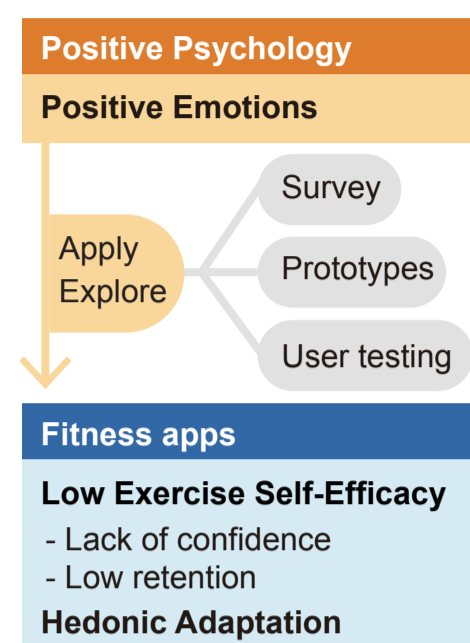# Investigating the influence of design to prolong positive emotions and prevent hedonic adaptation in fitness apps to sustain wellbeing

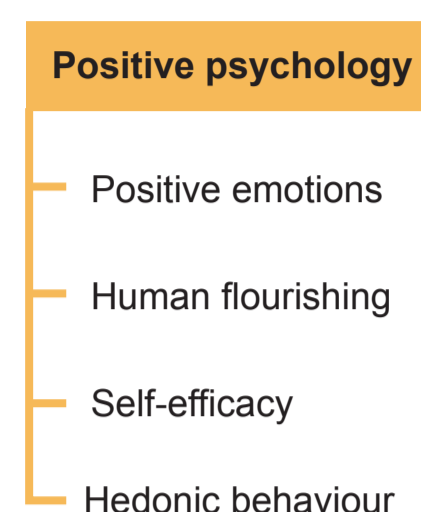Author: Tsai-Hsuan Lu | Supervisor: Dr Jennifer George

Abstract

The purpose of this project applies positive psychology to explore the feasibility of the design solutions for low exercise self-efficacy users with low retention in fitness apps. The explored design solutions are based on positive psychology, positive emotion, the hedonic adaptation prevention model, survey, and usability testing.

This study contributes to a better understanding of eliciting positive emotions, which benefit the mental and physical health of fitness app users.

Positive Psychology
- Positive Emotions
- Apply / Explore → Survey, Prototypes, User testing

Fitness apps
- Low Exercise Self-Efficacy
  - Lack of confidence
  - Low retention
- Hedonic Adaptation

Introduction & Background

Positive psychology
- Positive emotions
- Human flourishing
- Self-efficacy
- Hedonic behaviour

Positive Psychology

Positive psychology relates to positive emotions, and the previous studies suggest that experiencing positive emotions (such as joy) is an essential component of human flourishing, and it supports people's development of their lasting personal resources, including physical and intellectual.

Self-Efficacy

The definition of self-efficacy is people's beliefs about their capabilities to successfully achieve their specific action goals. Moreover, low self-efficacy has been identified as one of the important psychological factors that users unwilling to explore the fitness apps, and positive psychology benefits people's self-efficacy.

However, there are only a few fitness apps that incorporate positive psychology.

Hedonic Adaptation Theory

Hedonic adaptation is a phenomenon that describes how humans adapt quickly to new stimuli and become insensitive to them. Therefore, for someone to experience an emotion like happiness or excitement, the stimulus must be more intense than the previous stimulus.

If users experience hedonic adaptation, this may impact users perceiving positive emotions and wellbeing.

The Hedonic Adaptation Prevention (HAP) Model

The more variable the small positive events that flow from the initial change, the more likely they will continue to produce positive emotions.

Continuing appreciation of the positive change (such as new weight loss) can inhibit rising aspirations.

Happiness is best pursued by extracting the most possible from the present, before turning one's attention to the future.

Research Question

How to apply positive psychology in fitness apps to explore the feasibility of the design solution for inadequate exercise self-efficacy users with low retention?

