Mindful Matching: Enhancing Wellbeing through Positive AI on Dating Platforms

TU Delft

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Enhancing well-being through
Positive AI on Dating Platforms

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Executive Summary

The growth of dating apps has changed the way relationships are formed. These applications have enabled users to widen their dating pool of potential partners through profile recommendations based on proximity and shared interests. However, dating app usage was also found to impact well-being negatively, with the AI systems of these platforms, contributing to it. In this project it was therefore explored how well-being can be enhanced, by mitigating the detrimental impacts of dating apps.

Contextualising well-being

Literature research was conducted to explore the features within a dating app along with its effect on well-being. By linking the various experiences with dating apps to well-being theories, a theoretical model could be developed. This contextual model of well-being was validated in a participatory workshop with dating app users. Findings from this workshop indicated that autonomy and relatedness were mostly affected, especially during the profile setup, which also influenced the overall app experience such as during swiping.

Operationalising well-being

As relevant constructs were identified for further study, it was necessary to determine how these facets of well-being could be measured, in particular for the context of dating apps. In-depth research on the relationship between autonomy and relatedness indicated that in order for people to become more autonomous (showing one's true self to others), the need for relatedness (being understood or feeling a sense of belonging) had to be fulfilled first. For dating apps, a sense of relatedness could be achieved through sharing similar interests (or by experiencing a sense of belonging) with others, while autonomy relied on choosing qualities that are not necessarily desirable, but valuable to the user themselves (when it concerned self-expression).

Optimising well-being

Based on these insights, a design direction was formulated. This concerned, enhancing social connection by highlighting individuality (uniqueness of a person) within similarity (through a shared connection). This direction was used as a base for ideation. AI Ideation cards, which showcased the capabilities of the technology, were utilised. The possible interactions enabled by the technology were linked to desirable well-being outcomes defined previously.

Implementing well-being

This resulted in the design of a new dating app, MiHue. The app highlights a person's unique attribute and tries to find a common ground with others either through an uncommon trait or through mutual passions. The experience of autonomy and relatedness upon this design was measured and the outcomes were used for recommending future cycles.

Initiating a new cycle

For the next cycle, it was recommended that other well-being related aspects which were not considered in the design, but present in the theoretical model (such as self-acceptance, positive emotions and physical health) to be considered for future research. Furthermore, it was advised that the involvement of minorities should also be included and that gender differences should be taken into account for the next cycle.

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1. Introduction: Project Brief

Over time, the popularity of dating apps has increased significantly, This development has created a shift from offline dating to online through the use of mobile dating apps and has resulted in new ways of experiencing intimacy (Her & Timmermans, 2021). In addition, through geolocation users can find romantic interests in close proximity while staying up to date through push notifications informing them of new likes, matches or messages from conversations (Sumter & Vandenbosch, 2019).

Current research has focused on the negative effects of technology (such as AI) on interactive systems, but little on how to improve these systems to enhance the well-being of their users (Gaggioli et al., 2017). This, while AI has the potential to support individuals when it concerns well-being (D'Alfonso, 2020). In order to progress in AI technology positively, human well-being should be considered the main objective (Ozmen Garibay et al., 2023).

As of now, AI has few use cases and examples of being integrated for it to contribute to well-being. In this particular case, the chosen context consists of dating platforms where barely any attention has been paid to well-being even though it causes negative experiences among users in the form of ghosting, harassment and addiction (Stoicescu, 2020). Nonetheless, even though it is necessary to detect the harmful effects of the current system, it is also relevant to focus on the beneficial influences it has on well-being, as the intention of dating apps is originally also positive: to contribute to finding love.

In order to assess and support well-being in dating apps, the project has to tackle how well-being can be measured in the first place. Unlike with behaviour for which multiple standards of measurement exist, there is still no consensus over such an instrument when it concerns well-being (Cooke et al., 2016). Therefore, a form of metrics will be established in the research and used to optimise well-being in dating platforms. Following that, suitable actions for the AI system will be identified and designed. For this, it is important that this system meets the needs of the user and that rather than be autonomous, works together with the user (van der Maden et al., 2023). By following the Positive AI method, it will be explored how the system within dating apps could positively contribute to well-being.

2. Positive AI Design Method

Artificial Intelligence is gradually integrating into multiple aspects of people's daily life. With designers playing an important role in the development of technology, they need to ensure that AI has a positive impact on society. In order to do so, it is necessary that human values are aligned with well-being. This means that actions undertaken by the AI system should be beneficial to society (Van der Maden et al., n.d.). The Positive AI Design method by Van der Maden (2023) focuses on these aspects and aims to support designers in designing for well-being through AI. During this project, this method is utilised.

In the context of this project, AI can be defined as "the study of intelligent agents" (Russell and Norvig, 2010) which concerns what the system perceives and how it reacts upon it. This definition of AI, is considered throughout the project and is included in the method.

The Positive AI Design method consists of four main steps:

1. Contextualising well-being
The first step concerns contextualising well-being by identifying what particular components of the system affect what parts of well-being. This is established through literature research on well-being and the chosen platform, and is used for developing a "contextual model of well-being".

2. Operationalising well-being
Using the theoretical model validated previously, a measurement instrument has to be determined in order to measure the identified facets of well-being in the chosen context. These metrics are derived from existing well-being measurement tools and can be used with context-sensitive metrics that are drawn from the app's system. The defined metrics are used within the designed system to measure, adjust and re-adjust the actions taken by the system in a continuous loop.

3. Optimising well-being
Based on these measures, design directions can be drawn and used for designing interventions. Further in the research, these metrics can be utilised for evaluating the designed interventions. From the evaluation, interventions deemed impactful will be further developed and implemented.

4. Implementing actions
The implementation of the design includes designers, where it is fundamental that the interventions are being monitored and improved (when not working as intended or due to changed circumstances) to ensure that well-being remains aligned with the system.

(5. Initiating a new cycle)
For the last step, it is necessary to update the theoretical model, that was established previously, based on the occurred changes during the development. This is essential for making sure the system remains aligned with well-being over a period of time. After making the adjustments, a new cycle has to be initiated, where the process of developing metrics, designing interventions, prototyping and implementation is followed once again to allow optimisation of well-being within the AI system.

3. Dating Apps

When looking at the current market of dating apps, many applications exist with different purposes and target groups. In this section, it will be investigated what kind of features these apps contain through a comparative analysis. In addition, to gain a better understanding of how these dating app systems operate (in terms of collecting data and suggesting user profiles), recommendation systems were researched. Also, the type of users was studied to determine the user's needs and reasons for dating app use. Lastly, the impact of dating app use on well-being was explored and insights were utilised for formulating the theoretical well-being model in the following Chapter 4.

3.1 Comparative Analysis

A comparative analysis was executed to gain more insights into dating app features. In this analysis, emphasis was placed on finding common dating app features, unique functions and features related to well-being. The dating platforms analysed were: Tinder, Bumble, Badoo, Hinge, Happn, Grindr and Her as these were the most popular apps (Ceci, 2023). An overview was made from this analysis, containing all features of the seven compared apps, and can be found in Appendix A.

