 14 (23.0%) | 48 (14.4%) | |
| Dental School District | International/not disclosed | 10 (6.8%) | 7 (5.6%) | 6 (9.8%) | 23 (6.9%) | 0.0328 |
| | District 1 | 7 (4.8%) | 5 (4.0%) | 4 (6.6%) | 16 (4.8%) | |
| | District 2 | 23 (15.8%) | 17 (13.5%) | 11 (18.0%) | 51 (15.3%) | |
| | District 3 | 15 (10.3%) | 8 (6.3%) | 2 (3.3%) | 25 (7.5%) | |
| | District 4 | 21 (14.4%) | 8 (6.3%) | 2 (3.3%) | 31 (9.3%) | |
| | District 5 | 4 (2.7%) | 2 (1.6%) | 6 (9.8%) | 12 (3.6%) | |
| | District 6 | 5 (3.4%) | 5 (4.0%) | 4 (6.6%) | 14 (4.2%) | |
| | District 7 | 23 (15.8%) | 16 (12.7%) | 6 (9.8%) | 45 (13.5%) | |
| | District 8 | 4 (2.7%) | 11 (8.7%) | 3 (4.9%) | 18 (5.4%) | |
| | District 9 | 17 (11.6%) | 17 (13.5%) | 9 (14.8%) | 43 (12.9%) | |
| | District 10 | 10 (6.8%) | 12 (9.5%) | 2 (3.3%) | 24 (7.2%) | |
| | District 11 | 5 (3.4%) | 16 (12.7%) | 5 (8.2%) | 26 (7.8%) | |
| District 12 | 2 (1.4%) | 2 (1.6%) | 1 (1.6%) | 5 (1.5%) | | |
| Advanced Specialty of Interest | Pediatric 1st choice | 138 (94.5%) | 113 (89.7%) | 57 (93.4%) | 308 (92.5%) | 0.3047 |
| | Other | 8 (5.5%) | 13 (10.3%) | 4 (6.6%) | 25 (7.5%) | |
| MATCH Outcome | Not matched to a program | 49 (33.8%) | 58 (49.6%) | 24 (40.7%) | 131 (40.8%) | 0.0355 |
| | Matched to a program | 96 (66.2%) | 59 (50.4%) | 35 (59.3%) | 190 (59.2%) | |
| MATCH Outcome Rank Order | Did not match to 1 st choice | 38 (39.6%) | 26 (44.1%) | 15 (42.9%) | 79 (41.6%) | 0.8473 |
| | Matched to 1st choice | 58 (60.4%) | 33 (55.9%) | 20 (57.1%) | 111 (58.4%) | |
| ADAT Biomedical Sciences | | 493.5 (± 95.2) | 503.5 (± 92.9) | 494.8 (± 92.4) | 497.5 (± 93.7) | 0.6600 |
| ADAT Clinical Sciences | | 501.8 (± 94.1) | 499.6 (± 77.1) | 484.1 (± 85.0) | 497.7 (± 86.3) | 0.3854 |
| ADAT Data Research Interpretation and Evidence Based Dentistry | | 500.9 (± 75.1) | 499.3 (± 76.7) | 505.9 (± 80.3) | 501.2 (± 76.5) | 0.8563 |
| ADAT Total | | 500.8 (± 65.3) | 501.1 (± 68.0) | 492.8 (± 73.2) | 499.5 (± 67.7) | 0.6963 |
| GRE Quantitative | | 154.1 (± 5.2) | 152.3 (± 4.8) | 158.0 (± 9.2) | 153.8 (± 5.7) | 0.3236 |
| GRE Verbal | | 152.8 (± 10.7) | 151.5 (± 8.5) | 157.7 (± 10.0) | 152.9 (± 9.3) | 0.6269 |
| GRE Analytical | | 3.9 (± 0.8) | 3.8 (± 0.9) | 4.3 (± 1.0) | 3.9 (± 0.8) | 0.6411 |
| Dental School GPA | | 3.5 (± 0.3) | 3.4 (± 0.3) | 3.4 (± 0.3) | 3.4 (± 0.3) | 0.1853 |
| Dental School ranked | Class is not ranked or undisclosed | 68 (46.6%) | 60 (47.6%) | 27 (44.3%) | 155 (46.5%) | 0.9111 |
| | Class is ranked | 78 (53.4%) | 66 (52.4%) | 34 (55.7%) | 178 (53.5%) | |

