Predictors of Success in Post-Secondary Mathematics

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Predictors of Success in Post-Secondary Mathematics

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Introduction and Methods

- Recent research shows ANS, Mental Rotation, and math anxiety influence math testing scores [1, 2, 3]
- Mental Rotation (MR): ability to rotate mental representations of 2D and 3D shapes
  - Press the 'A' key if the image is rotated normally and press the 'B' key if the image is rotated backwards
- The STAR Math algebra assessment was utilized to test a participant’s math abilities
  - This assessment is a computer-based system that consists of 35 multiple choice algebra questions
- The SAT (Scholastic Aptitude Test) measures an individual’s skills in three core areas (Critical Reading, Math, and Writing) to judge their academic preparedness for college
- Participants indicated their SAT Math scores to correlate their STAR Math performance with the predictability of the SAT
- Math Anxiety (MA): feeling of tension and anxiety that interferes with the manipulation of numbers and solving mathematical problems
- Participants filled out a survey asking about their study habits and experiences with math anxiety

Discussion and Conclusion

- All data preliminary due to small sample size (COVID-19 interruption)
- Data shows a strong positive correlation between SAT scores and performance on the STAR Math assessment, indicating a high accuracy in the SAT’s ability to predict mathematical academic success
- A strong positive correlation was found between STAR Math performance and a participant asking a teacher for help
  - This indicates that participants with consistent contact with their teacher improves math performance.
  - This is likely due to more one on one time with teacher and more guided math practice
- A strong negative correlation was found between Mental Rotation performance and STAR Math performance
  - This indicates that Mental Rotation is not an indicator of success in algebra assessments
  - This could be because the assessment is based in algebra and not geometry
- No relation was found with math anxiety or ANS measures.
- Overall, data indicates that SAT is a good predictor of college algebra performance and that willingness to ask a teacher for help improves math performance.

Results

<table>
<thead>
<tr>
<th>ANS</th>
<th>MR</th>
<th>SAT</th>
<th>Ask Teacher</th>
<th>STAR Math</th>
<th>Math Anxiety</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>0.27*</td>
<td>-0.57</td>
<td>1</td>
<td>0.29*</td>
<td>0.75</td>
<td>0.44</td>
</tr>
</tbody>
</table>

Note: *p<0.05; **p<0.01

References