Noneliness:
A Gamified Mobile App to Reduce Loneliness Among University Students

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Motivation

- **Loneliness** is the third societal stressor in the world (World Economic Forum, 2019). This kind of burden arises when a person feels excluded and/or lacks appropriate social partners for desired activities (Rook, 1984; Cacioppo et al. 2002);
- Loneliness tends to be experienced **more severely by young adults** than other age groups (Rokach, 2000), such as students who face profound solitary periods when attending university in an unfamiliar place (Diehl et al. 2018);

"Room in Brooklyn" Edward Hopper (1932)

Nod App

Pokémon Go!

- Research has investigated the use of digital technologies to alleviate indices of loneliness in young adults (Bruehlman-Senecal et al. 2020) and even some institutions have explored mental health apps to help students manage mental health (Kern et al. 2018);
- Evidence of good uses of game mechanics to promote socialisation, such as the famous game *Pokemon Go!* (Wagner-Greene et al. 2017);
- Need for further evidence on the effectiveness of these resources in reducing loneliness and design-related aspects.

Research Methods

- The research is being conducted at the Offenburg University in collaboration with the institute's *Affective & Cognitive Institute (ACI)*;
- The methodological approach involves the following steps:
  - Literature search among major bibliographic databases in mobile digital technology, psychology and gamification for mental health;
  - Collaboration of computing specialists, psychologists and university students to investigate how a mobile app should be designed to reduce loneliness and isolation in universities;
  - Through the support of valid measuring instruments for loneliness (Russell, 1996), evaluate the app's efficacy with the target group.

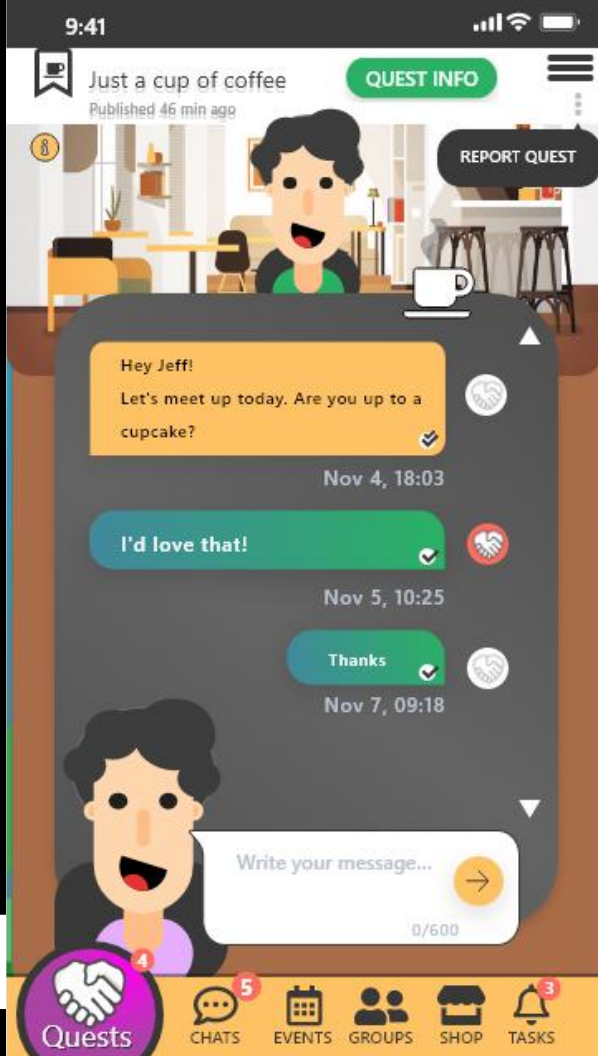# Features

(Masi et al. 2011;
Vasileiou et al. 2018)
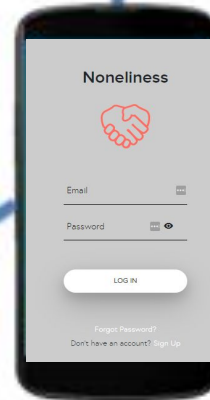
(Chandrashekar, 2018;
Bakker et al. 2016)

(Fleming et al. 2017)

Features

| HIGH-EFFICACY MHAPPS DESIGN (Chandrashekar, 2018; Bakker et al. 2016)	LONELINESS REDUCTION INTERVENTIONS (Masi et al. 2011, Vasileiou et al. 2018)	GAMIFICATION FOR MENTAL HEALTH (Fleming et al. 2017)
- Usage reminders; - Simple user interface (UI);; - User-centered approach; - Intersectoral and international collaborations; - Increase opportunities for mindfulness and limit time spent on device; - Avoiding diagnostic labels reduces stigma, increases accessibility, and enables preventative use.	- Social skills improvement; - Increase opportunities for social interaction; - Address maladaptive social cognitions; - Helps users who are in crisis to seek help (link to crisis support services).	- Encourage use of the app via rewards, internal triggers, positive reinforcement and behavioral conditioning; - Rewards (score, achievements, items); - Self-monitoring features (e.g. progression bars, levels, etc) to promote psychological growth and enable progress evaluation;.