Table 3: Correlation of scholastic performance and MATCH status/preference

| MATCH STATUS | | | | | |
|--|--|---------------------|--|---------------------|---------|
| Variables | MATCH outcome: not matched to a program | | MATCH outcome: Matched to a program | | P value |
| | N | Mean(\pm SD) | N | Mean(\pm SD) | |
| ADAT Biomedical Sciences | 131 | 491.9 (\pm 98.8) | 190 | 502.5 (\pm 89.0) | 0.3187 |
| ADAT Clinical Sciences | 131 | 481.4 (\pm 90.3) | 190 | 511.1 (\pm 80.4) | 0.0021 |
| ADAT Data Research Interpretation and Evidence Based Dentistry | 131 | 494.2 (\pm 73.4) | 190 | 506.9 (\pm 78.8) | 0.1455 |
| ADAT Total | 131 | 489.5 (\pm 71.4) | 190 | 507.7 (\pm 62.4) | 0.0161 |
| GRE Quantitative | 78 | 150.9 (\pm 6.9) | 32 | 155.1 (\pm 6.5) | 0.0044 |
| GRE Verbal | 78 | 148.8 (\pm 8.4) | 32 | 155.2 (\pm 7.2) | 0.0003 |
| GRE Analytical | 78 | 3.4 (\pm 0.9) | 32 | 4.1 (\pm 0.7) | <.0001 |
| Dental School GPA | 831 | 3.3 (\pm 0.4) | 970 | 3.5 (\pm 0.3) | <.0001 |
| MATCH PREFERENCE | | | | | |
| Variables | MATCH rank order: did not match to 1 st choice | | MATCH rank order: match to 1 st choice | | P value |
| | N | Mean (\pm SD) | N | Mean (\pm SD) | |
| ADAT Biomedical Sciences | 79 | 507.2 (\pm 90.6) | 111 | 499.1 (\pm 88.2) | 0.5371 |
| ADAT Clinical Sciences | 79 | 505.8 (\pm 74.2) | 111 | 514.9 (\pm 84.6) | 0.4462 |
| ADAT Data Research Interpretation and Evidence Based Dentistry | 79 | 512.3 (\pm 72.5) | 111 | 503.1 (\pm 83.1) | 0.4283 |
| ADAT Total | 79 | 508.0 (\pm 64.5) | 111 | 507.6 (\pm 61.1) | 0.9648 |
| GRE Quantitative | 15 | 153.4 (\pm 6.6) | 17 | 156.6 (\pm 6.2) | 0.1687 |
| GRE Verbal | 15 | 157.7 (\pm 7.1) | 17 | 153.0 (\pm 6.8) | 0.0634 |
| GRE Analytical | 15 | 4.1 (\pm 0.7) | 17 | 4.0 (\pm 0.6) | 0.7671 |
| Dental School GPA | 412 | 3.5 (\pm 0.3) | 558 | 3.5 (\pm 0.3) | 0.2042 |