App features overview

Most dating apps like Tinder, Bumble and Badoo make use of a similar infrastructure, where the app usage consists of three main phases: the user profile, swipe screen and chat screen. The features of such apps were therefore also discussed in such a manner

3.1.1 User profile

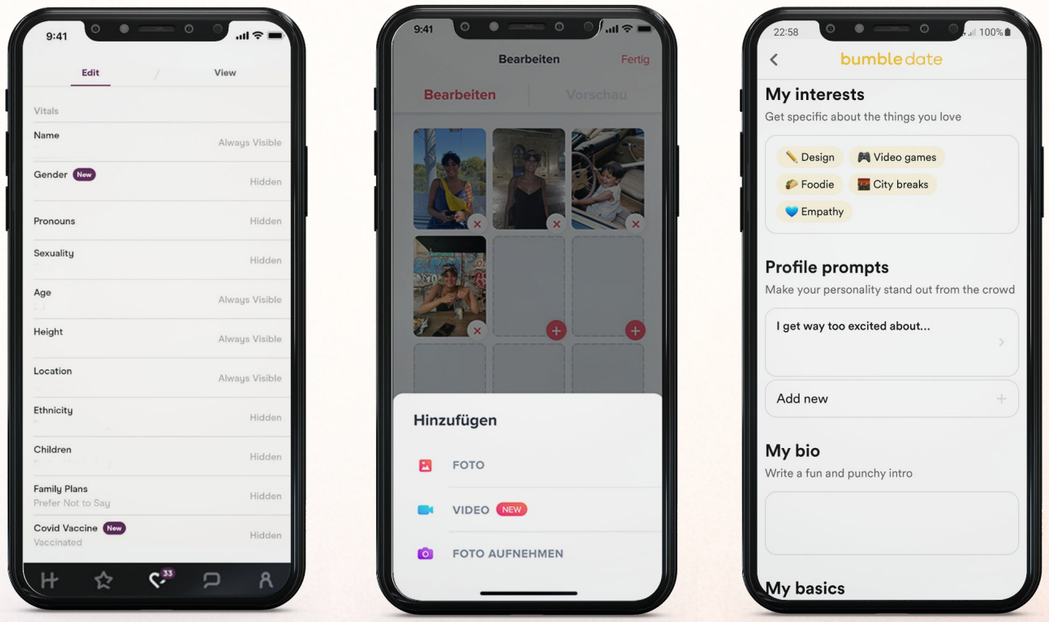


Figure 3.1: Profile setup: Socio-demographic info (right), Adding media (centre) and Bio, Interests & Prompts (right)

Socio-demographic information

Before a dating app can be fully utilised, users are required to create an account. Users are asked to provide socio-demographic information such as their gender, sexual orientation, education, etc. (Stoicescu, 2020).

Adding media

Apart from information, users are expected to choose a maximum of 9 pictures or videos (depending on the app) of themselves to display on their profile.

Bio, Interests & Prompts

Prompts (which are questions regarding a user's experiences or opinions) and interests (ranging from activities like sports to travel preferences and, in some cases, values & characteristics) can also be included. In addition to this, social media accounts (like Instagram and Spotify) can be added to the profile to show more of their personality by revealing more photos and their music taste.

Prior to profile completion, users are requested to enable access to their current location and are then welcomed by the swiping screen.

3.1.2 Swipe Screen

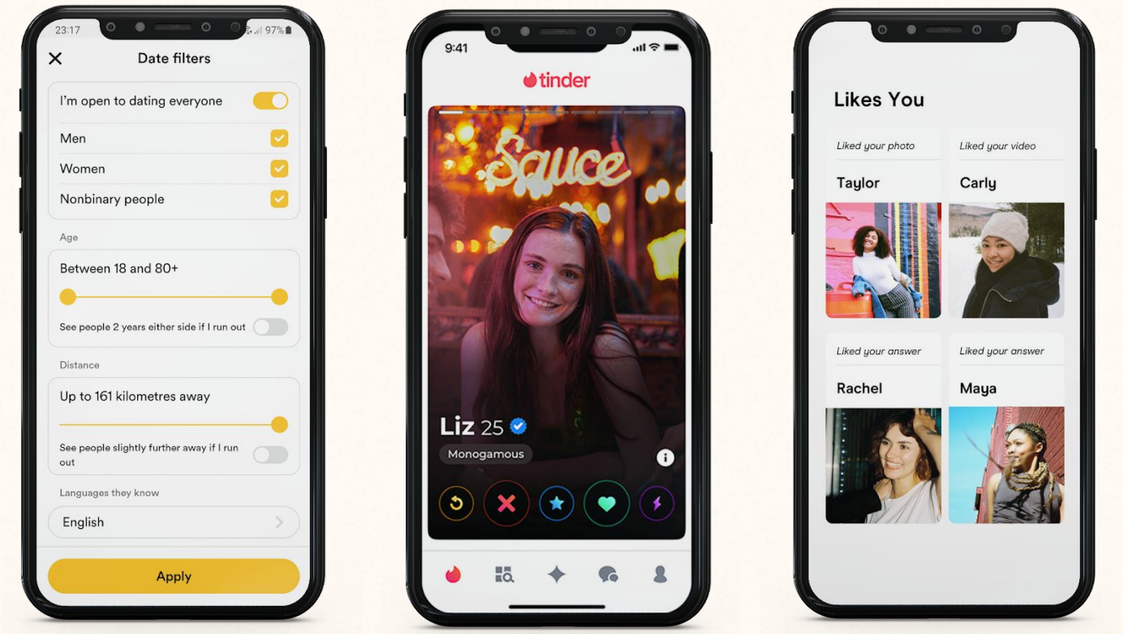


Figure 3.2: Filters (left), Swipe screen (centre), Likes overview (right)

Swipe screen

Followed by the profile setup, the user gains the option to start swiping (where swiping right is considered a like while left is a skip or dislike) or liking other profiles (by simply pressing on a heart). Emphasis is put on the picture where little information is provided such as name, age and location. For more detailed information such as an introduction and hobbies, users have to scroll down. Therefore, the first impression of each user is put on the appearance. In most apps, users are limited to a certain amount of swipes a day and are stimulated to resort to paid subscriptions for features such as swiping unlimitedly and boosting users which in turn can increase the chances of matching (Stoicescu, 2020).

Filters

To control what kind of profiles are presented to the user, filters can be applied based on age, distance and in some cases language, ethnicity or religion. Detailed filters on height, education, etc. are often locked behind a paywall. Apps targeted at minorities such as Grindr also provide the option to filter on body type and weight.

Likes overview

The likes users receive from other users are displayed in an overview, in the form of a numerical value and blurred profile pictures which are only visible after matching with the user or through payment. With Hinge in particular, users can also view what others liked about their profile (such as a photo/video, prompt or audio note).

