

An Analysis of Orthopaedic Residency Selection Criteria

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Abstract

The lack of literature on residency selection criteria used by orthopaedic program directors has left medical students in the position of relying on rumor and anecdotal information as to what program directors value most highly when sorting through large candidate pools. The purpose of this study was to compare the perspectives on resident selection criteria solicited from orthopaedic program directors and residency applicants. A power analysis was done to determine adequate sample size. A 26-item questionnaire was mailed to 98 residency applicants who interviewed at our program and 156 orthopaedic program directors. The program directors were also asked to elaborate on those factors that were most important in their selection process. A two-tailed Student's t-test was employed to compare the two groups. Significance was set at $p < 0.05$. Statistically significant differences between applicant and program director ratings were found in 12 of the 26 questionnaire items. Applicants ($n = 91$) ranked the following criteria as most important: a letter of recommendation from an orthopaedic surgeon (8.6 on a scale of 1 to 10, 10 being most important), USMLE I score (7.7), and rank in medical school (7.6). The most important criteria for the directors ($n = 109$) were: the applicant performed a rotation at the director's program (7.9), USMLE I score (7.8), and rank in medical school (7.8). This study provides the most comprehensive empirical data to date as to the factors which or-

thopaedic program directors consider most important during the residency selection process. To our knowledge, this is the first study in the orthopaedic literature that compares the program directors' and residency applicants' views on resident selection criteria. Significant differences were found between applicant and program director views on resident selection criteria.

The specialty of orthopaedic surgery annually fills a higher percentage of first year positions through the National Residency Matching Program (NRMP) than any other specialty.^{1,2} Moreover, the number of applicants to orthopaedic residency programs consistently exceeds the available number of positions each year. In 2000, there were 1,116 applicants for 554 postgraduate year-one (PGY-1) orthopaedic positions.¹ An oversupply of outstanding applicants compete for the limited number of first-year orthopaedic resident positions creating an intense competition among medical students. This process places tremendous pressure on medical students who often worry and strategize about residency positions as early as their first year of medical school. The lack of literature on selection criteria used by orthopaedic program directors has required students to rely on rumor and anecdotal information as to what program directors value most highly when sorting through large candidate pools.^{3,4}

Wagoner and Suriano reported the most comprehensive data on resident selection criteria as assessed by program directors across fourteen different medical specialties; however, less than one-third of the sampled orthopaedic directors returned the questionnaire.³ In 1992, Zagumny and Rudolph published a limited abstract comparing medical students' and residency directors' rankings of residency selection criteria across multiple medical specialties at a single institution.⁵ Although Sherry profiled the opinions of Australian orthopaedic registrars-in-training about se-

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lection criteria for orthopaedic training in Australia, a similar study of American orthopaedic residents or orthopaedic residency applicants has not been performed.⁴ Clark evaluated the characteristics of successful applicants to orthopaedic residency programs by reviewing the applications and letters of recommendations of orthopaedic residency candidates; however, in this study, there was no direct input from program directors or candidates.⁶

The purposes of this study were: 1. to compare the perspectives of program directors and residency applicants with respect to orthopaedic resident selection criteria; and 2. to assess the program directors' perceptions of the interview process and their assessment of the importance of the different components of the candidate's application.

Materials and Methods

Identical 26-item questionnaires (Table 1) were mailed to 98 orthopaedic residency applicants who interviewed at our program and to 156 orthopaedic surgery residency program directors across the country. The questionnaire asked respondents to rate the importance of 26 resident selection

variables on a scale of 1 to 10, with 10 being most important. Items for the questionnaire were initially based on previous reports evaluating residency selection criteria used by program directors across multiple medical specialties.³ A review of the orthopaedic literature provided additional specialty-specific selection variables found to be significant to the application process.^{6,7} Twenty orthopaedic residents reviewed the initial questionnaire. Based upon their feedback, several minor changes were made in the questionnaire to remove potential ambiguities.

