Emotion Regulation Strategies Among Students in STEM: A Pilot Study

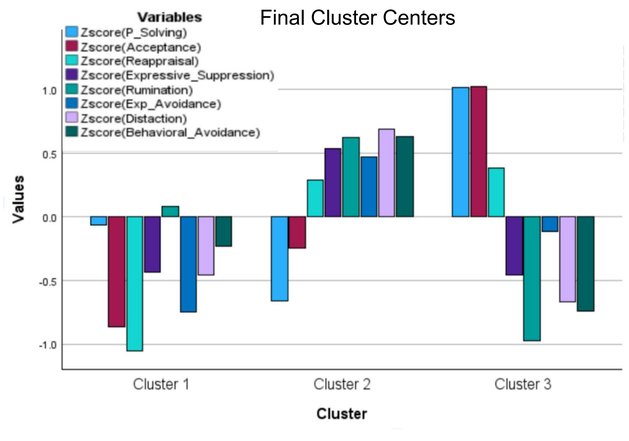
Pia Rugel, Sage Gerretz & Juhee Kim

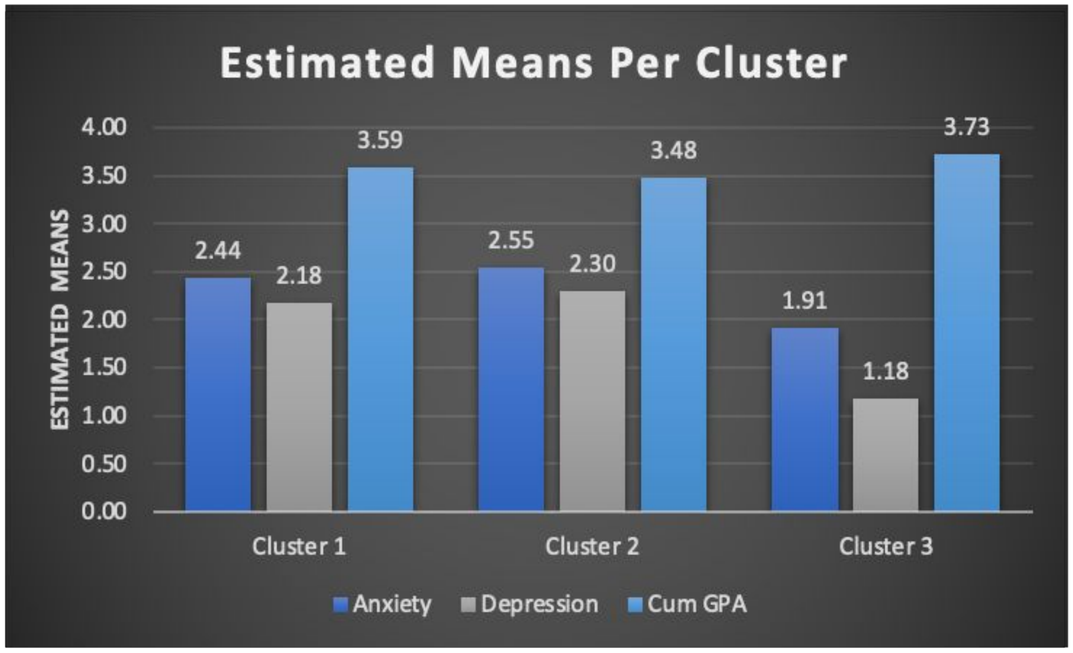
Introduction

Undergraduate students in Science, Technology, Engineering, and Mathematics (STEM) fields are often under immense levels of negative emotions. Their workload and course content are often at higher levels than students in other fields, potentially leading them to use emotion regulation strategies to cope with their negative emotions. Previous researchers have found that the most effective strategy that has positive effects on academic performance and well-being is cognitive reappraisal, while suppression can have the opposite effects. Nonetheless, the effects of each strategy is context-dependent (Pekrun). Given that little research investigated STEM students' various emotion regulation strategy use and their impacts, we examined whether or not using certain types of emotion regulation strategies are helpful in coping with negative emotions possibly caused by STEM student's academic demands, their academic performance, as well as their mental well-being.

Methods

The participants were undergraduate students who had a science, technology, engineering, or mathematics (STEM) major. 79 participants responded to the survey, but 55 of the responses were used due to the ineligibility. Participants received the Qualtrics survey link through their STEM courses. We used existing surveys to examine students' levels of eight different types of emotion regulation strategies, academic performance, and mental well-being. SPSS was used to analyze our data.





Results

Through cluster analysis, we identified 3 unique clusters that demonstrated different levels of emotion regulation strategies. Students in the first cluster, defined as minimal strategy, demonstrated low levels of all strategies except a slight positive level of rumination. Students in Cluster 2, defined as maladaptive strategy, demonstrated low engagement with adaptive strategies, while predominantly using maladaptive strategies. Lastly, students in Cluster 3, defined as adaptive strategy, were characterized by high levels of adaptive strategies with low levels of maladaptive strategies. Based on the cluster analysis, we conducted MANOVA to compare the clusters in terms of academic performance (e.g., GPA) and mental well-being (e.g., levels of anxiety and depression). While other indicators did not show statistical significance, Roy's Largest Root revealed a significant effect ($F(3, 51) = 3.996$, $p = .012$). Further analysis with the Tests of Between-Subjects Effects was conducted to understand the individual impact of the cluster membership on each dependent variable. The results demonstrated that the cluster membership had a significant effect on Depression ($F(2, 52) = 4.980$, $p = .011$) and Anxiety ($F(2, 52) = 3.275$, $p < .05$). However, no significant effects were observed on GPA ($F(2, 52) = 1.130$, $p = .331$).

Discussion

Despite the need for cautious interpretation of our results due to the small sample size, our results underscore the critical role of emotion regulation in educational settings by clearly identifying how various emotion regulation strategies impact students in STEM. Furthermore, as part of our pilot phase, we plan to conduct interviews with students across different clusters to deepen our understanding of the nuances in strategy use and the combined effects of using multiple strategies. These insights will inform the development of more effective support mechanisms for STEM students. After the preliminary phase, subsequent research will build on the insights gained from our pilot study. By employing a larger sample size, we will validate our initial results. This step will also facilitate the creation and application of tailored interventions designed to effectively improve the experiences and outcomes of STEM students.

References