3.1.3 Standouts & Chat screen

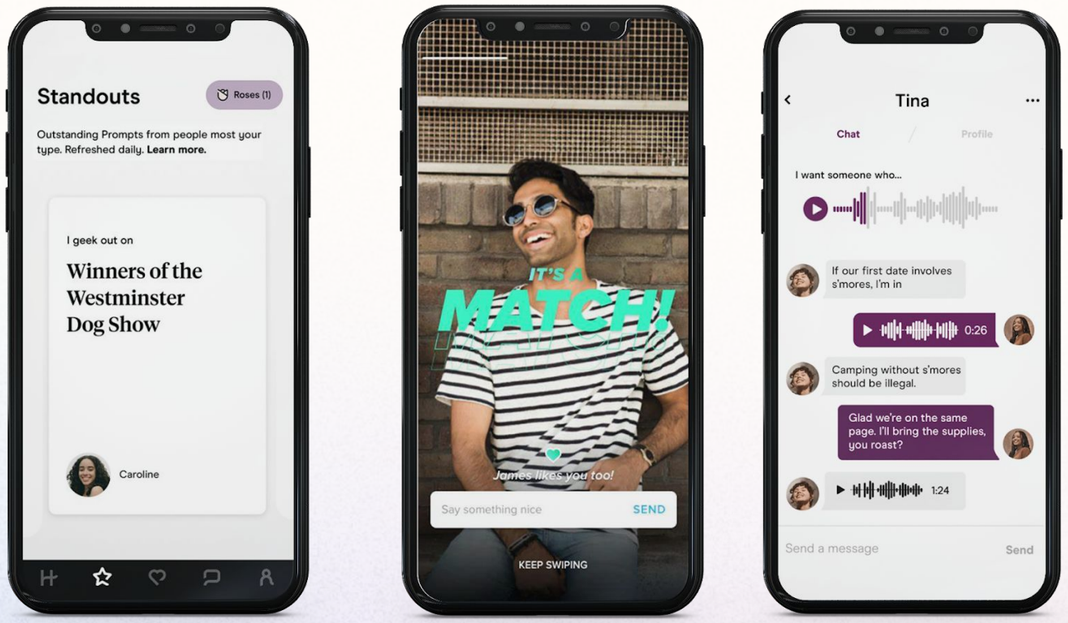


Figure 3.3: Standouts (left), Match pop-up (centre) & Chat screen (right)

Standouts
This section of the app, shows profiles that receive a lot of attention from other users while also taking into account whether they fit the user's preference based on their swiping activity and filters. When being subscribed to the premium service, users can send roses or a super like to receive the other user's attention by showing at the top of their likes.

Match screen
When a match occurs (where both users have liked each other), a message pops up notifying users that they can start communicating with each other.

Chat screen
For chatting, there are multiple mediums available such as voice and video calling and chatting. In certain apps like Bumble, features are available to support or ease communication between two strangers such as ice breakers or prompts.

3.1.4 Wellbeing-related features

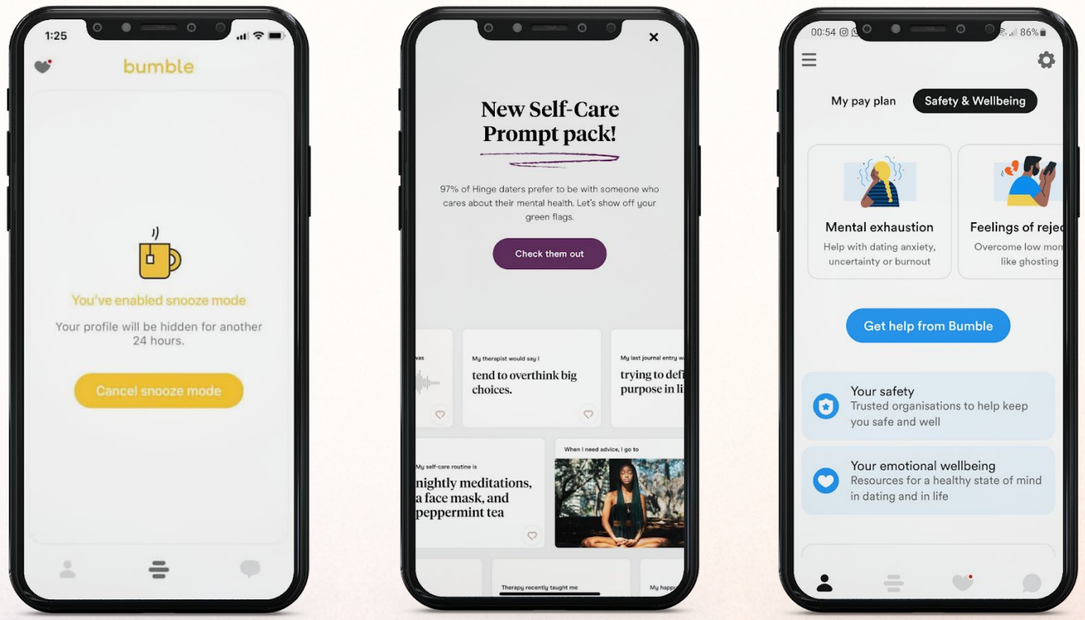


Figure 3.4: Snooze mode (left), Self-care prompts (centre) & Well-being guides (right)

Snooze mode
When users need a break from the app, they can use the snooze mode (or in other apps, invisible/pause mode). This feature allows users to hide their profile for a chosen period of time, while also disabling swiping. In some apps, matches can receive a message of the user's status when utilising this feature (Bumble, 2023) while in other cases users can still continue communication with the other party.

Self-care prompts
In addition to the regular prompts, Hinge and Bumble added prompts focused on self-care. This feature is meant to inspire users to initiate conversations about well-being (Malik, 2022).

Well-being guides
Within the dating app, Bumble has a section dedicated to safety and well-being. This category contains guides and advice on how to deal with certain situations affecting well-being such as ghosting and burn-out from dating (Bumble Safety Center, 2023).

3.1.5 Unique features

Figure 3.5: Lookalikes (left), Communities (centre), Recent crossings (right)

Lookalikes

Lookalikes is a Badoo-specific feature that makes use of facial recognition to find users that match the user's preference. This could include celebrities or a person they know from their own social circle. Based on the uploaded picture, profiles with similarities to the photo will be shown to the user (Best, 2017).

Communities

In the Her app, the function 'Communities' can be found. It encompasses a variety of social groups, each focused on a different topic which users can join. Within these communities, users can interact and share their thoughts with each other by creating posts or reacting to them (HER Support Center, 2022).

Recent crossings

This feature combines offline and online interactions, by detecting what users have crossed paths in real-life and displaying this in the app. These crossings are visualised on the map if they match the user's preferences, and can be interacted with through likes (Happn, 2023).

From the comparative analysis, it was concluded that all apps follow the same path when it concerns dating app usage, namely: profile setup, swiping/liking profiles, likes overview and lastly, online interaction. When looking at the dating app market, some apps like Bumble and Hinge already contain some wellbeing-related features, but these features expect the user to take action themselves and require them to be aware of their condition in the first place. Therefore, it could be an interesting direction to look at the different stages of the dating app (present in all the dating apps) and figure out how to design for these features to optimise well-being passively.