A second survey instrument, the program director survey (Table 2), was mailed to orthopaedic residency program directors. This survey asked program directors to answer four multiple choice and four true/false questions regarding their opinions on the importance of the personal statement, AOA membership, letter of recommendation, and the interview process. The program directors were also asked to indicate the percentage of current residents in their program who were members of AOA and the percentage of current residents who had completed a medical student rotation at their institution prior to the resident match.

Table 1 Selection Criteria for Orthopaedic Residency: 26-item Questionnaire

Instructions: On a scale of 1-10 please rate the importance you give to each of the following factors in selecting a candidate for residency. Please give an importance rating to each qualification.

Importance Rating Scale

No Importance 1 2 3 4 5 6 7 8 9 10 Utmost Importance

N/A = Not applicable

Qualification

Candidate is a member of AOA
 Personal Statement
 Appearance/Layout of Curriculum Vitae
 USMLE Step I Scores
 Candidate had/has relative affiliated with the institution
 Candidate has a published research experience
 Candidate had a dedicated research experience
 Inability to get into an orthopaedic program on initial attempt
 Letter of recommendation from orthopaedic surgeon
 Letter of recommendation from non-orthopaedic surgeon

Importance Rating

Qualification

Letter of recommendation from a senior resident
 Telephone call made on behalf of the candidate
 Reputation of undergraduate college
 Undergraduate grade point average
 Undergraduate major in engineering
 Reputation of medical school
 Dean's Letter
 Rank in medical school
 Candidate has rotated on a clinical service at your program
 M.D./Ph.D. candidate
 Personal appearance of candidate on day of interview
 Formality/politeness of candidate on day of interview
 Performance on ethical questions on day of interview
 Evaluation by psychiatrist/psychologist on day of interview
 Manual skills testing on day of interview
 Receipt of Thank You letters after completion of interview

Importance Rating

Table 2 The Program Director Survey

Instructions: Please circle one best answer for each of the following questions when applicable.

1. Letters of Recommendation: The most important aspects of a letter of recommendation are that:
 - A. The letter is written by an orthopaedic surgeon
 - B. The letter is written by a well known orthopaedic surgeon
 - C. The letter is overwhelmingly positive
 - D. The letter is written by someone that I know
2. Personal Statement: The most important aspect of a personal statement is:
 - A. To gain insight into the applicant's decision to pursue orthopaedics
 - B. To gain insight into the applicant's writing and communication abilities
 - C. To learn more about the candidate's personal interests and background
 - D. I do not feel that the personal statement is very important or valuable in evaluating a candidate
3. The interview process at our institution can best be categorized as:
 - A. Straightforward process with the goal of getting to know the applicant
 - B. Emphasis on problem solving and/or manual skills
 - C. Emphasis on ethical issues
 - D. Emphasis on psychological testing
4. How important is AOA membership when evaluating candidates:
 - A. Only applicants that are AOA are offered an interview
 - B. AOA is an important part of our evaluation process, more than 75% of the candidates we offer interviews to are AOA
 - C. AOA is an important part of our evaluation process, 50%-75% of the candidates we offer interviews to are AOA
 - D. Less than 50% of candidates offered interviews are AOA members
 - E. Candidates are evaluated regardless of their AOA status
5. List the total number of residents matched to your program over the past three years. _____
 How many residents matched to your program over the past three years were members of AOA? _____
 How many of the residents who have matched into your program over the past three years completed a medical student rotation at your institution prior to matching? _____
6. Your interview committee consists of a psychiatrist/psychologist.
 True False
7. Your interview process includes manual skills testing.
 True False
8. Your interview process includes presentations of clinical scenarios for assessment of the applicants.
 True False
9. Once selected for an interview, all candidates are considered as equal for the final decision made based solely on the candidates performance during the interview.
 True False

A total of 109 program directors and 91 residency applicants completed the questionnaire. Statistical analysis was accomplished with the SPSS system software package (SPSS, Inc., Chicago, IL). A power analysis was performed to ensure an adequate sample size. A two-tailed Student t test was used with the level of significance set at 0.05. A p-value of less than 0.05 was considered significant.