Version 1
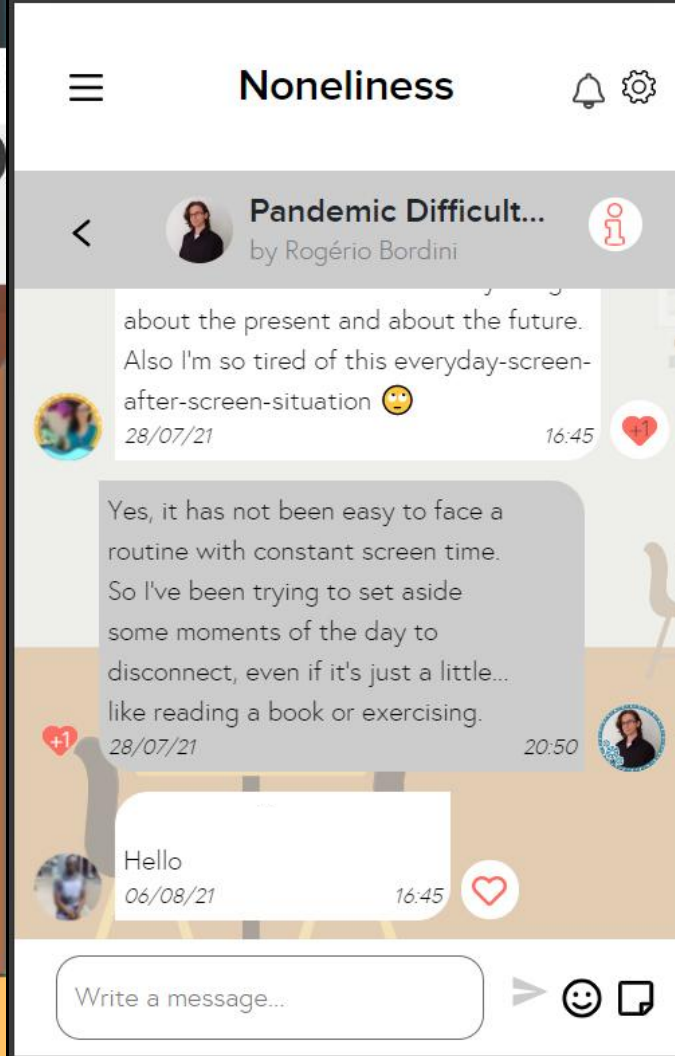
Version 2

The Noneliness App
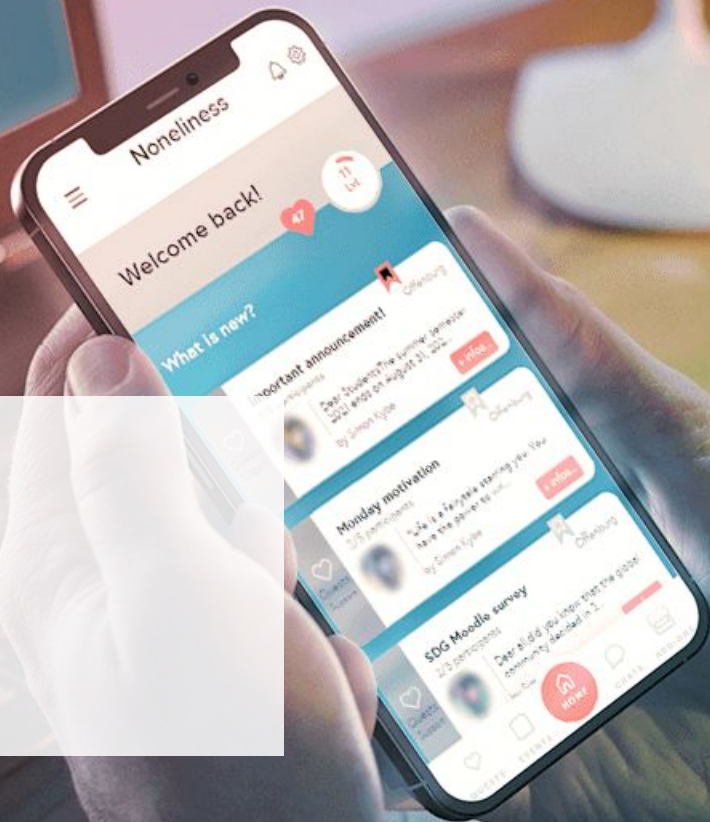
Social Features

- **Quests:** the idea behind this option is based on solving a task for someone in the community who needs help, either material (e.g., loan of some tool, book, etc), emotional or educational (e.g., help with some subject at university);
- **Chats:** text chat rooms through which users can exchange messages and Gratitude Points. These points can be earned or donated to the message's author as a reward which can be used for purchasing accessories or gifts;
- **Events:** exhibition of the upcoming local social events created by users ot the university staff;
- **Groups:** socializing environments that work as discussion forums about a particular topic.
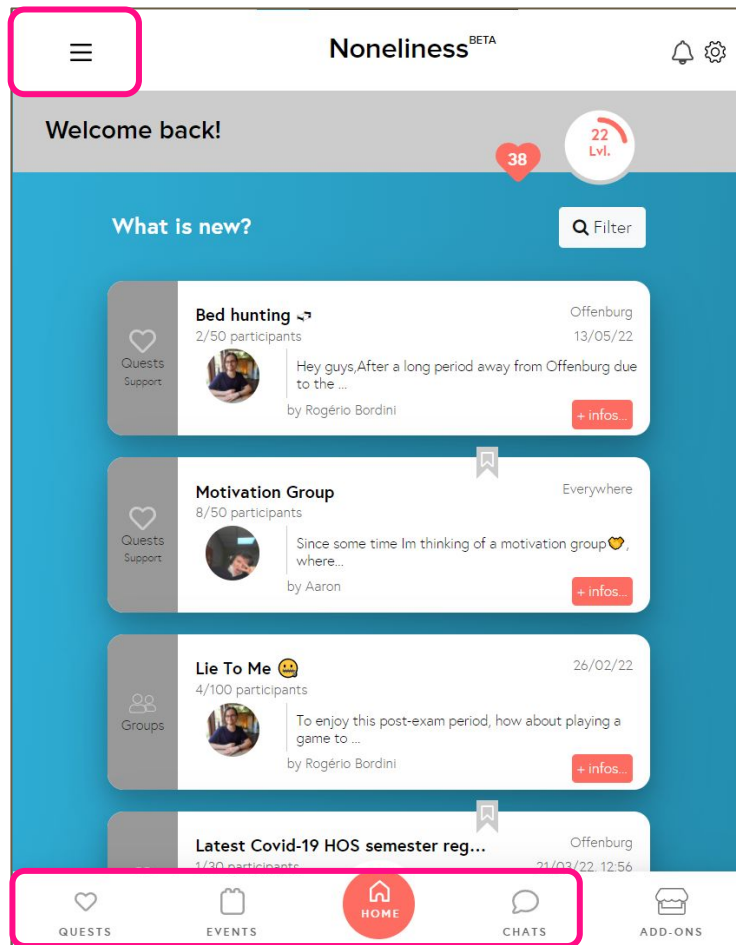
Gamification Aspects

