

Benchmarking Expert Performance to Establish Competency in Wire Navigation



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Benchmarking Expert Performance to Establish Competency in Wire Navigation

Matt Karam, Steven Long, Geb Thomas, J Lawrence Marsh, Don Anderson

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Saturday June 13th 10:01 -10:07 EDT



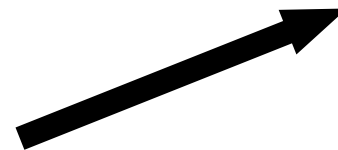
Disclosures

- Team member disclosures are current and reported on the AAOS website
- I, along with 3 co-authors (SL, DA, GT), own Iowa Simulation Solutions, LLC (www.iasimsol.com), a company that produces and sells the simulator used in this study

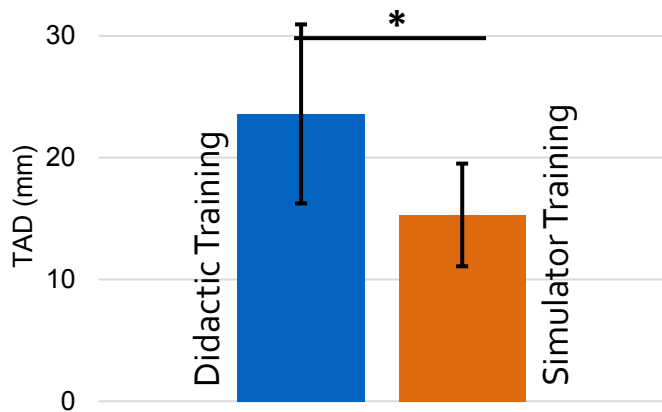


Wire Navigation

- Common and widely used skill
- Proficiency is important for patient and provider safety
- Task performance metrics can be measured and assessed in a simulated environment



Prior Work



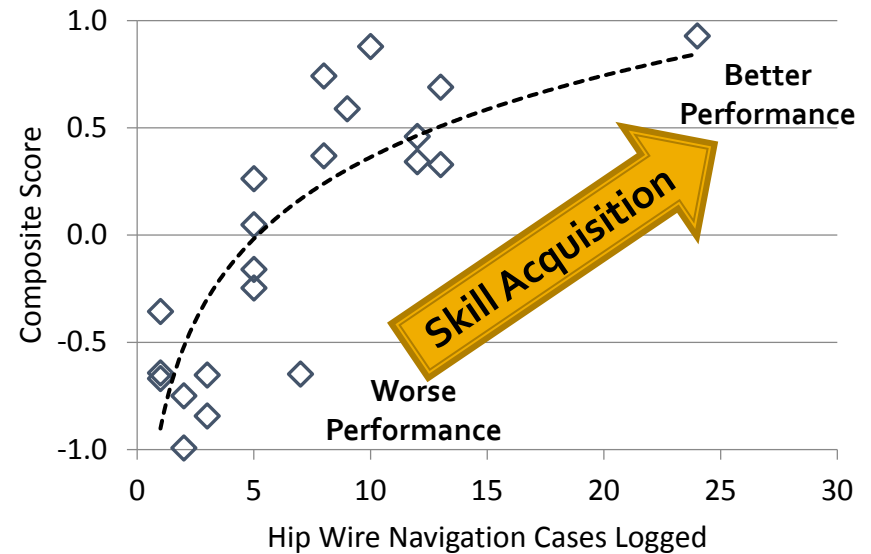
- Image-based Decision Error Analysis (IDEA) provides a composite score that measures OR wire navigation skill.

- *CORR 2020 (submitted)*

- ***What level of proficiency should be required on a simulation platform?***

- Simulation training demonstrated improved performance in OR like environment

- *CORR 2019 – Editors Spotlight article*



Objectives

1. Measure expert and novice level performance on a simulated hip wire navigation task
2. Set proficiency training benchmarks for hip wire navigation task based on observed differences between groups

OTA Resident Fracture Course

- 5 simulator stations
 - Simulator orientation
 - Demonstrate ideal wire placement on AP and lateral Images
 - 1 Assessment Case (pre-training)

- 69 Residents total
 - Average PGY 1.88



Residents at OTA Fracture Course
Orlando, Florida 2018

OTA Fellows Course

- 10 Simulator stations
 - Simulator orientation
 - Demonstrate ideal wire placement on AP and lateral Images
 - **3 Assessment Cases**
- 28 Fellows participated
 - 68 data points from multiple assessments

