WearDuke: Promoting Wellness Through Mobile Health Technology in a College Student Population

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Overview of Initiative

What is WearDuke?
An initiative designed to promote healthy living through student engagement with wearables & novel learning opportunities.

Pilot 1 Methodology (2019-2020)
*Goal: to assess feasibility and acceptance of using a wearable with a companion app to record rest and activity habits.
*All Gilbert Addoms first year residents invited to participate.
*Participants were given wearables (Apple Watch or Fitbit) to measure their rest and activity.
*Participants answered weekly surveys on topics such as sleep, general health, mental health, caffeine intake, and academics.

Pilot 2 Methodology (2020-2021)
*Initial plan was to invite two first year residence halls to participate and evaluate a range of interventions to improve healthy habits, using data from wearables and survey questions to monitor the interventions' impact.

COVID-19 caused a significant change in the methodology.
*All Duke undergraduate and graduate students were eligible
*Wearables were not provided to participants. Instead, rest and activity was monitored using data collected from survey questions and iPhone fitness data.
*Data from this pilot is currently being collected and will be examined by next year's Bass Connections team.

Data Analysis Methodology for Pilot 1

- Statistical analyses were completed by project statisticians and interpretation completed by the Bass team.
- General summary statistics were generated for all survey questions and relationships were examined between responses and gender, school (Trinity vs Pratt) and major (STEM vs non-STEM).

Selected Pilot 1 Results
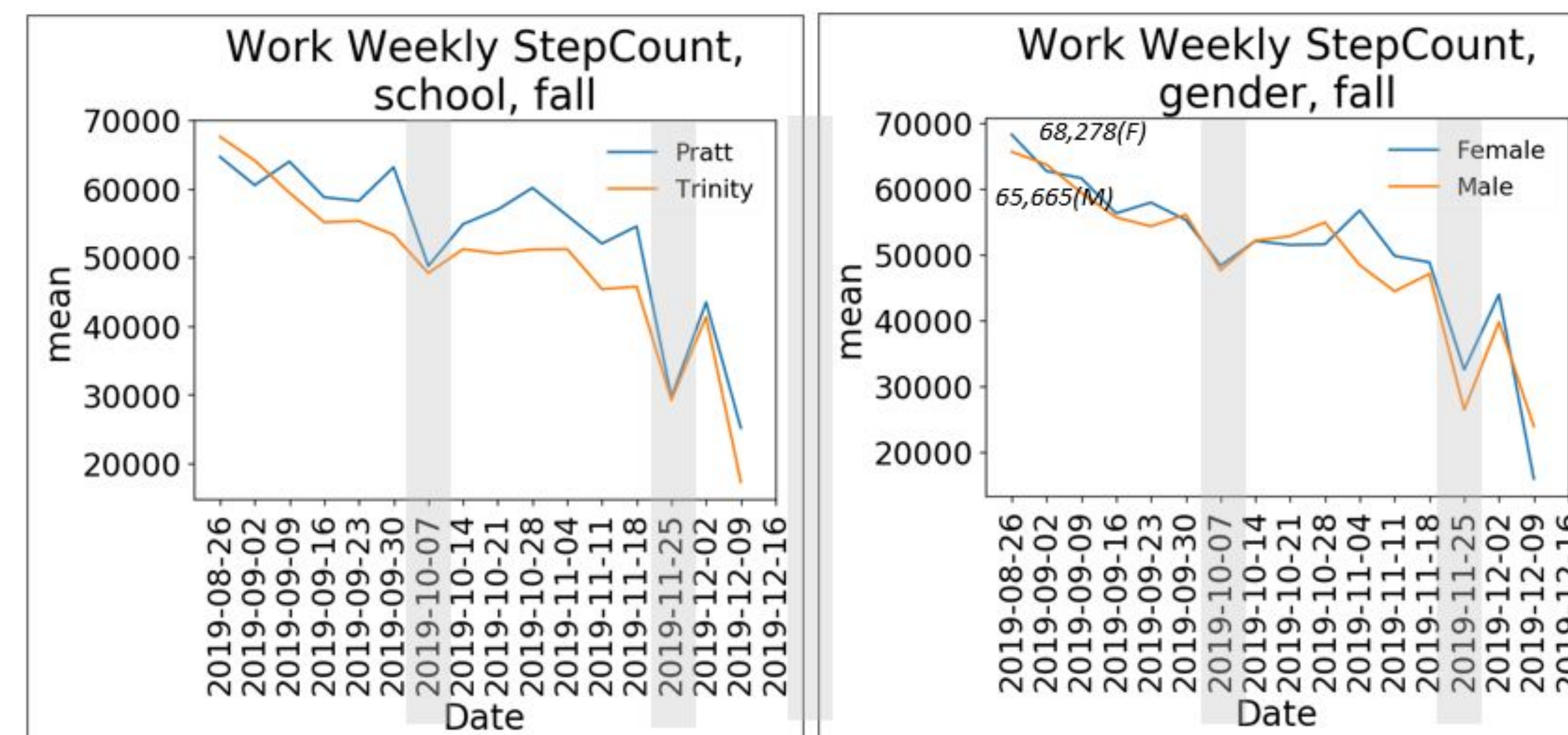
Table 1. Step Count by School and Gender