- **Gratitude Points:** a score that shows appreciation and empathy in the users' social interactions (e.g., a helpful message), which can be acquired or donated. These points can be donated by clicking on the heart icon next to the messages in the chat rooms;

- **Level Progression:** degree of experience that users have in using the app. The level can be increased by gaining experience points, which are acquired through the social interactions.

- **Add-ons:** option through which users can buy items with *Gratitude Points*, such as stickers for chats, picture frames, new chat backgrounds and gifts to send to friends. No real money is used;

- **Achievements:** badges that are earned every time the user reaches specific parameters through social interactions in the application.
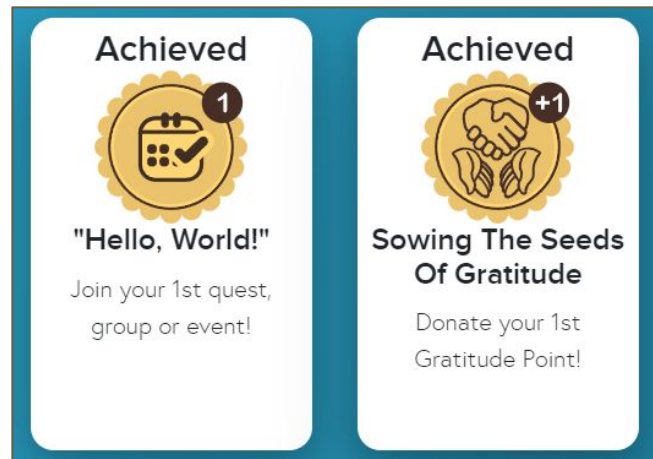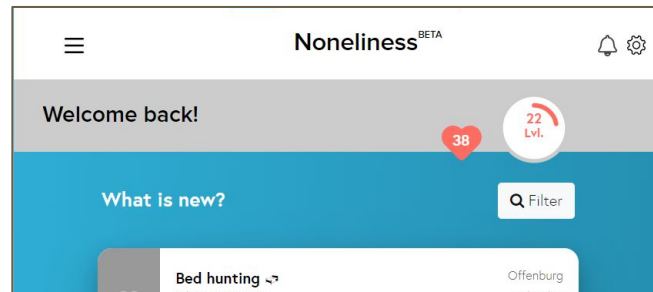
App Access