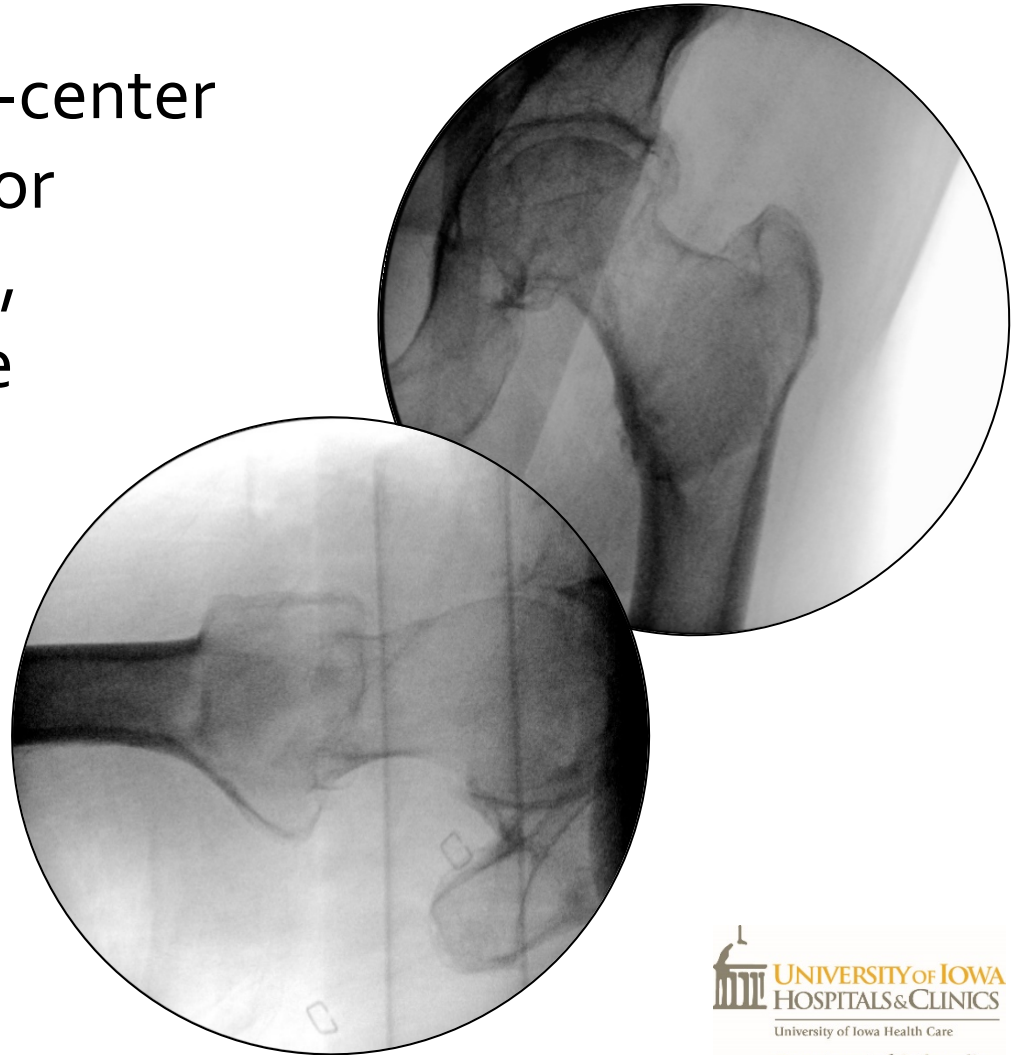


April 2019
Boston, MA



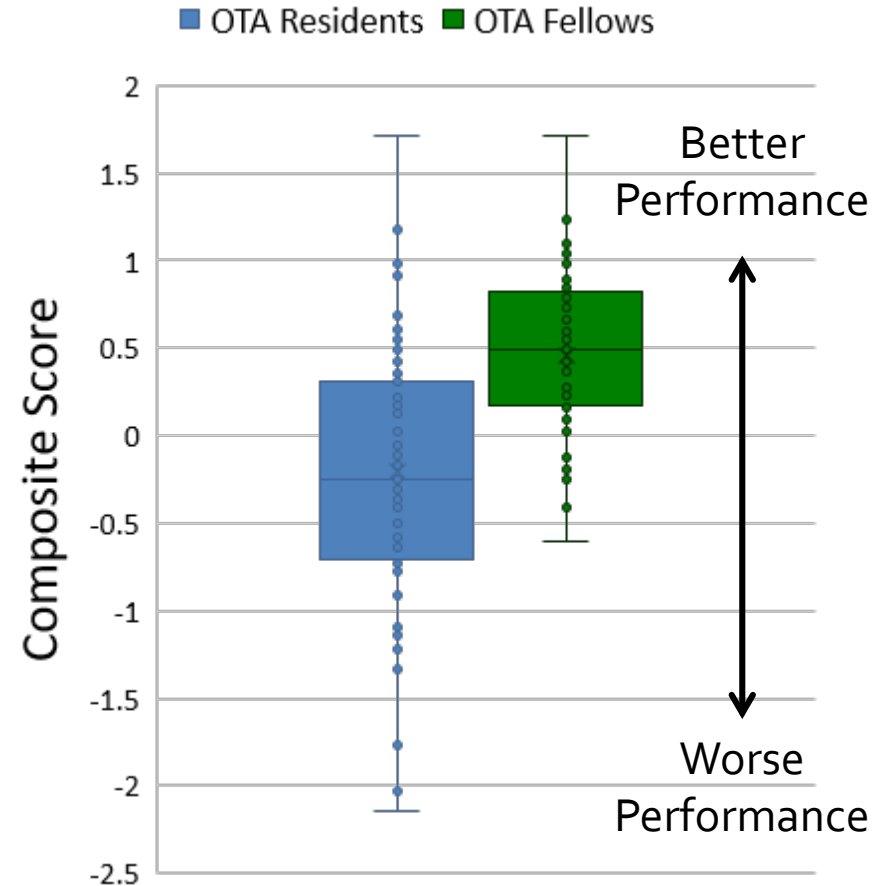
Simulator Assessment

- Asked to place center-center guide wire on simulator while minimizing TAD, use of fluoro, and wire navigation time
- Given AP and lateral pseudo-fluoro images at their request

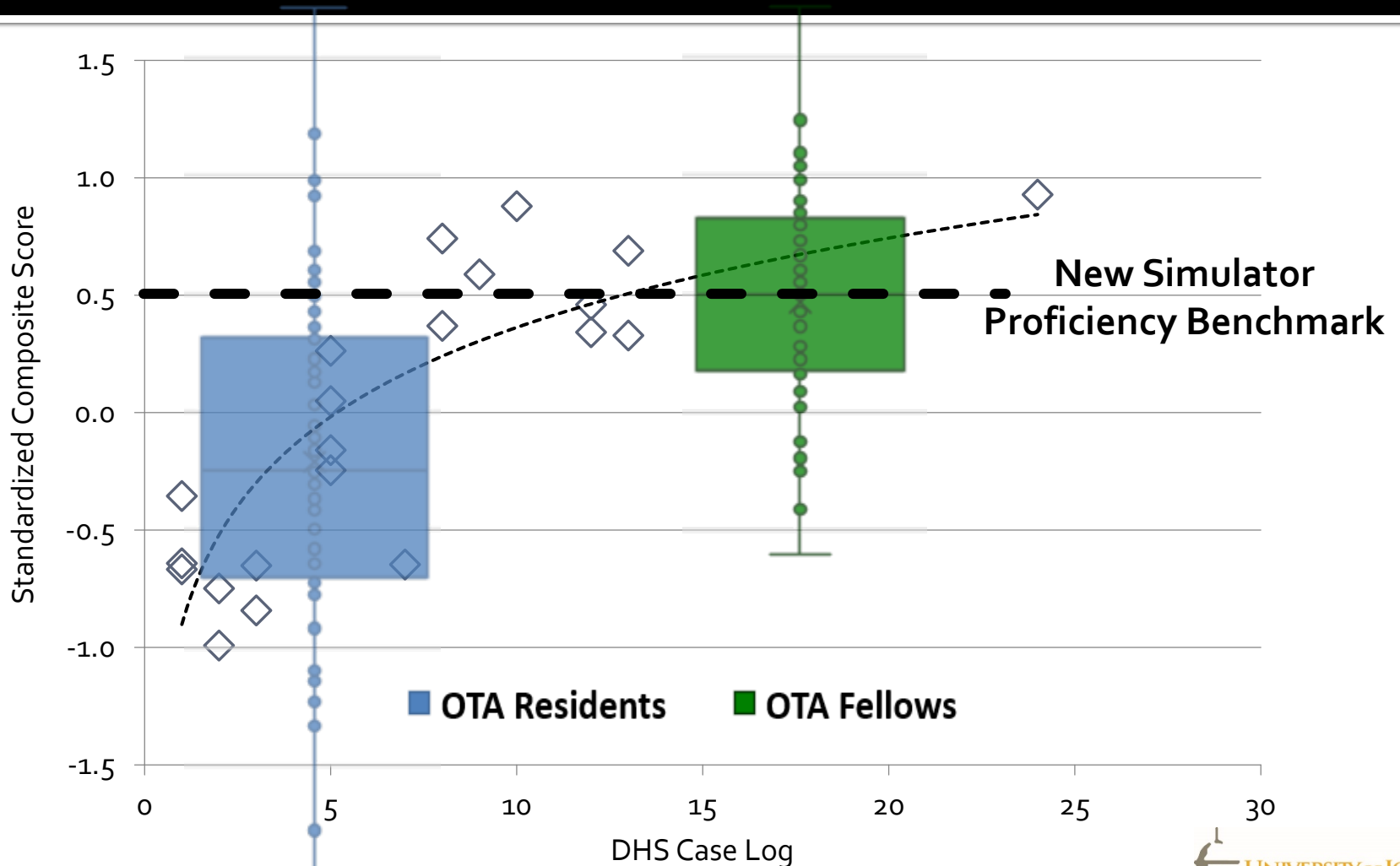


Results

Group	Fellows (N=28)	Residents (N=69)
Composite Score Metrics		
TAD (mm)	13.5 ± 5	19.7 ± 7
Decision Errors	9.2 ± 5	13.8 ± 7
Average Angle Error (°)	1.6 ± 1.8	3 ± 2.9
Out of Plane Movement (°)	7.4 ± 9	15.5 ± 20
Time (s)	121 ± 61	207 ± 88
Images	18 ± 8	22 ± 10



Setting the Benchmark



Discussion

- Fellows displayed expected superior performance across all categories of wire navigation assessment
- Ongoing research to demonstrate training to proficiency leads to transfer of skill and improved operating room performance
- Our residents have been doing this for the past 4 years, now we have a better understanding of how to shift learning curve out of the OR

Acknowledgments

■ Funding



■ Collaborators

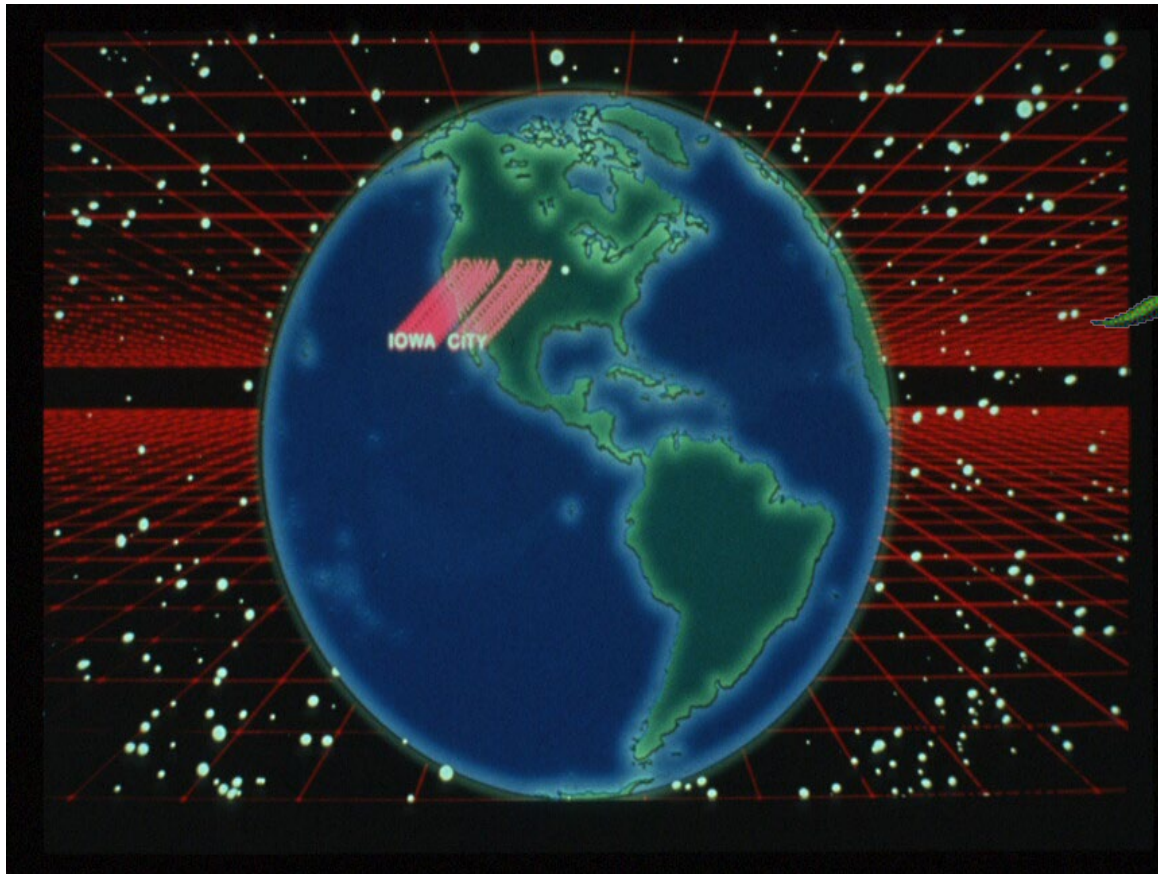
- 2019 OTA Fellows Course:
 - Paul Tornetta
 - Rachel O'Connell
- 2018 OTA Resident Course:
 - Carla Smith
 - Michael Leslie
 - Sara Arns