3.2 Recommendation Systems

Integration of Artificial Intelligence (AI) has affected different fields including mental health. Particularly for digital environments, AI has been utilised for enhancing the user experience while providing personalised solutions to mental health care. As the technology can be applied to predict and detect mental health conditions (D'Alfonso, 2020) and therefore contribute to well-being, it is relevant to investigate how AI systems in dating apps function.

3.2.1 AI System

In the context of dating platforms, the main application of AI is the recommendation system. The algorithm provides personalised suggestions on user profiles to the user based on the information it collects (Bartlett et al., 2023), which is retrieved from predefined categories filled in during the profile setup (Pidoux, 2022). The recommendation system within dating apps (such as Tinder) makes use of collaborative filtering, where the system detects the user's swiping behaviour and identifies patterns and similarities between users (NAYEK & DAS, 2021).

According to Tiffany (2019), the type of algorithm Tinder currently uses differs from the one used previously. In the past, Tinder utilised an 'Elo rating system' which ranks users based on how many times they were swiped right and what kind of people did so. Swipers with a high number of likes, who swiped on a particular profile, also determined the user's score of the profile they swiped on. Those with similar scores would be then recommended by the system to each other. It is assumed that based on this system, users were categorised based on desirability.

This system was changed from 2019 on, where the system is tailored to fit the user's preferences by predicting what type of people they would like or who would like them based on similarities. This also includes the bio and interests provided by users but also their pictures, where liking certain profiles result in recommendations of profiles with similar photos. Furthermore, Tinder mentions that the user's app activity matters the most, where frequent app use should lead to better matches. Apart from this, the algorithm also makes use of other metrics such as location (proximity between users) and age preference (*Powering Tinder® — The Method Behind Our Matching*, 2022).

When running out of user profiles to swipe on, the algorithm will recycle user profiles of those that were swiped left the first time, along with those a user has matched with and then unmatched. Therefore, the longer a user swipes, the worse the options might become.

Aside from swiping, other features such as Super Like are also taken into account by the system. Tinder promotes this feature as increasing the chances of getting a match, but it is unclear to what extent this is true. When a user Super Likes another person, the system will set aside the algorithm and move up the user's profile to guarantee being seen by the liked person. Tiffany (2019) also guesses that users who behave pickier are more likely to get rewarded in terms of receiving more serious and a higher number of matches compared to those who spam likes to get as many matches. The system can track when users have exchanged phone numbers and can distinguish between those who use the app for making real-life connections and those who use it for getting an ego boost by swiping too much. In the case of the latter, Tinder presents you with fewer users, decreasing the number of matches.

Other dating platforms such as Hinge supposedly operate on the Gale-Shapley algorithm which determines patterns concerning a user's dating preference (the type of users they like) and compares this to other users (who are likely to like them) (Carman, 2018). Overall, this system is similar to the one used by Tinder.

Alternative applications of AI are integrated in features such as 'Smart Photos' (seen in Figure 3.6). This feature rearranges the first picture of a user profile, based on the swiping response of other users when seeing a picture. Pictures that are first seen and swiped right by users are reordered to the top, to help increase the matching rate (Tinder Newsroom, 2016).

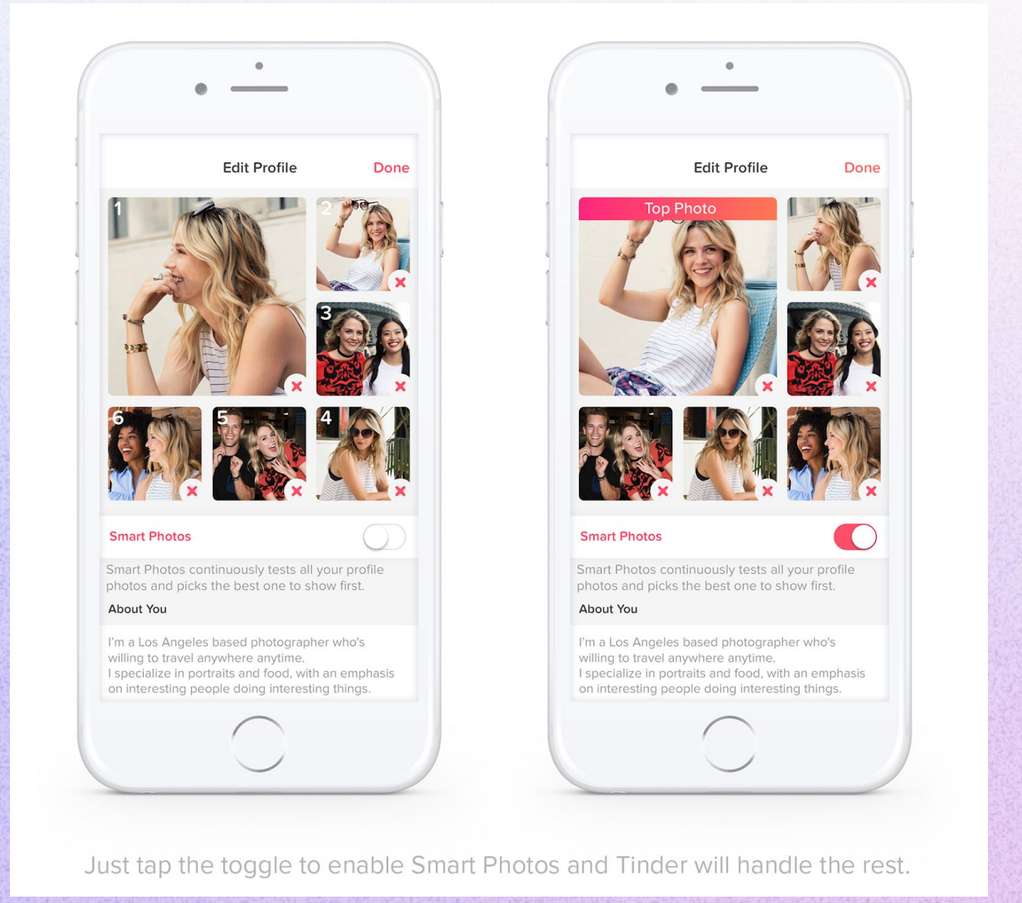


Figure 3.6: Smart Photos (Tinder Newsroom, 2016)

3.2.2 Data Collection

Apart from swiping app behaviour, dating apps such as Tinder collect other data from the user. This includes personal information such as birthday, gender, location, etc. (when setting up a profile), profile information like bio and interests, app user activity (users who you interacted with, send/received messages, frequency of login in and features used) and lastly face geometry data when verifying the user's profile (*Privacy Policy*, 2023).

The type of data collected is visualised in a diagram (Figure 3.7), to provide an overview of what data have to be taken into account when ideating and how this is used within the recommendation system.

