

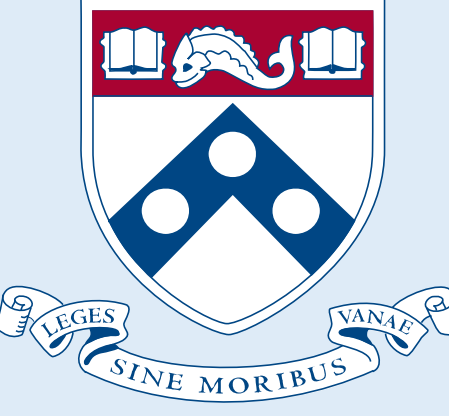
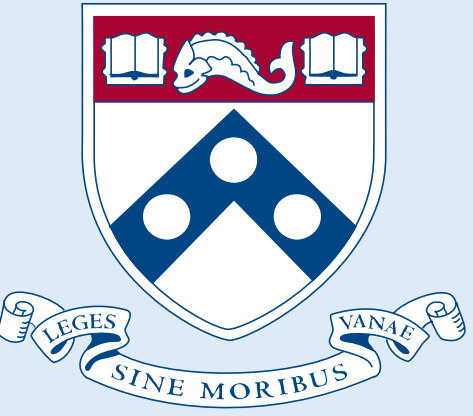
PennAWARE: A Novel Application for Studying Stress Responding in Daily Life

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INTRODUCTION

- Stress sensitivity has been established as a risk factor for anxiety, but little is known about how it unfolds in real time. (Farmer & Kashdan, 2015)
- With rising concern about anxiety in college students, it is important to understand how risk factors manifest in daily life.
- The open source AWARE Framework includes an iOS app that facilitates passive sensing studies using phone sensors. The app also has an interface for administering scheduled ESM (experience sampling method) surveys. (Ferreira, Kostakos, & Dey, 2015)
- To capture stress responses as they unfold in daily life, the AWARE Framework had to be modified to (a) allow follow-up surveys and (b) align surveys with users' daily schedules.

METHODS

- New functionalities were added to the modified app, now PennAWARE, that were not available in the original framework. These included:
 - Follow-up surveys at fixed intervals after a random, initial survey
 - Allowing the user to manually set their wake-sleep times
 - Sending surveys randomly within evenly spaced intervals throughout the user's waking hours
 - Giving users the option of a 5-minute extension for each survey window
- The app was then beta tested in a pilot study. ($N = 9$)

