

## Multiple mini-interviews versus traditional interviews: stakeholder acceptability comparison

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**CONTEXT** The McGill University Faculty of Medicine undertook a pilot, simulation-based multiple mini-interview (MMI) for medical school applicant selection, which ran simultaneously with traditional unstructured interviews (all applicants underwent both processes). This paper examines major stakeholder (applicants and evaluators) opinions towards the MMI compared with traditional interviews, including perceptions about the feasibility and utility of the MMI.

**METHODS** A total of 100 candidates applying to McGill University Medical School were enrolled in the pilot comparison of the MMI with the traditional, unstructured interview. Applicants' opinions were obtained by questionnaire shortly after the process (for all applicants) and approximately 6 months after the interviews (for non-accepted applicants). Evaluators' perceptions were also surveyed. Questionnaires contained both quantitative items and space for qualitative impressions. Descriptive statistics, repeated measures analysis of variance (MANOVA) and analysis of the topics raised in written comments were conducted.

**RESULTS** Univariate analyses of response scores revealed statistically significant differences, with the MMI rated more highly than the traditional interview on fairness, imposition of stress and effectiveness as a measurement tool. Compared with the traditional interview, applicants also felt the MMI: (i) allowed them to be competitive; (ii) was enjoyable, and (iii) was often a favourite part of their interview experience. It should be noted that applicants were aware that their MMI score would be included in their overall interview rating. Written comments were positive with regard to, for example, fairness, the provision of opportunities to show one's strengths, and appreciation of the fidelity of the simulations. Evaluators' responses were in agreement with applicants' responses, albeit that overall they expressed more caution about the MMI.

**CONCLUSIONS** Results suggest the MMI is a promising selection tool from the point of view of both applicants and evaluators. Both groups expressed concerns, but overall the response was favourable for the MMI in comparison with traditional interviews, and the MMI has been adopted by McGill University's medical school.

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## INTRODUCTION

It can be argued that the process of admission to medical school represents the most high-stakes evaluation a prospective doctor will undertake in his or her career. In Canada, approximately 26% of applicants to medical school gain entrance,<sup>1</sup> which is considerably less than the odds encountered when applying for most residency, fellowship or staff positions. Clearly, the admissions process to medical school is of paramount importance and can even be framed in terms of the social accountability of the profession towards society.

A number of types of assessment have been used in recent decades in the undergraduate medical school admissions context. Medical College Admissions Test (MCAT) scores and grade point averages (GPAs) have been widely used as selection criteria for acceptance into medical school. Autobiographical letters are also used by admissions committees at many schools as part of the selection criteria, but these can be subject to problems relating to reliability.<sup>2</sup> The predictive ability of these tools for future performance has been questioned, although GPA has been shown to correlate with performance on US Medical Licensing Examination (USMLE) Step I and MCAT verbal reasoning scores have been shown to correlate with communication skills assessments performed as part of licensing examinations in Canada (Licentiate of the Medical Council of Canada exams Part II).<sup>3,4</sup>

Interviews to assess personal qualities form important parts of most medical school selection processes. Yet these are also fraught with problems of reliability: although inter-rater reliability with multiple interviewers in the same interview can be good, it tends to be poor across interviews.<sup>5</sup> These data suggest that context is an important determinant of performance in interviews. Other difficulties with interviews have been noted and include social biases, standardisation of the process, and predictive power for future performance.<sup>6-9</sup> To summarise, candidates' performance on traditional interviews is likely to be highly determined by the context (questions asked, etc.) and there is little standardisation between interviewers on assessment criteria.

Partly because of the problems associated with the use of these various types of assessment in the undergraduate medical school context, researchers have considered other types of assessment for medical school admissions contexts. McMaster University has pioneered the medical school admissions version of

the objective structured clinical examination (OSCE), dubbed the 'multiple mini-interview' (MMI). It consists of multiple short stations with different scenarios (simulation-based or highly structured interviews). It is a competency-based assessment that runs much like an OSCE would for an evaluation of clinical performance. The psychometric properties of the MMI have been investigated by Eva *et al.*<sup>10</sup> and others.<sup>11</sup> The MMI has been shown to be reliable and cost-efficient compared with traditional interviews.<sup>12</sup>

Stations on the MMI are designed to allow applicants to demonstrate their abilities in areas that other more traditional forms of assessment may not address. For example, in order to identify some of the general competencies valued by stakeholders in medical education, researchers at McMaster University studied the opinions of faculty, students and community members. They identified ethical behaviour, good communication skills and high general intelligence as important attributes to assess.<sup>9</sup> Stations on the MMI can be designed to allow applicants to demonstrate their skills in these areas, which is not the case with more traditional types of assessment.

