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School of Dentistry
Virginia Commonwealth University

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Dr. Steven J. Lindauer, Thesis Director / Program Director Department of Orthodontics

Dr. Al M. Best, Committee Member, School of Dentistry

Dr. Bhavna Shroff, Committee Member, School of Dentistry

Dr. Steven J. Lindauer, Chairman Department of Orthodontics, School of Dentistry

Dr. Ronald Hunt, Dean – School of Dentistry

Dr. F. Douglas Boudinot, Dean of the School of Graduate Studies

June 15, 2004

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FACTORS INFLUENCING APPLICANT RANKING OF ORTHODONTIC PROGRAMS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

by

MICHAEL D. PAYNE
B.S.M.E., Brigham Young University, 1997
D.M.D., Oregon Health Sciences University, 2002

Director: STEVEN J. LINDAUER, D.M.D., M.D.SC.
PROFESSOR AND CHAIRMAN, DEPARTMENT OF ORTHODONTICS

Virginia Commonwealth University
Richmond, Virginia
June 2004

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Abstract

FACTORS INFLUENCING APPLICANT RANKING OF ORTHODONTIC PROGRAMS

By Michael D. Payne, D.M.D.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

Virginia Commonwealth University, 2004

Major Director: Steven J. Lindauer, D.M.D., M.D.Sc.
Chairman and Professor, Department of Orthodontics

Orthodontic programs spend considerable amounts of time and energy to attract, recruit, and interview the best and brightest applicants. Applicants and programs submit ranked preferences, and resident positions are filled by a computerized matching system (Match). The specific aims of this study were to determine the relative importance of certain factors in applicants' Match ranking of orthodontic programs and to determine differences between orthodontic Program Directors perceptions and actual factors cited by applicants influencing their ranking of orthodontic programs.

Surveys were mailed to 55 orthodontic Program Directors and 478 applicants participating in the 2002 orthodontic Match. Forty-nine Program Director (89%) and

224 applicant (47%) surveys were returned. Rankings and importance of factors cited by applicants in their decision-making process and perceptions of those factors cited by Program Directors were compared.

Applicants' top three factors were: "satisfied current residents," "multiple techniques taught," and "good quality of clinical facility." Program Directors' perceived top three factors were: "satisfied current residents," "good program reputation," and "good impression of current residents at interview." Comparing Program Directors perceptions versus applicants' factors overall, the two groups were statistically different ($P < .0001$). Factors that stood out for their differences included: "GRE required or emphasized" ($P < .0002$), "multiple techniques taught" ($P < .0007$), and "good location" ($P < .0008$).

Despite these differences, there was generally a high level of overall agreement between Program Directors perceptions and factors actually influencing applicants' ranking of orthodontic programs.

Introduction

Each year orthodontic programs spend considerable amounts of time and energy to attract, recruit, and interview the best and brightest orthodontic applicants. Orthodontic departments put considerable effort into sending out, receiving and reviewing applications. Even more time is spent selecting interviewees, interviewing, and making final decisions on which residents to accept. Despite large numbers of qualified applicants, programs continue to strive to attract and select the top candidates.

From the applicant's perspective, the orthodontic application process is a daunting task. Each program's application requires different forms, letters of recommendation, transcripts, and organization. For example, some programs require that the complete application be bundled together while others require that all transcripts and letters be sent individually from schools and references. Applying to as many as 25 schools is extremely challenging and requires adept organizational skills.

A third-party company (PASS, Postdoctoral Application Support Service) has attempted to simplify the process by centralizing the handling of applications. However, not all programs participate in this service. Many programs still require their traditional individualized forms and information in addition to the PASS application. This ends up making the PASS merely another layer of complicated forms to fill out and an additional fee to pay. From the perspective of the program, PASS can become a

source of redundant information that must be sorted and extra applications that must be reviewed.

At best, the orthodontic application process itself can be mildly confusing. In addition, orthodontic programs offer widely varying educational characteristics. Contrasting characteristics include number of residents, which ranges from one to ten or more. Length of program generally varies from 24 to 36 months. Some programs charge tuition while others offer a stipend. Some offer a certificate only, while others offer a Master's degree. Programs emphasize details such as the techniques they teach and the appliances they use while, in some cases, applicants at this stage understand little more than the fact that they want to be orthodontists.

In recent years, steps have been taken to make the entire admission process more organized. A computer-matched selection system (Match) has made order of the chaos that once characterized the acceptance process. Previously, phone calls or letters of acceptance and rejection were the matching process. Each program set its own day for making their selections. In a rush to "lock in" the best candidates, programs could leapfrog each other's acceptance dates. This frequently left the applicant to choose between guaranteed acceptance into a less desirable program, or gambling for a better one. A mutually agreed-upon common notification date reduced some of these practices, but programs often circumvented the system.