Program directors and applicants were assured that participation in the study would be anonymous. Questionnaires, which did not carry any identifiers that could link the information to the subjects, were returned to a third party to ensure that the investigators were blind as to the identity of individual responses.

Results

Ninety-one of 98 (93%) applicants and 109 of 156 (70%) program directors completed and returned the question-

naires. Not all respondents answered every question; therefore, the number of respondents for each questionnaire item is reported and varies as indicated.

26-item Questionnaire

Statistically significant differences between the program directors' and applicants' ranks were found in 12 of the 26 questionnaire items ($p < 0.05$). The three criteria ranked highest by the program directors were: performing a rotation at the director's institution, the USMLE (United States Medical Licensing Examination) Part I Score, and medical school class rank. The three criteria ranked highest by the candidates were: letter of recommendation by an orthopaedic surgeon, USMLE Part I Score, medical school class rank. The complete ranking of the questionnaire items for program directors and applicants are presented in Table 3. Of the 13 items ranked highest by the program directors,

Table 3 Results of Program Director and Residency Applicant Rankings from the 26-item Questionnaire

Program Director Mean*	Program Director	Residency Selection Criteria	Candidate	
	Program		Rank	Candidate Mean*
7.88 ± 1.71, (n = 109)	1	Rotation at Director's Institution	4	7.51 ± 2.00, (n = 91)
7.78 ± 1.48, (n = 109)	2	USMLE Part I Score	2	7.66 ± 1.81, (n = 91)
7.77 ± 1.34, (n = 108)	3	Rank in Medical School	3	7.55 ± 1.48, (n = 89)
7.55 ± 1.57, (n = 109)	4	Formality/Politeness at interview	5	7.44 ± 2.09, (n = 91)
7.35 ± 1.39, (n = 109)	5	Personal Appearance of Candidate†	9	6.63 ± 2.22, (n = 91)
7.11 ± 2.12, (n = 102)	6	Performance on ethical questions at interview†	10	6.51 ± 2.14, (n = 91)
7.01 ± 1.94, (n = 108)	7	Letter of recommendation by orthopaedic surgeon†	1	8.60 ± 1.59, (n = 91)
6.92 ± 1.90, (n = 109)	8	Candidate is member of AOA	7	6.97 ± 2.12, (n = 88)
6.47 ± 1.71, (n = 109)	9	Medical school reputation	11	6.37 ± 2.15, (n = 91)
6.25 ± 2.10, (n = 109)	10	Dean's Letter†	6	7.07 ± 2.09, (n = 91)
5.84 ± 2.26, (n = 108)	11	Personal Statement	16	5.54 ± 2.34, (n = 91)
5.74 ± 2.56, (n = 107)	12	Failed First Attempted at Orthopaedic Match†	17	5.00 ± 2.74, (n = 87)
5.67 ± 2.46, (n = 106)	13	Telephone call placed on candidate's behalf	14	6.05 ± 2.88, (n = 89)
5.66 ± 1.97, (n = 109)	14	Candidate has published research	13	6.13 ± 1.88, (n = 91)
5.50 ± 2.14, (n = 108)	15	Candidate participated in a dedicated research experience†	8	6.69 ± 1.72, (n = 91)
5.13 ± 1.89, (n = 108)	16	Letter of recommendation from non-orthopaedic surgeon†	12	6.31 ± 2.12, (n = 91)
4.93 ± 2.20, (n = 109)	17	Candidate is M.D./Ph.D.	20	4.55 ± 2.31, (n = 89)
4.83 ± 2.13, (n = 109)	18	Reputation of Undergraduate college	18	4.81 ± 2.29, (n = 91)
4.61 ± 2.38, (n = 108)	19	Undergraduate Grade Point Average	23	4.08 ± 2.30, (n = 91)
4.44 ± 2.16, (n = 107)	20	Appearance of Curriculum Vitae	21	4.14 ± 2.37, (n = 87)
4.30 ± 2.15, (n = 109)	21	Letter of recommendation from senior resident†	15	5.85 ± 2.42, (n = 91)
3.94 ± 2.48, (n = 109)	22	Candidate has a relative affiliated with director's program	25	3.83 ± 2.77, (n = 90)
3.56 ± 2.12, (n = 108)	23	Candidate has an undergraduate engineering major†	26	2.71 ± 1.79, (n = 89)
3.26 ± 2.41, (n = 108)	24	Thank You letter from candidate†	24	3.99 ± 2.46, (n = 90)
2.32 ± 2.22, (n = 66)	25	Performance on manual skills testing during interview†	19	4.63 ± 2.32, (n = 89)
1.78 ± 1.76, (n = 64)	26	Evaluation by psychologist/psychiatrist during interview†	22	4.09 ± 2.35, (n = 89)