Given the encouraging results from the McMaster experience and, more recently, those of other centres,<sup>13,14</sup> and important concerns about the current selection process from the medical education literature, we embarked upon a pilot project to assess the acceptability of the MMI in our context and to compare this new tool with our current selection tools, including the traditional interview. The McGill MMI was developed with the explicit intention of evaluating specific aptitudes valued by our Faculty of Medicine, such as professionalism, empathy and communication skills.

This paper examines the experiences of two main stakeholder groups involved in the MMI pilot: applicants and interviewers or evaluators (faculty members who evaluate applicant performance). Recently, two studies investigated the opinions of applicants and interviewers towards MMIs, although the contexts and MMI processes described differed from our McGill University undergraduate admissions MMI. The results suggest that MMIs can be acceptable to both groups. Both studies utilised post-questionnaires with Likert rating scales and written comments. In a study by Humphrey *et al.*,<sup>15</sup> applicants to a senior paediatric training programme completed three stations where they answered the same three questions (designed to highlight insight, reflection, etc.) Applicants expressed positive opinions about the MMI in terms

of fairness, organisation of the MMI process, etc. Interviewers felt the MMI was reliable and had a better format compared with the traditional interview. Similarly, Hofmeister *et al.*<sup>16</sup> examined the opinions of applicants to family medicine residency training and interviewers. This study utilised 10 stations which presented family medicine residency situations. Applicants felt the MMI was free from gender and cultural biases, that it allowed sufficient time for expressing ideas, and provided them with opportunities to show their strengths. They also preferred the MMI to other interviews. Interviewers rated the MMI quite highly on fairness and other aspects of their preparation (e.g. orientation session).

In sum, initial results of applicant and interviewer perceptions of the MMI have been positive. Our study adds to this developing literature; in the undergraduate admissions context we examined opinions from applicants who underwent *both* the MMI and the traditional interview using interactive stations. Applicants rated and commented on both selection interview formats. Both interview scores contributed to applicants' overall interview scores, but the MMI score was given significantly less weight overall. Secondly, we followed up several months later with applicants who were not accepted to our medical school to find out if they had any additional thoughts on the MMI.

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## RESEARCH QUESTIONS

We address two research questions in this paper.

- 1 What are applicants' opinions concerning the MMI compared with the traditional interview?
- 2 What are evaluators' opinions concerning the MMI?

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## METHODS

### Participants

The MMI pilot was undertaken for the 2008 cohort of international and non-Quebec Canadian applicants ( $n = 100$ ) who were offered interviews through the usual screening procedures. McGill University Faculty of Medicine members ( $n = 38$ ) also participated as MMI station evaluators.

### Assessment tools

The pilot MMIs were conducted at the state-of-the-art McGill University Medical Simulation Centre, with

access to a standardised actor programme. A set of 10-station scenarios were created for each of the four interview days. These were designed to provide applicants with opportunities to demonstrate non-academic abilities (e.g. professionalism, communication skills) that McGill University values in its medical students.<sup>17</sup> Some involved interactions with standardised actors and none were clinical or medical in nature; they required only a layperson's level of knowledge.

The 10-item online Applicants' Questionnaire (administered 1 week post-interview), the 9-item Evaluators' Questionnaire (administered immediately after the MMI) and the 6-item Applicants' Follow-up Questionnaire (administered 6 months after the MMI for applicants who were denied admission) are included in Appendix S1. Participants rated items using a 6-point Likert rating scale (from 1 = strongly disagree to 6 = strongly agree) and were invited to include further comments.

