

Association of Admissions Factors with Student Performance in Preclinical Operative Dentistry

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INTRODUCTION

Admission to dental school is based on various factors including academic achievements in undergraduate coursework and Dental Admission Test (DAT) scores. Students' success in an operative course requires fundamental knowledge, hand skills, spatial awareness, and self-assessment ability. Previously, we have shown a correlation between self-assessment and preclinical performance.¹ This study aims to evaluate how admissions factors, such as GPA and DAT, including the PAT, relate to students' academic and preclinical performance, and self-assessment skill in preclinical operative dentistry. To our knowledge, this may be the first study to evaluate associations between admission criteria and students' self-assessment ability.

METHODS & MATERIAL

The Harvard University Faculty of Medicine verified that this study met the exemption criteria defined by the U.S. Department of Health and Human Services and FDA 45 CFR 46.101(b)(2)(Protocol #IRB 20-1131). A total of 239 students were included from seven class years (2016-2022). Third-year dental students participated in a preclinical operative dentistry course. At the end of the course, they took the final multiple-choice exam and performed four competency examination procedures: Class II amalgam preparation and restoration and Class III resin-composite preparation and restoration. Calibrated faculty graded students' work independently and students also self-assessed their performance using the same rubrics as faculty. Linear regressions were performed to estimate the association between the admission factors with the mean faculty scores (measuring preclinical performance), student-faculty (S-F) gap scores (evaluating self-assessment skills), and their final didactic exam scores.

RESULTS

Overall, students' self-assessment was higher compared to faculty score. Linear regression analysis demonstrated positive correlations between the PAT and students' preclinical performance as well as between the DAT and their didactic exam scores. In general, S-F gap score decreased as PAT score increased, and it was statistically significantly lower for the Class III preparation, indicating better self-assessment skills. No correlations were observed between student performance and GPA scores.

Table 1: Characteristics of students at Harvard School of Dental Medicine from Classes of 2016-2022 (N=239)

Characteristics	Overall Mean	SD	Male (N=114)		Female (N=125)	
			Mean	SD	Mean	SD
GPA	3.87	0.13	3.88	0.12	3.85	0.14
DAT score	23.37	1.68	23.5	1.65	23.3	1.71
PAT score	21.82	2.11	21.9	1.96	21.7	2.23

Table 2: The association between Harvard School of Dental Medicine students' admission scores with their performance in pre-clinical operative dentistry for the Classes of 2016-2022

Exercise	GPA	DAT score	PAT score
	Adjusted ^a difference in mean score (95%CI ^b)	Adjusted ^a difference in mean score (95%CI ^b)	Adjusted ^a difference in mean score (95%CI ^b)
Class II Amalgam Preparation			
Mean faculty score	-3.22 (-14.61, 8.17)	0.81 (-0.10, 1.73)	0.83 (0.10, 1.56)*
Mean S-F Gap ^c	2.96 (-7.76, 13.67)	-0.75 (-1.61, 0.11)	-0.01 (-0.69, 0.68)
Class II Amalgam Restoration			
Mean faculty score	1.84 (-8.58, 12.26)	-0.25 (-1.08, 0.59)	0.85 (0.19, 1.52)*
Mean S-F Gap ^c	10.95 (-1.68, 23.57)	-0.10 (-1.11, 0.92)	-0.57 (-1.37, 0.24)
Class III Composite Preparation			
Mean faculty score	1.32 (-8.17, 10.82)	-0.26 (-1.02, 0.51)	0.86 (0.26, 1.47)*
Mean S-F Gap ^c	3.91 (-5.09, 12.91)	0.10 (-0.62, 0.82)	-0.64 (-1.22, -0.07)*
Class III Composite Restoration			
Mean faculty score	0.87 (-9.20, 10.93)	-0.25 (-1.05, 0.56)	0.64 (0.01, 1.28)*
Mean S-F Gap ^c	-0.45 (-11.14, 10.24)	-0.34 (-1.20, 0.52)	-0.48 (-1.16, 0.20)
All Exercises Combined			
Mean faculty score	-0.36 (-7.45, 6.73)	0.04 (-0.53, 0.61)	0.81 (0.36, 1.27)*
Mean S-F Gap ^c	4.41 (-3.25, 12.07)	-0.27 (-0.89, 0.34)	-0.43 (-0.92, 0.06)
Final didactic exam			
Mean Score	5.08 (-1.70, 11.85)	1.07 (0.52, 1.61)*	-0.15 (-0.58, 0.29)