Thank You

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When (Almost) Everyone is Above Average:

A Critical Analysis of Standardized Letters of Recommendation

PM Inclan. A Cooperstein. A Powers. CJ Dy. SE Klein.



Washington University in St. Louis

SCHOOL OF MEDICINE

No Disclosures



Washington University in St. Louis

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Applying to Orthopaedic Surgery



Table **Summary Statistics on U.S. Allopathic Seniors**
ORS-1 *Orthopaedic Surgery*

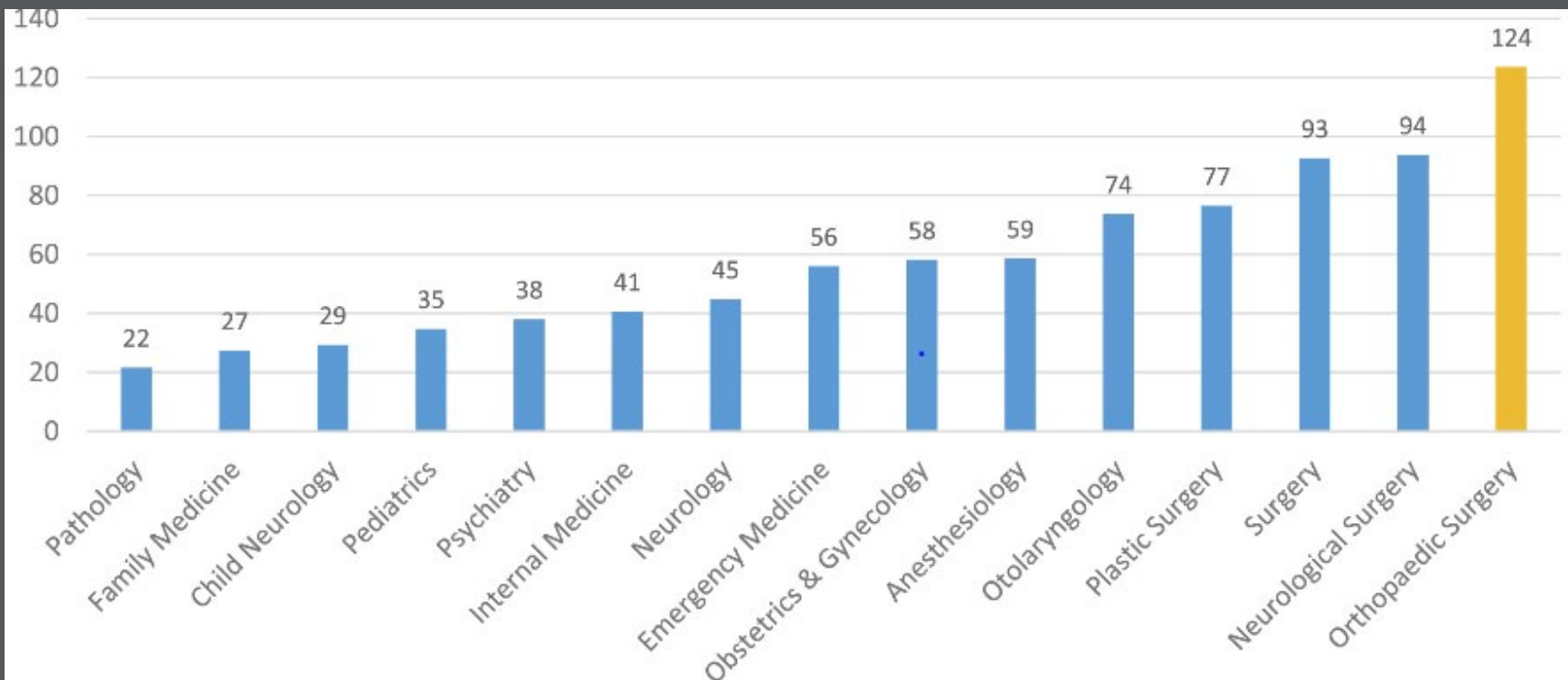
Measure	Matched (n=678)	Unmatched (n=132)
1. Mean number of contiguous ranks	12.5	6.6
2. Mean number of distinct specialties ranked	1.1	1.3
3. Mean USMLE Step 1 score	248	240
4. Mean USMLE Step 2 score	255	246
5. Mean number of research experiences	4.9	4.9
6. Mean number of abstracts, presentations, and publications	11.5	6.7
7. Mean number of work experiences	3.2	3.4
8. Mean number of volunteer experiences	7.3	6.3
9. Percentage who are AOA members	40.4	15.9
10. Percentage who graduated from one of the 40 U.S. medical schools with the highest NIH funding	31.9	26.5

Matching in Orthopaedic Surgery

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Author Information

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Letters of Recommendation

- Highly-considered during selection process
- Numerous Short-comings
 - “Glowing Reports”
 - Variable interpretation
 - Kappa = 0.28

Standardized Letters of Recommendation

AOA
THE AMERICAN ORTHOPAEDIC ASSOCIATION
Council of Orthopaedic Residency Directors
Standardized Letter of Recommendation Form

Applicant's Name: _____ ERAS Letter ID: _____
Reference Provided By: _____
Present Position: _____ Professorial Rank (if applicable): _____
Institution/Group Practice Name: _____
Specialty: _____
Email: _____ Telephone Number: _____

BACKGROUND INFORMATION

1. Length of clinical or professional contact with applicant:
 < 2 weeks 1-6 months 1-2 years
 1 month 6-12 months 2+ years

2. Nature of contact with applicant: (Check all that apply)
 Extended direct clinical contact (> 20 hrs/week) Know indirectly through others/evaluations
 Limited direct clinical contact (< 20 hrs/week) Committee prepared letter of recommendation
 Direct research contact Other (Please describe): _____

QUALIFICATIONS FOR ORTHOPAEDIC SURGERY
*Compared to other orthopaedic applicants, rank this student by placing an "X" in the appropriate percentile category. *The ranking is listed from lowest to highest.* (For example, a student ranked in the 100th percentile is the most highly qualified.)*

1. **Patient Care** – Ability to develop and justify an appropriate differential diagnosis and a cohesive treatment plan.
10th 20th 30th 40th 50th 60th 70th 80th 90th 100th Cannot assess

2. **Medical Knowledge** – Level of general and orthopaedic-specific medical knowledge.
10th 20th 30th 40th 50th 60th 70th 80th 90th 100th Cannot assess

3. **Interpersonal and Communication Skills** – Ability to interact effectively with others on the health care team and communicate in an effective and caring manner with patients and their families.
10th 20th 30th 40th 50th 60th 70th 80th 90th 100th Cannot assess

4. **Procedural Skills** – Ability to perform surgical tasks in a competent manner.
10th 20th 30th 40th 50th 60th 70th 80th 90th 100th Cannot assess

