

UX Research Portfolio

06/2022 • Jisoo Lee

Hello!

I am a UX design researcher, equipped with **qualitative and quantitative research methods**.

With evidence-based research competence and solid foundation on design thinking, I understand users in their broad and deep context, and produce ideas for useful/usable/enjoyable solutions.

In industrial /applied research settings, I worked on a number of problem domains including: lifestyle improvements, learning of software tools, context-aware services, product design evaluation, etc.

I am currently working as a freelance researcher based in the Bay area, CA. I earned my Ph.D. in Human Computer Interaction at Arizona State University. Before I studied Industrial Design at KAIST, Korea.

Generative & Evaluative research

I conduct user research for all phases of the product development process: from open explorations to validation-oriented study.

Qualitative & Quantitative research methods

I carefully choose methods considering both efficacy and availability. I utilize a broad set of methods, from in-depth interview to statistical modeling.

- In-depth interviews
- Diary studies
- Ethnographic field studies
- Competitive analysis
- Surveys
- Usability studies
- A/B testing



Case Study 1.

Fitness Tracker Use by People with Multiple Sclerosis

- Early stage of product development
- **Need discovery** with interview study
- **Concept validation** with field study



Case Study 2.

Will technology-augmented “self-nudging” be helpful?

- Middle stage of product development
- **Effectiveness test** with comparative field study

Case Study 1.

Fitness Tracker Use by People with Multiple Sclerosis

Problem

People with multiple sclerosis (MS) are often inactive. In tackling this issue, a fitness tracker is considered promising. But, **what challenges** will patients have? **What can lead to the most benefits** from use of a tracker?

Process

Explore (**in-depth interview**) → Ideate (affinity diagram, brainstorming) → Prototype (proof of concept) → Test (**field study**)

Outcome

- We proposed a tool for goal setting, and confirmed demand for it.
- Our work was presented in a prestigious conference (CHI 2016 Conference on Human Factors in Computing Systems).

Funding: Agile Project Grant subaward funding received through the Health Data Exploration project (Robert Wood Johnson Foundation)

Team

It was a collaboration between Arizona State University¹ and PatientsLikeMe² (www.patientslikeme.com)

- Jisoo Lee¹: Creation of study protocol, data analysis / synthesis
- Erick Hekler¹: Project lead
- Emil Chiauuzzi²: Project lead
- Auriell Towner²: Conduction of studies

Date: April, 2015 ~ Jun, 2015

Case 1: Tracker + People with MS

Exploratory Interview Study

Method

We conducted a **1-hour semistructured interview** to understand how people with MS manage their physical activity and MS challenges.

For recruitment, we invited people with MS who **used a fitness tracker at least one month** prior to beginning of the study.

The interview data were analyzed as follows:



The audio recordings were converted into notes.



Two researchers individually found high-level recurring themes, and then reviewed together to resolve discrepancies.



A report was made to share with the team, and identify challenges to focus on.

Results

7 participants completed the interview (female = 6, male = 1 ; age range 50 – 68). The length of time since diagnosis ranged from 9 to 37 years, with mild-to-moderate disability.

Top themes

- Participants came up with strategies to manage life fluctuations.
- Despite these strategies, many reported **both 'overdoing' it and 'underdoing' at times.**

" Last week I weeded the garden for 3 hours and couldn't believe it. The next day I felt so crappy that I had to skip volunteering the next day. "

- Many participants reported that the device became part of their everyday life.
- The specific frequency with which they viewed the data varied.
- No patients mentioned using the 'Goal' feature within the device.

Case 1: Tracker + People with MS

Approach

We decided to focus on patients' overdoing & underdoing issue.

There were times when activities caused them to 'overdo it,' resulting in worsening symptoms. Meanwhile, patients also worried about 'underdo it.'

