

# Qualitative Analysis of the Process for Selecting Graduate Orthodontic Students in Canada

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## ABSTRACT

The literature on selection criteria for admission to graduate orthodontic programs in Canada and the United States is limited. The objectives of this study were to describe the processes for selecting students for master's programs and to identify the qualities of "ideal candidates." Grounded theory was used to analyze recorded telephone interviews with 14 Canadian participants (directors or faculty members of orthodontic programs or students). The following chronology of events was identified: pre-application steps, application, evaluation of references, social evening, testing, clinic visit, interviews, post-interview discussion and ranking, final selection and candidate feedback. The "ideal candidate" was one with excellent intellectual abilities, a particular set of skills and personality traits, and additional positive attributes. The findings of this study may serve as a resource for future applicants and may allow individual programs to analyze their selection procedures.

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Becoming an orthodontist is an ambition for many dentists and dental students. A recent survey concluded that Canadian orthodontists were more satisfied with their choice of profession than were Canadian dentists.<sup>1</sup> A search of PubMed and MEDLINE databases for the period between 1966 and 2005 yielded few studies about selection procedures for orthodontic programs.

Despite inconsistent evidence regarding the relationship between undergraduate grades, academic ranking and successful performance as a student,<sup>2-9</sup> undergraduate grades or rankings were given great importance in the selection process.<sup>10-14</sup> This was not always the case, however,<sup>15,16</sup> and policies restricting admission to those with high grades or rankings in their dental class have been questioned.<sup>17</sup>

In some specialties, the results of cognitive function tests have been predictive of similar test results during residency but have not been predictive of clinical performance.<sup>2,4,18,19</sup>

Some authors have questioned the reliability and validity of selection interviews.<sup>4,20,21</sup> One study found that interviewers tended to select applicants like themselves,<sup>22</sup> which prompted others to suggest that interviews might have greater validity if interviewers were blinded to information about applicants<sup>23-25</sup> and if questions were structured.<sup>26-28</sup>

With a limited number of training programs in Canada, there is an oversupply of outstanding candidates competing for only a few positions. The lack of consensus among program directors results in the use of various selection procedures, and there is no literature

to guide this undertaking. This study was intended to address this knowledge gap by identifying the qualities of the “ideal candidate” and by developing a process that models current recruitment practices in Canadian graduate orthodontic programs.

**Methods**

The research question for this study was, “How are Canadian orthodontic students selected?” Grounded theory, a qualitative research method, was uniquely suited to this question because it would aid in identifying the basic social process embedded in the data and would thus provide a framework for the process by which candidates are selected.<sup>29</sup>

Approval was obtained from the University of Alberta Human Research Ethics Board, and recruitment materials were then mailed to program directors for distribution to faculty and students. Reminders were sent to all a few months later. Written consent was obtained from all participants. Limited information about participants has been included in this paper to protect their identity. Fourteen participants were recruited from 4 Canadian programs: 4 program directors, 1 former program director, 2 full-time faculty members and 7 students (Table 1).

One open-ended, unstructured telephone interview lasting 45–90 minutes was conducted with each participant. Examples of prompts, refined over time, included the following:

1. Tell me about the best students you have admitted.
2. Describe the selection procedure chronologically.

Interviews were tape-recorded and transcribed to facilitate analysis. The sample size was small, but dense category development and clear relations between the categories suggest that data saturation (i.e., replication of information) was attained.

Data were managed through QSR-N6 software (QSR International, Australia). Ideas were identified and labelled using the words of the participants (“in vivo” codes). Broader categories were developed to group related codes, and the category that linked the greatest number of codes was designated as the core category. Finally, relationships between ideas within the core category were specified, whereby the basic social process underlying the selection of Canadian orthodontic students was identified. Reliability and validity were established using the following strategies<sup>30</sup>:

- Investigator responsiveness: Validity and reliability in grounded theory are determined on the basis of the creativity, flexibility, sensitivity and skill demonstrated by the researcher. In this study, the analysis was carried out by the primary investigator (PB), who was an orthodontic graduate student, and was reviewed by 2 individuals (KO, LK) who had expertise

**Table 1** Characteristics of participants

| Position                      | Male | Female | Total |
|-------------------------------|------|--------|-------|
| Program director <sup>a</sup> | 5    | 0      | 5     |
| Faculty member <sup>b</sup>   | 1    | 1      | 2     |
| Student <sup>c</sup>          | 6    | 1      | 7     |
| Total                         | 12   | 2      | 14    |

<sup>a</sup>One director from each participating program and 1 former director

<sup>b</sup>From different programs

<sup>c</sup>Two students from each of 3 participating programs and 1 from the fourth program

in qualitative methods but no expertise in orthodontics. The results of the analysis were then discussed in a research group comprising graduate students from other health disciplines.