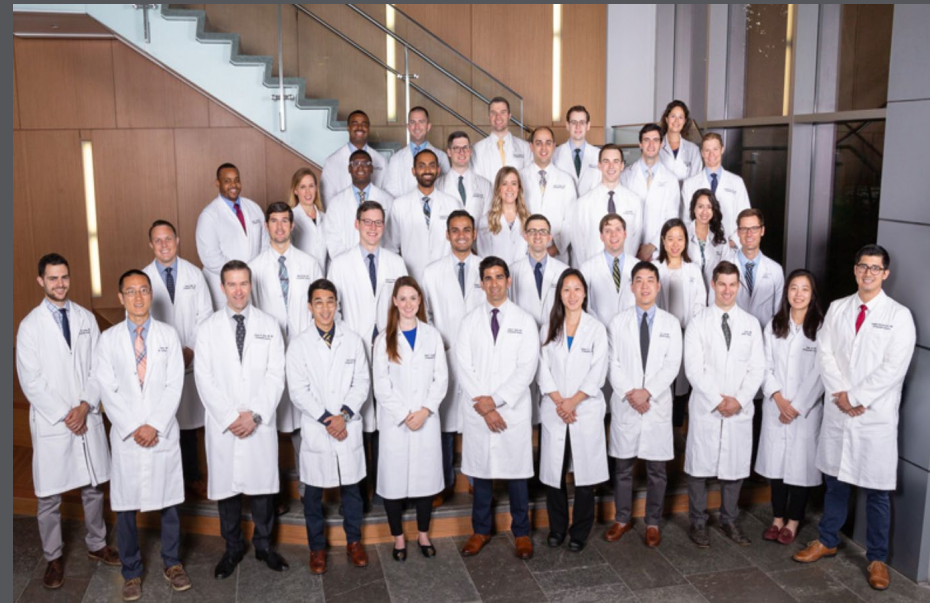
“provide a global perspective on an applicant’s candidacy...that allows for easier and potentially more meaningful comparison to peers”

Objective

- Primary: To define the AOA standardized letter of recommendation utilization and distribution of applicant ratings
- Secondary: Determine the presence of gender differences in AOA standardized letter of recommendation applicant domain ratings

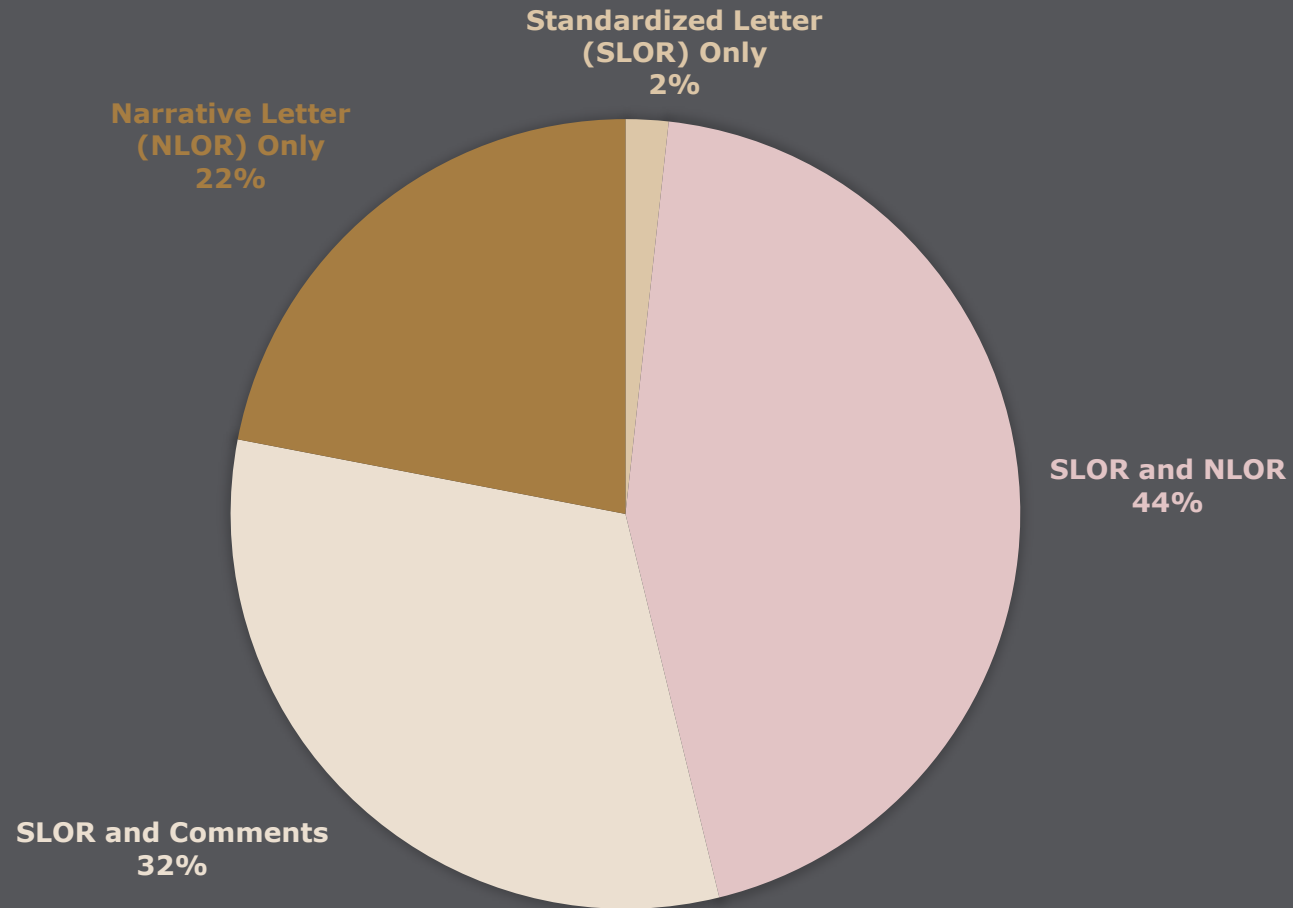
METHODS

- Retrospective Review
- All Applicants to a Single, Midwest Academic Residency Program
 - No Screening Criteria
 - Randomly Selected
- Single Reviewer
- ERAS & Letter of Recommendation

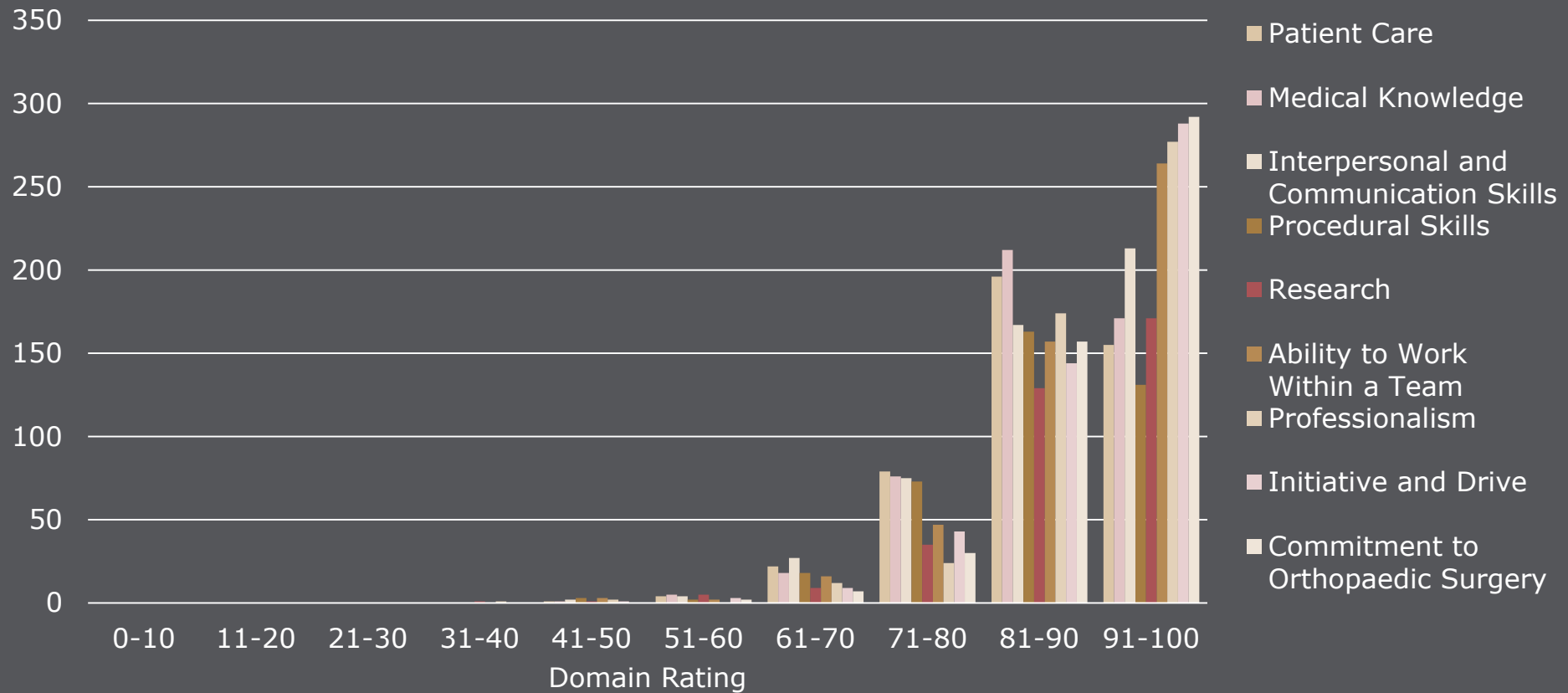


RESULTS

Instrument Utilization



Distribution of Domain Ratings



Applicants Domain Ratings

- 16/4,124 (0.3%) below the 50th Percentile
- 2/4,124 (0.04%) below the 40th Percentile
- 48% of Applicants “ranked to guarantee a match”