Access via computer or mobile browser:

https://gratitude.affective-lab.org/

Study Protocol 🔍

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RESEARCHERS RESPONSIBLE	Rogério Bordini and Prof. Dr. Oliver Korn (supervisor)
APPLICATION METHOD	Pilot randomized controlled trial (RCT) to evaluate the initial efficacy, feasibility, and desirability of *Noneliness App*
POPULATION	Offenburg University students experiencing medium to high loneliness (according to the UCLA-20 scores).
SAMPLE SIZE EXPECTED	Between 12 and 30 students (or more)
TOOLS	Anonymous online questionnaires (LimeSurvey) and *Noneliness App* interaction
STUDY DURATION	6 weeks
STUDY START AND END	mid-February to end of March
ETHICS	Protocol approved by the ethics committee of Helmut Schmidt University: https://tinyurl.com/2p82f5v8

Participants and Recruitment

- **Eligibility:**
  a. students aged 18 to 29 years (German and international);
  b. English-literate;
  c. not residing with parents/guardians;
  d. access to a smartphone or computer capable of supporting a modern web browser (e.g. Chrome, Firefox, Safari, etc);
- Invitation through institutional email: study explanation, short app presentation and participation form attached.

Experimental group: participants will have immediate access to the *Noneliness app* and will be free to engage with it as much as they like for four weeks.

Control group: participants in this group will not receive any intervention. They will be exposed to the normal integration and socialization activities promoted by the university itself.
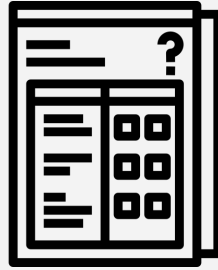
42-item questionnaire, with 4-point Likert scale items and open questions for qualitative data.

• UCLA LONELINESS SCALE (Russell, 1996), composed of 20 statements on a four-point Likert scale about feelings or actions linked to loneliness. Scores range from 20 to 80, indicating low to high-level loneliness;

• DEPRESSION, ANXIETY AND STRESS SCALE (DASS) (Lovibond & Lovibond, 1995), a 21-item self report instrument designed to measure the three related negative emotional states of depression, anxiety and tension/stress;

Week 6

• USABILITY SCALE - 20-item scale that assesses the systems' usability by measuring effectiveness, efficiency, and satisfaction based on the System Usability Scale (Brooke, 1996). Only experimental group participants completed this questionnaire at week 6.
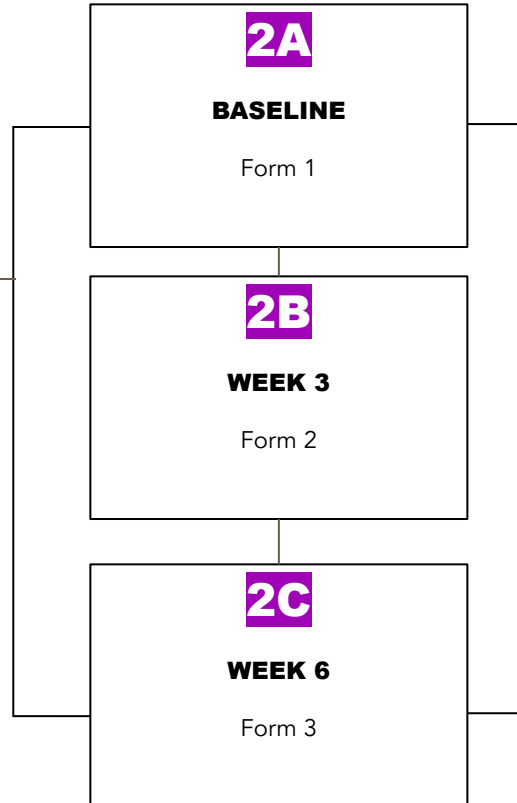
Use Scenarios

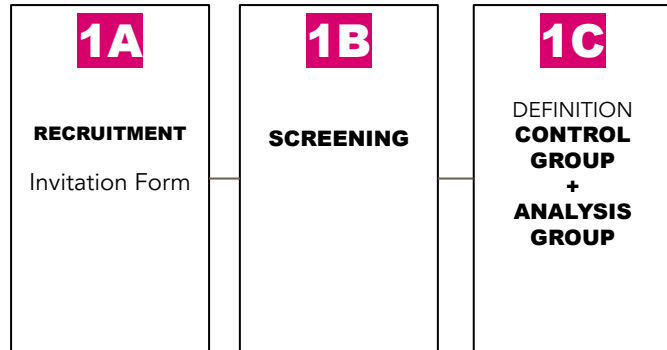- Sense of Belonging online activities (Rovai, 2002) can be carried in the app, such as:
  - Creating and following groups for discussion about specific topics (study difficulties, hobbies, mental health at university, etc.);
  - Offering freshmen orientation, raising awareness on psychological support (crisis lines, counselling centres, etc.), sharing tips on good practices for mental health care and for periods of exams;
  - Online interactions to speed up and extend the assistance of the institution's psychologists and the mentoring program to students who are seeking counselling, since the face-to-face service can be overstretched or/and understaffed;
  - Bring university staff and students closer together through ice breakers activities, institution announcements, etc.