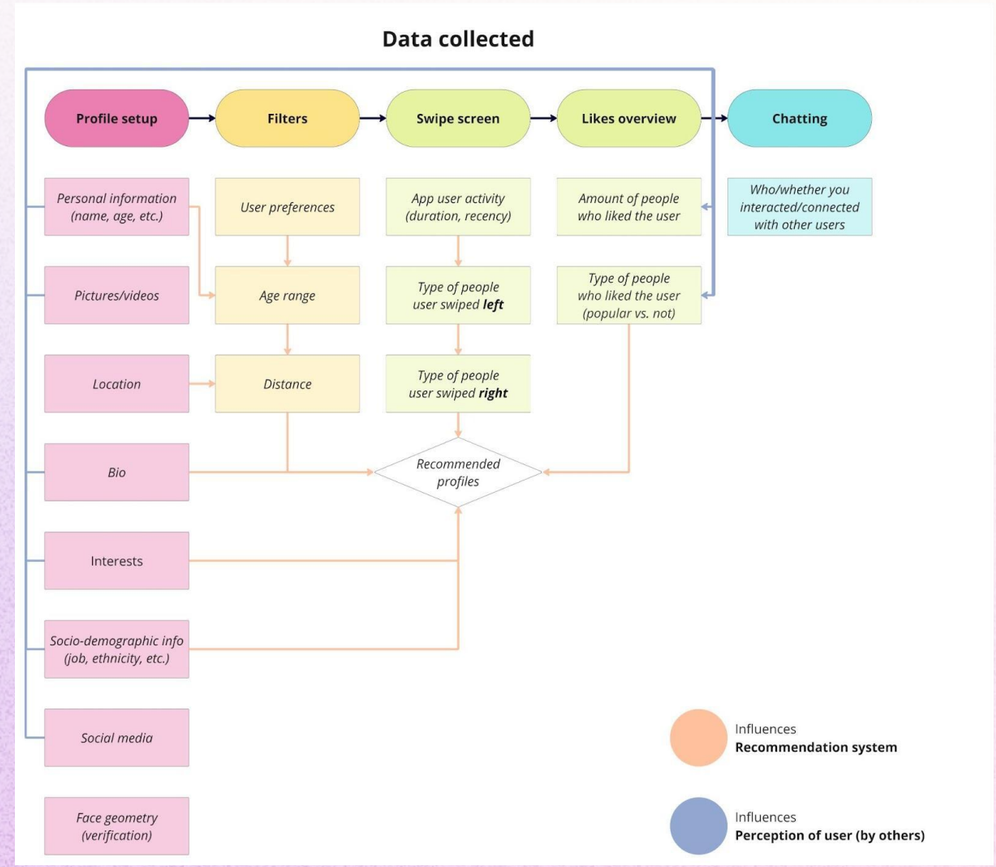


Figure 3.7: Data Collection

3.3 User group

3.3.1 Demographics

Dating app services have accumulated over 300 million users worldwide in 2022 (Dixon, 2023), with Tinder, Bumble and Badoo having the highest user base (Ceci, 2023). Within dating apps, millennials and Generation Z make up the majority of the user base, aged from 18 to 34 years old (Curry, 2023). Depending on the platform, the gender distribution can be highly unbalanced, with Tinder as an example where 76% of the users appear to be male in comparison to 24% of female users (Dixon, 2023). This imbalance affects the way users experience the app. Due to a lower availability of female users within the app, men have more competition and need to appeal to other users through creative strategies while women are likely to gain likes more easily, at a faster rate and can therefore be more selective (Stoicescu, 2020).

3.3.2 Motives for dating app use

Studies like (Ranzini & Lutz, 2017), (Sumter & Vandenbosch, 2019) and (Sumter et al., 2017) found similar reasons for dating app use that could be reduced to six motivations, namely:

- **Romantic relationships:** To build a serious and lasting relationship or form an emotional connection with one another
- **Uncommitted sexual relationship:** To find one-night stands, increase sexual experience or to live out a sexual fantasy
- **Ease of communication:** To easily open up to others, communicate and find friends
- **Self-worth validation:** To get an ego-boost (measure attractiveness) and due to sensation seeking (attention)
- **Entertainment:** To experience the thrill of excitement and because of trendiness

Although the stereotype is that dating app users mostly are motivated by seeking sex or a long-term relationship, it was found that dating platforms are commonly used to relieve boredom (Albury et al., 2019).

Gender differences concerning motivations for app use were also found. Men were more likely to use dating apps for casual sex and for seeking a relationship compared to women. While women tended to use such apps for friendship and self-worth validation (Ranzini & Lutz, 2017). Though some studies say there is no difference in gender when it concerns self-validation. Furthermore, thrill-seeking was also a big motivator for men when using dating apps. A study by Sumter et al. (2017) pointed out that ease of communication as a motivator applied especially to men as they found it easier to communicate online with the opposite gender compared to offline.

From this, it can be concluded that relevant factors affecting motivations for dating app use, concern mostly seeking a (romantic or sexual) relationship, ease of communication, self-worth validation and entertainment.

3.4 Impact on well-being

While dating platforms can increase the chances for new romantic relationships to come to fruition (Hutson et al., 2018), the usage of these apps also has brought negative experiences affecting well-being. Depending on the different sections of the app (user profile, filters, swipe screen, likes overview and chat screen), different features were found to have varying effects on well-being.

3.4.1 User Profile

Self-representation and Inauthenticity

As mentioned during the profile creation phase, users can present themselves on the platform through pictures and by providing a short 'about me' description. Stoicescu (2020) states that users who do not meet the conventional standards of beauty, have to put more effort into achieving likes. This is due to the manner in which users are presented to each other, as dating applications create a focus on attractiveness (through the emphasis on pictures) and hierarchise the users based on this (those who gain many likes versus those who do not). As a result, users learn to take advantage of this system by choosing categories or activities that are more desired (and will therefore be presented to a higher volume of profiles during filtering). Users will try to craft an ideal image that will increase their chances. Other tactics involve omitting information about the user when it is deemed as an undesirable trait (Pidoux, 2022). Overall, the profile creation stage is limiting if it concerns self-representation as it consists of predefined options (interests and hobbies) while also allowing little control over profile presentation and visibility (Olgado et al., 2020).

3.4.2 Filters

Exclusion

In dating apps, users are required to fill in the information regarding themselves for different pre-defined categories. This information is translated into data used for the recommendation system. With this feature, users have the ability to filter out profiles based on the qualities they chose. In this way, they can receive recommended profiles which they can relate to. However, at the same time, it indirectly allows the exclusion and fetishisation of other users based on the characteristics (such as ethnicity) they chose to filter on and thereby also reduces the diversity in potential partners (Hutson et al., 2018).

Sense of control

In order for dating apps to determine what profiles are shown to the user and in what order, data is collected (user's preferences, interests and personal information) and sorted through algorithm-based systems (Parisi & Comunello, 2020). Through filter selection, users are provided with a sense of control over the profiles they view and select (by swiping).

As reported by Her & Timmermans (2021), it was determined that compulsive use of Tinder (which is also applicable to other dating apps) may lead to feelings of sadness and anxiety afterwards while experiencing joy at the same time. However, its relationship with negative affect is found to be stronger and therefore it is suggested that addicted users are more likely to experience decreased well-being. Similar effects were observed in the research by Courtois & Timmermans (2018). The study showed that a long period of Tinder usage (starting from the first time using the app) was associated with a negative impact on the user's mood after use. This is supported by the study from Holtzhausen et al. (2020) where also a pattern was found between a long period of dating app usage (on a daily basis) and the high rates of psychological distress and depression experienced by users.