- Methodological coherence was ensured by choosing a research method that fit the research question.
- Theoretical sampling and sampling adequacy were sought by ensuring that participants were recruited from as many Canadian orthodontic programs as possible. Saturation demonstrated sampling adequacy.
- Concurrent collection and analysis of data allowed interaction between what was known at a given point in time and the information still required by the emerging theory.
- The process of thinking theoretically was demonstrated by comparing new codes with those derived from previously collected data.
- The theory was developed gradually as the study progressed.

**Findings**

*The Ideal Candidate*

Participants were in general agreement about the characteristics of the “ideal candidate.”

- Intellectual abilities  
 Top grades or academic rankings: Successful applicants were often in “the top 10%,” but those without high class standing could “compensate elsewhere.”  
 Research experience: Publications and research qualifications were evaluated positively.  
 Inquiring minds: Committees looked for “lifelong learners.”  
 Teaching experience: Individuals with dental teaching experience were preferred.
- Knowledge of orthodontics as a profession: Candidates who were knowledgeable about the profession were preferred.
- Skills  
 Clinical skills: There was a preference for some clinical experience.

Interpersonal skills: Arrogant applicants were seldom selected.

Communication skills: Strong oral and written communication skills were valued.

- Personality Traits

Integrity: Admission was denied if there was any doubt in this area.

Altruism: Service-minded individuals, for whom financial returns were not the sole motivation, were preferred.

Self-direction: Selection committees sought self-directed individuals.

Extracurricular activities: Applicants who showed achievement in activities outside professional work were highly rated.

Maturity: Candidates who had been out of dental school for a few years were considered more mature and were preferred.

Ability to work under pressure: Any tests were administered under strict time limitations to evaluate ability to work under pressure.

Creativity: Ability to think “outside the box” was valued.

Perseverance: Unsuccessful candidates who improved themselves and applied again stood a better chance of being admitted.

- Additional Positive Attributes

Desire to enter the particular program: There seemed to be some preference for candidates who wished to study within a particular program.

### Selection Trajectory

The programs represented by study participants had detailed admission procedures (Table 2). Grounded theory methods help researchers identify a basic social process that arises from social interactions between people. In this study, the process of admitting students to a graduate orthodontic program was identified based on interviews with directors and students of orthodontic programs. In the interviews, participants discussed their views regarding the way admissions materials and other information about the needs of the orthodontic profession were used to make selection decisions. Because meaning is created within a social context, it changes over time. Although participants were not explicitly asked to comment about changes over time, it was not surprising to find that the meaning of particular admissions procedures changed over the years, as program directors responded to the needs of the profession and of individual training programs.

**Table 2** Selection trajectory, categorized by stages of performing due diligence

|   |
|---|
| <b>Building the case for selection</b><br><i>Collecting evidence, reading between the lines (“buyer beware”), forming impressions</i>   |
| Preapplication steps  |
| Application <sup>a</sup>  |
| References <sup>a</sup>   |
| Social evening  |
| Testing   |
| Clinic visit and lunch  |
| Formal interview <sup>a</sup>   |
| <b>Weighing the options</b><br><i>Creating framework of acceptability, establishing rank (democratic process), determining outcomes</i> |
| Post-interview discussion and ranking <sup>a</sup>  |
| <b>Finalizing decisions</b>   |
| Final selection <sup>a</sup> ( <i>communicating results</i> )   |
| Feedback to unsuccessful candidates <sup>a</sup> ( <i>planning for the future</i> )   |

<sup>a</sup>Steps common to all programs

### Basic Social Process: “Performing Due Diligence”

Although the analysis resulted in many categories, “collecting the evidence” was identified as the core category.<sup>31</sup> Throughout the selection process, committees relied on multiple sources to provide evidence of candidates’ suitability. This evidence was then used to justify selection of particular candidates. Applicants also sought evidence of program suitability, in case they had to choose between programs. The following 3 stages were embedded in the core category: building the case for selection, weighing options, and finalizing decisions (Table 2).