In an attempt to level the playing field for programs and applicants, the acceptance process has been modeled and computerized by the Match. Programs that enroll in the Match agree to standardized rules and a set acceptance day. With

interviews completed, applicants and programs each generate a prioritized list from their first choice to their last. According to the National Matching Services Website:

> "The process starts with an attempt to place an applicant into the program that is most preferred on the applicant's list. If the applicant cannot be matched to this first choice program, an attempt is then made to place the applicant into the second choice program, and so on, until the applicant obtains a tentative match, or all the applicant's choices have been exhausted.
>
> "An applicant can be tentatively matched to a program in this process if the program also ranks the applicant on its Rank Order List, and either:
>
> - the program has an unfilled position. In this case there is room in the program to make a tentative match between the applicant and program.
> - the program does not have an unfilled position, but the applicant is more preferred by the program to another applicant who is currently tentatively matched to the program. In this case the applicant who is the least preferred current match in the program is removed from the program to make room for a tentative match with the more preferred applicant.
>
> "Matches are referred to as tentative because an applicant who is matched to a program at one point in this process may later be removed from the program, to make room for an applicant more preferred by the program, as described in the second case above. When an applicant is removed from a previous tentative match, an attempt is then made to re-match this applicant,

starting from the top of this applicant's list. This process is carried out for all applicants, until each applicant has either been tentatively matched to the most preferred choice possible, or all choices submitted by the applicant have been exhausted. When all applicants have been considered, the matching process is complete and tentative matches become final."[1]

All this is done with the execution of a single computer program. Thus, the Match effectively eliminates the time and effort previously taken making phone calls and sending letters of acceptance and rejection. Some violations of Match rules, including verbal and written agreements before Match day, still persist.[2,3] For the most part, however, the system is a success.

With 50 out of 55 US orthodontic residencies participating in the Match,[1] much of the guesswork of pairing a program with an applicant has been removed. Programs and applicants with organized approaches to creating rank order lists based on clearly defined criteria are at an advantage.[4]

Incorporating more of the features most desired by applicants can make a program more attractive to applicants. Understanding what applicants are looking for can make a program's efforts to communicate its strengths more effective. Some factors may be important to most applicants, such as having up to date facilities and equipment, for example. These could therefore be identified as targets for program improvement. However, individual preferences for other factors may vary. An example of this may be program length, where some applicants may prefer a longer and others prefer a shorter program. While many factors about a program are not under the

direct control of the Program Directors (location, for instance), others may be more amenable to change.

Although little information is currently available regarding the factors considered specifically by orthodontic residents during the selection process, many studies have investigated applicants' preferences for other dental, and especially medical residencies. These studies have shown various and sometimes conflicting results.

Keith et al[5] reported a survey of orthodontic residents in 1994. They surveyed 168 orthodontic residents at a national meeting. They questioned the residents on a wide variety of topics pertaining to their residencies. An interesting facet of this study was their elicitation of reasons for choosing orthodontics as a career. The top three reasons for choosing orthodontics were job satisfaction, lifestyle, and financial security. Another small section was dedicated to factors that influenced their ranking of orthodontic programs. Residents were asked to cite the reason they ranked a particular program first. Reasons, from most to least frequently cited, were: reputation, location, clinical content, cost, head of the department, research, and teaching. Program reputation was also at or near the top of the list of factors in multiple studies in all fields of medicine and dentistry.[6-10] Research opportunities provided during an orthodontic program was a relatively unimportant factor in Keith et al's survey, another common theme in many studies of other professional residency programs.[9,11-15]

Two studies published in 2003 dealt with oral and maxillofacial surgery residencies. The first was by Marciani et al.[8] They surveyed 370 applicants on a wide

range of topics related to surgery programs with a 38% response rate. The study investigated both why candidates applied to a particular program, and why they ranked programs in the order they did. Geographic location and national reputation were the top two factors that led people to apply to programs. When it came time to actually rank programs, reputation again was highly important, while personalities of the current residents and attending staff became equally important. Interestingly, geographic location became secondary, along with resident's salary, the presence of a medical school, and the ability to "moonlight." This study was representative of many other similar medical and dental studies. A program's location is often cited by applicants as a reason for a high ranking,[9-12,16] although at least two other studies showed that location was unimportant.[6,14]

A second study surveying oral and maxillofacial residents, by Laskin et al,[13] solicited 675 surgery residents and had a 30.8% response rate. The two most important factors in ranking residency programs were good relationships among current residents and good relationships between residents and attending doctors. These interpersonal factors scored higher than academic content and scope of clinical training. Of lesser importance were association with a dental school and amount of stipend. Near last on the list was the opportunity to perform research.

While there is considerable disparity among studies of applicants in varying fields of medicine and dentistry, certain factors in addition to those mentioned above were routinely ranked as being highly important. Satisfaction of current residents with the program was almost universally near the top of the list.[7,10,11,14,16-18] In multiple

studies, salary was found to be an unimportant factor.[7,9,13,14,16,17] Other studies have shown the great importance of spousal or partner input.[19,20]

Each study in the literature reports results that vary slightly by specialty and methodology. A number of studies found statistically significant differences in response dependent on race, age, and gender.[3,9,11] Some studies felt it was important to poll applicants before the Match results were released so as to not bias the study with hindsight.[2,21] Sledge et al[12] broke their results down to describe both the desirability and importance of various factors. They felt that a single survey might be misleading, as a factor considered desirable might be relatively less important compared to other factors. For example, a stipend might be desirable but, when compared to a preferred geographic location, it may be considerably less important. Conversely, a factor like high tuition might be very undesirable and an important factor in the decision-making process. However, in their study they found that factors that ranked as highly desirable were usually also considered important. DeLisa et al[18] compared survey results from applicants, Program Directors, and faculty members. They found no significant difference between the three groups.

The current study incorporated many of the most interesting and useful methods gleaned from the previously cited studies. The specific aims of this study were twofold:

- To determine the relative importance of certain factors in applicants' ranking of orthodontic programs
- To determine differences between orthodontic Program Directors' perceptions and actual factors used by applicants to rank orthodontic programs.