Choice overload

In addition, choice overload due to the display of a high volume of profiles was found to lead to reduced choice satisfaction. This was caused by the constant need to make decisions from the many available options when in some cases users were unable to (D'Angelo & Toma, 2017). Furthermore, in some cases, users experienced dissatisfaction and pessimism when looking for a potential partner due to a "rejection mindset" that had developed within the user due to the burden of too many choices (Pronk & Denissen, 2020).

Likes overview

Self-validation

One of the key motivations for dating app use, concerns self-validation. When this is not fulfilled, by being unsuccessful on the app through a lack of matches and likes, users can experience negative emotions such as frustration or feelings of rejection (Strubel & Petrie, 2017). However, in cases of success, this can create an opposite effect where users can experience an increased feeling of joviality and decreased sadness and anxiety.

Another study focusing on the effect of swipe-based dating apps found a significant relationship between the use of such apps and the experience of higher levels of psychological distress, anxiety and depression (Holtzhausen et al., 2020).

Rejection & Body Image

Orosz et al. (2016) suggests that using dating apps can bring positive effects such as reducing a user's anxiety. Due to the structure of the system where users will only be notified of a match and not of rejection, negative feedback directed to the user is then experienced as less straightforward.

However, in other cases, this indirect form of rejection is perceived as appearance-based rejection, especially by women, triggering a negative mood and leading to disordered eating in order to enhance their perceived attractiveness and therefore also their dating success. This complies with the fact that being evaluated negatively by others, is likely to result in unhealthy eating habits (e.g. binge eating and purging) in women (Portingale et al., 2022). In addition, it was found that users of Tinder experienced less satisfaction with their bodies and faces, as they were more likely to monitor their appearance and felt more shame regarding their bodies. This contributed to lower self-esteem (Strubel & Petrie, 2017).

Social comparison

Findings by Her & Timmermans (2021) suggest that users who compare themselves with other users are more likely to experience decreased well-being, even though they do not witness other people's success (of receiving many likes). This is also supported by a study conducted by Strubel & Petrie (2017), where the researchers found that Tinder users were more likely to compare their appearance compared to non-users.

Chatting

Online social interaction

In general, social interactions taking place online were found to be beneficial to well-being according to Lomanowska & Guitton (2016). This includes increased self-esteem, improved mood, enhanced feelings of social support, reduced loneliness and decreased chances of depression and anxiety. However, depending on the situation of the user, it could result in opposing effects such as an increase in feelings of loneliness and depression.

Ghosting

Ghosting can be defined as the act of ending communication suddenly without an explanation. It is one of the observed phenomenons which have impacted users' psychological well-being, leaving users perplexed and searching for answers (Stoicescu, 2020). Rather than direct confrontation when dissolving a relationship, users tend to avoid confrontation by ending the conversation with silence, causing the other party to experience negative emotions such as distress (Freedman et al., 2022).

Dating apps, in particular, allow access to high volumes of profiles, therefore also making it easier to cut off contact with existing connections. Nevertheless, ghosting does not always occur with a harmful intent, sometimes the reasons concern self-protection (from rejection-sensitive and hostile people) or are unintentional (deletion of the app due to bad experiences) (Timmermans et al., 2021).

The overall use of dating apps

Social connection

Using dating apps was also found to have beneficial effects. Albury et al. (2019) reported that dating app platforms open up new ways to meet potential partners, allowing access to a diverse amount of people. For minorities who have been silenced or marginalised, in particular, this is considered an advantage for meeting like-minded people. Moreover, its use is experienced as a non-intimidating way to start connecting and requires less effort compared to traditional means. It is also believed to improve social connection, relationships and friendships.

Safety

While dating apps bring more opportunities for contact, it also has left users to become more vulnerable (Castro & Barrada, 2020). For instance, Andrighetto et al. (2019) found that when men are rejected in an online dating environment, it can lead to aggressive behaviour towards potential partners, in some cases even induce hostility towards women. Apart from its effect on psychological well-being, dating platforms were also found to have risks to physical and financial well-being. A study by (Shapiro et al., 2017) investigated that Tinder use increased the risk of contracting sexually transmitted diseases and/or experiencing nonconsensual sex, particularly for women and minorities. In addition, Feldman (2019) reported that scams taking place in the setting of dating apps have significantly grown from 8,500 reports in the United States in 2015 to 21,000 in 2018. Fake accounts, impersonation cases and bots have enabled drug-related situations along with human traffickers luring potential victims. As a result, dating apps such as Tinder have strengthened their regulations and integrated safety measures into their app (Tinder Newsroom, 2020).

Offline interactions

Although platforms such as Tinder try to limit the provision of fake information by either linking their profiles to an existing social media account or users are met with the chance of having to meet the other in real life, face-to-face meetings sometimes still result in disappointment. This is often due to the lack of coherence between the online-created image and the one presented offline, creating different expectations beforehand (Ward, 2017). In addition to this, as men are more likely to be strongly motivated by casual sex compared to women, disappointment may occur due to different expectations between the two (O'Sullivan and Gaines, 1998).

4. Well-being

To design for well-being, it was first necessary to understand what well-being signifies. Through literature research, well-being was defined and relevant theories were summarised. From these theories, relevant aspects of well-being were derived and linked to existing dating app features. These insights resulted in a theoretical model of well-being.

4.1 Definition

According to Deci & Ryan (2008), well-being is referred to as the optimal psychological experience and functioning and compromises two different perspectives: hedonic and eudaimonic.

The hedonic view focuses on happiness, defining well-being as the presence of positive affect in combination with a low level of negative affect. This approach involves how people experience the quality of life. While for the eudaimonic view, meaning and self-realisation are the core. This includes the degree to which a person is fully flourishing and is actualising their human potential, which depends on the way they live their life.
Although these are separate concepts of well-being, overlap can occur between the two where both can be experienced. These traditions are the basis of many well-being theories discussed in the next section.

4.2 Well-being theories

4.2.1 Subjective well-being

Subjective well-being (SWB) is an approach that can be categorised under the hedonic tradition and requires people to evaluate their well-being for themselves. This involves the experience of a high level of positive affect, a low level of negative affect and a high degree of life satisfaction. SWB can be affected by personal, social-environmental and cultural factors (Deci & Ryan, 2008).

4.2.2 Six dimensions of psychological well-being

The eudaimonic-focused theory by Ryff & Singer (2008) consists of six components of psychological well-being, namely: autonomy, environmental mastery, personal growth, positive relationships, purpose in life and self-acceptance.