#### Building the Case for Selection

This stage, comprising the first 7 steps in the selection trajectory, included gathering information and creating a framework to guide the admission process. Typically, the framework was adjusted over the years according to the needs of the program and the profession. Thus, a candidate who was not competitive one year might be selected in the future. During this stage, committee members engaged in the following phases:

- Collecting data: The objective of this phase was to find indicators of the pre-established framework and to identify any new and interesting elements presented by applicants that were not yet part of the framework.
- Reading between the lines: Selection committees looked for individuals who were seeking admission

for the “right reasons.” Reading between the lines helped committees to exclude applicants who aggressively tried to “sell themselves,” “curry favour” or “brown nose.” Committees also preferred applicants who were willing to temporarily put aside competitive interests to foster a positive learning environment.

- **Forming impressions:** As candidates went through the selection process, committee members formed impressions about them. During this phase, data developed “weight.” For example, high grades were viewed positively and would typically tip a committee’s impression in favour of a particular applicant. However, some students with lower grades were nonetheless selected if they could provide other evidence, such as a history of publication, that was of equivalent weight.

#### *Weighing the Options*

After the interviews, selection committees met to create the framework of acceptability for that year, to establish ranking and to determine outcomes.

- **Creating the framework of acceptability:** Members of the selection committee debated their perceptions of the candidates, a process that led to the establishment of the framework that would be used to select students.
- **Establishing ranking:** During the ranking process, the attributes and characteristics of each prospective student were reviewed in relation to the framework of acceptability.
- **Determining outcomes:** This phase provided an opportunity to finalize the framework of acceptability and to rank all applicants according to the framework.

#### *Finalizing Decisions*

During the third stage of the admissions process, committees made their final decisions in 2 phases.

- **Communicating results:** Applicants were assigned to 1 of 3 categories: successful, wait-listed or unsuccessful. Successful candidates were asked to confirm acceptance of an offer within a specified period. Those selected by more than one institution had to choose their preferred program.
- **Planning for the future:** During this phase, program directors spent time counselling unsuccessful applicants, if requested.

### **Discussion**

Orthodontic selection committees spend considerable time reviewing applications to develop a short list of candidates appropriate for interviews and testing. Each program director who participated in this study thought that the selection process used by his or her program was sound, since it yielded excellent students, and none of

the directors supported adoption of a national selection process. Other medical specialties have reported minimal correlation between application ranking and eventual performance in the profession.<sup>2-4</sup>

Academic performance or ranking is the first criterion considered for short-listing of Canadian orthodontic applicants. Program directors thought that this approach correlated well with students’ success in their respective programs. Similar findings have been reported by other authors,<sup>6-14</sup> but the literature is not unanimous.<sup>2,4,5,15-19</sup> This inconsistency may be related to differences between the programs.

This study is, to the authors’ knowledge, the first to discuss selection committees’ consideration of other evidence, such as publications, when grades or academic rankings were not as high as might be preferred. Canadian orthodontic programs placed greater emphasis on research experience than did other medical specialties.<sup>13,15</sup>

The selection committees for Canadian programs preferred candidates who had at least 1 year of practice experience following graduation from dental school. This is a good strategy, given the results of a study at a Michigan institution, in which those who had practised for at least a year performed better in the orthodontic training program than those who entered the program immediately after dental school.<sup>5</sup>

Although some Canadian programs welcomed international candidates, representatives of other programs regretted their inability to evaluate such candidates. The latter recommended that international students complete dental or postgraduate training in Canada or the United States before submitting an application. In a study of internal medicine programs, Gayed found that completion of these types of postings was an important predictor of success.<sup>32</sup>