The hypothesis was that there were significant differences between Program Directors' perceptions and actual factors cited by applicants, influencing their ranking of orthodontic programs.

Methods

After receiving institutional review board (IRB) approval, a survey was developed by selecting factors and formats from previous studies. Analogous surveys were developed for applicants and Program Directors. The surveys consisted of three sections. Demographic information was requested of each recipient. Applicants were asked about the influences on their ranking of programs. Program Directors were asked about their perceptions regarding factors applicants used in making their program rankings. Each subject selected from a list the top five most important factors, in order, used to rank programs. Lastly, each subject rated the desirability of each factor in the list from 1 (very desirable) to 5 (very undesirable).

The survey was approved by the American Association of Orthodontists and National Matching Services to obtain permission to use the names and addresses of orthodontic Match applicants. In late November 2002, 478 surveys were mailed out to orthodontics applicants living in the United States. Applicants from foreign countries were excluded from the study. The mailing was timed such that applicants would have a one-week window to respond to the survey prior to the announcement of the Match results.

The return envelopes were coded so that nonrespondents could be identified for a second mailing. Immediately upon receipt of a returned survey the coded envelope and the survey were separated from each other to maintain anonymity. A follow-up

mailing was sent to 327 nonrespondents in early 2003. Since the Match results became available on December 9, 2002, all respondents from the second mailing completed their surveys after the results were known. The pre-Match and post-Match surveys were kept separate to analyze the data for significant differences between those two groups.

Fifty-five surveys were mailed to directors of orthodontics programs in the United States. Again, return envelopes were coded to identify nonrespondents and these Program Directors received a subsequent second mailing.

For data entry, the surveys were kept in three distinct groups: applicants who responded to the pre-Match mailing, applicants who returned their surveys post-Match, and Program Directors. The data from each survey were entered separately into two Excel™ (Microsoft™, 1997) worksheets on different occasions to prevent data entry errors. The same person performed all data entry. A logical comparison of the two data entry sheets was performed using Excel. Any discrepancies in the data entry were identified and corrected using the original, numbered surveys.

The applicant versus Program Director differences and the importance of factors were compared by mixed-model repeated-measures ANOVA followed by Tukey's HSD multiple comparison post-hoc testing. Analyses of the data were performed using JMP software (Version 5.0.1, SAS Institute Inc., Cary, NC USA). Significance was determined at alpha = 0.05. Due to the large number of factors in the survey, it was probable that some factors would be statistically different between applicants and

Program Directors merely by chance. A Bonferroni correction was applied as a more stringent test to show which factors had clear differences.

Results

A total of 478 surveys were mailed to applicants and 224 were returned for a response rate of 46.9%. Two of the surveys were returned blank. 49 out of 55 or 89.1% of surveys were returned by Program Directors.

Applicants

The demographic characteristics of the applicants are shown in Table I. Due to the timing of sending out the questionnaires, 158 of the applicants returned the survey before the Match occurred and 66 returned the survey afterward. These two groups of applicants were compared on all of the characteristics shown in Table I and the factors listed in Table II and were found to be not different ($P > .30$) except for the number of programs ranked. Those applicants returning the survey pre-Match ranked more programs (mean = 5.0) than those returning the survey post-Match (mean = 3.7, $P = .02$). Thus, the data from the two groups were combined for all further analysis.

Table I
Description of the Applicants (n = 222)

Characteristic		n
Female		76
Male		146
Single		117
Married		105
Dependents:	0	164
	1	23
	2+	34

	Mean	SD	range
Age	28.5	3.9	23 - 47
Dental grad. Year	2000.9	3.50	1982 - 2003
Number of:			
Applications	12.80	8.60	1 - 41
Ranked	4.65	3.95	0 - 23

Debt	n
$<50K	68
$50K-100K	50
$100K-150K	64
$150K-200K	16
$>200K	15

In part 2 of the survey, applicants were asked to identify the top 5 most important factors (of 31). In part 3 of the survey, applicants were asked to rate each of the 31 different factors from 1 (very desirable) to 5 (very undesirable). The results of the applicant survey, ordered from most to least desirable, are given in Table II. Section 2, the top 5 section, was filled out incorrectly or left blank on a large portion of the responses. Thus, this data was not analyzed and is presented hereafter merely as reference.