In digital environments, this can be defined as (Alhalafawy et al., 2021):

- **Autonomy:** To have a choice over one's life (self-determination) and to rely on own judgement. To evaluate oneself by personal standards, not feeling pressured by the evaluations of others.
- **Environmental mastery:** To have a sense of control over one's digital environment and have the ability to adapt this to one's needs. To be aware of surrounding opportunities and benefit from them.
- **Personal growth:** To continue developing, improving and being aware of one's growth over time. To realise one's potential and to be open to new experiences.
- **Positive relations with others:** To have warm, satisfying and trusting relationships with others. To care about the welfare of others, and be capable of empathy, affection and intimacy.
- **Purpose in life:** To have personal goals or aims in life and a sense of direction, as well as having the determination to achieve these goals. To have a sense of meaning in life.
- **Self-acceptance:** To view oneself positively, including one's past life. To be aware of one's strengths and weaknesses and to accept them, along with those applicable in digital environments.

4.2.3 PERMA Theory

As reported by Seligman (2011), well-being is defined as a construct rather than a real thing, containing five measurable elements, specifically:

- **Positive emotions:** To experience positive emotions when relating to the past, present and future.
- **Engagement:** To be immersed in doing an activity in the moment (to be in flow) while also being interested in the activity as it plays onto one's strengths
- **(Positive) Relationships:** To form meaningful and healthy relationships with others from one's surroundings
- **Meaning:** To find meaning, belonging and serving something bigger than one's self.
- **Achievement:** To achieve a desired goal, motivated by personal fulfilment through one's continuous effort.

4.2.4 Self-determination theory

The Self-determination theory (SDT) of Deci & Ryan (2000), focuses on human motivation that is driven by psychological needs.

Intrinsic motivation

In the case of intrinsic motivation, a person is driven by personal interests and values such as curiosity and the satisfaction of doing a certain activity. Furthermore, feelings of competence and efficacy also contribute to this drive.

Extrinsic motivation

For extrinsic motivation, external factors play a major role in motivating a person such as rewards and opinions from others. However, extrinsic motivation is not as effective in the long-term if intrinsic motivation is not maintained.

The psychological needs associated with these motivations are:

- **Autonomy:** To be independent while also participating in social life.
- **Competence:** To experience a sense of control over oneself's behaviour, while also engaging in activities that challenge one's capabilities and result in a feeling of accomplishment when achieving a goal.
- **Relatedness:** To have a sense of belonging while wanting to feel connected to others.

4.3 Theoretical model

From the comparative analysis, existing dating app features were deduced. Using ChatGPT, potential effects of each feature on well-being were determined and connected to existing well-being theories or facets. This table was very extensive (consisting of over 30 features) and was condensed to a list with only the main features (presented in Figure 4.1). This was done to visualise the process of relating the features to well-being.

Figure 4.1: Link to well-being

Through desktop research on the impact of dating app use on well-being (found in Chapter 3.4), the content of this model was narrowed down to well-being theories discussed in section 4.2. By combining the literature research on dating apps with well-being theories, an overview of the theoretical model was made. This well-being model (found in Figure 4.2) is validated further in the research (Chapter 5).

The theoretical model of well-being consists of the most common features found within dating apps, as most of the literature discussed these features when it concerned well-being. The features concern: user profile (specifically 'adding media' and 'choosing interests/hobbies' options), filters, swipe screen, likes overview and the chat screen.

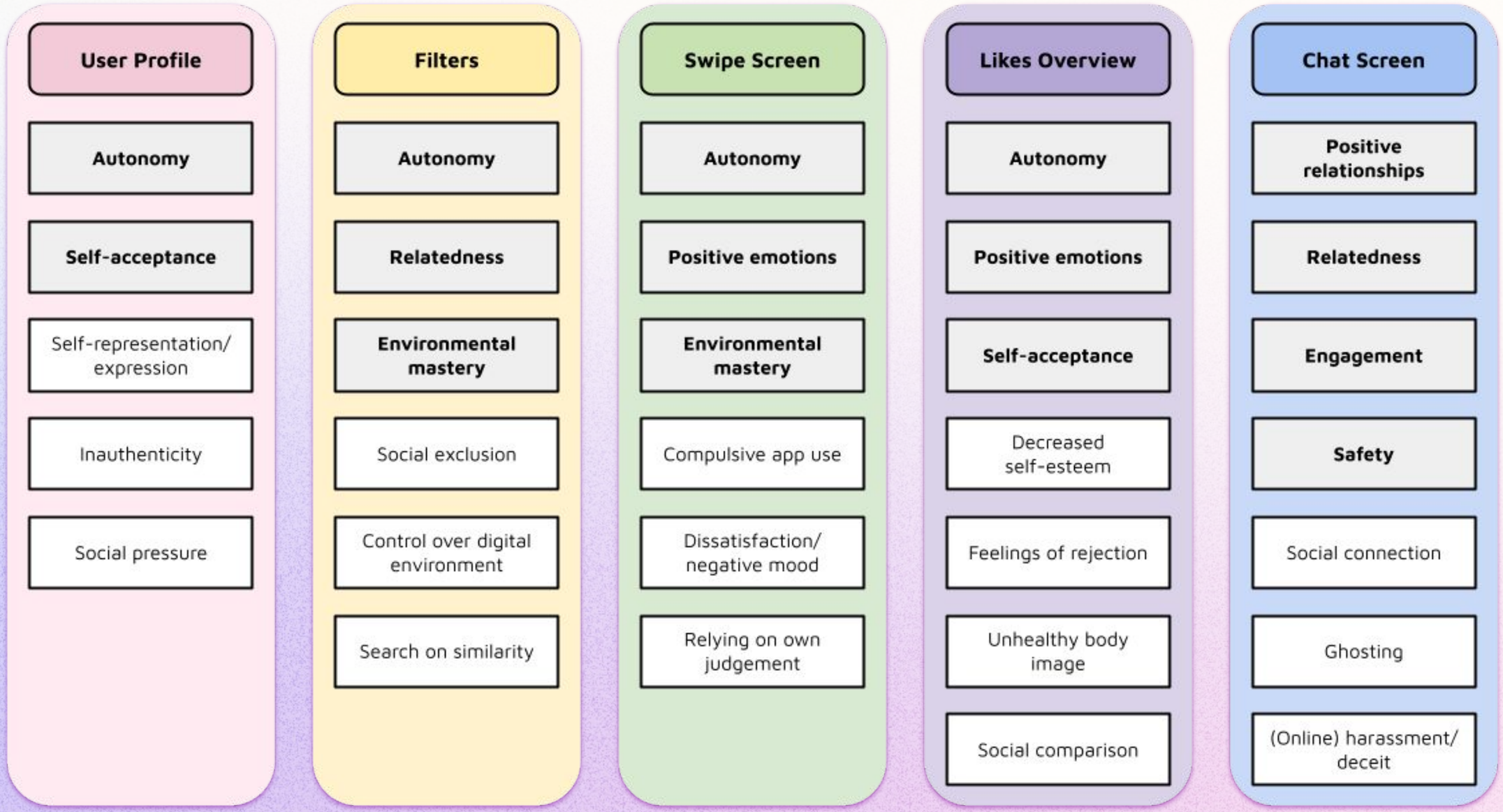


Figure 4.2: Theoretical model

Findings of both the well-being theories and desktop research (from Chapter 3) are summarised below.