Preliminary Results

- 25 Offenburg University students expressed interest. 14 were accepted for presenting medium to high rates of loneliness. 2 control group members discontinued participation in week 3;
- Participants were N = 12 (6 female; 7 experimental), mean age 26.3 (SD = 5.26) ranging from 19 to 29, from Germany (50%), India (8.3%), Kosovo (8.3%), Russia (8.3%), Colombia (8.3%), Lithuania (8.3%) and Brazil (8.3%);
- Students enrolled in Biomechanic, Computer Science, Media & Communication and Business Psychology undergraduate and graduate courses.

Preliminary Results (Loneliness)

6-week loneliness measurement (UCLA-20)
20–34 low-level loneliness | 35–48 medium-level loneliness | 49–80 high-level loneliness

UCLA-20 (Scores)

Control: 47.4 (12.3) → 47.8 (14.0) → 46.6 (14.3)

Experimental: 45.1 (8.71) → 42.9 (10.5) → 40.1 (9.10)

Baseline, mean (SD) | Week 3, mean (SD) | Week 6, mean (SD)

☐ Experimental   ☐ Control
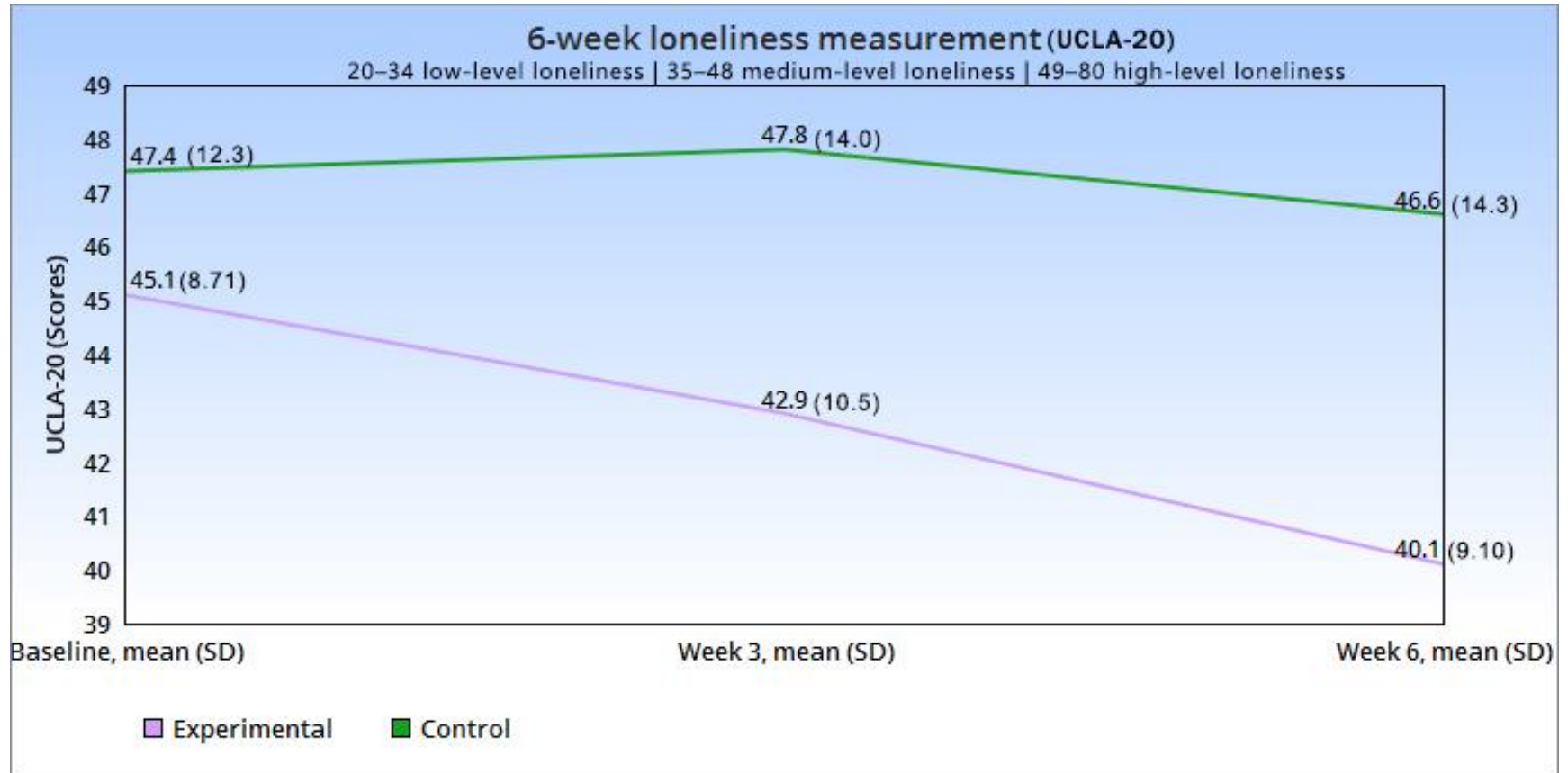
Preliminary Results (Depression)