Table II
Average Applicant Response

				Percentage					# top 5 rank					
Factors	**n**	**Mean***	**SD**	**VD**	**D**	**N**	**U**	**VU**	**1**	**2**	**3**	**4**	**5**	**total**
Satisfied current residents	215	1.39	0.57	65.6	30.2	4.2	0.0	0.0	16	13	9	9	5	52
Multiple technique(s) taught (straightwire, etc.)	215	1.52	0.64	56.3	35.8	7.9	0.0	0.0	4	10	7	12	10	43
Good quality of clinical facility	210	1.52	0.56	51.0	46.7	1.9	0.5	0.0	2	5	5	4	10	26
Good program reputation	217	1.54	0.62	53.0	40.1	6.9	0.0	0.0	26	13	7	6	5	57
Good impression of current residents at interview	214	1.55	0.65	53.7	38.3	7.5	0.5	0.0	4	8	5	8	3	28
Good impression of faculty at interview	213	1.62	0.62	45.5	47.4	7.0	0.0	0.0	7	3	7	12	2	31
Heavy emphasis on clinic time	215	1.62	0.58	43.3	51.6	5.1	0.0	0.0	8	5	8	11	10	42
Low cost (tuition and expenses)	213	1.63	0.74	50.2	38.0	10.3	0.9	0.5						
Use of new technology in the clinic	215	1.65	0.62	42.8	49.3	7.9	0.0	0.0	2	5	5	7	7	26
Good location (hometown, inexpensive, fun)	213	1.65	0.71	47.9	39.4	12.2	0.5	0.0	21	7	4	9	10	51
High # of cases treated	213	1.72	0.69	40.8	47.4	10.8	0.9	0.0	4	7	10	5	5	31
Good reputation of Full-Time faculty	213	1.73	0.64	37.1	52.6	10.3	0.0	0.0						
High stipend or salary	213	1.80	0.75	39.4	41.3	18.8	0.5	0.0	4	9	10	5	7	35
High participation of part-time faculty	212	1.94	0.70	25.9	55.7	17.0	1.4	0.0						
Program length < 30 months	211	1.95	1.01	44.5	23.7	24.6	6.2	0.9	4	7	14	7	9	41
Extensive interdisciplinary care training	214	2.05	0.71	22.0	52.3	24.8	0.9	0.0						
High number of assistants/auxiliary staff	212	2.07	0.67	18.9	55.7	25.0	0.5	0.0						
High number of Full-Time faculty	213	2.09	0.68	18.3	55.4	25.4	0.9	0.0						
Lab fabricates appliances (vs. resident)	210	2.17	0.86	24.8	38.1	33.3	2.9	1.0					8	8
Positive spouse, family or peer input	213	2.18	0.88	24.4	38.5	33.3	2.3	1.4						
Dental school based program	212	2.30	0.80	16.0	42.0	38.7	2.4	0.9						
Masters offered/required	213	2.40	0.84	15.0	36.2	43.7	3.8	1.4	1	2	3	2	3	11
Class size >4	211	2.82	0.71	6.6	15.2	67.8	10.0	0.5						
Class size <= 4	210	2.84	0.76	5.7	18.6	64.3	9.0	2.4						
Heavy emphasis on class time	212	2.89	0.85	3.8	28.3	45.8	19.8	2.4						
Certificate only offered (no degree)	211	3.21	0.91	4.7	10.4	52.1	24.6	8.1						
Non-dental school based (i.e. hospital based)	212	3.26	0.77	1.9	6.6	62.7	21.2	7.5						
Heavy emphasis on research time	211	3.31	1.00	3.8	15.6	38.4	29.9	12.3						
Program length >= 30 months	210	3.39	1.04	6.2	9.5	37.1	33.3	13.8						
Lots of work required after regular hours	212	3.81	0.90	1.4	5.2	27.4	42.9	23.1						
GRE required or emphasized	210	3.82	1.01	3.3	3.3	31.4	31.9	30.0						

abbreviations: VD = very desirable, D = desirable, N = Neutral, U = undesirable, and VU = very undesirable.
* scale: 1 = VD, 2 = D, 3 = N, 4 = U, 5 = VU.

Repeated-measures ANOVA was used to determine if the desirability of an item was related to demographic effects and to determine if the desirability of items were different. The results showed that gender, age, status, number of dependents, dental school graduation year, and debt level were not significantly related to item desirability ($P > .09$). However, there were clear differences between the items ($P < .0001$).

The most desirable factor was “satisfied current residents.” “Multiple techniques taught” and “good quality of clinical facility” tied for second. Work after hours and an emphasis on the GRE were clearly the least desirable program characteristics cited by applicants.

Program Directors

The Program Directors were predominantly male (see Table III). Not all sections were filled out on all returned surveys, thus, the numbers in the tables do not always add to 49.

Table III
Description of Program Directors (n = 49)

Characteristic	n		
Female	5		
Male	40		
	Mean	**SD**	**range**
Age	56.3	9.7	37 - 81
Dental grad. Year	1973.3	11.00	1947 - 1997
Ortho. grad. Year	1978.1	10.40	1953 - 1997

Program Directors rated what they perceived the residents’ responses would be. Their results, ranked from most to least desirable, are shown in Table IV.