Domain Ratings and Applicant Gender

Domain	Male, n=392 (Mean ± SD)	Female, n=102 (Mean ± SD)	p-value
Patient Care	86.3 ± 8.7	88.6 ± 8.2	0.01
Medical Knowledge	86.9 ± 8.8	88.5 ± 7.5	0.17
Interpersonal & Communication	86.9 ± 9.6	90.6 ± 7.3	<0.001
Procedural	86.3 ± 9.2	87.7 ± 7.6	0.40
Research	88.5 ± 9.6	90.2 ± 6.9	0.33
Ability to Work Within a Team	89.2 ± 8.8	91.3 ± 6.3	0.05
Professionalism	90.5 ± 7.7	91.9 ± 5.9	0.09
Initiative and Drive	90.3 ± 7.9	91.8 ± 6.2	0.06
Commitment to Orthopaedic Surgery	91.0 ± 6.9	91.7 ± 5.8	0.66

DISCUSSION


Ceiling Effect

- Noted in Recent Similar Studies
 - Samade et al, JBJS 2020
 - Kang et al, JAAOS ahead of print
- Limits utility of Instrument
 - “When everyone is outstanding, no-one in particular stands out”
- Innumerable Causes
 - Outstanding population of applicants
 - Desire to improve applicant’s chance
 - Limited exposure to discerning situations

Future Direction

- Widely Adopted
 - Continued Standardization
- Improved ability to discriminate between applications
 - Increased granularity
- Etiology of gender differences noted in domain ratings



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Competence Measures for the ACGME Meniscus Milestone: Arthroscopic Video Cadaveric Assessment

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Dawn M. LaPorte MD
June 13, 2020



ORTHOPAEDIC SURGERY

ORTHOPAEDIC SURGERY

Disclosures

- Arthroscopic shavers donated by Stryker
- Fast-Fix 360 devices donated by Smith and Nephew
- Other coauthors disclosures available on EOA App



Purpose

- “Lack of assessment methods and tools” for Milestones
- One-on-one feedback, group evaluation, self-assessment, “self-directed assessment seeking”
- **Create a rubric for a Milestone**
 - *Standardized, interrater-validated, unbiased*
- **Allows for comparison, competence-based evaluation**



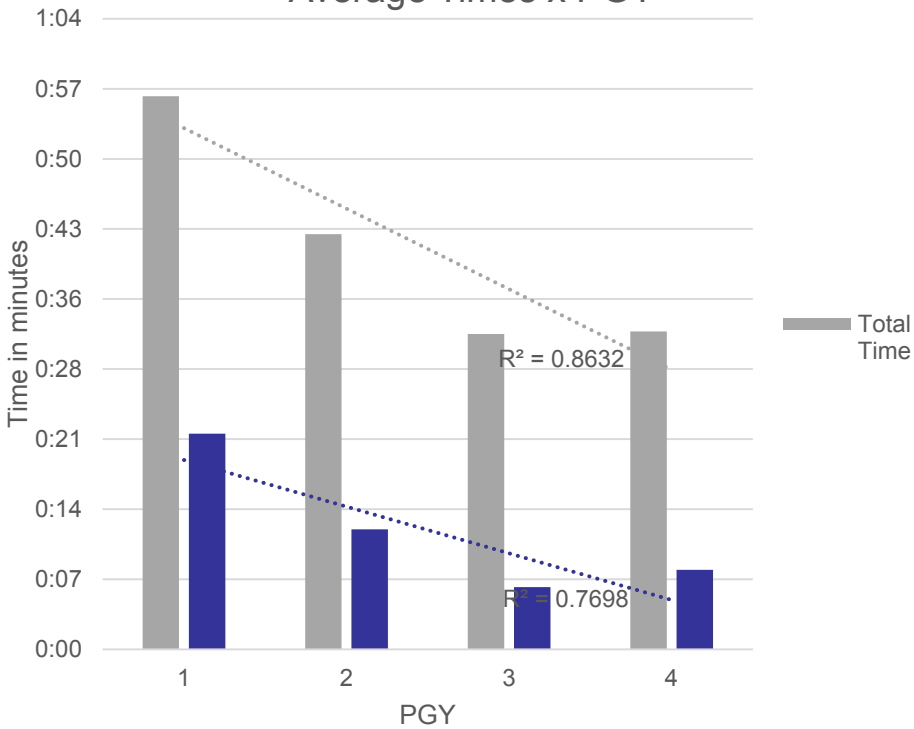
Methods

- 24 resident participants
 - *Demographic and case log data*
- Cadaveric model, arthroscopic video
 - *High fidelity training*
 - *Inherently anonymous*
- Blinded video evaluated by fellowship-trained faculty
 - *Arthroscopic Surgical Skill Evaluation Tool (ASSET)*
 - *Task-specific checklists: meniscectomies, meniscus repairs*