* The values are given as the mean and the standard deviation; † = statistically significant $p < 0.05$; n = number responding.

five were ranked significantly different by the applicants. Six of the top 13 ranked items by the applicants were ranked significantly different by the program directors.

Program Director Survey

All 109 of the program directors responding to the 26-item questionnaire also returned the separate program director survey. Results from the responses to each of the four multiple-choice questions in the program director survey are calculated and reported in Table 4.

Responses to the four true or false questions in the program director survey, addressing the interview process at each director's program, are tabulated and summarized in Table 5. A psychologist or psychiatrist was used in 2% of the responding programs' interview process. Manual skill testing was used during the interview process in 5% of responding programs. Presentations of clinical scenarios to evaluate the applicants were used during the interview process in 18% of responding programs. Once selected for an interview, only 22% of program directors reported that the candidates were considered equal and judged solely on their performance during the interview.

Program directors were asked to report the number of residents who matched into their program over the last three

years and list the number of these residents who were members of the AOA. Averaging the data from the 85 responding programs, the percentage of residents matched into programs over the past three years that were members of AOA was 54%. Sixty-five percent of the responding programs reported at least 50% AOA membership among residents who matched over the previous three years (Table 6).

Program directors were asked to provide the number of residents matching in their program over the previous three years who performed a medical school elective in orthopaedic surgery at the director's program. The average percentage of residents who performed medical school orthopaedic electives at the program they subsequently matched in was 56%. Sixty-six percent of the responding programs reported that 50% or more of their matching residents over the previous three years had performed medical school orthopaedic rotations at the program prior to matching for residency (Table 6).

Discussion

The residency selection process is a taxing but critical activity for residency directors.^{8,9} Extraordinary amounts of time and money are expended in efforts to select candidates that will not only survive the program, but will

Table 4 Results of the Multiple Choice Questions from the Program Director Survey

Question	Program Director Response
Question 1	n = 105
The most important aspects of a letter of recommendation are that:	
The letter is written by an Orthopaedic Surgeon	2%
The letter is written by a well known Orthopaedic Surgeon	10%
The letter is overwhelmingly positive	34%
The letter is written by someone that I know	54%
Question 2	n = 105
The most important aspect of a personal statement is:	
To gain insight into the applicant's decision to pursue orthopaedics	6%
To gain insight into the applicant's ability to write and communicate effectively	32%
To learn more about the candidate's personal interests and background	43%
I do not feel the personal statement is very important in candidate evaluation	19%
Question 3	n = 107
The interview process at our institution can best be categorized as:	
Emphasis on getting to know the applicant	99%
Emphasis on problem solving and/or manual skills	0%
Emphasis on ethical issues	1%
Emphasis on psychological testing	0%
Question 4	n = 107
How important is AOA membership when evaluating candidates:	
Only applicants that are AOA are offered an interview	1%
More than 75% of the candidates offered interviews are AOA members	26%
50% to 75% of the candidates offered interviews are AOA	29%
Less than 50% of candidates offered interviews are AOA	14%
Candidates are evaluated regardless of their AOA status	30%

n = number of program directors responding

also represent the program and profession in a positive manner.^{6,8,10} Candidates are equally burdened throughout the selection process, which is often stressful, expensive, and disruptive to their academic training.^{3,8,9} In efforts to improve the residency selection process, factors involved in residency recruitment have been extensively studied for over thirty years.^{1,3,5,8-13}

