Study Design Document: Study I

Content

1) Purpose of study (research hypothesis/questions)

Research Question:
Is social permission, as experienced through social media in the form of toxic productivity, transferable to a different interface in the form of feeling less guilty about doing hobbies?

Null Hypothesis (H0):
Social permission is not transferable towards investing more time in hobbies.

Alternative Hypothesis (H1):
Social permission is transferable towards investing more time in hobbies.

2) Participant profile

Participants should fulfill the following criteria:

- Age between 18 and 30 years
- High screen time average/used to work with various social apps throughout the day
- (TU Wien student)

3) Compensation plan

- Snacks for participants (e.g., vegan chocolate)
- Reciprocative Participation in their Study (if participants also attend URM)

4) Methodology

Study Design:
The study aims to provide quantitative and formative results. Using multiple questionnaires, the study offers quantitative insights to investigate the research question. These results provide the base layer and actively form the design of the prototype in question.

Number of participants: 20

Within-Subject design:
Habits and routines of the individual participants can vary from person to person. Someone might spend more time working, while others might only pursue high-time-consuming hobbies. This is why we chose a within-subject design.

Participants must visit the study prototype once per day, but can decide at what time. When they visit, one of the two conditions is shown:

- **Condition A:** When a user visits the prototype, they do not see if friends are engaged in their hobbies. They can still start/stop tracking their own hobbies. This is the baseline condition and represents no social signal.
- **Condition B:** When a user visits the prototype, a number between 6-12 active friends is displayed. They can also start/stop tracking their own hobbies. This stands for high social permission.

The two conditions are evenly distributed among the participants, with all permutations of “AAABB” and “AABBB” being served exactly once. This means that on any day, each condition is active for 10 of the 20 participants.

Every evening, each participant completes a short daily questionnaire that includes values for each dependent variable (total minutes spent on hobby that day, number of hobby sessions, daily motivation, sentiment) as well as control values like the number of active people shown in the prototype at the time of their visit or if something unusual happened that day that strongly affected how they spent their day (e.g. illness).

One session is defined as any hobby activity that lasts longer than 10 consecutive minutes and is separated by at least 30 minutes of inactivity.

Pilot Interviews:
Five pilot interviews with individuals fulfilling the set participant profile were conducted to reevaluate the chosen approach (questions, prototype). Afterwards, questions were refined according to the pilot study participants' feedback to ensure better understanding. Additionally, questions regarding the user's sentiment were added to both the Pre- and Post-Questionnaire.

The Prototype:
The prototype “Hobby Tracker” can be visited at:
urm25.wasabi.science/p/[participant-nickname]

The “Hobby Tracker” consists of a website that the participants can easily access at home. The interface is quite simple and just displays one of the two conditions, based on the day and the permutation. In the background, the prototype logs page visits and

allows the user to start/stop tracking time spent on a hobby by logging time stamps of start and end.

Variables:

Independent variables	Dependent variables	Confounding variables
Social permission Conditions: High social permission: A lot of friends are pursuing their hobby (e.g., 6-12) Baseline: No social signal: No notification that friends are pursuing their hobby	Daily time spent on hobbies in minutes (continuous data)	Available free time per day
	Frequency of hobby sessions per day (discrete data)	Time expenditure of a hobby (high time-consuming hobbies might be done less often)
	Daily motivation to pursue a hobby (Likert scale, ordinal data)	
	Sentiment* after spending time with their hobby (Likert scale, ordinal data)	

*Sentiment refers to the emotional response a participant might have. For example, this includes motivated, content, jealous, guilty, relaxed, ambitious, anxious, and more. The selected sentiments in the questionnaire consist of neutral, positive, and negative connotated adjectives.

5) Material & Apparatus

- Laptop/Smartphone/Tablet with internet connection
- 3 Questionnaires
- Pre-Study-Questionnaire (Demographics, Influential Factors, Baseline for Sentiments)
- Daily Questionnaire (5x)
- Post-Study-Questionnaire (Individuals' Insights, Post-Sentiments, Experiment Experience)

For the questionnaires, Microsoft Forms will be used as it fulfills the criteria of the TU Wien for studies. The questionnaires can also be found in this submission.

