

# INTRODUCTION

- Mental health issues in college students are a very serious issue.
- There are a lack of mental health professionals and resources provided to help these students.
- Roadmap 2.0 is a mobile health software application that offers activities aimed at fostering positive emotions and thinking to support the mental health of college students.
- The software supports the physical, mental, and social health related quality of life (HRQOL).

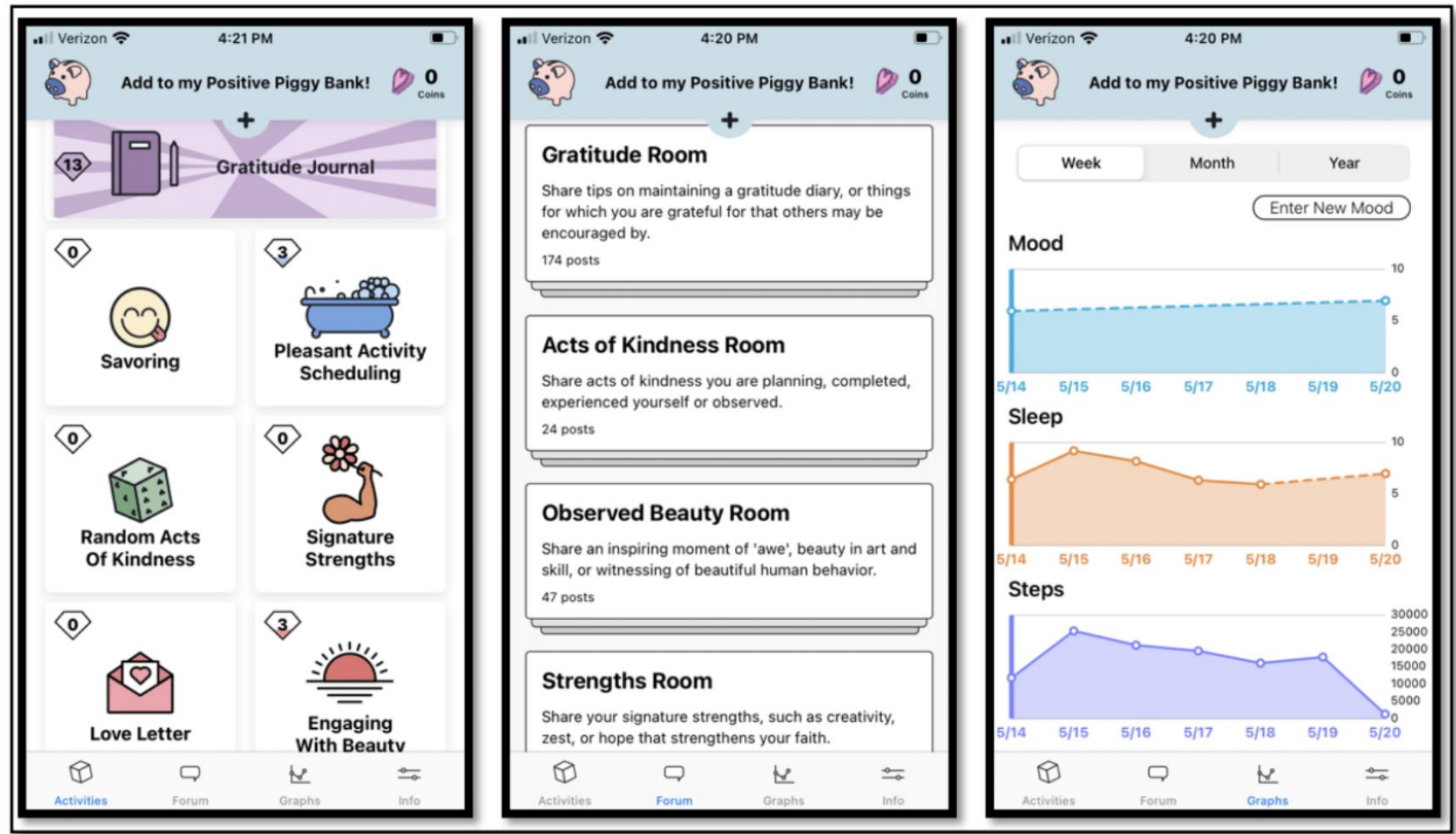
# mHealth App Based Positive Psychology Intervention in College Students May Enhance Human Flourishing