Wagoner and Suriano have established that as a specialty becomes more competitive, its residency programs will rely more heavily on academic credentials when sorting through applicant pools.^{1,3,8,12} Orthopaedics, which ranks among the most competitive of surgical subspecialties, has been shown to put a premium value on objective criteria such as USMLE scores, class rank, and AOA selection.^{1,3,6} Our study supports these findings as USMLE scores, medical school class rank, and

AOA standing were all ranked within the top ten most important selection criteria by program directors and candidates alike (Table 3).

Clark and colleagues reported that AOA membership was one of the strongest predictors of a successful application to an orthopaedic residency; however, less than 20% of the successful candidates in the Clark study were AOA members.⁶ Wagoner and Suriano concluded that membership in AOA is likely to carry significant weight for orthopaedic directors in the initial narrowing of large candidate pools.³ Our study finds that the majority of residents that matched in orthopaedic programs over the last three years were also members of AOA (Table 6). Furthermore, 55 of the 85 (65%) responding programs in our study reported that at least 50% of their matching residents over the past three years were members of AOA

Table 5 Results of the True/False Questions from the Program Director Survey

		Percentage of "true" responses
Psychologist/Psychiatrist involved in the interview process	n = 107	2%
Manual Skills included in the interview process	n = 107	5%
Clinical scenarios used in the interview process	n = 106	18%
Candidates considered equal once selected for an interview	n = 106	22%

n = number of program directors responding

Table 6 Results Regarding AOA Membership and Medical Student Rotations Calculated from the Program Director Survey

		Number Responding
1. Matching orthopaedic residents over the past three years that were members of the AOA	54%	(n = 85)
2. Programs with at least 50% membership in AOA among residents matching over the past three years	65%	(n = 85)
3. Orthopaedic residents over the past three years who performed medical school orthopaedic rotations at the institutions they eventually matched to	56%	(n = 98)
4. Programs with at least 50% of matched residents over the past three years performing medical school rotations at the program prior to the match	66%	(n = 98)

(Table 6). AOA membership continues to be highly valued by orthopaedic residency directors and applicants, as evident by its top ten ranking in the selection criteria evaluation of our study. However, AOA membership is certainly not a requirement for obtaining an orthopaedic residency position, as 30% of the program directors in our study evaluated candidates regardless of their AOA status (Table 4).

Performing a medical school rotation in orthopaedic surgery at the program director's institution was ranked the most important selection criteria by program directors in our study. Wagoner and Suriano reported similar results in their study of program directors' ranking of academic criteria in resident selection, which included the polling of 46 orthopaedic program directors.³ They found that the most important academic criteria in the selection of residents among orthopaedic program directors were the grades the candidates received in their orthopaedic senior elective.³ Crane and Ferraro stated that performance in an elective specific to the residency a student applies to was one of the most important criteria for residency selection.¹⁴ In 1986, Wagoner and associates found that 86% of program directors across multiple medical and surgical specialties gave preference to students who had done well in an elective in the program director's specialty and hospital.¹² Wagoner's findings fueled concerns over the impact the residency application process had on students' education, as students indicated that they spent a considerable portion of their senior year taking electives in the specialty and hospital in which they hoped to match for their post-graduate training.^{12,15} Concerns continue to exist regarding the consequences of students using their senior year electives to "audition" at desirable residency programs at the expense of a well rounded medical education.^{3,9,15} Our study, however, further emphasizes the value that orthopaedic program directors place on a rotation in the director's specialty and hospital. In addition to ranking the rotation at the director's institution the highest of all

selection criteria, the responding program directors reported that the majority of residents matching to their orthopaedic program over the previous three years had performed a medical school rotation in orthopaedics at their program (Table 6).