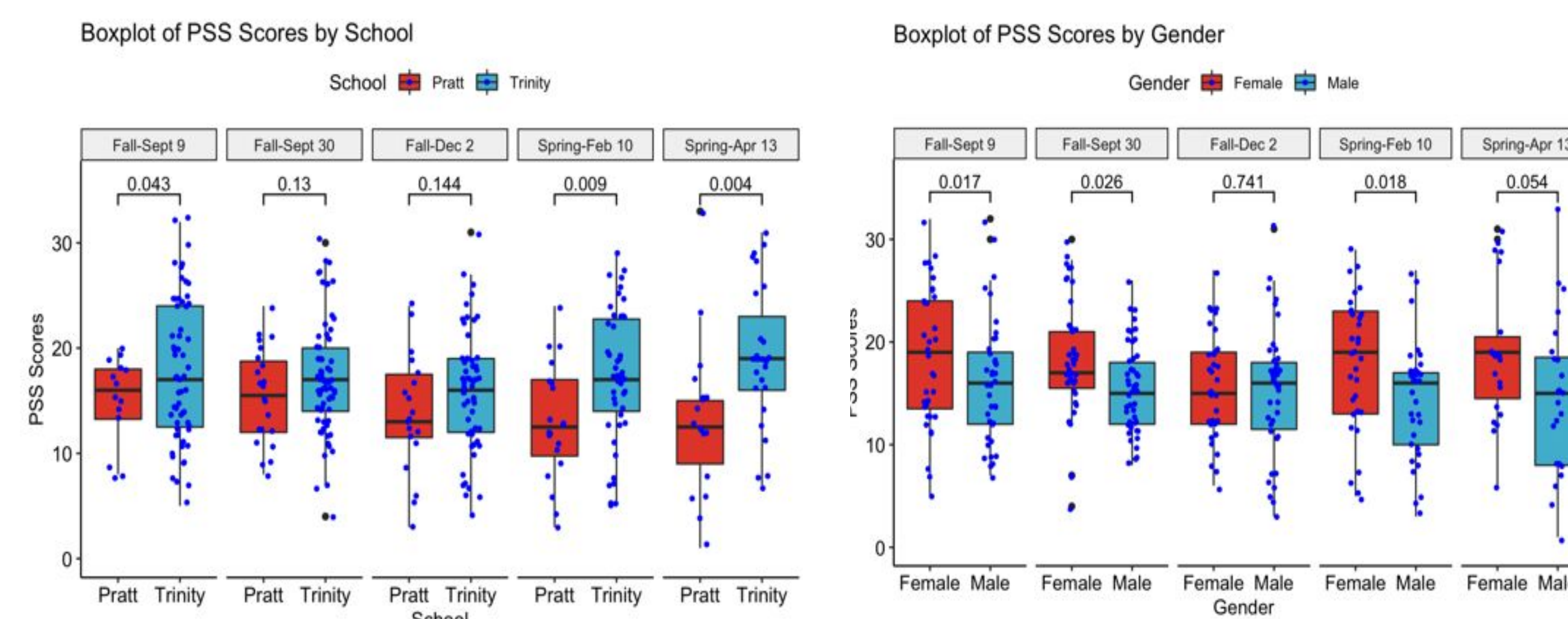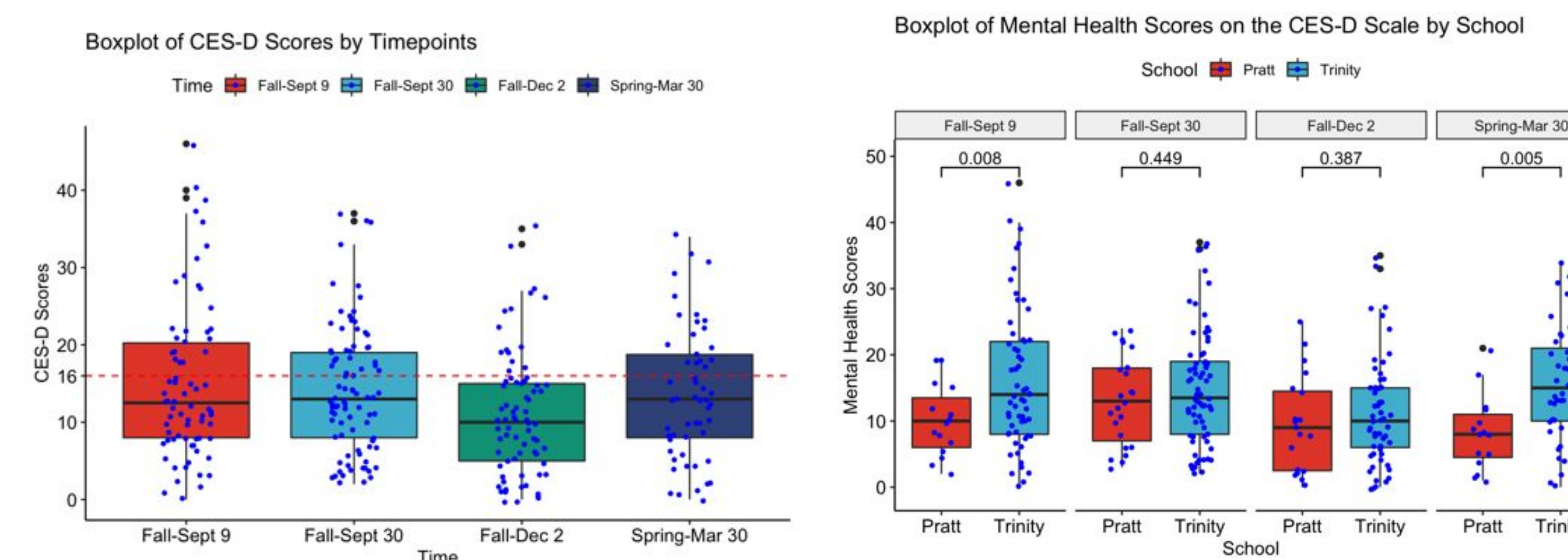Table 2. Perceived Stress Scale (PSS) by School and Gender