Objectives

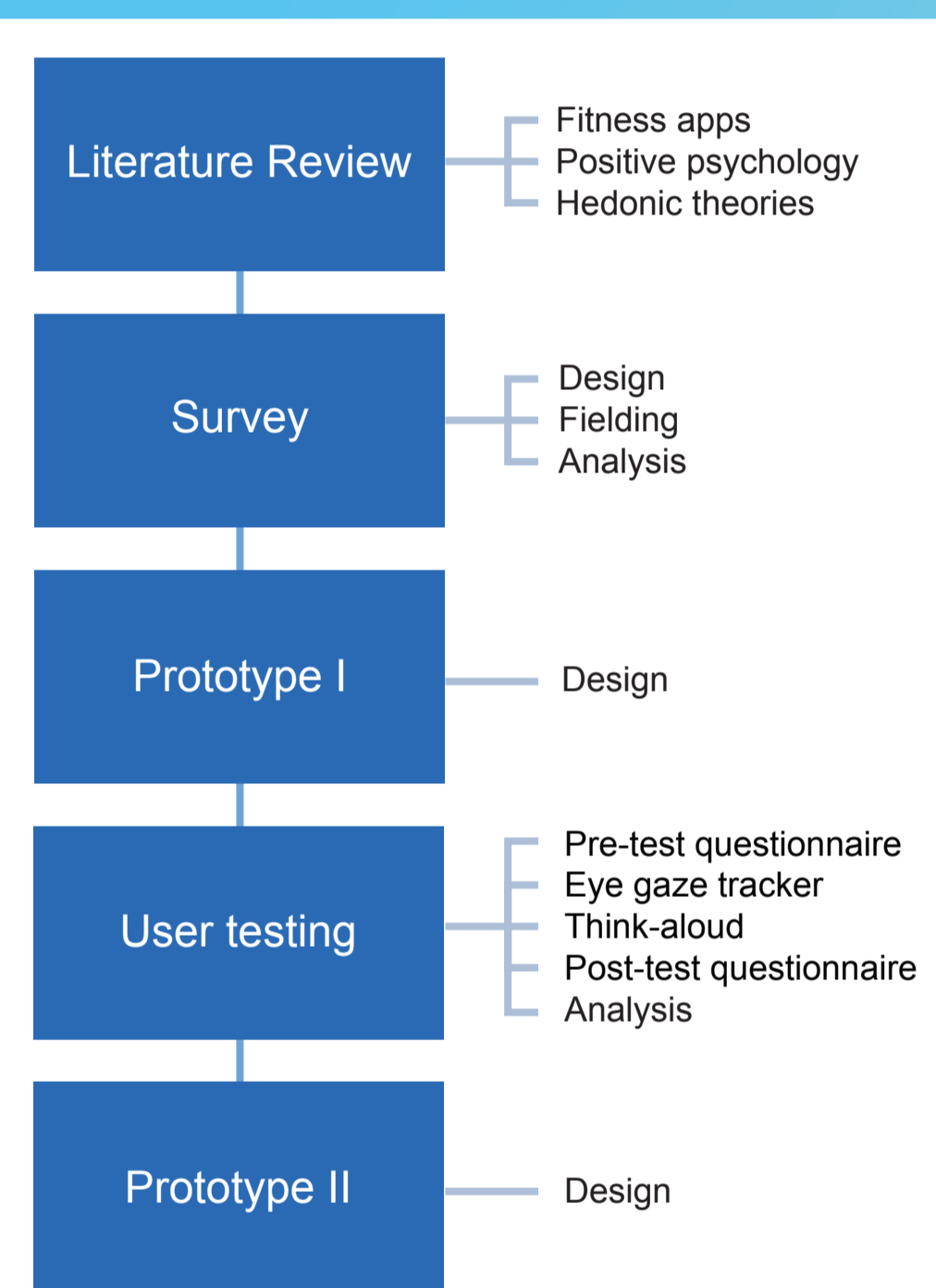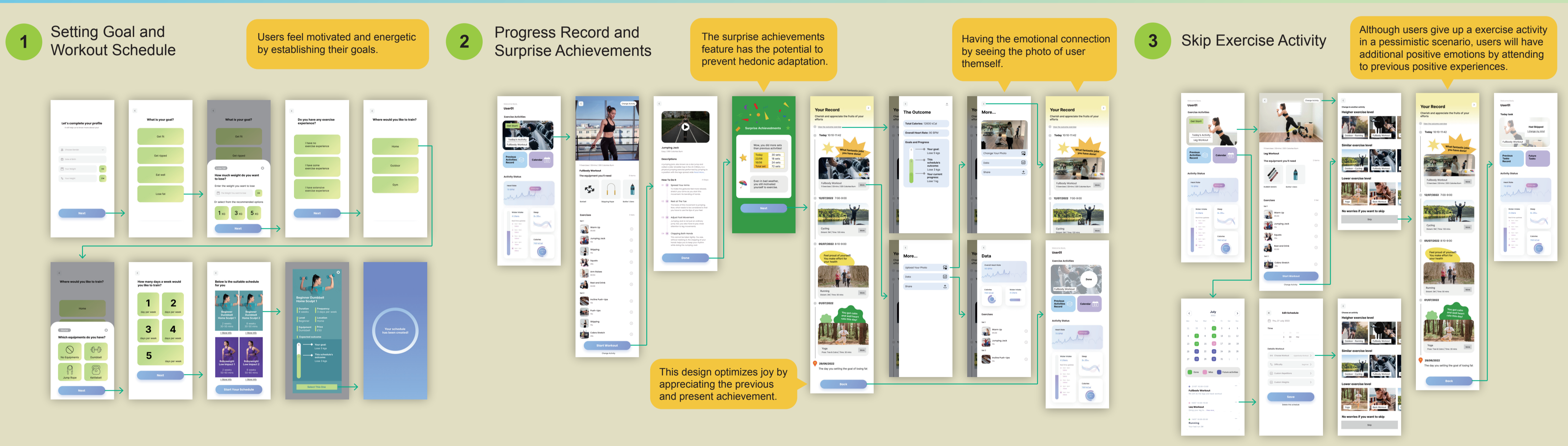| Objective	Method
Understanding retention / hedonic adaptation of fitness app usage	**Method:** Literature review, survey
Investigating how positive psychology relates to fitness apps	**Method:** Literature review, survey, eye gaze tracker
Exploring the feasibility of the design solutions	**Method:** Design, eye gaze tracker, analysis