Applicants' personal and professional values are often referred to in educational terminology as their affective domain.^{6,16} The affective domain of an applicant may be best evaluated by personal interaction and direct observation.^{6,16,17} Our study suggests that program directors are currently giving considerable weight to factors that constitute an applicant's affective domain based on the high ranking of the selection criteria that allows for personal interaction with and direct observation of the applicant. Specifically, six selection criteria in the questionnaire allowed for evaluation of a candidate in person: rotation at the director's institution, formality/politeness at the interview, personal appearance of the candidate, performance on ethical questions at the interview, performance on manual skills testing during the interview, and evaluation by a psychologist/psychiatrist during the interview. The rankings on the manual skills testing and psychologist/psychiatrist evaluations are difficult to interpret as only a limited number of orthopaedic programs, 5% and 2% respectively, use these methods during the interview process (Table 5). The remaining four criteria in our study that allow for evaluation of a candidate in person were all ranked within the top six most important selection criteria by the program directors and within the top ten by the candidates (Table 3). Most notably, the directors ranked all four of these selection criteria higher than the candidates ranked them; and a significant difference was found between rankings of the personal appearance of the candidate and performance on ethical questions at the interview, both criteria being ranked higher by program directors (Table 3). Furthermore, almost all of the program directors in our study indicated that the interview process at their institution was geared toward getting to know the applicant

and a large percentage of directors felt that the most important aspect of the personal statement was to learn more about the candidate's personal interests and background (Table 4).

The considerable importance that the program directors placed on factors that constitute a candidate's affective domain is supported in a review of the pertinent literature. Zagumny and Rudolph compared medical students' and residency directors' ratings of resident selection criteria in a limited study across multiple medical specialties at a single institution.⁵ Zagumny concluded that program directors placed more importance on the personal characteristics of candidates, such as interpersonal skills, stability, maturity, and attitude, compared to the medical students. Wagoner and Suriano urged medical students to be as concerned with their personal and professional development as they are with their academic achievements given the high consideration that program directors give to factors that comprise the affective domain of the candidate.³ In 1989, Clark and coworkers reported that deficiencies in the affective domain are the most common reasons leading to discipline or dismissal of residents and may be the most important indicator of the individual's ability to function professionally as an orthopaedic surgeon.^{6,16} Clark and coworkers questioned the relative lack of attention that character and personality traits were given during the application process at the time of their report.⁶ Dale and colleagues found that a significant number of orthopaedic residency applicants falsified research citations on their applications.¹⁸ These authors emphasized the seriousness of applicant misrepresentation and potential consequences; furthermore, they urged orthopaedic residency programs to address applicant misrepresentation in a manner that leaves no doubt as to a program's standard of integrity.¹⁸

Based on the relationship between the affective domain and resident performance, we expect that the importance of the affective domain in the resident selection process will increase significantly in the future. The ability of residency selection committees to predict future resident performance has long been sought with little documented success.^{6,7,19} Variables that constitute an applicant's affective domain, such as integrity, reliability, diligence, commitment, respect, and interpersonal skills, are now being heralded as important predictors of resident performance.^{7,20,21} Fueled by the encouraging results of published studies, further testing is warranted on the ability to predict resident performance from variables that constitute a candidate's affective domain.^{7,21}

Results from our study suggest that the candidates place significantly more value on the importance of letters of recommendation compared to program directors. Candidates in our study ranked all three of the questionnaire criteria regarding letters of recommendation sig-

nificantly higher than did the program directors. Specifically, the highest ranked criterion by the candidates in our study was a letter of recommendation from an orthopaedic surgeon (Table 3). The candidates also ranked the importance of the dean's letter significantly higher than did the directors in our study. Although the program directors' rankings of the reference letter criteria were lower than the candidates', the program directors in our study still rated the dean's letter and a letter of recommendation from an orthopaedic surgeon within their top ten most important selection criteria (Table 3). Finally, a majority of the directors in our study indicated that knowing the author of a reference letter was the most important aspect of a letter of recommendation (Table 4).