Table 4: Correlation of demographic markers and MATCH status/preference

| MATCH STATUS | | | | |
|--------------------------------|--|---|---|---------|
| Variables | Category | MATCH outcome: not matched N=1106 | MATCH outcome: Matched to a program N=1258 | P value |
| Age | 21-24 | 50 (4.5%) | 111 (8.8%) | <.0001 |
| | 25-29 | 542 (49.0%) | 768 (61.0%) | |
| | 30-34 | 299 (27.0%) | 268 (21.3%) | |
| | 35-39 | 121 (10.9%) | 77 (6.1%) | |
| | 40 and older | 94 (8.5%) | 34 (2.7%) | |
| Gender | Males | 298 (27.5%) | 390 (31.3%) | 0.0473 |
| | Females | 785 (72.5%) | 857 (68.7%) | |
| Ethnicity | Not Hispanic/Latino or did not disclose | 986 (89.2%) | 1131 (89.9%) | 0.5496 |
| | Hispanic/Latino | 120 (10.8%) | 127 (10.1%) | |
| Race | African Americans | 97 (9.6%) | 102 (8.8%) | 0.1340 |
| | American Indians | 2 (0.2%) | 4 (0.3%) | |
| | Asian | 380 (37.6%) | 383 (33.0%) | |
| | White | 494 (48.9%) | 629 (54.3%) | |
| | More than one race | 37 (3.7%) | 41 (3.5%) | |
| Citizenship | United States | 795 (71.9%) | 1024 (81.4%) | <.0001 |
| | Other (Permanent resident, Foreign citizen, Eligible non- citizen) | 311 (28.1%) | 234 (18.6%) | |
| Dental School District | International/not disclosed | 219 (19.8%) | 165 (13.1%) | <.0001 |
| | District 1 | 83 (7.5%) | 98 (7.8%) | |
| | District 2 | 149 (13.5%) | 160 (12.7%) | |
| | District 3 | 102 (9.2%) | 165 (13.1%) | |
| | District 4 | 68 (6.1%) | 129 (10.3%) | |
| | District 5 | 79 (7.1%) | 77 (6.1%) | |
| | District 6 | 61 (5.5%) | 50 (4.0%) | |
| | District 7 | 51 (4.6%) | 78 (6.2%) | |
| | District 8 | 46 (4.2%) | 71 (5.6%) | |
| | District 9 | 66 (6.0%) | 56 (4.5%) | |
| | District 10 | 56 (5.1%) | 58 (4.6%) | |
| | District 11 | 105 (9.5%) | 128 (10.2%) | |
| | District 12 | 21 (1.9%) | 23 (1.8%) | |
| Advanced specialty of Interest | Pediatric 1st choice | 952 (86.1%) | 1228 (97.6%) | <.0001 |
| | Other | 154 (13.9%) | 30 (2.4%) | |
| Dental School Ranked | Class is not ranked or undisclosed | 558 (50.5%) | 616 (49.0%) | 0.4711 |
| | Class is ranked | 548 (49.5%) | 642 (51.0%) | |
| MATCH PREFERENCE | | | | |
| Variables | Category | MATCH rank order: did not match to 1 st choice N= 521 | MATCH rank order: match to 1 st choice N=737 | P value |
| Age | 21-24 | 52 (10.0%) | 59 (8.0%) | 0.5939 |
| | 25-29 | 320 (61.4%) | 448 (60.8%) | |
| | 30-34 | 108 (20.7%) | 160 (21.7%) | |
| | 35-39 | 27 (5.2%) | 50 (6.8%) | |
| | 40 and older | 14 (2.7%) | 20 (2.7%) | |
| Gender | Males | 163 (31.5%) | 227 (31.1%) | 0.8712 |

| | | | | |
|--------------------------------|--|-------------|-------------|--------|
| | Females | 354 (68.5%) | 503 (68.9%) | |
| Ethnicity | Not Hispanic/Latino or did not disclose | 467 (89.6%) | 664 (90.1%) | 0.7898 |
| | Hispanic/Latino | 54 (10.4%) | 73 (9.9%) | |
| Race | African Americans | 42 (8.7%) | 60 (8.9%) | 0.7008 |
| | American Indians | 1 (0.2%) | 3 (0.4%) | |
| | Asian | 166 (34.4%) | 217 (32.1%) | |
| | White | 254 (52.6%) | 375 (55.5%) | |
| | More than one race | 20 (4.1%) | 21 (3.1%) | |
| Citizenship | United States | 447 (85.8%) | 577 (78.3%) | 0.0008 |
| | Other (Permanent resident, Foreign citizen, Eligible non- citizen) | 74 (14.2%) | 160 (21.7%) | |
| Dental School District | International/not disclosed | 43 (8.3%) | 122 (16.6%) | 0.0003 |
| | District 1 | 42 (8.1%) | 56 (7.6%) | |
| | District 2 | 86 (16.5%) | 74 (10.0%) | |
| | District 3 | 79 (15.2%) | 86 (11.7%) | |
| | District 4 | 54 (10.4%) | 75 (10.2%) | |
| | District 5 | 32 (6.1%) | 45 (6.1%) | |
| | District 6 | 15 (2.9%) | 35 (4.7%) | |
| | District 7 | 36 (6.9%) | 42 (5.7%) | |
| | District 8 | 23 (4.4%) | 48 (6.5%) | |
| | District 9 | 22 (4.2%) | 34 (4.6%) | |
| | District 10 | 28 (5.4%) | 30 (4.1%) | |
| | District 11 | 52 (10.0%) | 76 (10.3%) | |
| | District 12 | 9 (1.7%) | 14 (1.9%) | |
| Advanced Specialty of Interest | Pediatric 1st choice | 513 (98.5%) | 715 (97.0%) | 0.0969 |
| | Other | 8 (1.5%) | 22 (3.0%) | |
| Dental School Ranked | Class is not ranked or undisclosed | 275 (52.8%) | 341 (46.3%) | 0.0228 |