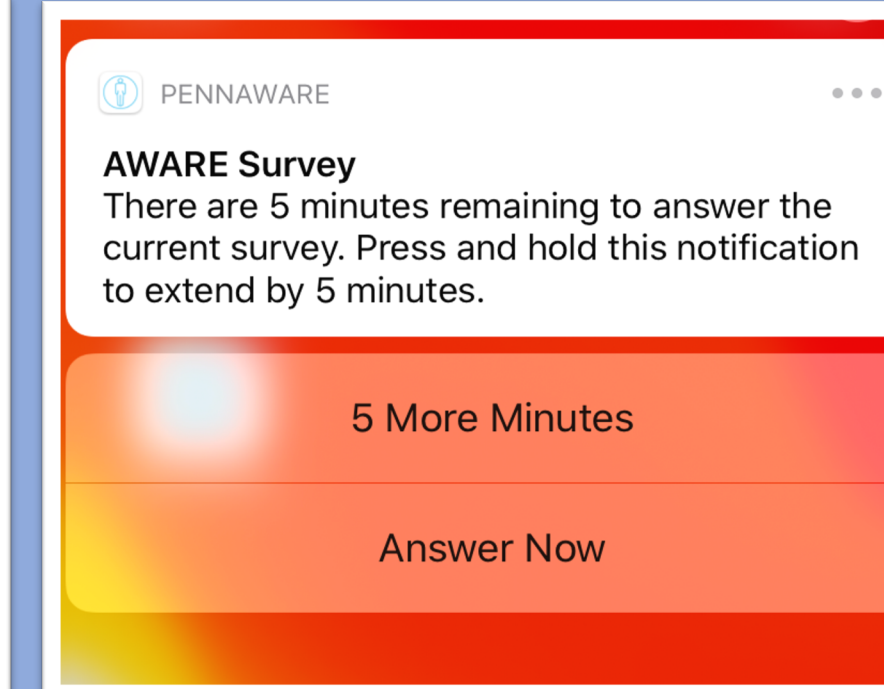
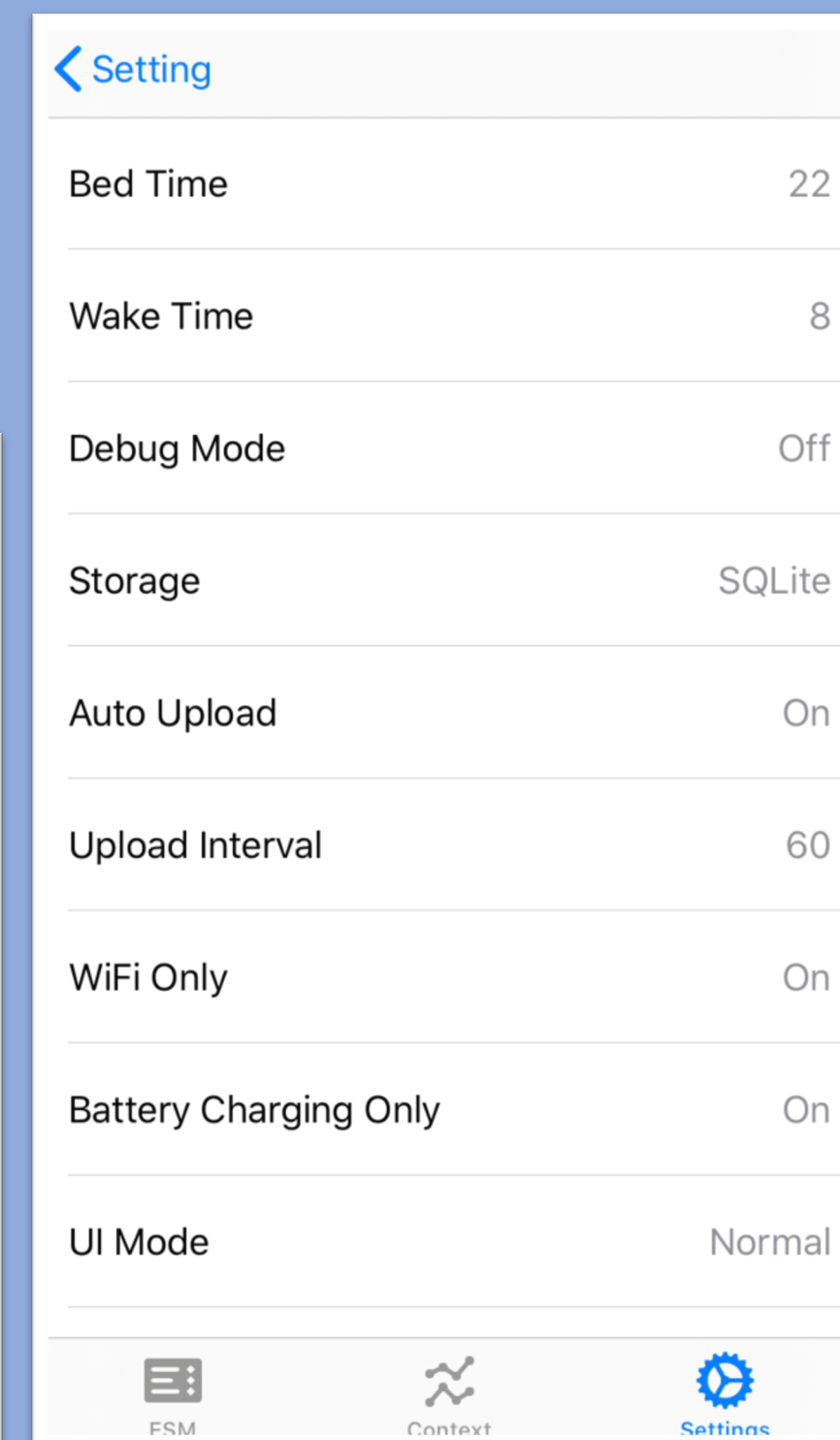
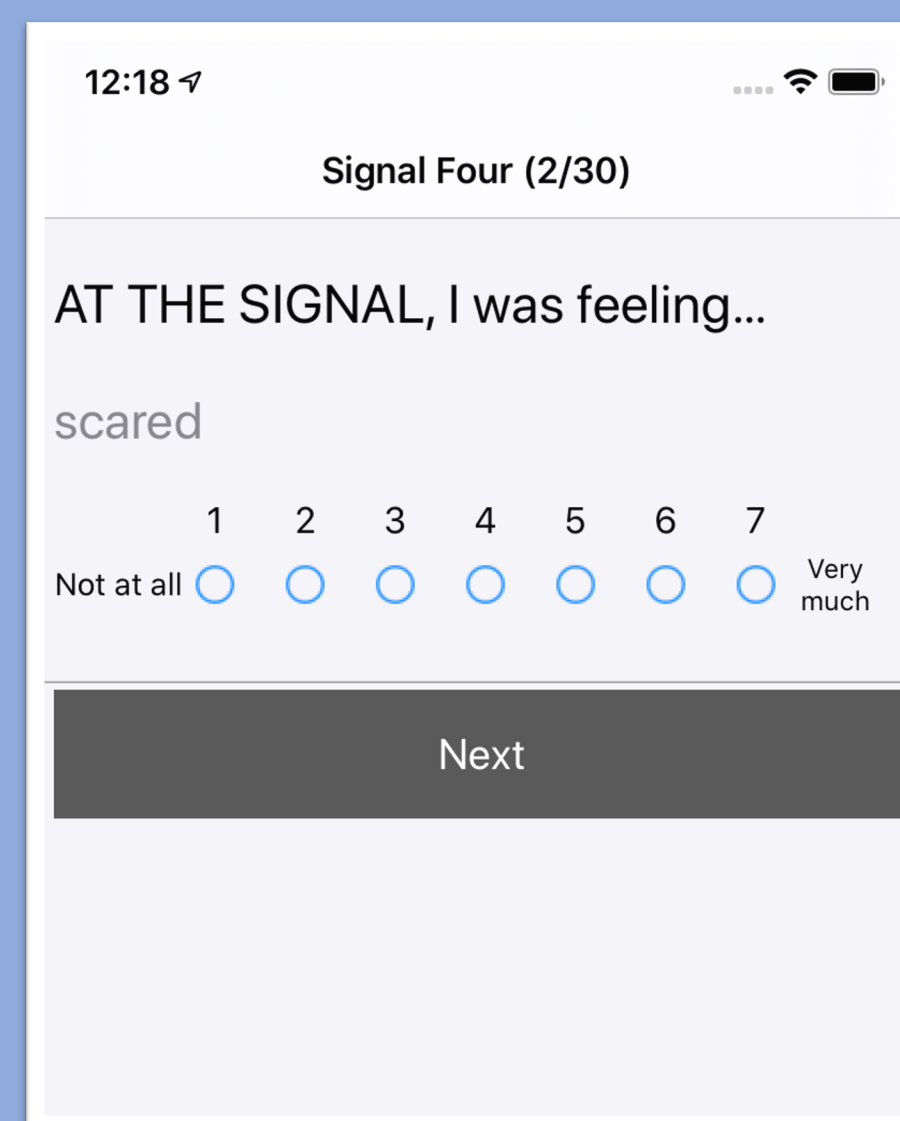
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The addition of follow-up surveys to experience sampling studies allows the change in stress-related processes to be examined in real time.