6-week depression measurement (DASS-21)
0-9 Normal | 10-13 Mild | 14-20 Moderate | 21-27 Severe | 28+ Extremely Severe
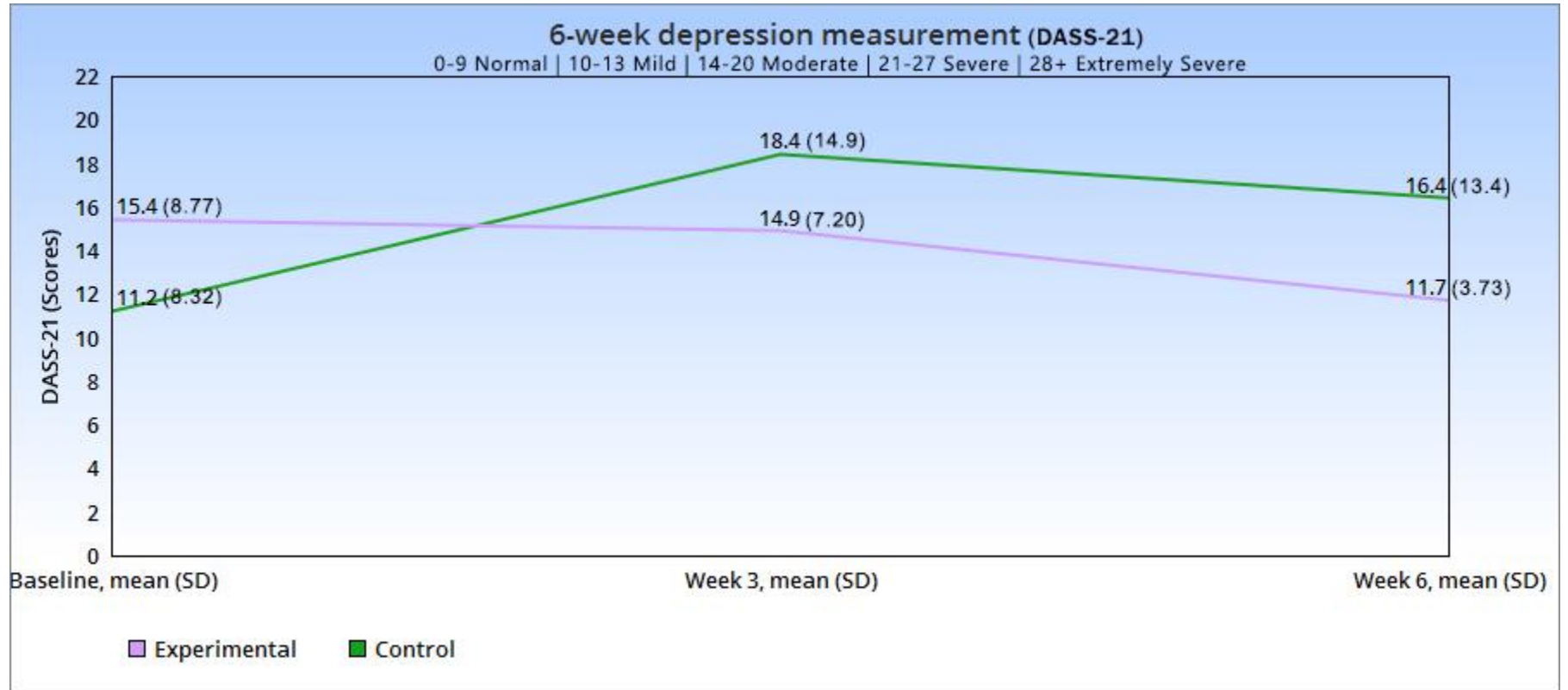
Preliminary Results (Anxiety)

6-week anxiety measurement (DASS-21)
0-7 Normal | 8-9 Mild | 10-14 Moderate | 15-19 Severe | 20+ Extremely Severe

Y-axis: DASS-21 (Scores)