Study Methodology

- **Literature Review** — Fitness apps, Positive psychology, Hedonic theories
- **Survey** — Design, Fielding, Analysis
- **Prototype I** — Design
- **User testing** — Pre-test questionnaire, Eye gaze tracker, Think-aloud, Post-test questionnaire, Analysis
- **Prototype II** — Design

Prototype Design

1 Setting Goal and Workout Schedule

Users feel motivated and energetic by establishing their goals.

2 Progress Record and Surprise Achievements

The surprise achievements feature has the potential to prevent hedonic adaptation.

Having the emotional connection by seeing the photo of user themselves.

This design optimizes joy by appreciating the previous and present achievement.

3 Skip Exercise Activity

Although users give up a exercise activity in a pessimistic scenario, users will have additional positive emotions by attending to previous positive experiences.


Existing fitness apps usage survey

86 individuals responded to the questionnaire, 25 of them were invalid responses, and therefore **61 responses were used**.

These 61 responses reviewed 106 fitness apps, and 2 fitness apps' reviews were excluded. In total, **104 fitness apps' reviews were effective.**

Questionnaire

Demographic - Gender + age	**Hedonic adaptation** - 2 questions
Exercise self-efficacy scale - 9 questions + 3 questions	**Positive emotion** - 23 questions
The number of fitness apps have used - 1 question	**Negative emotion** - 8 questions
Existing fitness apps usage - 6 questions (per app)	**Open questions** - 2 questions

Result

Demographic

57% Female 43% Male 70% 18-34 years old
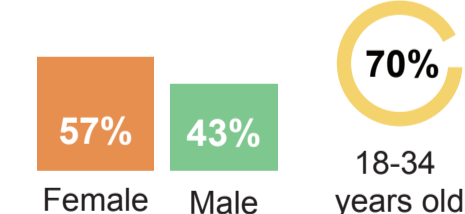
Users' Feedback

There are overall explanations from users on their positive and negative emotions on different design features. A fitness app design guideline can refer from this synthesis data.

Hedonic Adaptation

The data supports hedonic adaptation exists in about **half** of usage.

How positive psychology relates to fitness apps

► **The underlying mechanisms**

"Freedom and ability to experiment", "pursuing goals and rewards", "achieving goals", and "greater self-awareness" are significant important factors for users to experience the app and continue to keep using it.

► **Feeling of joy**

To prolong joy in fitness apps, providing the experience of **"confidence", "making a breakthrough"** are especially important.

► **Positive design framework**

In the positive design framework, **pleasure, personal significance, and virtue** are also identified as important factors by users.

Testing & Evaluation

Procedure

Participants Recruitment

Number of participants: 1 (pilot test) + 6

18-34 years old
- Based on the primary users' age of fitness apps gathered from the survey

Low exercise self-efficacy
- The data of exercise self-efficacy level were collected from the scale in the survey.

Pre-test questionnaire
- 20 questions

User testing tasks
- 3 Tasks
- 4 Hypothesis

Think-aloud
- Sound recording

Eye gaze tracker
- Heat maps

Post-test questionnaire

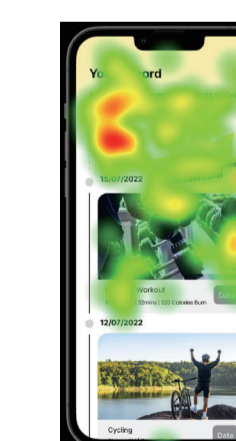**The evaluation of each user testing task**
- 28 questions

The evaluation of overall user testing task (PANAS-X)
- 64 items

Interview
- 3 questions

Research Results

The data of the post-test questionnaire provides evidence that this design successfully elicited users' positive emotions, and has the potential to prevent hedonic adaptation.

In addition, the results from think-aloud, eye gaze tracker, and interview indicate the usability problem and provide the direction that how to optimize the prototype.

← Heat map

Conclusions & Future Work

This study explores the feasibility of the design solutions linked to positive psychology and hedonic adaptation prevention. To sustain users' wellbeing, it is suggested the design of setting goals and workout schedules should provide different situation options; the exercise plan should be flexible and adjustable by users; it is recommended to add a feature that notices surprise / unexpected achievements. The progress record plays an important feature to prolong users' positive emotions because it can optimise joy by appreciating the previous and present achievement.

However, the limitation is that there are other design features and psychological factors that may also influence users' intention on apps, so it is recommended future work explores more feasibility of design solutions. Another limitation is that user testing is only conducted in a short term, the long-term influence on the emotion from the design needs more experiments.