Screenshots from PennAWARE

Below: The AWARE Framework provides an interface through which users can answer surveys about their day.

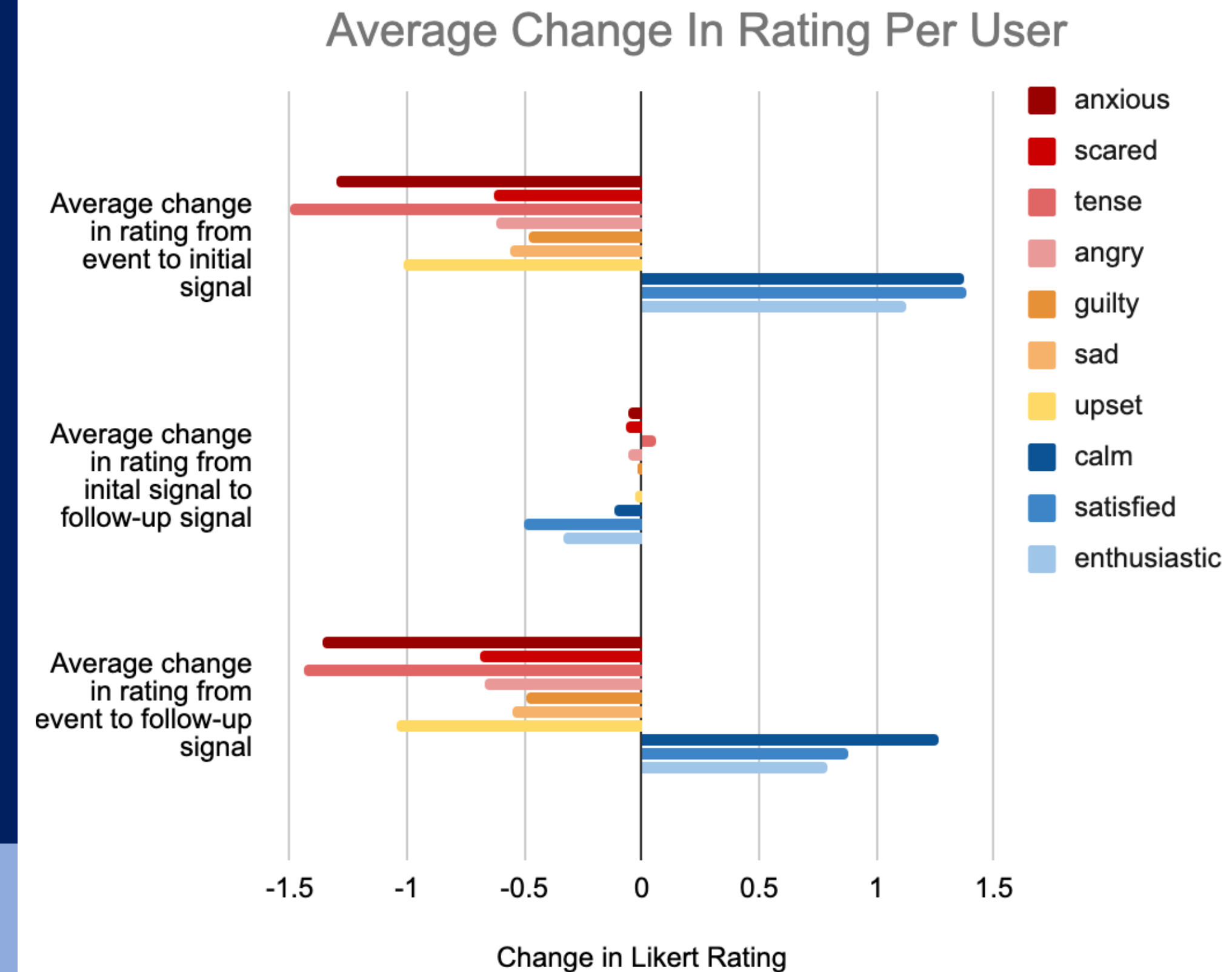


Above: Users are given the option to extend the validity window of a survey by 5 minutes in case they are unable to answer in the given timeslot.

Left: Users can input their "Bed Time" and "Wake Time" to ensure ESM surveys arrive during the hours they are awake.

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RESULTS



DISCUSSION

- The addition of follow-up surveys allows affective processes to be examined.
- The greatest average change in rating was observed between the participant's event report ratings (the reflective rating of their emotions during a recent stressful event) and the participant's ratings of their emotions at the time PennAWARE signaled their initial report.
- Negative emotions (shown in red/orange) decreased while positive emotions (blue) increased, suggesting a return to baseline after the initial reaction to the stressful event.

LIMITATIONS AND FUTURE DIRECTIONS

- Sample size was small for the pilot study, which may limit the ability to make generalizations from the data.
- Plans are underway to use PennAWARE to study a large sample varying widely in stress sensitivity.