### Procedure

On each of four interview days, 25 applicants ( $n = 100$ ) completed both the MMIs and the traditional interviews. Half the participants completed the MMIs in the morning and half completed them in the afternoon. They were informed that both the traditional interview and the MMI would contribute to their overall interview score (75% traditional interviews, 25% MMIs). All applicants went through the circuit of 10 stations located in 10 separate interview rooms. At each station, applicants were given 2 minutes to read a description of the station scenario which was posted on the door. They then entered the station, were given 8 minutes to complete the station, and were then directed to the next station. At each station, one or two evaluators were positioned behind a one-way mirror and were not visible to the applicants. One-way mirrors were used to reduce as far as possible applicants' stress with regard to being evaluated.

Applicants were contacted via e-mail several days after the interviews and invited to complete the Applicants' Questionnaire. Six months after the interviews, applicants who had not been accepted to McGill University were contacted by e-mail and invited to fill out the Applicants' Follow-up Questionnaire. Both questionnaires were distributed electronically via <http://www.surveymonkey.com>.

### Data analysis

Quantitative data from the Evaluators' Questionnaire were analysed using basic descriptive statistics.

Five quantitative items on the Applicants' Questionnaire compared applicants' opinions of the MMI and traditional interviews. These data were analysed using basic descriptive statistics and a MANOVA to examine whether the differences between mean ratings for the two interview types differed significantly. NVivo (QSR International Pty Ltd, Doncaster, Vic, Australia) was used following an iterative process to code written comments by topic area. All analyses were conducted by an independent education researcher.

## RESULTS

A total of 82 applicants completed the Applicants' Questionnaire (response rate = 82%). Over 50% of students had previously participated in traditional medical school admissions interviews, but only approximately 12% of students had previously experienced an MMI-type interview.

### Quantitative data

Table 1 shows evaluator responses to the stakeholder questionnaire (using a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree)).

Table 2 shows descriptive statistics and univariate results, representing applicant questionnaire data. (A comparison of applicants' ratings [6-point Likert scale, as above] of MMIs versus traditional interviews, with statistically significant items [ $P < 0.05$ ] was noted.)

Table 3 shows the top five responses, frequency counts for the most and least enjoyed aspects of the interview (i.e. the frequency with which applicants rated specific items as 'most enjoyed' or 'least enjoyed').

### Qualitative data

Fifty-nine applicants responded to item #8, which provided the opportunity to write open-ended comments about specific MMI station(s). The comments indicated that some stations were generally enjoyed, a few were not, and several stations were good 'tests' of specific capabilities. Several comments suggested that stations with actors were enjoyed more than others. Several students expressed a concern that it was possible to 'act' your way through it. Others made concrete suggestions about how to improve the process, such as by making certain aspects of some stations more realistic.

Table 1 Evaluator responses to the stakeholders' questionnaire (n = 38)

Questionnaire items	Mean (SD)
1 The MMI is a fair assessment tool	5.21 (0.66)
2 The MMI is an effective tool for assessing McGill medical school applicants	5.14 (0.67)
3 The MMI can be used with all of McGill's student quotas (Quebec, Canadian and foreign students)	4.87 (0.99)
4 Assessment using the MMI is an open and transparent process	5.18 (0.73)
5 The specified competencies can be accurately evaluated by the MMI	4.81 (0.7)
6 The MMI is consistent with the goals of McGill's School of Medicine	5.18 (0.65)
7 Applicants to McGill's medical school seemed to react well to the demands of the MMI	5.03 (0.51)
8 I would be in favour of using the MMI instead of traditional interviews	4.68 (1.25)

1 = strongly disagree; 2 = disagree; 3 = disagree somewhat; 4 = agree somewhat; 5 = agree; 6 = strongly agree  
SD = standard deviation; MMI = multiple mini-interview

For the 6-month follow-up survey for applicants not accepted to McGill University, a total of 84 former applicants were contacted and 50 of them completed the survey (60%). They were asked: 'Several months have passed since you took the McGill MMI. Do you have any additional thoughts about it?' Twenty-four former applicants gave responses to this item. Most comments were positive. For example, 12 respondents indicated that the MMI was an enjoyable experience, some indicated it was a good evaluation tool (five), and that it was fair (two). Interestingly, some responses (three) consisted of comparisons between the McGill MMI and MMIs used in other institutions. Two comments indicated that applicants thought the McGill MMI was administered well compared with MMIs used at other institutions and that McGill used more stations with actors than other institutions. A few negative comments (five) were also recorded, including the suggestion that it may be possible to get through some MMI stations simply by 'acting' (two), and that the MMI could have been designed better than it was (two), and that the interview process itself had been stressful (one). Overall, the comments from applicants who were