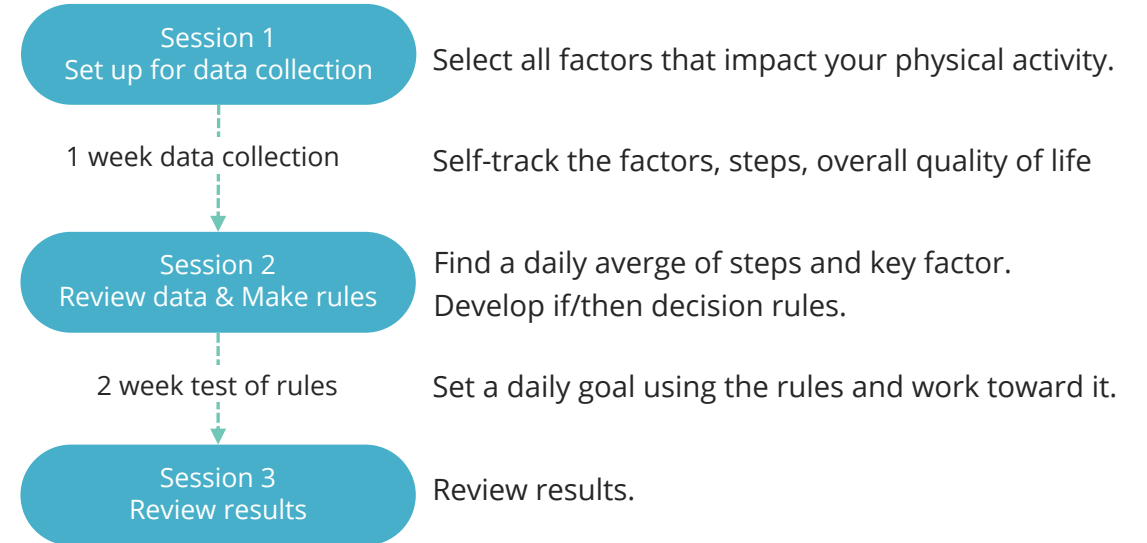
We shaped an approach that helps people with MS **generate rules to define their daily "sweet spot"** of steps to take.

Example of user-generated rules

"With 3000 average daily steps, if pain is mild then stick with the average, if no pain then goal=3,500, if pain is severe goal=2,500"

Intervention

For testing of the approach, we implemented a course-based intervention, which consists of **three sessions over a three-week period**.



Case 1: Tracker + People with MS

Field Study > Measures & Analysis

We evaluated the intervention with people with MS: 3 criteria, qualitative and quantitative measures

Evaluation Criteria	Measures	Analysis
Demand Practicality	(Qualitative data) <ul style="list-style-type: none">• Daily journal records• Exit interview*	Combination of deductive and inductive coding (i.e., grouping by topics of interest a priori & data-derived themes based on participant perspectives)
Efficacy	(Quantitative data) <ul style="list-style-type: none">• Target steps• Tracked steps	<p>Descriptive summary of tracked steps (mean, median, coefficient of variation)</p> <p>Daily match success or failure (concordance between daily goals with device measured activity within a +- 20% range)</p>

* The interview involved:

- understanding the patient's perception of what they felt they learned the past 2 weeks
- how the rule impacted them on a daily basis,
- if they felt they found their sweet spot
- a brief discussion related to their overall experience with the course (what worked and did not work).

Field Study > Results

19 participants started, and 12 completed the course (female = 11, male = 1; age range 44 – 64).

Demand

Participants appreciated the rules idea.

"I gained more insight into myself and what motivates me...what hinders me more than any other time in my life"

Practicality

Some commented on the burden of daily measurement, and difficulty to fully anticipate issues that would arise later in the day.

Efficacy

We found mixed results in the mating rating; 6 out of 12 participants achieved their “sweet spot” target 50% of the time or greater.

Participants	Days	Mean	CV ¹	Match	Match Rate
1	13	3589	47	9/13	69%
2	14	6978	12	12/14	86%
3	13	5117	33	3/12	25%
4	15	2019	40	4/13	31%
5	14	14,625	15	9/14	64%
6	13	2694	48	1/10	10%
7	14	5400	32	4/9	44%
8	14	3290	26	9/14	64%
9	20	4163	62	2/13	15%
10	14	2225	29	9/14	64%
11	14	13063	31	5/6	83%
12	13	3644	25	3/11	27%
Mean		5567	33	-	49%

¹CV (Coefficient of variation) = Standard deviation (SD)/mean a measure of variability in relation to the mean.

Case 1: Tracker + People with MS

Design Considerations

There was **a need for a rule-based adaptive goal-setting strategy** for people with MS, and plausibly other patients with chronic pain.

There should be a tool that allows users to collect **data with less burden**, and find **meaningful aspects easily** to define/refine better goal-setting rules.

It may be necessary to devise rules that can be even more adaptive to fluctuations within the day. This could enable **"half- successes"**, especially for people with higher variability in symptoms.