Experimental: 12 (5.16), 11.7 (5.71), 8.57 (6.80)
Control: 9.2 (7.56), 16.4 (7.13), 12.8 (10.3)

X-axis: Baseline, mean (SD) | Week 3, mean (SD) | Week 6, mean (SD)

Legend: Experimental | Control
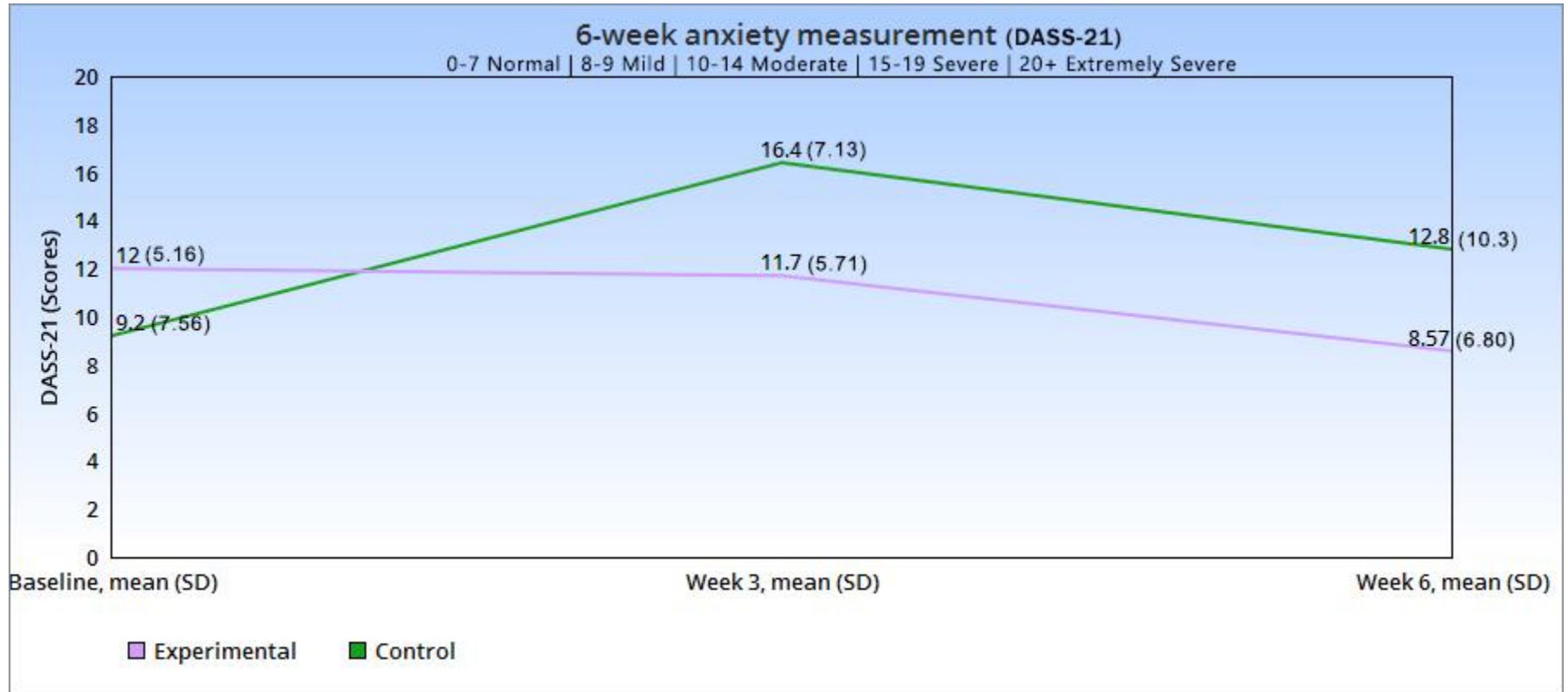
Preliminary Results (Stress)

6-week stress measurement (DASS-21)
0-14 Normal | 15-18 Mild | 19-25 Moderate | 26-33 Severe | 37+ Extremely Severe

Experimental: 19.7 (4.23), 16.6 (5.62), 16.3 (5.82)
Control: 13.2 (4.82), 18.8 (5.59), 20.8 (7.69)

Y-axis: DASS-21 (Scores)
X-axis: Baseline, mean (SD) | Week 3, mean (SD) | Week 6, mean (SD)