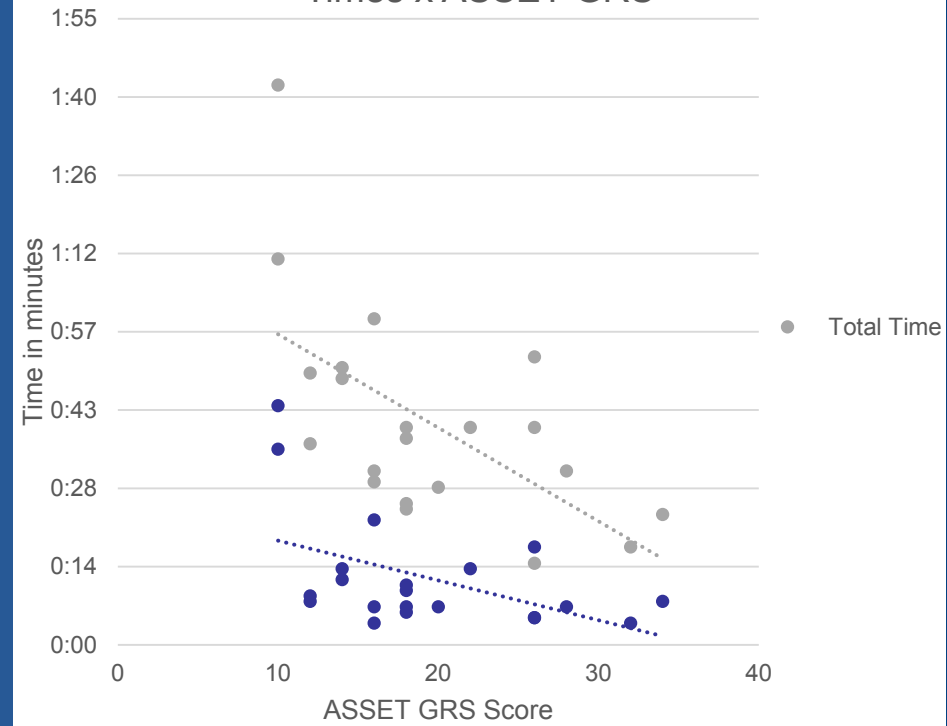


Results

Average Times x PGY

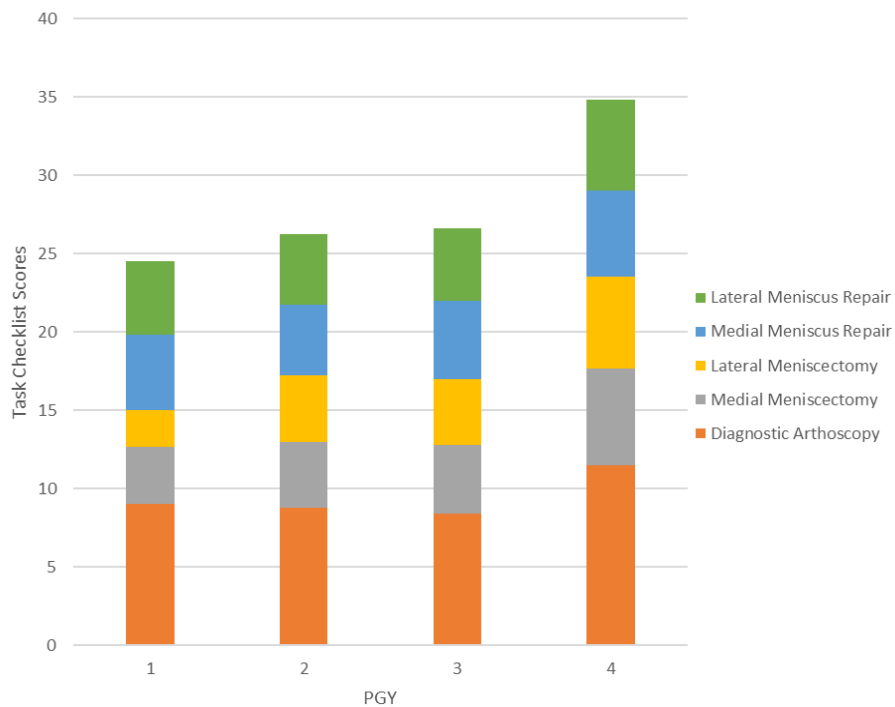


Times x ASSET GRS

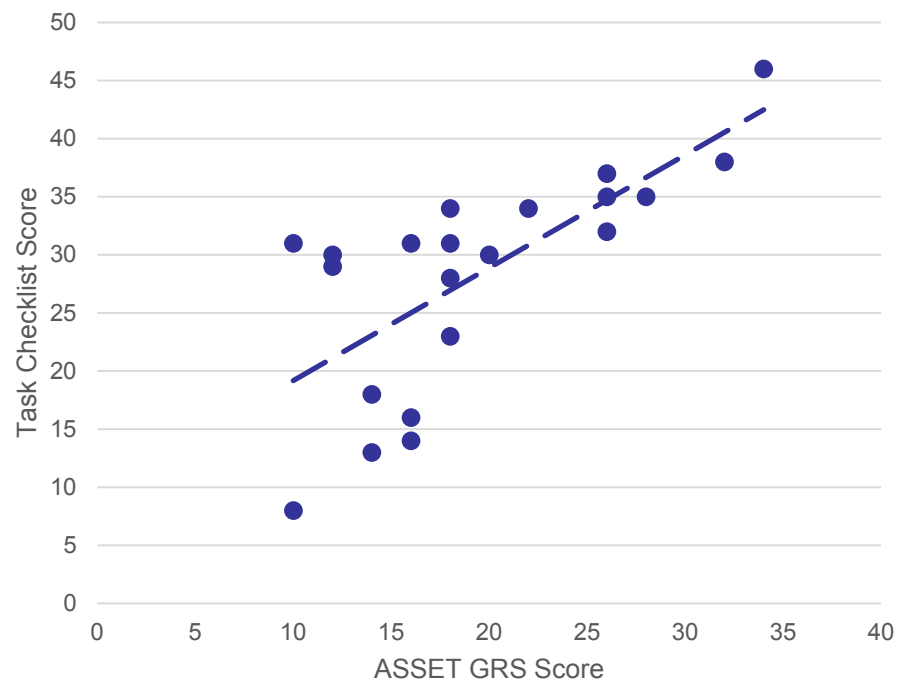


Results

Task Checklist Scores by PGY



Task Checklist Scores x ASSET GRS Score



Conclusions

- Task-Specific Checklists and ASSET can assess competence in the “Patient Care” domain of the Meniscus Tear Milestone
- Anonymous arthroscopic video could be used in evaluation and formative educational feedback
- Expansion to different Milestones, residency programs



Resident Recruitment in the Digital Age:

What Information Are Residency Applicants Looking For And Where Do They Turn To Find It?

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Ilda B. Molloy, MD, MS^{1,2}; Michael T. Torchia, MD, MS¹;
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Disclosures

None of the authors have conflicts of interest or financial disclosures relevant to the content of this work.



Applicants reference online resources frequently

- Residency program websites
- Circulating Google Doc
- Doximity Residency Navigator



The quality ratings of online resources lag in comparison to direct advice from various types of mentors



Quality of life and interpersonal factors are important to applicants

- Resident camaraderie
- Quality of relationships between faculty and residents
- Overall happiness and quality of life



Information may impact application patterns

Background

- Applying to orthopaedic surgery residency is incredibly competitive

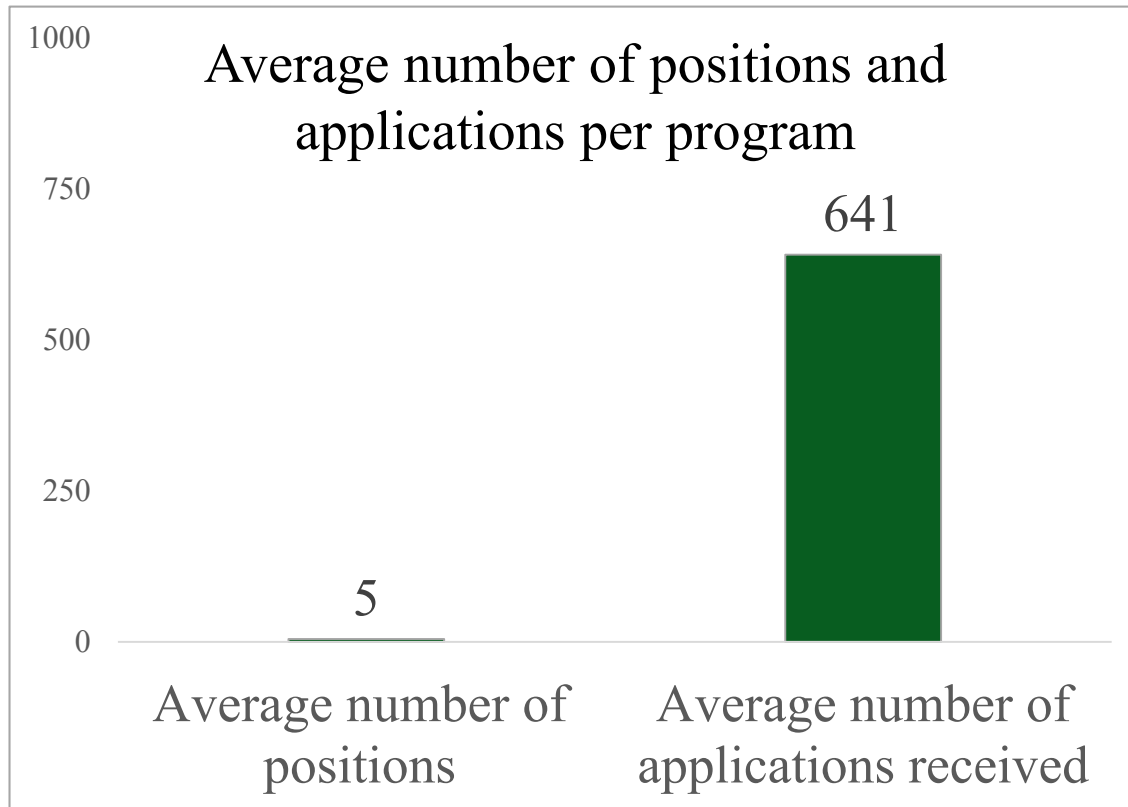
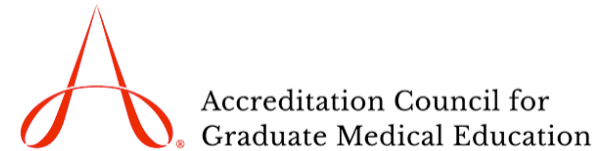


Figure adapted from data in the 2018 NRMP Program Director Survey



Background

- Proliferation of online platforms for applicants





What type of
information?

Which
resources are
referenced?

Are they
useful?