Table IV
Average Program Director Response

				Percentage					# top 5 rank					
Factors	**n**	**Mean***	**SD**	**VD**	**D**	**N**	**U**	**VU**	**1**	**2**	**3**	**4**	**5**	**total**
Satisfied current residents	45	1.24	0.48	77.8	20.0	2.2	0.0	0.0	5	3	5	2	1	16
Good program reputation	45	1.30	0.50	71.1	26.7	2.2	0.0	0.0	10	3	3	2		18
Good impression of current residents at interview	45	1.42	0.54	60.0	37.8	2.2	0.0	0.0			3	2	2	7
Low cost (tuition and expenses)	45	1.58	0.54	44.4	53.3	2.2	0.0	0.0						
Good quality of clinical facility	45	1.67	0.64	42.2	48.9	8.9	0.0	0.0			2	2	2	6
Good impression of faculty at interview	45	1.67	0.67	42.2	51.1	4.4	2.2	0.0		3	1	1	2	7
Good reputation of Full-Time faculty	45	1.71	0.59	35.6	57.8	6.7	0.0	0.0						
High stipend or salary	45	1.76	0.80	46.7	31.1	22.2	0.0	0.0	6	5		1	3	15
Use of new technology in the clinic	45	1.84	0.67	31.1	53.3	15.6	0.0	0.0				1	2	3
Heavy emphasis on clinic time	45	1.93	0.72	24.4	62.2	8.9	4.4	0.0		2	3	3		8
Multiple technique(s) taught (straightwire, etc.)	45	1.93	0.62	22.2	62.2	15.6	0.0	0.0						
High # of cases treated	45	1.98	0.66	20.0	64.4	13.3	2.2	0.0		1			1	2
High participation of part-time faculty	44	2.00	0.75	25.0	52.3	20.5	2.3	0.0						
Positive spouse, family or peer input	45	2.07	0.75	22.2	51.1	24.4	2.2	0.0						
Good location (hometown, inexpensive, fun)	45	2.07	0.72	20.0	55.6	22.2	2.2	0.0	1		2	1	1	5
Dental school based program	45	2.09	0.76	24.4	42.2	33.3	0.0	0.0						
Masters offered/required	44	2.13	0.62	13.6	59.1	27.3	0.0	0.0			1	1	1	3
High number of Full-Time faculty	45	2.18	0.68	15.6	51.1	33.3	0.0	0.0						
Extensive interdisciplinary care training	45	2.22	0.64	11.1	55.6	33.3	0.0	0.0						
Program length < 30 months	45	2.27	0.78	13.3	53.3	26.7	6.7	0.0		1	1	2	1	5
High number of assistants/auxiliary staff	45	2.38	0.58	2.2	60.0	35.6	2.2	0.0						
Lab fabricates appliances (vs. resident)	45	2.53	0.73	11.1	26.7	60.0	2.2	0.0				1		1
Class size <= 4	45	2.73	0.65	2.2	31.1	57.8	8.9	0.0						
Class size >4	45	2.98	0.62	0.0	20.0	62.2	17.8	0.0						
Heavy emphasis on class time	45	3.00	0.83	2.2	24.4	46.7	24.4	2.2						
Program length >= 30 months	45	3.13	0.89	2.2	22.2	40.0	31.1	4.4						
Non-dental school based (i.e. hospital based)	45	3.32	0.56	0.0	4.4	57.8	37.8	0.0						
GRE required or emphasized	45	3.36	0.93	4.4	8.9	42.2	35.6	8.9						
Certificate only offered (no degree)	45	3.44	0.69	0.0	6.7	46.7	42.2	4.4						
Heavy emphasis on research time	45	3.53	0.79	0.0	11.1	31.1	51.1	6.7						
Lots of work required after regular hours	45	3.80	0.89	0.0	11.1	17.8	51.1	20.0						

abbreviations: VD = very desirable, D = desirable, N = Neutral, U = undesirable, and VU = very undesirable.
* scale: 1 = VD, 2 = D, 3 = N, 4 = U, 5 = VU.

There was a significant difference among the perceived desirabilities of the 31 factors considered ($P < .0001$). "Satisfied current residents," "good program reputation," and "good impression of current residents at interview" were perceived to be the top three factors by Program Directors. "Heavy emphasis on research time" was near the bottom of the list, with "lots of work required after regular hours" perceived as least desirable.

Comparison of Applicants and Program Directors

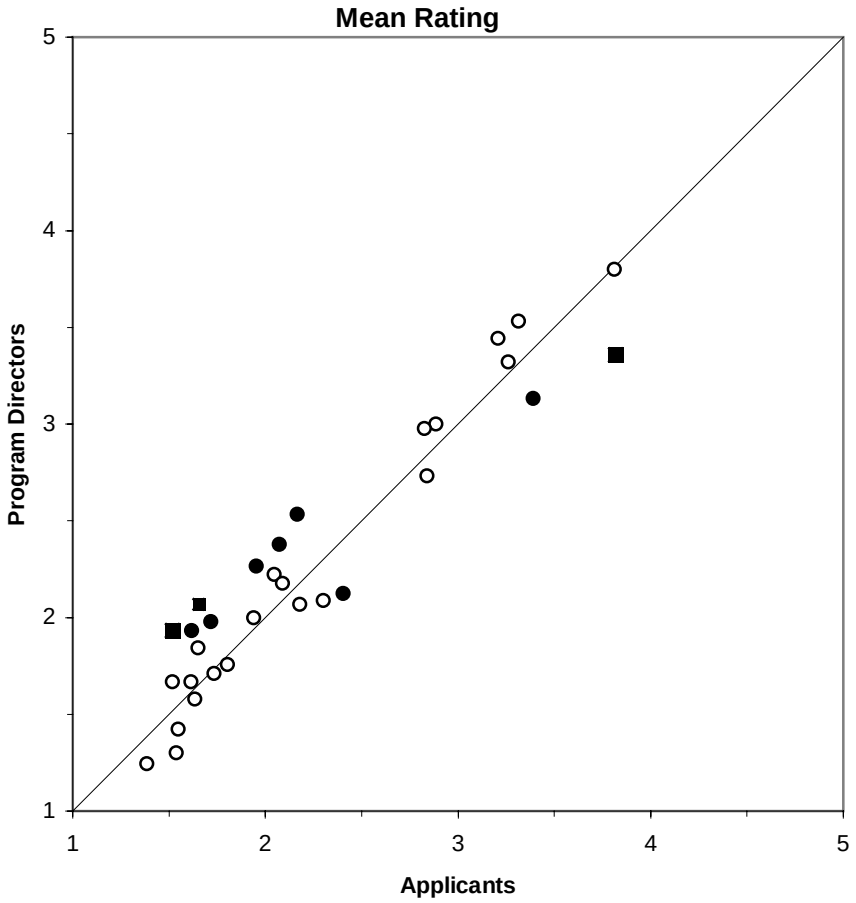
Mean desirabilities of the factors studied were significantly different between applicants and Program Directors ($P < .0001$). The desirability of factors for applicants and the perceptions of Program Directors are compared in Table V. There were clear differences on three items (Bonferroni corrected $P < .05$). These were: "GRE required or emphasized," for which the applicants were more negative than the Program Directors, and "good location" and "multiple techniques taught," for which applicants indicated more desirability than the Program Directors. There were also differences for 7 other factors as shown in Table V (uncorrected $P < .05$). There were no differences for the remaining 21 items. Figure 1 is a correlation plot of the information in Table V.

