A 10-station Multiple Mini-Interview (MMI) for Undergraduate Pharmacy Admission: Reflecting on Six Years of Experience

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Introduction

- In 2010, the Leslie Dan Faculty of Pharmacy (LDPF) added an interview component to its selection process for the undergraduate pharmacy program, to assess specific non-academic attributes deemed important for the success of its graduates.
- The interview format selected was the Multiple Mini-Interview (MMI). Evidence available in 2010 and subsequently summarized in several systematic reviews, supports its lesser potential for bias and significant prediction of medical student performance on Objective Structured Clinical Examination (OSCE)-type licensure examinations.
- Admission tools at the LDPF included the MMI, pre-pharmacy university average, and the Pharmacy College Admission Test (PCAT).
- The MMI at the LDPF is 10 stations, each designed as a seven-minute situational-based interview. Performance at each station is scored on a single 10-point global rating scale.
- Substantial data related to the MMI have been generated during six years of use at the LDPF; this poster will focus on three particular aspects: repeating candidates, student interviewers, repeating stations.

Research Questions

1. For candidates repeating the MMI, how did mean scores change from first to second attempt?
2. Did senior student interviewers rate candidates differently than other interviewers did?
3. When a station was reused in another session, how did mean scores change?

Methods

The University of Toronto Research Ethics Board has approved an annual protocol to study feedback and psychometric analyses of the LDPF’s admissions MMI.

Descriptive statistics were calculated/summarized for selected data from 2010 to 2015 (Table 1). This included the intraclass correlation coefficient (ICC), a measure of reliability, calculated on MMI scores using a 2-way random effects ANOVA, with N = all “candidates” consenting interviewees.

Question 1 Results: Mean score change from 1st to 2nd attempt

- 18 to 29% of interviewees each year (who consented to study) had attended the MMI at least once before, (Table 1)
- For 208 with 2 attempts between 2010 and 2013, MMI scores were an average 6.03/100 points higher (p<.0005), an 11.2% gain:
  - Attempt 1: mean 53.76, standard deviation (SD) 11.11
  - Attempt 2: mean 59.79, SD 11.15
  - 114 (54.8%) were offered admission
  - (Mean MMI T-score for all candidates: 60.0, SD: 11.4)

Question 2 Results: Student interviewers compared to others

- Mean score +/- SD given by student interviewers (n=119) was 5.95 +/- 2.12 compared to 6.13 +/- 2.11 by other interviewers (n=162); this difference was significant (p<.004).

Question 3 Results: Mean score change on reused stations (Table 2)

- 2014: Mean scores for two of the stations (B and C) did not differ significantly, but were significantly lower at the third station (A) (5.99 vs 5.26; p = .02).
- 2015: Mean scores for two stations (E and F) that were reused at a later day in the term, did increase significantly, by 1.00 and 0.70, respectively. The other stations (D and G), repeated on the same day did not show a significant change.

Table 1: Selected MMI Trend Data 2010 to 2015

<table>
<thead>
<tr>
<th>Year</th>
<th># Interviewees</th>
<th># (%) Attending MMI for ≥ 2 years</th>
<th># (%) Admitted after ≥ 2 MMI attempts</th>
<th>Total # admits</th>
<th># 1st time Interviewers</th>
<th># 1st time</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>579</td>
<td>126 (29%)</td>
<td>70 (14%)</td>
<td>238</td>
<td>318</td>
<td>228</td>
<td>0.73</td>
</tr>
<tr>
<td>2011</td>
<td>433</td>
<td>89 (21%)</td>
<td>33 (14%)</td>
<td>241</td>
<td>228</td>
<td>65</td>
<td>0.75</td>
</tr>
<tr>
<td>2012</td>
<td>428</td>
<td>86 (18%)</td>
<td>12 (5%)</td>
<td>235</td>
<td>64</td>
<td>68</td>
<td>0.75</td>
</tr>
<tr>
<td>2013</td>
<td>488</td>
<td>112 (22%)</td>
<td>26 (11%)</td>
<td>235</td>
<td>65</td>
<td>58</td>
<td>0.75</td>
</tr>
<tr>
<td>2014</td>
<td>507</td>
<td>131 (25%)</td>
<td>28 (12%)</td>
<td>237</td>
<td>64</td>
<td>58</td>
<td>0.75</td>
</tr>
<tr>
<td>2015</td>
<td>533</td>
<td></td>
<td></td>
<td>237</td>
<td>65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Stations Reused within Same Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Station</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>A</td>
<td>5.99</td>
<td>5.51</td>
<td>5.61</td>
<td>6.43</td>
<td>5.28</td>
<td>5.87</td>
<td>5.79</td>
<td>5.26</td>
<td>6.00</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2.22</td>
<td>1.97</td>
<td>2.14</td>
<td>1.67</td>
<td>1.92</td>
<td>2.12</td>
<td>2.56</td>
<td>2.78</td>
<td>1.83</td>
</tr>
<tr>
<td>2015</td>
<td>C</td>
<td>5.61</td>
<td>1.93</td>
<td>1.90</td>
<td>1.80</td>
<td>2.48</td>
<td>2.54</td>
<td>2.42</td>
<td>2.38</td>
<td>2.30</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>5.26</td>
<td>5.68</td>
<td>6.18</td>
<td>6.28</td>
<td>5.67</td>
<td>5.69</td>
<td>5.26</td>
<td>5.68</td>
<td>1.82</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>0.00</td>
<td>0.05</td>
<td>0.25</td>
<td>0.00</td>
<td>0.70</td>
<td>0.70</td>
<td>0.01</td>
<td>0.18</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Question 1: Reflection of Six Years of Experience

- Scores for applicants repeating the MMI may increase, on average, by 6 points/100., or 13%. Factors contributing to this may include: familiarity with the process and stations (as some may be reused), preparation courses, increased confidence, self-reflection. Repeated applicants may be identified to the Admissions Committee at time of offer decisions, to enable awareness of this effect.
- Student interviewers did not score applicants more leniently than other types of raters. This counters an impression held by some faculty that students would give higher ratings.
- Use of the same station in different interview sessions in the same year, same day did not lead to higher mean scores; however, when the repeat use occurred on a different day later in the term, the scores did show an increase. This suggests candidates are sharing station content during time between interview days. The reason for a significant drop in Station A score is not clear. Further analysis and review of station selection and scheduling may be warranted.

Limitations: While overall data was collected for 6 years, for each research question only a subset of years was analyzed. Further studies with other years is recommended.

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References


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