Legend: Experimental | Control
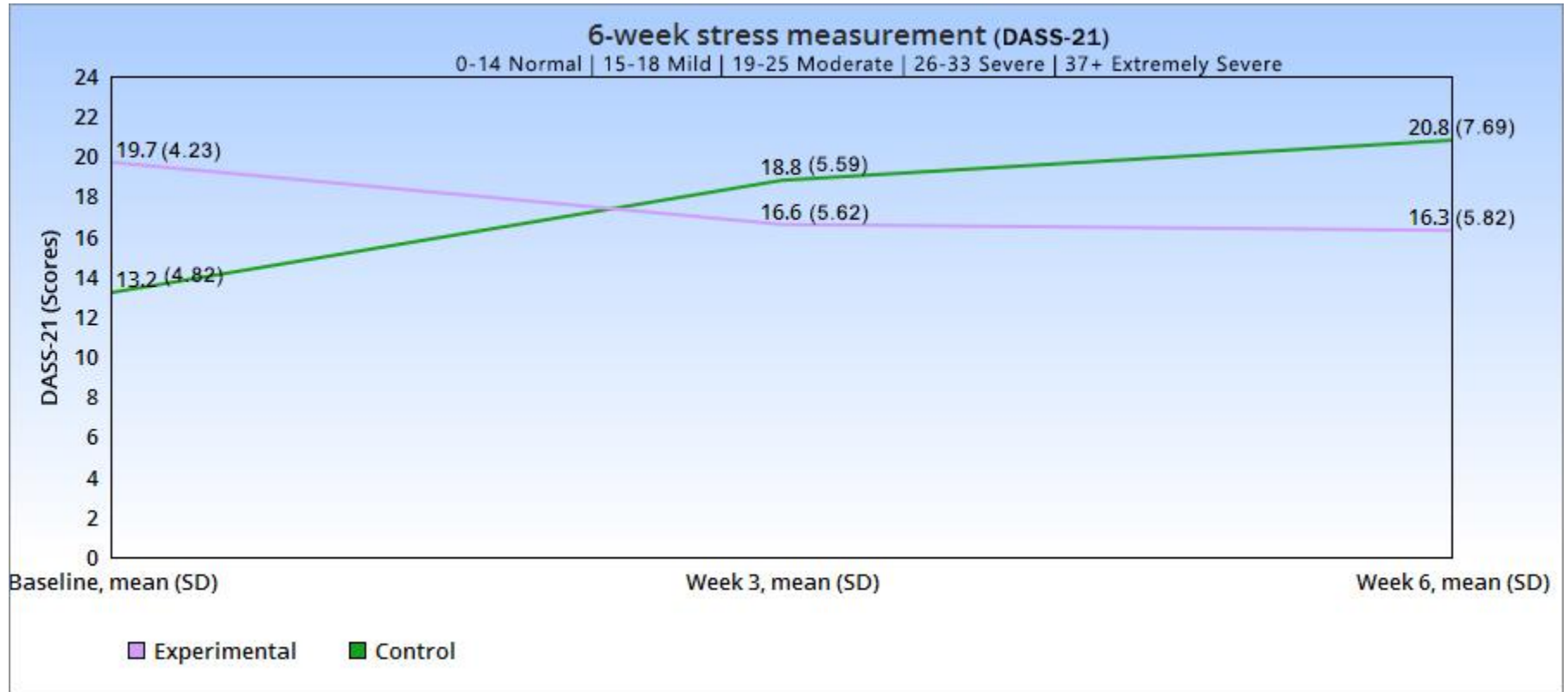
Preliminary Results (Usability)

- ***Events*** was chosen as the best option to help newcomer students find social opportunities. ***Chats*** was considered equally important for users' interaction and identification. ***Quests*** was stated less effective, but it could help lonely people to establish social bonds, even if initially online.

- ***Level Progression*** and ***Gratitude Points*** were most favoured gamification elements, as they can keep users socially engaged within the app.

Preliminary Results (Institutional strategies)

- The page containing this information was difficult to find on the website. It was necessary to go through several submenus to get to the details of offering this service;
- Finding encouraged university staff to rethink new strategies to promote the counselling services, such as distributing flyers from time to time, offering mental health lectures, webinars, and workshops on campus, and email reminders about these same services;
- Offer English psychology sessions for international students, as they tend to be more prone to be affected by loneliness.

Next Steps

- Conducted another RCT round with Reutlingen University (Germany) students in the second semester of 2022 in order to obtain more evidence regarding the app's effectiveness;
- Evaluate the app's accessibility aspects with visually impaired users to verify if the navigation elements adopted allow the app's use by this target audience.
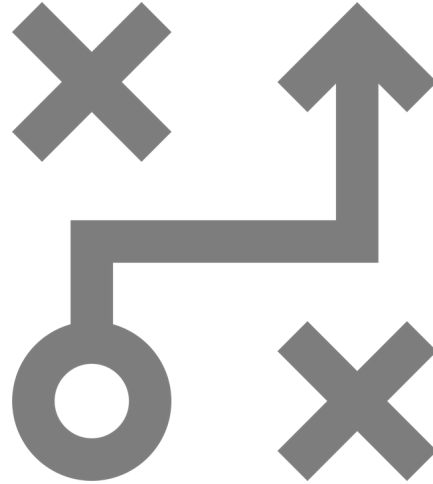
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Questions?

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