Table V
Comparison of Desirability

	Applicants		Program Dir.		
Factors	**Mean[a]**	**SD**	**Mean[a]**	**SD**	**p-value**
Satisfied current residents	1.39	0.57	1.24	0.48	0.2636
Multiple technique(s) taught (straightwire, etc.)	1.52	0.64	1.93	0.62	0.0007 **
Good quality of clinical facility	1.52	0.56	1.67	0.64	0.2200
Good program reputation	1.54	0.62	1.30	0.50	0.0558
Good impression of current residents at interview	1.55	0.65	1.42	0.54	0.3300
Good impression of faculty at interview	1.62	0.62	1.67	0.67	0.6532
Heavy emphasis on clinic time	1.62	0.58	1.93	0.72	0.0105 *
Low cost (tuition and expenses)	1.63	0.74	1.58	0.54	0.6782
Use of new technology in the clinic	1.65	0.62	1.84	0.67	0.1135
Good location (hometown, inexpensive, fun)	1.65	0.71	2.07	0.72	0.0008 **
High # of cases treated	1.72	0.69	1.98	0.66	0.0330 *
Good reputation of Full-Time faculty	1.73	0.64	1.71	0.59	0.8934
High stipend or salary	1.80	0.75	1.76	0.80	0.7314
High participation of part-time faculty	1.94	0.70	2.00	0.75	0.5833
Program length < 30 months	1.95	1.01	2.27	0.78	0.0098 *
Extensive interdisciplinary care training	2.05	0.71	2.22	0.64	0.1491
High number of assistants/auxiliary staff	2.07	0.67	2.38	0.58	0.0121 *
High number of Full-Time faculty	2.09	0.68	2.18	0.68	0.4554
Lab fabricates appliances (vs. resident)	2.17	0.86	2.53	0.73	0.0028 *
Positive spouse, family or peer input	2.18	0.88	2.07	0.75	0.3818
Dental school based program	2.30	0.80	2.09	0.76	0.0944
Masters offered/required	2.40	0.84	2.13	0.62	0.0272 *
Class size >4	2.82	0.71	2.98	0.62	0.2004
Class size <= 4	2.84	0.76	2.73	0.65	0.4288
Heavy emphasis on class time	2.89	0.85	3.00	0.83	0.3392
Certificate only offered (no degree)	3.21	0.91	3.44	0.69	0.0541
Non-dental school based (i.e. hospital based)	3.26	0.77	3.32	0.56	0.5858
Heavy emphasis on research time	3.31	1.00	3.53	0.79	0.0692
Program length >= 30 months	3.39	1.04	3.13	0.89	0.0421 *
Lots of work required after regular hours	3.81	0.90	3.80	0.89	0.9596
GRE required or emphasized	3.82	1.01	3.36	0.93	0.0002 **

abbreviations: VD = very desirable, D = desirable, N = Neutral, U = undesirable, and VU = very undesirable.
a) scale: 1 = VD, 2 = D, 3 = N, 4 = U, 5 = VU.
* = Applicant mean significantly different than program director mean, uncorrected p-value < .05.
** = Applicant mean significantly different than program director mean, Bonferroni corrected p-value < .05.

Figure 1
Item Desirability for Applicants and Program Directors



*Items with significantly different desirability are solid. The large, solid squares represent factors that remained significantly different after the Bonferroni correction.

Discussion

The 46.9% response rate for applicants was considerably higher than some previous studies.[8,13] The Program Directors responded very well at a rate of 89.1%. This probably reflects their desire to contribute to the quality of orthodontic research as well as an interest in this particular topic.

The most desirable factor identified by applicants was clearly "satisfied current residents." This is consistent with several other studies surveying the preferences of residents in other disciplines.[7,10,11,14,16-18] Next were "multiple techniques taught" and "good quality of clinical facility." The strong influence of techniques was somewhat surprising as previous studies have shown that residents in other specialties place lesser importance on specific educational content.[11,13,17] The high desirability of a good clinical facility might make a relatively easy target for improvement for orthodontic programs.

Financial factors fell in the middle of the importance scale, being neither very desirable nor undesirable. However, between the inception of the survey and the time of this writing, a significant change has occurred which potentially has a large impact on these results. In many programs, classes starting prior to 2004 could rely on Graduate Medical Education funding either as direct scholarships or in the form of tuition waivers. This funding was discontinued for most orthodontic programs

beginning with the class entering in 2004. This dramatic change in financial arrangements could lead to a change in desirability of factors related to money.

The requirement of taking the Graduate Record Exam was clearly unpopular among applicants. A comparable factor in studies of other specialties could not be found. In agreement with previous studies was the low ranking of the importance of research.[9,11-15] "Lots of work required after regular hours" also reflected the trend of previous studies regarding long hours and on call schedule.[2,9,14]

Program Directors correctly perceived that "satisfied current residents" would be the most influential factor in the decision-making process for applicants. Second on their list was "good program reputation," the applicants' 4th factor. This was followed by "good impression of current residents," the applicants' 5th choice. This trend of accurately predicting applicants' desires continues with a few exceptions throughout the list of factors.