While pursuing scientific rigorousness for this so-called self-experimentation, designers should not forget individuals' different **capabilities / preferences** in handling it.



Case Study 2.

Will technology-augmented “self-nudging” be helpful?

Problem

We had developed **tools to support people’s creation** of habit change solutions. Then, it was required to **investigate effectiveness** of them.

Method

7-week experiment comparing three conditions (one control, two treatments)

Outcome

- We confirmed the effectiveness of our proposals, and obtained insights on how to improve them.
- Our work was presented in a prestigious conference (CHI 2017 Conference on Human Factors in Computing Systems).

Funding: Google Research Faculty Award (Principal Investigator: Hekler).

Team: I worked through from the whole process, under guidance of Eric Hekler, Arizona State University.

Date: Mar, 2015 ~ Sep, 2015

Case 2: Technology Nudge

Our Proposals

We established **two levels of a behavior change solution**, and developed a support for each: tutorial for behavioral plans and toolkit for just-in-time apps.



Tutorial for behavioral plans

Step-by-step planning with behavior change techniques presented with text and audio.



Toolkit for just-in-time (JIT) apps

Prototyping of simple rule and event-based systems that include physical sensing, data storage, and media event components.



Experimental Conditions

We conducted a **comparative field test**. Improving sleep quality was chosen as a study domain. Participants were randomly assigned to one of three conditions.

Review sleep hygiene information

Choose habit targets, e.g., Do not use phone close to bedtime

Condition 1

Make plans on their own way

Condition 2

Make plans with the tutorial

Condition 3

Make plans with the tutorial

Create JIT apps

Case 2: Technology Nudge

Participants

We recruited users with **sleep complaints but no diagnosed** sleep disorder.

Part 1. On Your Sleeping *Part of the screener*

During the past month, what time have you usually gone to bed at night? *

Hr : Min AM

During the past month, how long (in minutes) has it usually taken you to fall asleep each night? *

During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) *

Inclusion criteria:

- 1) Significant complaints with their sleep
- 2) Smartphone to be used to gather self-tracking data
- 3) No plans to travel during the 7 weeks of the study.

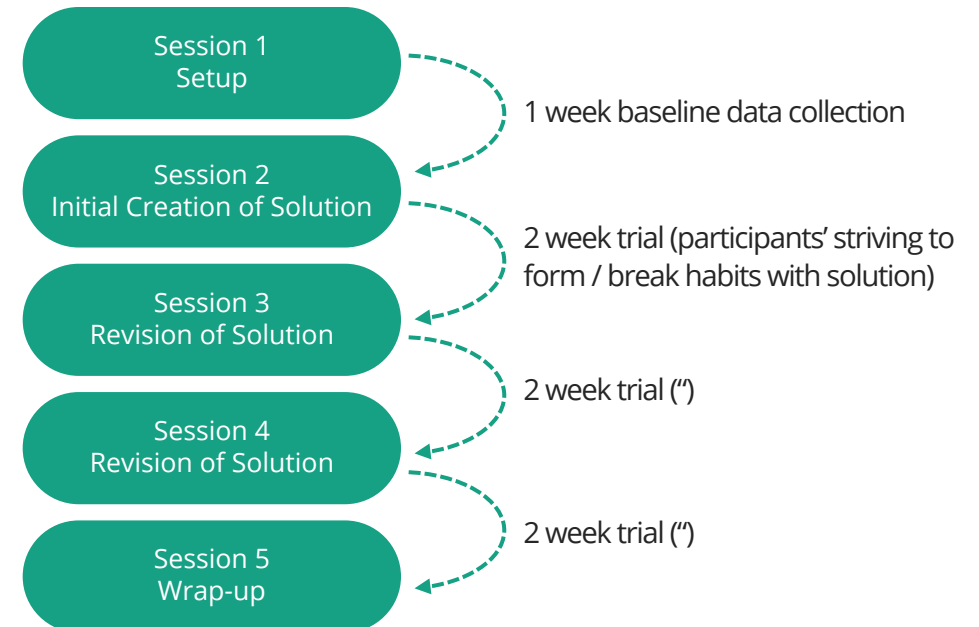
Exclusion criteria

- 1) Diagnosed sleep disorder
- 2) Co-sleeping with someone else in the same bed/bedroom
- 3) Disruptive and uncontrollable sleep schedules, such as night shift workers.

In total, 27 participants (14 male, 13 female) completed the study, 9 for each condition.