^a Adjusted for gender, overall GPA, DAT score, PAT score, ^b 95% confidence interval, ^c S-F Gap = Self-assessment-Faculty assessment, * P-value<0.05

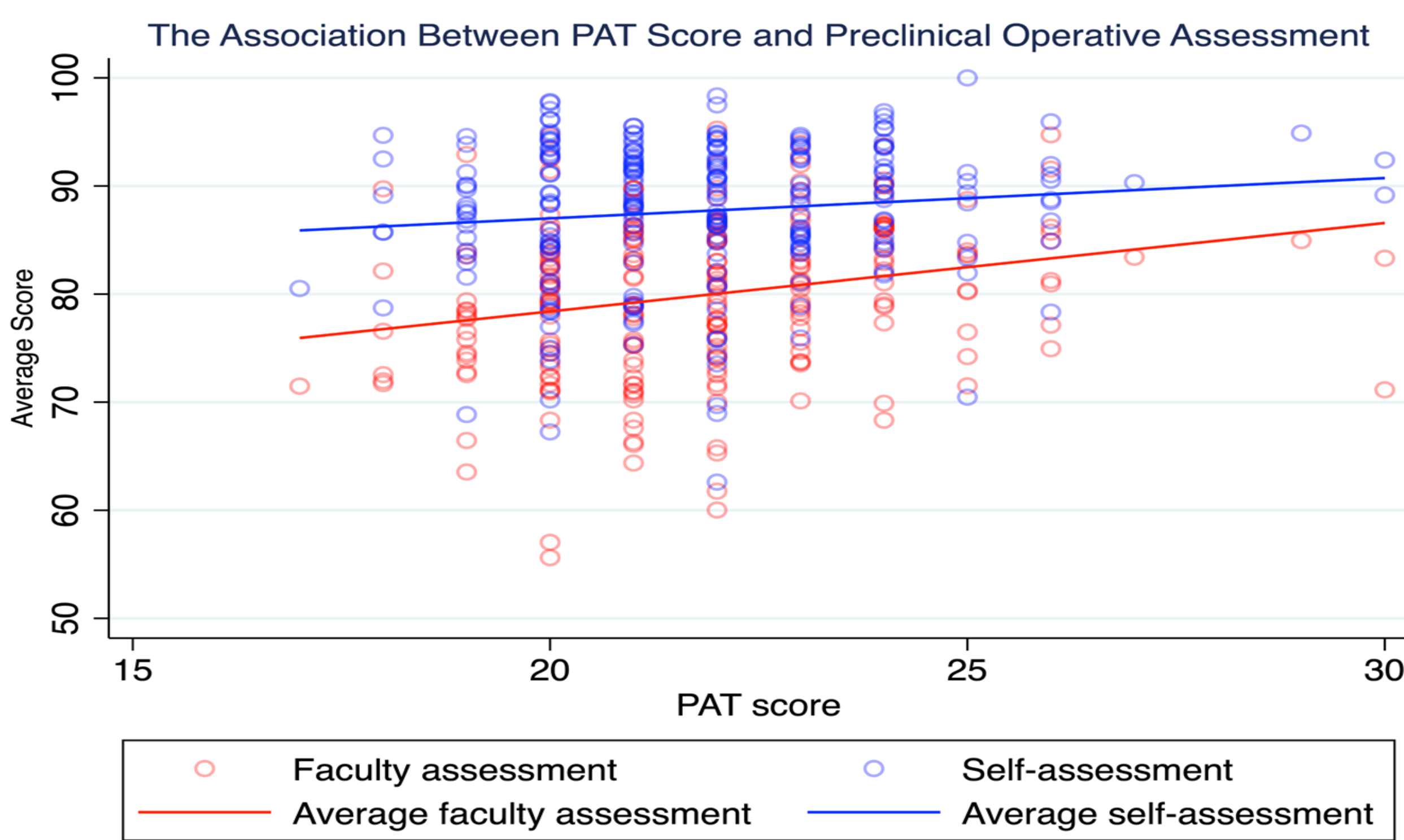


Figure 1: Association of PAT score and preclinical operative assessment

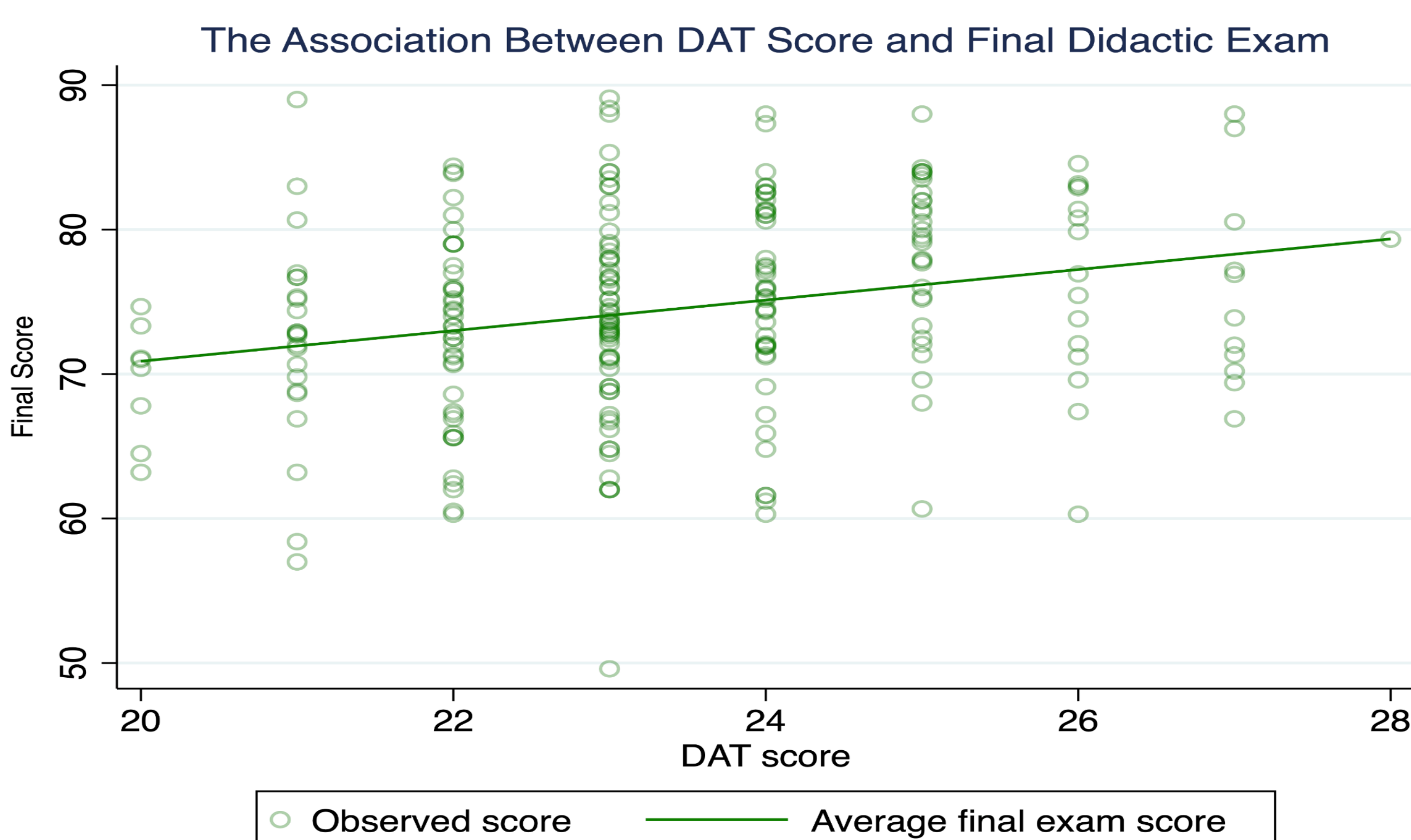


Figure 2: Association of DAT score and final didactic exam

CONCLUSION

Recognizing factors that affect admissions is important to prospective dental applicants, admissions personnel, and faculty. In addition to academic excellence, dentistry requires other skills, including accurate self-assessment abilities to evaluate clinical work, self-directed learning as well as spatial awareness and manual dexterity. Elucidating admissions factors that correlate with these skills is beneficial not only for the admission process, but also teaching students beyond their admission to dental school.

Work Cited

- Lee, C, Asher, S. R, Chutinan, S, et al. The Relationship Between Dental Students' Assessment Ability and Preclinical and Academic Performance in Operative Dentistry. J Dent Educ 2017;81(3), 310-317.