Program Directors differed most from applicants on the factor "GRE required or emphasized." Not surprisingly, applicants were more negative than the Program Directors on this subject. For many applicants, taking the Graduate Record Exam seems like just another obstacle, unrelated to their qualifications for a residency. In fact, this is the case in some residencies where submitting the GRE score is a formality imposed by a graduate program administered from outside the dental school. Often it is considered lightly, if at all, in the orthodontic admission process.

For the items "good location," and "multiple techniques taught," applicants indicated more desirability than Program Directors. In a number of studies, location has

been cited by applicants as important in their ranking process.[9-12,16] However, this seems to vary by specialty, as at least two other studies showed that location was unimportant.[6,14] It is possible that the number and distribution of programs in a given specialty may contribute to these differences. With regard to techniques taught in orthodontic programs, no direct correlation in previous studies could be found. "Clinical content" was found to be unimportant to oral surgery applicants[13] but was important to orthodontic residents.[5] Whether or not "clinical content" is related, in this study it is clear that applicants want to learn various orthodontic techniques.

The statistical analysis of the data shows significant differences between the applicant and Program Director responses. Due to the design of this study, the odds against applicants and Program Directors producing identical results is large. Aside from the notable and interesting differences described above, applicants' responses and Program Directors' perceptions were remarkably similar for the majority of factors considered during the orthodontic application process.

Conclusion

The purpose of this study was to determine the relative importance of factors in applicants' ranking of orthodontic programs and to determine differences between orthodontic Program Directors' perceptions and actual factors cited by applicants.

Applicants' top three factors were: "satisfied current residents," "multiple techniques taught," and "good quality of clinical facility." Program Directors' perceptions of the applicants' top three factors were: "satisfied current residents," "good program reputation," and "good impression of current residents at interview." Comparing Program Directors perceptions versus applicants' factors overall, the two groups were statistically different ($P < .0001$). Factors that stood out for their differences included: "GRE required or emphasized," cited as more negative by applicants ($P < .0002$), "multiple techniques taught," cited as more positive by applicants ($P < .0007$), and "good location," cited as more positive by applicants ($P < .0008$).

This study found statistical differences between Program Directors perceptions and factors actually influencing applicants' ranking of orthodontic programs. However, there was generally a high level of overall agreement. Thus, it appears that, with a few notable exceptions, Program Directors have a good understanding of what makes an orthodontic residency more desirable to applicants.

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Literature Cited

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Appendix A

Cover Letters and Surveys

Dear Doctor,

Each year you and your department expend considerable amounts of time and energy to recruit the best and brightest applicants to your program. The purpose of this survey is to assess what factors make orthodontic programs more attractive to applicants and compare them to what program directors perceive as the likes and dislikes of applicants. We hope that this information will be useful to program directors as well as future applicants, by more clearly communicating what applicants look for in a residency.

Please fill out the survey as you think an applicant would. In this way, we will be able to know where program directors accurately predict the responses of applicants and where they do not.

Your participation in this survey is entirely voluntary, but very important in order to draw meaningful conclusions. **It should take you no more than five minutes to complete the survey.** When finished, please return it in the included self-addressed envelope.

Please be assured that the information you submit will be kept confidential, and will not be tracked to you individually. Returning the survey implies your willingness to have your responses included in this study. If you have any questions or would like a copy of the finished study, please contact us at orthostudy@hotmail.com.

We hope this data will become useful to you in the future and look forward to receiving your completed questionnaire.

FACTORS INFLUENCING APPLICANT RANKING OF ORTHODONTIC PROGRAMS: SURVEY OF PROGRAM DIRECTORS, 2002

Part I. Demographic Information:

1. Gender: ☐ Male ☐ Female
2. Year of Birth: _____
3. Dental School: _____
4. Year graduated from dental school: _____
5. Where did you receive your Orthodontic education: _____
6. Year completed Ortho education: _____

Part II. Of the factors listed in Part III below, please rank what you think are applicants' top five most important, by writing numbers from 1 to 5 (1 most important, 2 second most important, etc.) on the line next to the appropriate factor. If items in your perceived top five are not listed, please write them in the comments section below.

Part III. How desirable do you think the following are to applicants developing their Rank Order Lists (circle one):

	Very Desirable	Desirable	Neutral	Undesirable	Very Undesirable
__ Good program reputation	1	2	3	4	5
__ Good reputation of Full-Time faculty	1	2	3	4	5
__ Use of new technology in the clinic	1	2	3	4	5
__ Lab fabricates appliances (vs. resident)	1	2	3	4	5
__ GRE required or emphasized	1	2	3	4	5
__ Positive spouse, family or peer input	1	2	3	4	5
__ Extensive interdisciplinary care training	1	2	3	4	5
__ High stipend or salary	1	2	3	4	5
__ Good location (hometown, inexpensive, fun)	1	2	3	4	5
__ High # of cases treated	1	2	3	4	5
__ High number of assistants/auxiliary staff	1	2	3	4	5
__ Good quality of clinical facility	1	2	3	4	5
__ Satisfied current residents	1	2	3	4	5
__ Lots of work required after regular hours	1	2	3	4	5
__ Heavy emphasis on clinic time	1	2	3	4	5
__ Heavy emphasis on research time	1	2	3	4	5
__ Heavy emphasis on class time	1	2	3	4	5
__ Program length ≤ 30 months	1	2	3	4	5
__ Program length ≥ 30 months	1	2	3	4	5
__ Low cost (tuition and expenses)	1	2	3	4	5
__ Certificate only offered (no degree)	1	2	3	4	5
__ Masters offered/required	1	2	3	4	5
__ High number of Full-Time faculty	1	2	3	4	5
__ Dental school based program	1	2	3	4	5
__ Non-dental school based (i.e. hospital based)	1	2	3	4	5
__ Good impression of faculty at interview	1	2	3	4	5
__ Good impression of current residents at interview	1	2	3	4	5
__ Class size ≤ 4	1	2	3	4	5
__ Class size >4	1	2	3	4	5
__ High participation of part-time faculty	1	2	3	4	5
__ Multiple technique(s) taught (straightwire, etc.)	1	2	3	4	5