The questionnaires are designed to collect data on the above-defined dependent variables. The questions are mostly worded to be answered through a Likert scale for easier analysis. To avoid leading questions, especially questions about sentiment, the questions used are worded according to recommendations from various papers about guilt and other sentiment questionnaires. These papers recommend using statements and Likert scales, as well as wording the statements without using the words they aim at. To give an example, instead of asking directly about feeling guilty, a question could be framed like „Doing … sometimes makes me feel like I should be doing something else”. By not actually using the word, but describing a situation, negative connotations can be avoided. The questions regarding sentiment are worded according to these standards. To quantify motivation, we used PANAS standardized questions.

The questions are directly aimed at specific DVs or (in the case of sentiments) at specific sentiments - or they are simply for control measures. Defining these before the experiment started should allow for easier analysis after the experiment.

Task for participants:
- Fill out a pre-questionnaire at the start of the study.
- Pursue hobbies as usual during the 5 days & visit the prototype at least once a day.
- Fill out the daily questionnaire every evening before going to bed.
- Fill out a post-questionnaire after the last day of this study.

6) Structure & Timeline

Preparation required before the study starts:
- Consent form
- (Ethical) approval by lecturers
- Demographic data (pre-study questionnaire)
- Assessment of influential factors like hobby behavior (pre-study questionnaire)

Timeline of each task:

Subject	Time
Fill out the Pre-Questionnaire	15 mins
Open Prototype (at least once a day, 5 days)	3 mins
Fill out the daily Questionnaire (once a day, 5 days)	Max. 5 mins
Fill out the post-questionnaire	15 mins

Timeline of experiment:

Phase	What's happening	Material/Staff	Time (min)
Prep	Participants will be informed about the experiment and its structure (consent form) Collection of demographic data and "influential factors" (Questionnaire)	Consent Form, Questionnaire for Demographics and Influential Factors	20
Running	Participants document their hobby behavior for 5 days, visit the prototype online at least once a day, and answer a daily questionnaire	Daily Questionnaire, Prototype	7200 min (5 days)
Post	Participants fill out a final form to evaluate their experience over the last 5 days	Questionnaire for final evaluation	15

7) Analysis

Method of analysis:
To prepare the data for in-depth analysis, the daily averages per participant per condition are calculated, as well as missing data and manipulations are checked (if our

social signal was actually perceived as one). Should this not be the case, any following results must be interpreted with caution.

As our design is a within-subject two-condition study, we will make use of repeated-measures tests to evaluate our hypothesis. Each dependent variable requires a slightly different approach, as the data form varies. For the daily time spent on hobbies in minutes, we propose a paired-sample t-test (baseline vs. high social permission). The second dependent variable, frequency of hobby sessions per day, is discrete, and we plan on doing a Wilcoxon signed-rank test. As the daily motivation and the sentiments after hobby time are both using Likert scales, our primary test will be a Wilcoxon signed-rank test as well. Optionally, we could treat the Likert scale as an interval and perform a paired t-test as a secondary analysis.

Following the main analysis, depending on our time frame, exploratory analyses would also offer interesting perspectives. For example, one could investigate whether baseline behavior/sentiments predict a sensitivity to social permission.

Data form/Logs:
The data is collected through a daily questionnaire in which the participants report the time they spent on hobbies and their state of mind. Tracking on the “Hobby Tracker” website is handled via HTTP requests: when a participant starts a hobby, the backend receives a “start” API call, and when they stop, it receives a corresponding “stop” call. An automatic timeout is used if participants forget to manually stop tracking. Additionally, every website visit is logged with a timestamp to record when participants open the site.

8) Personnel Involved & Responsibilities

Study Design:
- Figma-Wireframes – Alex, Alina
- Questionnaire – Tamara, Hannah
- Prototype backend, logging – Benjamin
- Participant recruitment – Alex, Alina, Tamara, Hannah, Benjamin
- Documentation – Tamara, Hannah

During Study:
- App maintenance – Benjamin
- Daily reminder to fill out questionnaires - Alex
- Responding to questions/concerns from participants / Participants support & hospitality (e.g., compensation) – Hannah, Tamara
- Data integrity monitoring – Alina

After Study work (tasks will be split afterwards):
- Data preprocessing & checking for corrupt data
- Data analysis (hypothesis testing)
- Interpretation, documentation, and visualization of results
- Conclusions and recommendations for further design