Table 5: Univariate logistic regression model estimating probability of MATCH status/preference

| MATCH STATUS | | | | | | |
|--|---|------|------------|----------------|----------------|---------|
| Variables | Effect | N | Odds Ratio | OR 95%CI Lower | OR 95%CI Upper | P value |
| ADAT Biomedical Sciences | | 321 | 1.001 | 0.999 | 1.004 | 0.3180 |
| ADAT Clinical Sciences | | 321 | 1.004 | 1.001 | 1.007 | 0.0026 |
| ADAT Data Research Interpretation and Evidence Based Dentistry | | 321 | 1.002 | 0.999 | 1.005 | 0.1460 |
| ADAT Total | | 321 | 1.004 | 1.001 | 1.008 | 0.0172 |
| GRE Quantitative | | 110 | 1.098 | 1.027 | 1.175 | 0.0064 |
| GRE Verbal | | 110 | 1.102 | 1.042 | 1.165 | 0.0007 |
| GRE Analytical | | 110 | 3.917 | 1.904 | 8.057 | 0.0002 |
| Dental School GPA | | 1801 | 3.921 | 2.954 | 5.206 | <.0001 |
| Age at Submission | 21-24 vs 40 and older | 2364 | 6.138 | 3.667 | 10.273 | <.0001 |
| | 25-29 vs 40 and older | | 3.918 | 2.607 | 5.887 | |
| | 30-34 vs 40 and older | | 2.478 | 1.619 | 3.792 | |
| | 35-39 vs 40 and older | | 1.759 | 1.083 | 2.858 | |
| Gender | Male vs female | 2330 | 1.199 | 1.002 | 1.434 | 0.0474 |
| Ethnicity | Not Hispanic vs Hispanic | 2364 | 1.084 | 0.833 | 1.411 | 0.5490 |
| Race | African Americans vs more than one race | 2169 | 0.949 | 0.562 | 1.603 | 0.1350 |
| | American Indians vs more than one race | | 1.805 | 0.312 | 10.433 | |
| | Asian vs more than one race | | 0.910 | 0.570 | 1.450 | |
| | White vs more than one race | | 1.149 | 0.726 | 1.820 | |
| Citizenship | US vs others | 2364 | 1.712 | 1.411 | 2.077 | <.0001 |
| Advanced Specialty of Interest | Pediatric 1st choice vs other | 2364 | 6.620 | 4.437 | 9.878 | <.0001 |
| Dental School Ranked | Class is not ranked or undisclosed vs Class is ranked | 2364 | 0.942 | 0.802 | 1.108 | 0.4711 |
| MATCH PREFERENCE | | | | | | |
| Variables | Effect | N | Odds Ratio | OR 95%CI Lower | OR 95%CI Upper | P value |
| ADAT Biomedical Sciences | | 190 | 0.999 | 0.996 | 1.002 | 0.5350 |
| ADAT Clinical Sciences | | 190 | 1.001 | 0.998 | 1.005 | 0.4443 |
| ADAT Data Research Interpretation and Evidence Based Dentistry | | 190 | 0.998 | 0.995 | 1.002 | 0.4264 |
| ADAT Total | | 190 | 1.000 | 0.995 | 1.005 | 0.9646 |
| GRE Quantitative | | 32 | 1.087 | 0.965 | 1.224 | 0.1705 |
| GRE Verbal | | 32 | 0.902 | 0.807 | 1.009 | 0.0725 |
| GRE Analytical | | 32 | 0.844 | 0.287 | 2.481 | 0.7582 |
| Dental School GPA | | 970 | 0.782 | 0.536 | 1.143 | 0.2043 |
| Age | 21-24 vs 40 and older | 1258 | 0.794 | 0.365 | 1.729 | 0.5962 |
| | 25-29 vs 40 and older | | 0.980 | 0.488 | 1.969 | |
| | 30-34 vs 40 and older | | 1.037 | 0.502 | 2.142 | |
| | 35-39 vs 40 and older | | 1.296 | 0.566 | 2.967 | |
| Gender | Male vs female | 1247 | 0.980 | 0.769 | 1.250 | 0.8711 |
| Ethnicity | Not Hispanic vs Hispanic | 1258 | 1.052 | 0.726 | 1.525 | 0.7891 |
| Race | African Americans vs more than one race | 1159 | 1.361 | 0.657 | 2.819 | 0.7061 |
| | American Indians vs more than one race | | 2.853 | 0.274 | 29.732 | |
| | Asian vs more than one race | | 1.245 | 0.653 | 2.373 | |
| | White vs more than one race | | 1.406 | 0.747 | 2.647 | |