Comments: _____

November 26, 2002

Dear Orthodontic Program Applicant,

The purpose of this survey is to determine what factors applicants consider when choosing an orthodontic program. This will help ascertain what makes certain orthodontic programs more attractive to prospective residents. Additionally, it will compare how program directors perceive the likes and dislikes of applicants. We hope that this information will be useful to future applicants as well as program directors by more clearly communicating what applicants look for in a residency.

Your participation in this survey is entirely voluntary, but very important in order to draw meaningful conclusions. **It should take you no more than five minutes to complete the survey.** When finished, please return just the survey in the included self-addressed, postage-paid envelope.

Please be assured that all individual information you submit will be kept confidential, and will not be tracked to you individually. Additionally, know that responding to this survey will neither improve nor decrease your chances of matching at any particular program. Returning the survey implies your willingness to have your responses included in this study. If you have any questions or would like a copy of the finished study, please contact us at orthostudy@hotmail.com.

In order to eliminate any bias that might be created by your being admitted to a particular program, we ask you to fill out the survey before the Match takes place on December 9, 2002. We look forward to receiving your completed questionnaire by December 15, 2002.

Thank you very much for your participation. Best wishes in all your future endeavors.

Sincerely,

Michael D. Payne

FACTORS INFLUENCING APPLICANT RANKING OF ORTHODONTIC PROGRAMS:
SURVEY OF APPLICANTS, 2002

Part I. Demographic Information:

1. Gender: ☐ Male ☐ Female
2. Year of birth: _____
3. Status: ☐ Single ☐ Non-Single
4. Number of dependants: _____
5. Year of dental graduation:_____
6. Educational debt: ☐ $<50k ☐ $50k-100k ☐ $100k-150k $150k-200k ☐ $>200k
7. Number of programs you applied to: _____
8. Number of programs you ranked:_____

Part II. Of the factors listed in Part III below, please rank your top five most important by writing numbers from 1 to 5 (1 most important, 2 second most important, etc.) on the line next to the appropriate factor. If items in your top five are not listed, please write them in at the bottom of the page in the comments section.

Part III. How ***desirable*** are the following in developing your Rank Order List (please circle one):

	Very Desirable	Desirable	Neutral	Undesirable	Very Undesirable
__ Good program reputation	1	2	3	4	5
__ Good reputation of Full-Time faculty	1	2	3	4	5
__ Use of new technology in the clinic	1	2	3	4	5
__ Lab fabricates appliances (vs. resident)	1	2	3	4	5
__ GRE required or emphasized	1	2	3	4	5
__ Positive spouse, family or peer input	1	2	3	4	5
__ Extensive interdisciplinary care training	1	2	3	4	5
__ High stipend or salary	1	2	3	4	5
__ Good location (hometown, inexpensive, fun)	1	2	3	4	5
__ High # of cases treated	1	2	3	4	5
__ High number of assistants/auxiliary staff	1	2	3	4	5
__ Good quality of clinical facility	1	2	3	4	5
__ Satisfied current residents	1	2	3	4	5
__ Lots of work required after regular hours	1	2	3	4	5
__ Heavy emphasis on clinic time	1	2	3	4	5
__ Heavy emphasis on research time	1	2	3	4	5
__ Heavy emphasis on class time	1	2	3	4	5
__ Program length < 30 months	1	2	3	4	5
__ Program length ≥ 30 months	1	2	3	4	5
__ Low cost (tuition and expenses)	1	2	3	4	5
__ Certificate only offered (no degree)	1	2	3	4	5
__ Masters offered/required	1	2	3	4	5
__ High number of Full-Time faculty	1	2	3	4	5
__ Dental school based program	1	2	3	4	5
__ Non-dental school based (i.e. hospital based)	1	2	3	4	5
__ Good impression of faculty at interview	1	2	3	4	5
__ Good impression of current residents at interview	1	2	3	4	5
__ Class size ≤ 4	1	2	3	4	5
__ Class size >4	1	2	3	4	5
__ High participation of part-time faculty	1	2	3	4	5
__ Multiple technique(s) taught (straightwire, etc.)	1	2	3	4	5

Comments:_____

VITA

Dr. Michael D. Payne was born in Boise, Idaho on February 5, 1973. He received a Bachelor of Science degree in Mechanical Engineering from Brigham Young University in 1997. After working for Hewlett Packard as a research and design engineer in Washington, he attended Oregon Health Sciences University School of Dentistry. He earned his DMD degree in 2002 from OHSU. He entered the orthodontic residency program at Virginia Commonwealth University that same year.