Procedure

For **7 weeks**, participants joined **5 sessions for setup / creation or revision of their solution** to attainment of chosen habit targets.



Case 2: Technology Nudge

Measures

Questions		Measures
Outcome	Degree of sleep quality chage	PSQI score* measured in each session
Process	Degree of target achievement	Participants' ratings to the question, Rate how well you achieved your goals on a 0 to 10 scale
	Quality of planning / solutions	Paticipants' ratings on 7-point scales to the questions: 1) Overall, I am satisfied with my goal; 2) The plan fits my lifestyle well; and 3) The plan will be essential for me to achieve my goal. Researcher's review <ul style="list-style-type: none">• (Behavioral plan) Occureances of target changes• (Behavioral plan) Occureances of plan adjustments• (JIT apps) Components included
	Perceived benefits / difficulties in using JIT apps	Semi-structured Interview in Session 5

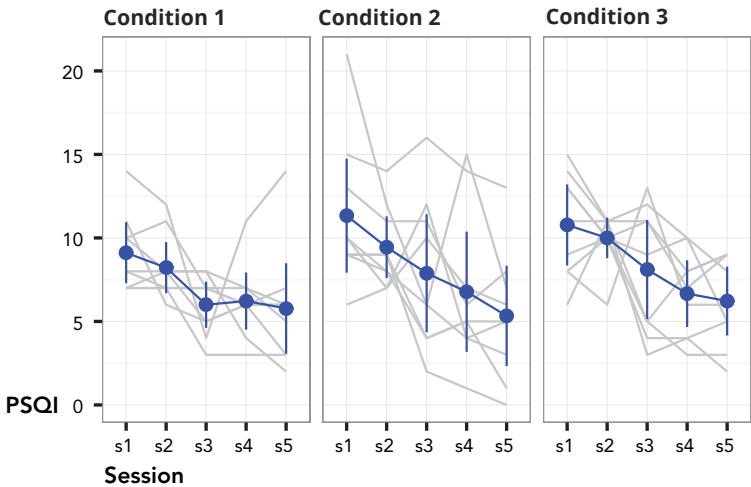
* Pittsburgh Sleep Quality Index (PSQI) 0~21 score; the lower, the better sleep

Case 2: Technology Nudge

Analysis

Survey data

PSQI scores measured in each session
Blue line, mean for each session with 95% CI

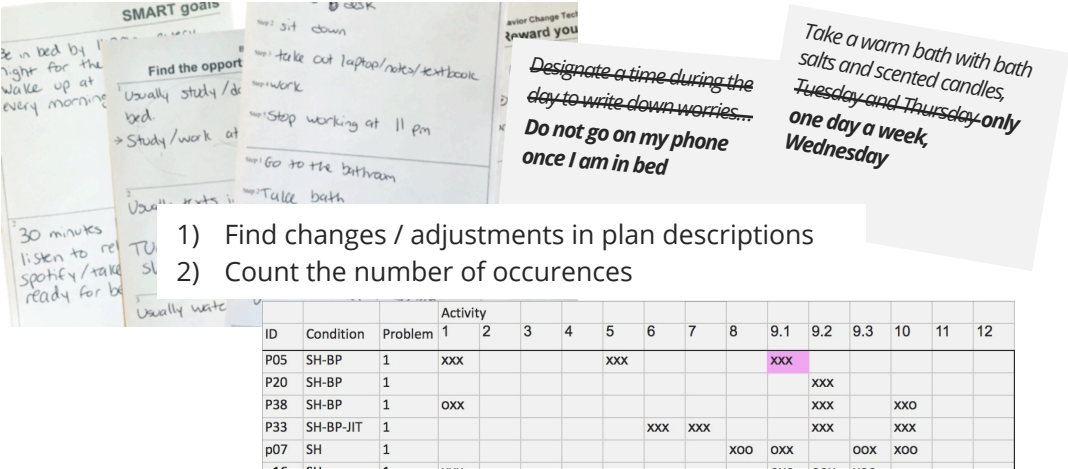


Ratings on target attainment, mean (SD)

	Condition 1	Condition 2	Condition 3
Session 5	6.4 (2.9)	6.8 (1.8)	8.4 (1.2)
Session 5-Session 3	.8 (1.2)	2.9 (2.4)	1.9 (2.0)