| | | | | | | |
|--------------------------------|---|------|-------|-------|-------|--------|
| Citizenship | US vs others | 1258 | 1.675 | 1.238 | 2.268 | 0.0008 |
| Advanced specialty of interest | Pediatric 1st choice vs other | 1258 | 0.507 | 0.224 | 1.148 | 0.1034 |
| Dental School Ranked | Class is ranked vs. Class is not ranked or undisclosed | 1258 | 1.299 | 1.036 | 1.626 | 0.0229 |

Table 6: Multivariate logistic regression model estimating probability of MATCH status/preference

| MATCH STATUS | | | | |
|--|----------------|----------------------------|--------|---------|
| Effect | Point Estimate | 95% Wald Confidence Limits | | P value |
| | | Lower | Upper | |
| ADAT clinical sciences | 1.004 | 0.998 | 1.010 | 0.2266 |
| ADAT total | 1.002 | 0.993 | 1.011 | 0.6520 |
| Dental school GPA | 1.699 | 0.639 | 4.516 | 0.2879 |
| Age: 21-24 vs 40 and older | 4.701 | 0.892 | 24.774 | 0.0680 |
| Age: 25-29 vs 40 and older | 5.360 | 1.280 | 22.448 | 0.0216 |
| Age: 30-34 vs 40 and older | 4.338 | 0.944 | 19.930 | 0.0593 |
| Age:35-39 vs 40 and older | 2.216 | 0.401 | 12.257 | 0.3619 |
| Gender: male vs female | 1.270 | 0.676 | 2.385 | 0.4574 |
| Citizenship status: US vs others | 0.919 | 0.366 | 2.309 | 0.8568 |
| Advanced Specialty of Interest: Pediatric 1st choice vs Other | 2.625 | 0.878 | 7.848 | 0.0843 |
| MATCH PREFERENCE | | | | |
| Effect | Point Estimate | 95% Wald Confidence Limits | | P value |
| | | Lower | Upper | |
| Dental school GPA | 0.818 | 0.540 | 1.241 | 0.3448 |
| Citizenship status: US vs others | 0.817 | 0.545 | 1.224 | 0.3274 |
| Advanced Specialty of Interest: Pediatric 1st choice vs Other | 2.427 | 0.944 | 6.211 | 0.0657 |
| Dental School Ranked: class is ranked vs class not ranked or undisclosed | 1.764 | 1.311 | 2.369 | 0.0002 |