Methods



Study design

- Web-based, anonymous, voluntary survey
- All NRMP applicants to our residency program during the 2018-2019 application cycle (610)

Survey

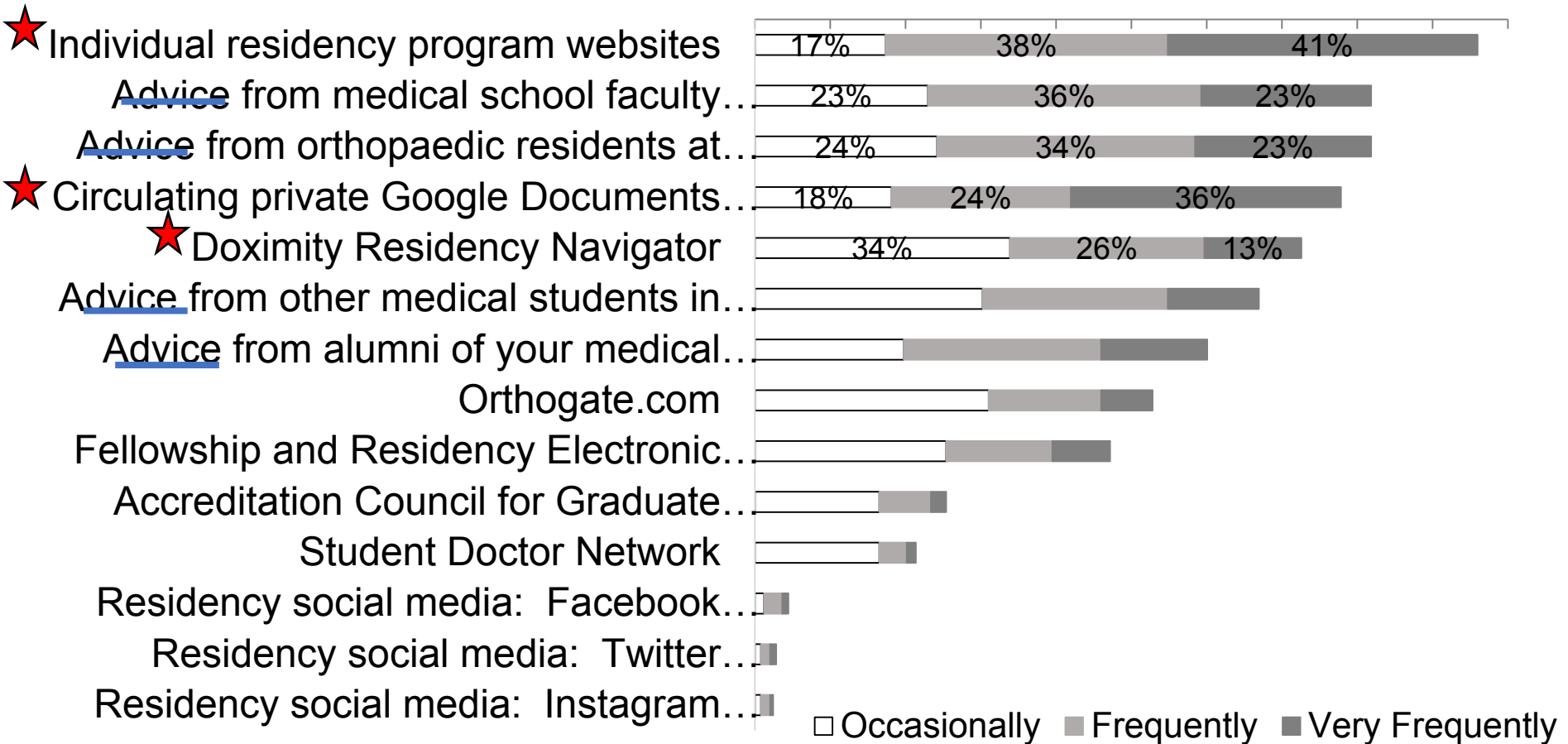
- 3 domains
 - Frequency of use and quality of selected resources
 - Applicant attitudes about available information
 - Factors important to applicants in decision-making

Table 1: Demographics of Survey Respondents (N = 259)

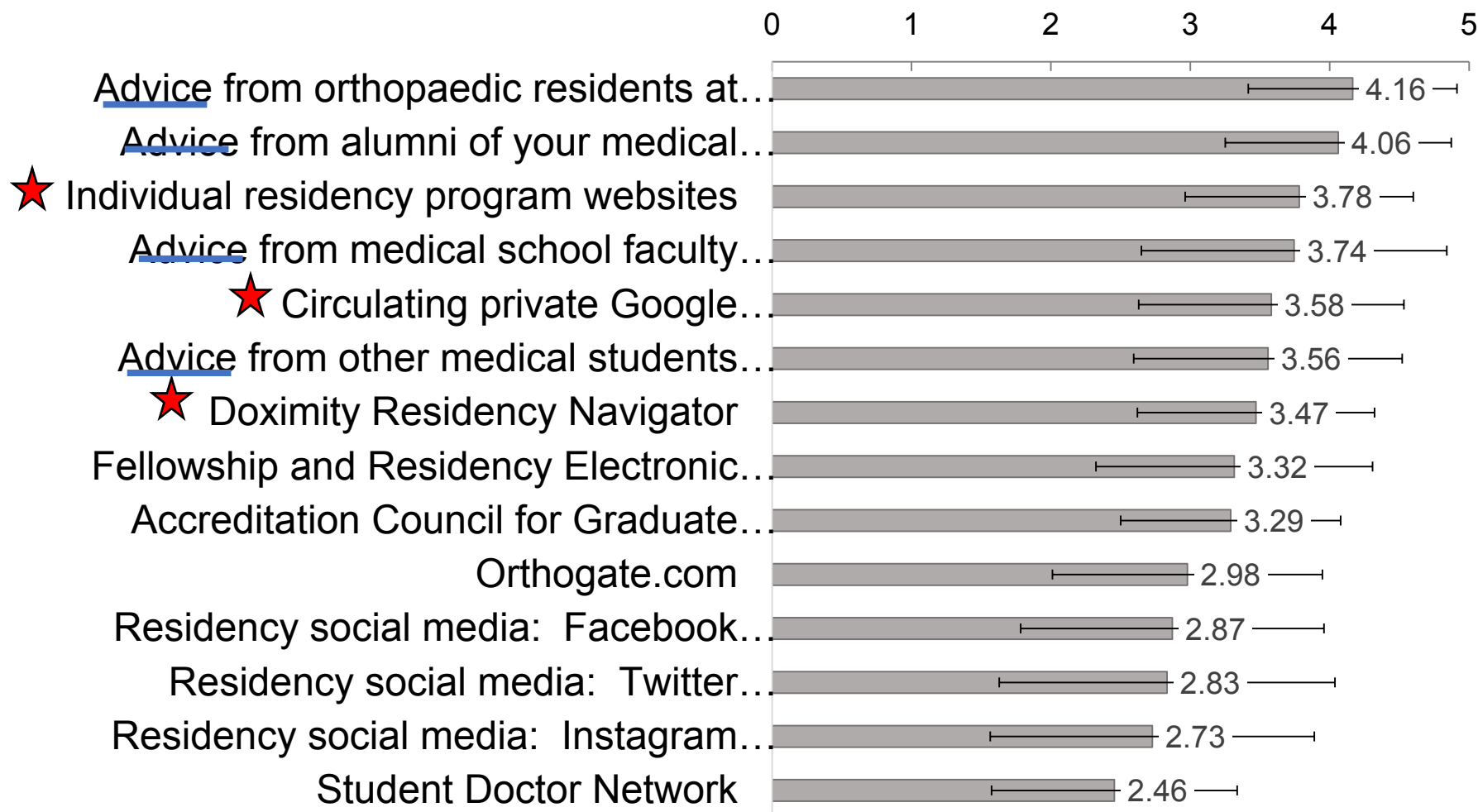
Age	27.1 (2.5)
Sex	
Male	70% (181)
Female	29% (76)
Race	
White, non-Hispanic	71% (183)
Asian/Pacific Islander	14% (35)
Hispanic	5% (14)
Black/African American	4% (10)
Multiple race or ethnic minority	7% (17)
Geographic region of medical school	
Northeast	34% (87)
Midwest	25% (65)
Southeast	18% (46)
Southwest/Texas	8% (21)
West Coast	5% (13)
Pacific Northwest	2% (4)
Other	9% (23)
Orthopaedic rotations (excluding home program)	
0	2% (4)
1	3% (8)
2	24% (62)
3	56% (146)
4	12% (30)
More than 4	4% (9)
Number of applications submitted	92.4 (27.8)

- 42% response rate
- Corresponds to 22% of overall applicant pool (1,191 US and Canadian medical graduates)