Orthodontic selection committees varied in the degree to which they valued other written evidence. Some program directors put great emphasis on reference letters, particularly those from academics, whereas others barely read them. This finding is consistent with data from other graduate medical programs.<sup>10-13,15,16</sup> Most authors have found little or no correlation between references and performance during residency,<sup>2,6</sup> although one study found that deans’ letters predicted success among emergency medicine residents.<sup>9</sup> Programs attached various degrees of importance to applicants’ letters of intent. This finding was also consistent with the literature. Program directors in emergency medicine placed the least emphasis on personal statements.<sup>13</sup>

The relative value of the social evenings hosted by some programs was difficult to evaluate. Although such events provide opportunities to evaluate applicants’ interpersonal skills, they also allow applicants to ascer-

tain the warmth and friendliness of program faculty and potential colleagues.<sup>33</sup>

There was a difference of opinion among Canadian program directors about the value of the selection interview, a finding that is in keeping with previous research. Some authors<sup>6,12,13</sup> have found that the interview was among the most important factors in determining final candidate selection, whereas others have questioned the reliability and validity of interviews.<sup>4,20,21</sup> Participants in the current study thought that the interview focused on personality characteristics such as honesty, teamwork and “confident humility.” The usefulness of interviews in assessing these qualities is also reflected in other health-related graduate programs.<sup>10,14,15,34</sup> One program director lamented that, “it almost sounds like they’ve prepared all of their answers ... in advance. And so it comes off as rather contrived.” However, coaching, preparation and role-playing have shown positive associations with interview performance.<sup>35</sup>

Canadian orthodontic programs valued extra-curricular achievements and desired well-rounded students. It was interesting that similar distinctive factors (e.g., championship athlete, officer in medical school) were important predictors of success among emergency medicine residents.<sup>9</sup>

The potential for inadvertent bias in the selection process surfaced in this study, a problem that has been identified in other graduate programs.<sup>22</sup> One program director admitted that “professors like to pick disciples who are more like themselves.” All admissions committee members for the programs represented in this study had access to applicants’ files, which has been shown to decrease interview validity.<sup>23–25</sup> On a related point, although orthodontic committee members often identify in advance the questions to be asked during an interview, there was variation across programs in the extent of interview structure. One participant suggested that the lack of a structured interview format may lead to inadvertent bias. The arguments for and against structured interviews are complex. Some authors<sup>26–28</sup> have shown that structured interviews are advantageous. However, unstructured interview formats have been shown to produce significantly more accurate judgments about job-related personality attributes than structured interviews.<sup>36</sup>

In this study, participants reported that the program director and faculty worked together in a democratic manner when making final selection decisions, which could be expected to reduce the potential for inadvertent bias. A student representative was often involved, but this person’s role varied. The structure of admissions committees and the decision-making processes in health-related graduate programs are not well documented, but the approach identified here for Canadian orthodontic programs was used in at least one other specialty.<sup>10</sup>

## Implications

Several of the participants in this study were very satisfied with the orthodontic selection process, but others saw a need for change. There was some concern regarding a perceived oversupply of practitioners. One program director admitted that “the big cities are getting to the point of being pretty much saturated ... certainly the income of the existing pool is going to decrease.” The training programs, in consultation with the orthodontic practice community, may weigh overall levels of enrolment and reconsider whether to start new graduate programs.

Some participants wished to see more fairness and objectivity in the selection process. Commercially available personality and integrity tests, as well as group-based situational testing during the interview process, may be considered.

Applicants may use the findings of this study to learn more about the “ideal candidate.” Increased awareness of selection factors may facilitate candidates’ analysis of their own strengths and weaknesses when considering application to orthodontic programs. This study may also help to dispel unfounded myths regarding the selection process. International applicants may benefit from the knowledge that their applications are welcomed by some programs, but that North American academic experience is preferred by others.

Further research to establish valid measures of student performance and predictors of success as an orthodontist are needed. Studies investigating the attitudes of unsuccessful applicants would enhance understanding of the selection process.

## Conclusions

Admission to Canadian orthodontic programs is highly competitive. Because orthodontic programs are based within universities, it is not surprising that individuals who have demonstrated academic success are most likely to be selected. Given the nature of orthodontic practice, however, participants in this study also stressed the importance of clinical experience, excellent interpersonal skills, a well-rounded personality and evidence of perseverance. ✦

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