Table 2 Descriptive statistics and univariate results: applicants' questionnaire data

Applicant questionnaire items	Traditional interview	MMI	Univariate results	
	Mean (SD)	Mean (SD)	F-value	P-value
1 The (traditional interview/MMI) format is fair to all students	3.89 (1.2)	4.68 (0.97)	25.53	0.0001
2 The (traditional interview/MMI) format allowed me to demonstrate my strengths	4.45 (1.16)	4.73 (1.01)	2.21	0.14
3 I enjoyed participating in the (traditional interview/MMI)	4.66 (0.91)	4.96 (1.10)	3.65	0.06
4 The (traditional interview/MMI) format was stressful for me	3.39 (1.31)	3.78 (1.40)	6.04	0.016
5 I believe the (traditional interview/MMI) format is an effective tool for evaluating one's aptitudes (non-academic) for the medical profession	3.96 (1.31)	4.87 (1.00)	21.36	0.0001

1 = strongly disagree; 2 = disagree; 3 = disagree somewhat; 4 = agree somewhat; 5 = agree; 6 = strongly agree  
MMI = multiple mini-interview; SD = standard deviation

Table 3 Top five responses, frequency counts for most and least enjoyed aspects of the interview

9A What did you enjoy the most...? (n = 74)		9B What did you enjoy the least...? (n = 67)	
Response	Frequency	Response	Frequency
1 MMI	31	1 MMI	2
MMI actors/role play	2	Some MMI stations	6
2 Traditional interview	7	2 Traditional interview	5
Interviewers	8	Med student interview	2
3 Friendly/relaxed	10	3 Long day/early start	17
4 Talking to students	8	4 Wait times	8
5 Well-organised day	6	5 Little time to eat	5

ultimately not accepted to McGill University's medical school were quite positive towards the MMI.

Analysis of the Evaluators' Questionnaire data showed that the evaluators' opinions were positive towards the MMI. Overall they found it to be fair, an effective assessment tool, usable with different student quotas, and to represent an open and transparent process. Further, they indicated that it appeared to be able to assess specified competences, to be consistent with the goals of McGill's School of

Medicine, and that applicants seemed to react well. Many but not all evaluators were comfortable with the idea of replacing the traditional interview with the MMI. Thirty-four evaluators wrote additional comments that will be informative for MMI developers. In summary, the topic areas, sub-topics and frequency of occurrence were:

- 1 candidate differences may affect MMI evaluation outcomes (e.g. cultural background [9]; language differences [4]; applicant maturity [2]; prior experience [2], and personality types [2]).

- 2 *The MMI is effective for evaluating relevant skills, abilities, etc.* (it is fair and objective [7], clearly discriminates between candidates [4], and taps into important skills [4]).
- 3 *The MMI doesn't have some of the benefits of traditional interviews* (using both formats may be more effective [4]; traditional interviewers get to know applicants [3]).
- 4 *The MMI process is a positive one* (it worked well [3], and was a good experience [3]).
- 5 *There is a need to address practical concerns to improve the MMI process* (operational details [3]; evaluator fatigue [2]; evaluator preparation [2]; long-term planning requirements [2]; fairness and transparency [2]; comments about the Stakeholder Questionnaire [2], and station-specific comments [2]).

In summary, compared with the traditional interview, the applicants rated the MMI more highly on fairness and on being an effective evaluation tool. The level of stress they experienced was higher in the MMI. A majority of applicants indicated that the MMI allowed them to be more competitive compared with their peers. In addition, 45% of them listed the MMI as a most enjoyable aspect of the interview, whereas 20% listed the traditional interview or interviewers as more enjoyable. Fewer applicants listed the MMI or specific stations as representing what they enjoyed least. In terms of the long-term follow-up survey results, a number of applicants who had not been accepted to McGill University indicated that the MMI had been an enjoyable experience. Finally, evaluators also rated the MMI quite positively on several dimensions and their written comments identified a number of topics that will be informative in the design of future MMIs.