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***Purpose:** To examine whether the usage of the software application Roadmap 2.0 was correlated with mental health outcomes.*



# RESULTS



# METHODS

- Participants were recruited between September 2020 and January 2021, 2,164 students were consented and enrolled at the University of Michigan
- College students (≥18 years)
- Participants wore a Fitbit and downloaded the Roadmap 2.0 software application for 3 months.
- In the app, participants actively engaged in eight unique positive activities designed to boost well-being.
  - Gratitude Journaling, performing Random Acts of Kindness, and Savoring life's moment
- Participants completed mental health surveys in the app.
- The app also enables students to self-report mood and self-monitor activity and sleep patterns using Roadmap
- All data was stored on a secure and private server. Descriptive statistics and longitudinal multivariate analyses were conducted with mental health variables as outcomes

# RESULTS

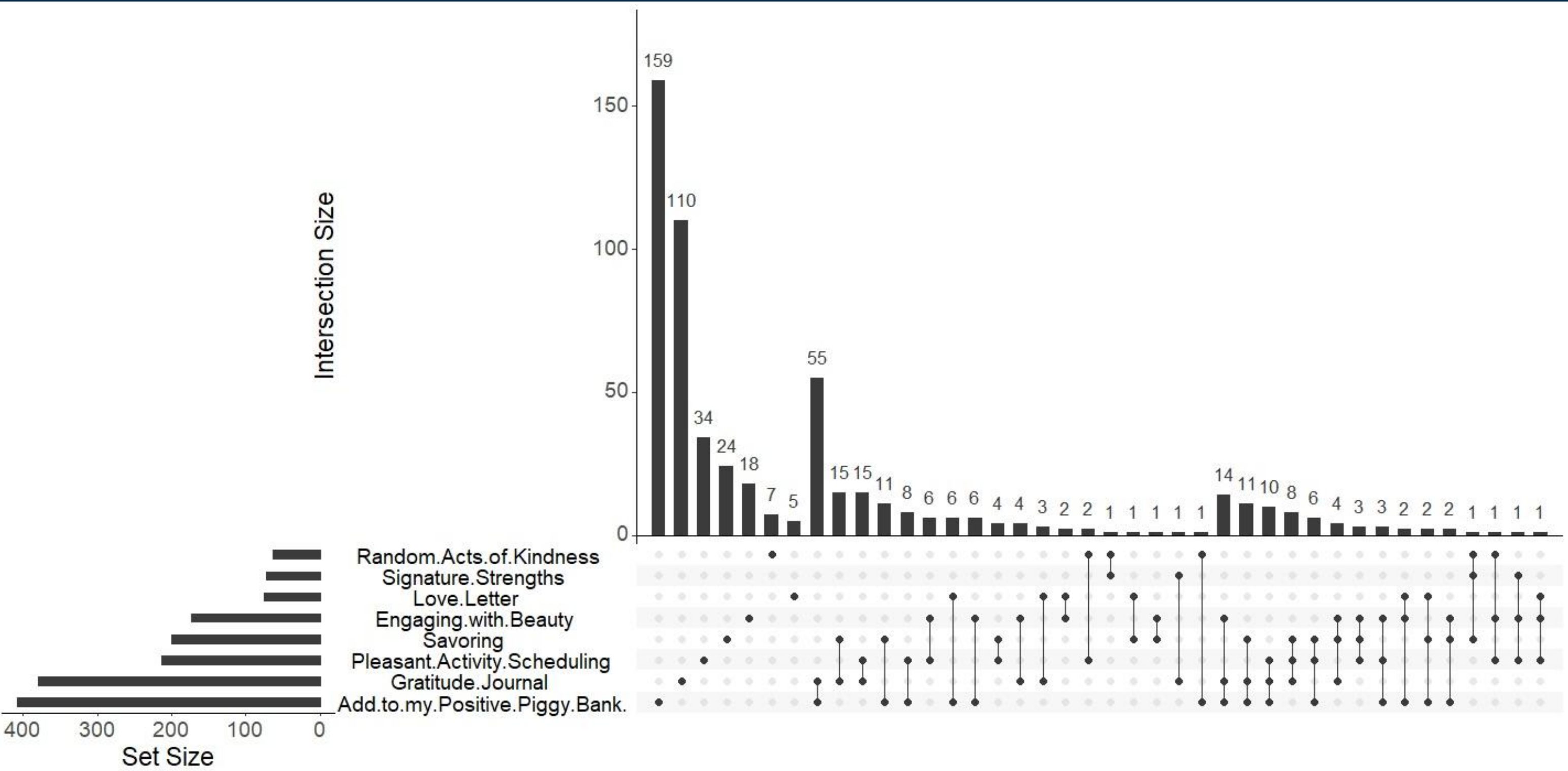
- Over half of the students expressed at least mild depressive symptoms
- The three most common activities used in the app were: Gratitude Journal, Positive Piggy Bank, and Pleasant Activity Scheduling
- There were no significant demographic differences among students using the app. However, Black students were more likely to be depressed and lonely than White students; Asian students reported lower levels of anxiety but also indicated decreased flourishing and increased loneliness; and first-generation students, as well as female and gender non-binary students, were more likely to experience higher levels of depression, anxiety, loneliness, and lower levels of flourishing.
- Students who consistently used the app were more likely to experience a sustained increase in mood ratings and decreased anxiety symptoms