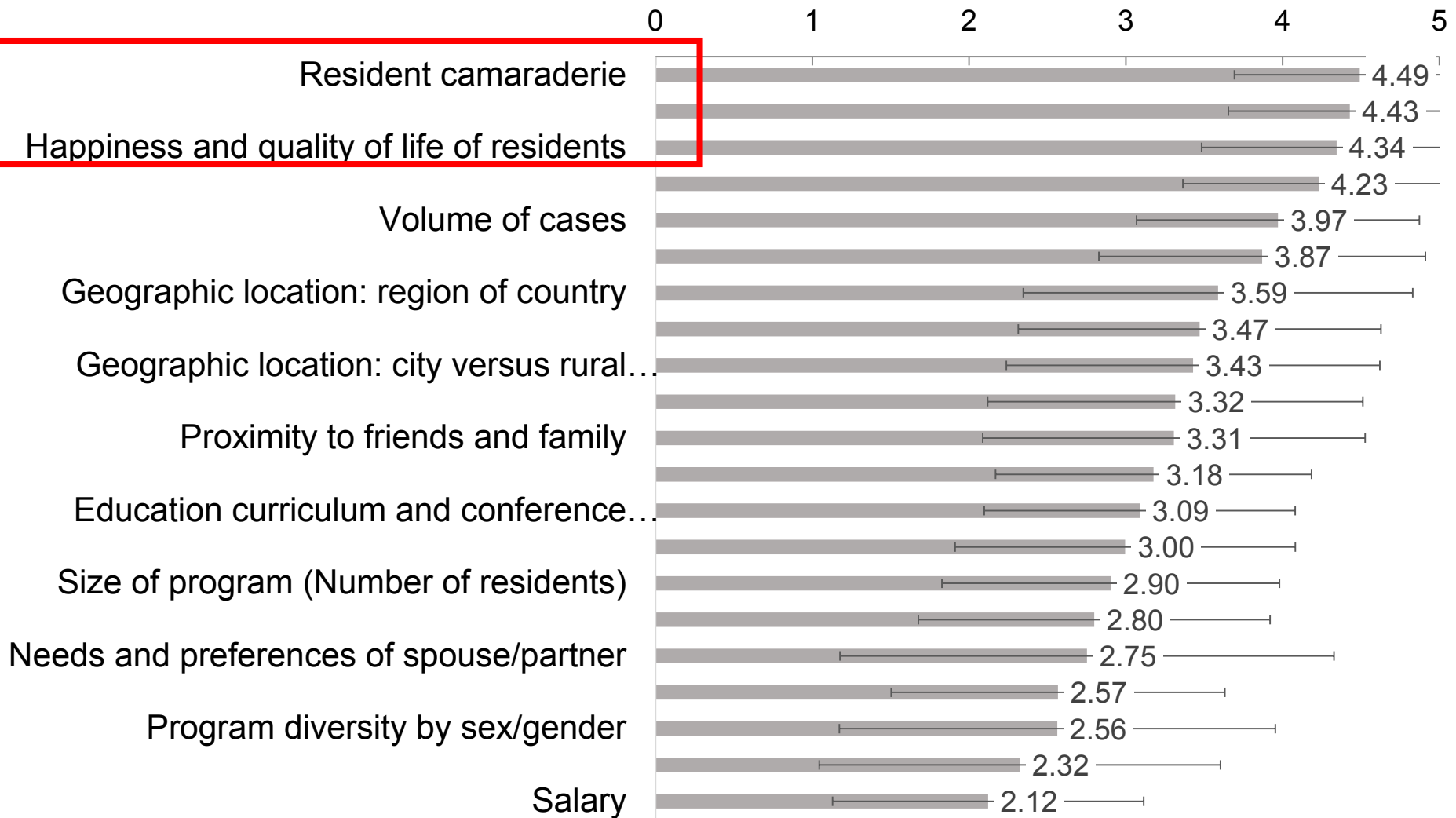
Online resources are used frequently



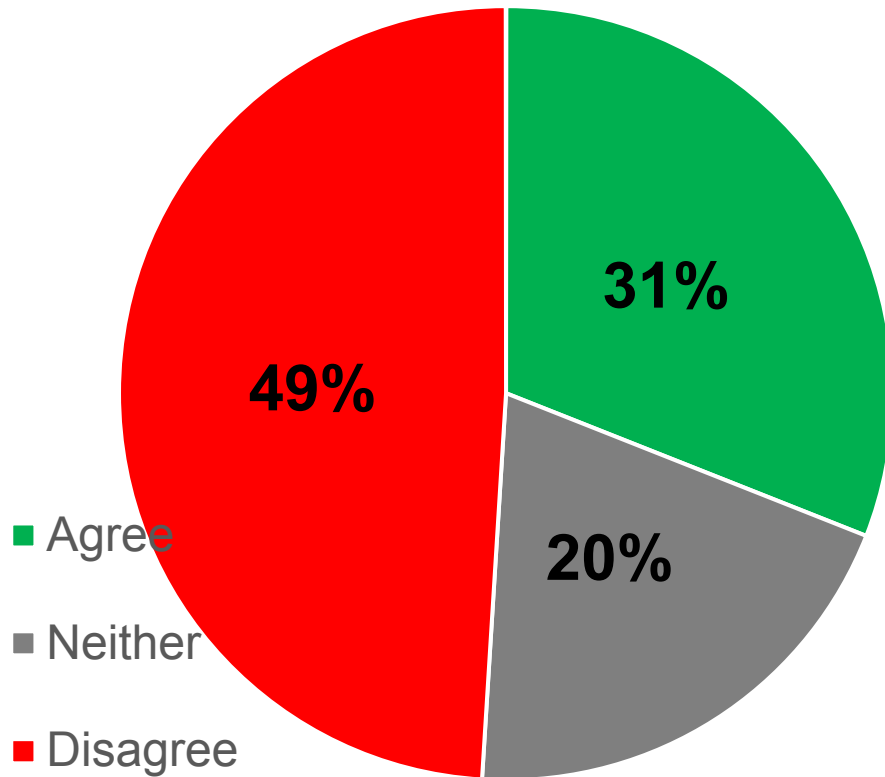
Quality ratings of online resources lag behind direct advice from mentors



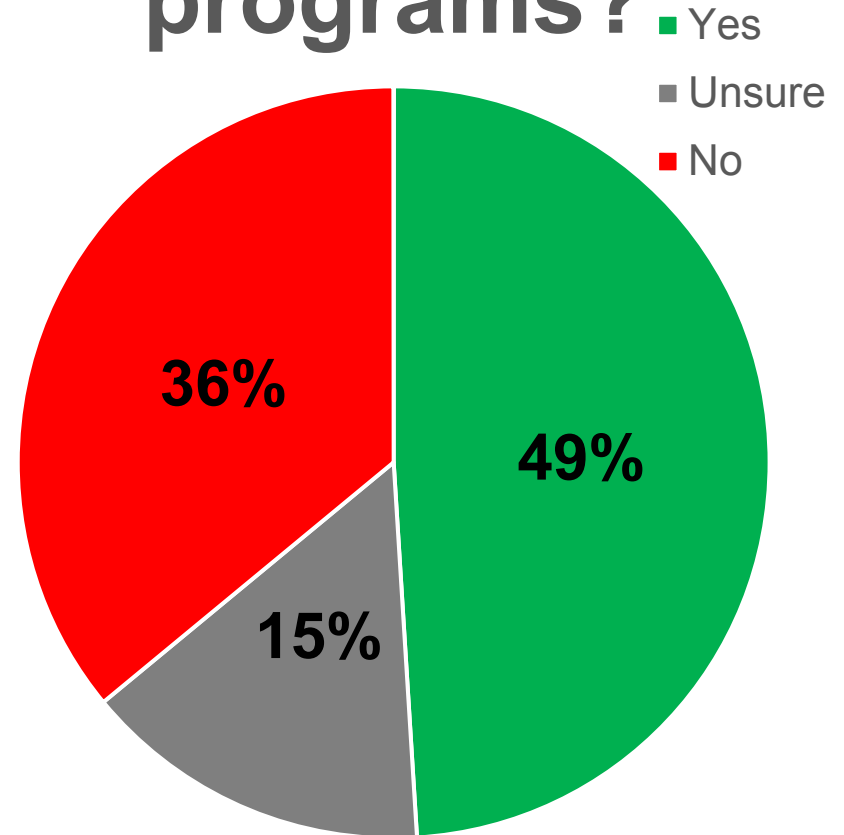
Quality of life and interpersonal factors are important to applicants




Sufficient information?



Fewer programs?





Conveying the type of information applicants are looking for on the appropriate platforms will benefit applicants and programs.

Thank You