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## DISCUSSION

In implementing this MMI pilot, we faced significant concerns on the part of admissions committee membership about the possible negative impact on recruitment of the switch from traditional interviews to competency-based assessment making heavy use of simulation (in terms of student stress and expectations) and some doubts from prominent stakeholders concerning the feasibility of the MMI. We were thus pleasantly surprised to find that the results are quite favourable towards the MMI as a fair, effective, enjoyable and interesting interview process.

The experience of assessing applicants' and evaluators' perceptions of the pilot MMI for medical school admissions was instructive on several levels. Appli-

cants and evaluators reviewed the MMI favourably in several respects and also noted some potential concerns and areas where the MMI process could be improved. In general, applicants expressed a preference for the MMI compared with the traditional interview, 'as a fair and better way for them to demonstrate their strengths and suitability for a career in medicine'. Initial doubts about the feasibility of the MMI on the part of some prominent stakeholders were somewhat alleviated by these findings. Finally, although our findings are consistent with those from a few similar studies,<sup>16,17</sup> our study is somewhat distinct given the undergraduate admissions context, the interactive nature of the stations, and the fact that applicants participated in and rated the MMI and traditional interview formats on the same criteria. A long-term follow-up was also conducted with unsuccessful applicants.

When our faculty was contemplating reinvigorating the admissions process by undertaking the MMI pilot, many concerns were voiced by members of the admissions committee about the potential negative impact of such a change. Faculty members raised fears of undue student stress and a negative effect on recruitment. As the survey of students and evaluators showed a positive impact of the MMI, and initial data on the perceptions of students revealed that students felt better able to showcase their talents with it, we have indeed adopted the MMI for all categories of applicants for 2009.

Some student comments on the 6-month follow-up survey (when many had experienced other schools' selection processes, including MMIs) showed appreciation for innovative and realistic simulations (using standardised actors) in preference to mini-interviews *per se*. We do feel that access to a state-of-the-art simulation centre with a well developed standardised actor programme contributed significantly to the success of the pilot project. Whether the use of scenario-based simulation versus focused interview interactions improves the predictive value of the MMI as a selection tool remains to be ascertained, and will be the focus of future scholarly work in our institution with respect to the MMI. We will also follow the performance of the cohort of selected students through medical school to assess the predictive value of the MMI in our context.

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## LIMITATIONS OF THE STUDY

This initial pilot study has several limitations. Firstly, only one cohort of students participated. Secondly,

half the applicants included in the study completed the MMI before the traditional interview and half completed the traditional interview before the MMI. The order in which they participated in the two formats may have had an impact on their ratings. Further, a delay of a few days after the interviews was necessary before distributing the first questionnaire because it was important that all applicants be given the same amount of time to complete the questionnaires. This time delay may have had an impact on how respondents rated the two-interview format. Although we do not expect that these factors played a significant role in the outcomes reported in this paper, it is important to acknowledge that these possibilities do exist. Finally, the lower response rate on the Applicants' Follow-up Questionnaire may limit the extent to which we can generalise these results.

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## CONCLUSIONS

The inclusion of competency-based assessment into medical school admission practices, specifically the MMI, is promising. One focus of the MMI admissions selection tool pilot for this year was on assessing faculty and applicant buy-in for this new admissions process, which we have been able to demonstrate in this study. The MMI shows promise as it appears to be perceived as fair and reasonable by both applicants and evaluators. Given the high stakes involved in medical school admission processes, a perception of fairness and, indeed, an assurance of it, is an important part of the social accountability of the profession towards the society it serves.

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*Contributors:* SR served as principal investigator and was integrally involved in the study design and the conduct of research, and in manuscript preparation. SF contributed methodological expertise to data collection and analysis, and to manuscript preparation. FD served as a facilitator of data collection and analysis, and contributed to the study design and the commentary on the manuscript. LS contributed to methodological consultation, identification of research questions, and the manuscript preparation. JW contributed to the methodological consultation, manuscript preparation, and to participation in the research pilot. JP contributed to the identification of research questions, methodological consultation and the manuscript commentary. All authors approved the final manuscript for publication.

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#### **Appendix S1.** The questionnaires.

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