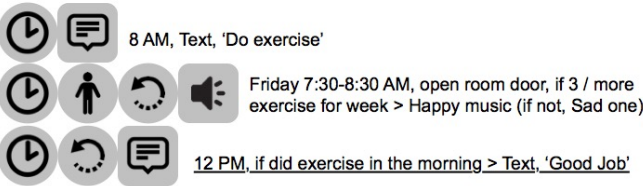
Content data

Frequency of habit target changes / plan adjustments



- 1) Find changes / adjustments in plan descriptions
- 2) Count the number of occurrences

Types / quantity of components



Case 2: Technology Nudge

Results

Sleep quality change

A one way ANOVA on PSQI score change from session 2 to session 5 suggested there were no significant differences between condition means ($F(2,24) = .84, p = .44$).

Bayesian analysis indicated:



The treatments are better than the control?

Fairly likely



Any difference between the treatments?

Highly unlikely

Experience with JIT apps

Most participants found JIT apps beneficial, with two overall themes in their reports:

Remind

*P31, 'Yeah, like if I was distracted, playing video game or working on the homework, it was nice to get that text message...and then I **realize it's late** [sic]...'*

Inspire

*P13 (music play to reminder her about prep for the next day, when she came home after work), 'Not necessarily about snack/lunch prep. **Now you're are at home... now [I am] relaxed**[sic],*

Case 2: Technology Nudge

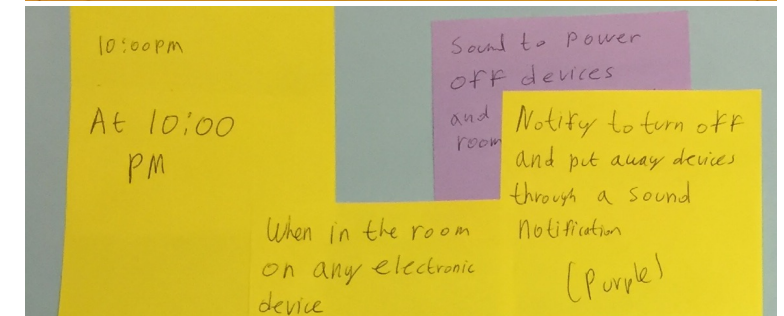
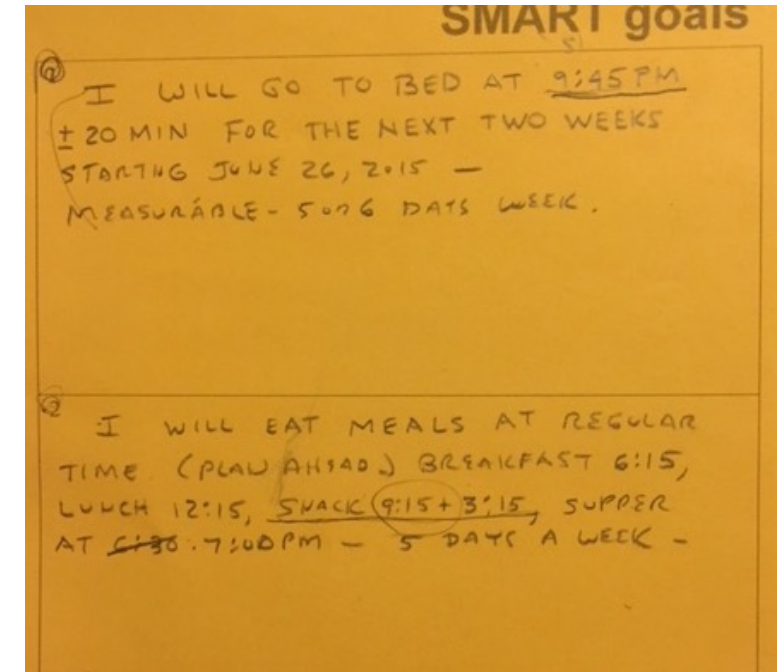
Design Considerations

It appeared that our tutorial resulted in **more realistic, specified and personalized plans**, which translated to better attainment of habit targets and improved sleep quality.

We found that future work on JIT interventions should focus more on better facilitating **people's creativity** (more use of sensors, greater iteration of designs).

In supporting people's creativity, we considered the following approaches promising:

- Provide a tool with **simple functionality**,
- Prompt users to **start small and continue building up**,
- Present ready-made **examples** for instant use.



Thank you!

If you have any questions, please feel free to contact me:

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