Table 3. CES-D (Depressive) Scores Throughout Fall Semester, and by School

Discussion of Pilot 1 Results

- Pratt students consistently report higher average step counts than Trinity students. We speculate that this difference is because engineering buildings are usually further away from the main Duke West Campus bus stop than Trinity buildings.
- Females consistently scored higher than males through the fall semester on stress scores. However, this difference is consistent with reported national college PSS averages
- It is interesting that Pratt students also consistently report lower stress than Trinity students (Sept 9th: p = 0.043; Feb10: p = 0.009; April 13th: p = 0.004). We speculate that this is because our Pratt sample had a higher proportion of males, who generally report lower PSS scores, which may result in a lower average PSS score than Trinity students.
- The CES-D survey showed that students experienced stable levels of depressive symptoms throughout September, and reported lower depressive symptoms in December.
- Trinity students consistently reported higher (worse) scores in depression compared to Pratt students, although only the Sept 9th (p = 0.008) and March 30th (p = 0.006) data points were significant. This difference is in line with the trends observed from the PSS survey results.

Literature Review

We conducted a literature review on the use of mHealth in children and young adults to address the following questions:
- What trends exist in interventions / technologies used with certain age groups, study purposes, and demographics?
- What challenges have been reported about the use of this technology in promoting wellness in children, adolescents, and young adults?

Results:
- 54 studies included in final analysis.
- Mobile applications were the most common intervention type (55%; n=30) and sexual/reproductive health was the most common purpose (22%; n=12).
- Among the 15 US-based studies reporting population racial/ethnic diversity, 40% (n=6) looked exclusively, or almost exclusively, at non-white populations, defined as having a white percentage between 0-20%. Self-monitoring and self-reporting results was the most commonly reported challenge (30%, n=16), and homogeneity in the study population was the most commonly reported limitation (28%; n=15).