Reports comparing the candidates' and program directors' opinions on reference letters are scarce and conflicting. Zagumny and Randolph found that medical students ranked the importance of recommendation letters significantly higher than program directors.⁵ Ross and Leichner, in a comparative study between Canadian psychiatry residents and program directors, reported that program directors tended to value reference letters higher than the residents, but no significant differences between the groups were found.¹³ More striking than prior comparisons between candidates and directors is the large number of reports that criticize the use of letters of recommendation in the resident selection process.^{6,13} Clark and associates indicated that reference letters are virtually all laudatory, seldom contain useful information, and have not been found to correlate with residency performance.^{6,19} Dirschl and Adams measured the inter-observer reliability of faculty evaluation of recommendation letters for applicants to an orthopaedic training program and found significant variability between the faculty members' interpretations of the letters.²² Letters written by deans have been described as vague, inconsistent, and unreliable predictors of resident performance.^{12,19,23} Regardless of critical reports, letters of recommendation are still considered by many authors to be valuable in the screening of applicants.^{6,10,13,24} Similar to the findings in our study, letters of recommendation are reported to be most significant when written by faculty who are within the specialty applied to or known to the program directory personally.^{6,12}

Results from our study also suggest that program directors place significantly more weight on a failed first attempt at the orthopaedic match than do the candidates (Table 3). This finding is difficult to interpret, as the reasons for an unsuccessful match in orthopaedic surgery can be diverse. Although the failed first attempt criterion was ranked significantly higher by the program directors compared to the candidates, the directors' complete ranking of the 26 selection criteria had the failed first attempt criterion at the relatively neutral twelfth

position (Table 3). The neutral ranking of this criterion may reflect the great variability among candidates who fail a first attempt at the orthopaedic match. The results from our study draw similar conclusions to the few prior reports addressing this factor. For example, Clark and coworkers found that previous commencement of a residency in another specialty was negatively correlated with a subsequent successful application to an orthopaedic residency. However, residents who were reapplying to the orthopaedic match after failing to obtain an orthopaedic position during prior attempts only made up a percentage of the previous residency commencement group studied by Clark. Clark and coworkers reported that the diversity of the applicants included in their previous residency commencement group precluded any further significant analysis.⁶

We found a significant difference between program directors and applicants with regard to the importance of an applicant having a dedicated research experience. The applicants ranked both of the research criteria (dedicated research experience and a research publication) higher than did the directors. A statistically significant difference was found between the applicants and directors regarding the dedicated research criterion (Table 3). These results are consistent with prior findings. In 1999, Wagoner and Suriano found that the category of published medical school research was ranked last of 12 criteria in their survey of orthopaedic program directors.³ Similarly, Clark and coworkers found a lack of significant increase in success rates for applicants with research experience.⁶ They reported that the majority of orthopaedic residency candidates have participated in some formal research prior to their application; therefore, the research experience itself is not a major distinguishing value. Furthermore, Clark did not find a significant increase in the success rate of orthopaedic residency candidates who have published research prior to the match.⁶

Our study is the only comparative study in the orthopaedic literature examining the perspectives of program directors and residency applicants on orthopaedic resident selection criteria. The strength of our study revolves around the relatively high response rate of the orthopaedic program directors nationwide. Prior to our study of 109 orthopaedic program directors, Wagoner and Suriano reported orthopaedic program directors' views on resident selection criteria using responses from 46 program directors. A limitation to our study concerns the potential for selection bias. All candidates used in our study had already been invited for an interview at our institution. As the candidates used in our study were already selected from the applicant pool, the views of our candidate group may not accurately reflect the views of the entire pool of applicants. Although all efforts were made to assure anonymity to responding candidates, it is possible that some candidates felt pressure to rank

categories under the suspicion that their application to our program would be judged by their questionnaire responses. A second limitation to our study is that only program directors were solicited for participation. It is possible that the views of the directors do not accurately reflect those of all the faculty members that comprise a program's admissions committee.

This study provides the most comprehensive empirical data concerning what orthopaedic program directors value during the residency selection process. Results from this study may serve as a means for residency programs to evaluate their own selection process. Medical students applying for an orthopaedic residency position may use findings from this study to maximize their chances of a successful residency application.

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