# DISCUSSION

- Student mental health must remain an essential public health priority in higher education and university-based settings, particularly for marginalized populations.
- While these findings need to be validated in a larger randomized controlled trial, they provide promising insight into the potential of such interventions for emerging adults. In future work, we aim to gain a deeper understanding of underlying mechanisms and to identify characteristics of users who may benefit the most.
- An mHealth app-based positive psychology interventions college students may sustain mood and contribute to human flourishing.

# ACKNOWLEDGEMENTS

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Multimedia Appendix II: Fixed Effects Results from Mixed Effects Model

Variables	Estimate	P value
Problem Focused Coping	4.192	<0.001
Emotion Focused Coping	2.266	<0.001
Avoidant Coping	-3.395	<0.001
PHQ Score	-9.130	<0.001
GAD Score	-4.138	<0.001
Loneliness Score	-2.182	<0.001
Age	-1.143	0.079
App Usage	9.158	0.003
<b>School Year</b>		
Undergraduate	-ref	-ref
Graduate	7.699	0.152
No longer a student	1.894	0.808
<b>Gender</b>		
Female	-ref	-ref
Male	-6.615	0.217
Other	5.755	0.037
<b>Ethnicity</b>		
No	-ref	-ref
Yes	1.143	0.215
<b>International Status</b>		
Domestic	-ref	-ref
International	3.355	<0.001
<b>Generation</b>		
Continuing Generation	-ref	-ref
First Generation	-3.252	0.570
<b>COVID Diagnosis</b>		
No	-ref	-ref
Yes	-6.663	0.619
<b>Mental Condition</b>		
No	-ref	-ref
Yes	-1.041	0.052
<b>Race</b>		
White	-ref	-ref
Asian	-3.845	<0.001 ***
Black	-2.345	0.064
AIAN	-4.915	0.485
Multi	-7.066	0.501
Other	-3.955	0.05

Table 1. Demographic Characteristics of Study Participants

Participant Demographics (population, n %)	
Demographics	Year 1
<b>School year</b>	
Undergraduate	1429 (66.04)
Graduate	719 (33.22)
No longer a student	15 (0.69)
N/A	1 (0.05)
<b>Gender</b>	
Female	1467 (67.80)
Male	677 (31.28)
Other	11 (0.51)
N/A	9 (0.42)
<b>Race</b>	
White	1243 (57.44)
Black or African American	94 (4.34)
Asian	652 (30.13)
Multiracial	113 (5.22)
Other	39 (1.80)
N/A	23 (1.06)
<b>Ethnicity</b>	
Hispanic or Latino	210 (9.70)
Non-Hispanic or Latino	1949 (90.04)
N/A	5 (0.23)
<b>Domestic or International</b>	
Domestic	1996 (92.24)
International	163 (7.53)
N/A	5 (0.23)
<b>First or continuing generation</b>	
First generation	541 (25.00)
Continuing generation	1617 (74.74)
N/A	6 (0.28)

<sup>a</sup>P values are representative of a chi-square test performed for the entire study population.