User Profile
In this particular phase, studies indicated that the features affected autonomy and self-acceptance negatively. While 'adding media' enables the user to choose how they represent themselves (by providing a sense of choice), users can be affected negatively by social pressure and the desire for success (receiving likes). This causes them to represent an inauthentic image of themselves, where flaws are omitted.

Filters
Filters provide users with the option to filter out profiles based on chosen qualities (autonomy). They gain control over what profiles are recommended (environmental mastery) and attain the ability to find people they relate to (relatedness). However, at the same time, as users can filter on certain attributes, users who do not fit these categories are excluded.

Swipe Screen
Swiping through profiles was found to be addictive due to its nature being similar to that of a slot game, affecting environmental mastery (due to unintentionally using the app for a long period). Studies (discussed in Chapter 3.4) indicated that compulsive app use was associated with negative mood and in some cases even distress or depression. Though swiping allows users to eliminate profiles that they deem unrelatable (allowing users to rely on their own judgement), the overload of profiles and therefore choice can sometimes result in dissatisfaction.

Likes Overview
One of the main motivations for using dating apps is the seeking of self-validation (through receiving likes). When users receive little to no likes, users may experience this as rejection, resulting in negative emotions. This rejection can also affect their body image negatively (self-acceptance). In addition, lack of success can also contribute to social comparison where users feel inadequate to others due to the amount of likes of their appearance (autonomy).

Chat Screen
Online interaction with matches can contribute to an increased social connection with others (due to the ease of communication) and sustain positive relationships. However, when phenomenons such as ghosting occur, conversations can end abruptly (disrupting engagement between users). Other impacts of dating, involve safety where rejection in an online environment can lead to hostility and harassment.

5. Workshop: Theoretical Model Validation

In the previous chapter, a theoretical model was created. According to the Positive AI method, this model has to be tested with the community, in this case, dating app users. A participatory workshop was chosen as the validation method as this enabled active discussions among the participants and could support the generation of potential ideas (Stappers & Visser, 2007). From the insights of this workshop, potential design directions were determined, which were later used for ideation (shown in Chapter 6).

5.1 Research aim

The first aim of the workshop was to validate the theoretical model of well-being among dating app users, which was established beforehand through literature research. The second aim concerned verifying which features were the most influential and how to enhance them to optimise well-being. From these aims, two research questions were formulated:

- How do dating app features affect a user's well-being?
- In what way should dating app features be improved?

Pilot study

Prior to the workshop session, a pilot study was performed. This was done with a non-dating app user along with the researcher, to pinpoint possible areas for improvement to the research. From the results of this session, some questions in the first section were rephrased for more clarity, while the well-being cards presented in section two were improved visually through the addition of icons to make each card more distinguishable. Lastly, ideation and designing (in section three) on the spot after finishing previous parts of the workshop, was found to be quite difficult for non-designers. Therefore, wireframes from the features shown in part two of the workshop were reused (leaving the participants with the choice between designing with blank wireframes or improving existing ones), to support users in coming up with ideas.

5.2 Method

Participants

As the majority of dating app users consist of Millennials and Generation Z (Curry, 2023), selected participants were aged between 18-34 years old. Participants were recruited through convenience sampling as this was more flexible in terms of planning the workshops within a feasible time frame. The type of participants is visualised in Table 5.1.

Table 5.1: Participants

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**
Age	25	25	26	24	26	24	22	25
Gender	Female	Female	Female	Male	Female	Female	Male	Male
Sexuality	Hetero	Hetero	Asexual	Hetero	Hetero	Hetero	Hetero	Hetero
Dating app	Tinder	Hinge, Tantan, FB	Tinder, Hinge, Bumble, Tantan	Tinder, Bumble, Hinge	Tinder Tantan, Hinge, Bumble, OK Cupid	Tantan & Hinge	Tinder & Bumble	Tinder, Bumble, Hinge & Feeld
Daily app use	every day some-times an hour/or not at all	10 min & then forget about it	30 min, few times a week	20-30 minutes a day	15 min - 1 hour, twice a day	30 min a day	20 min a week	15 min a week, 3-4 times

Tools & Equipment

The workshop sessions were held online. Participants were required to use a laptop or computer to take part in the study. The application Zoom was used and participants received a link for the call before the session. Apart from Zoom, the platform Miro was utilised. On the Miro board, three main assignments were displayed where users were shown questions and could interact with the content by moving and filling in sticky notes.

Procedure

Before the workshop officially started, the researcher briefly explained the topic of the project. Users were then requested to fill in a consent form and after receiving their approval, the session began.

The first section of the workshop consisted of providing demographic-related information, such as the participant's age, gender and sexuality. This was then followed by answering four questions related to app use. This was a warm-up exercise to make users familiar with the topic and each other, as shown in Figure 5.1. The first workshop session (out of four), included a short well-being-related exercise, based on the Typology of Fundamental Needs (Desmet & Fokkinga, 2020) where users had to ideate for a simple object (in this case a fork) using the aspects affecting well-being (for instance, how to create a fork that provides more autonomy). However, since the workshop was considered too long by participants and mentioned understanding the following assignments without this segment, it was decided to leave this part out. An outcome of this part is visualised in Figure 5.2.

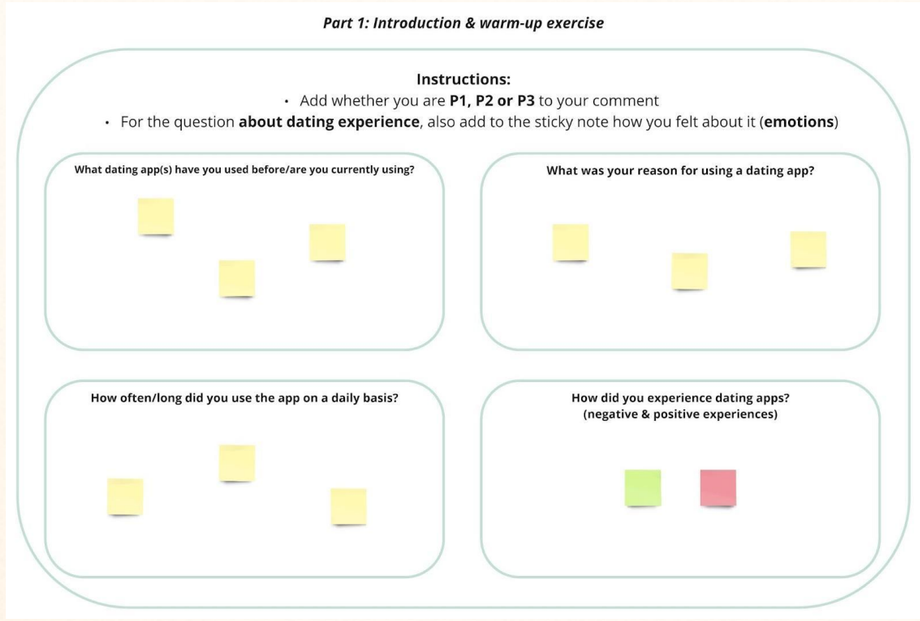


Figure 5.1: Part 1: Introduction & warm-up exercise

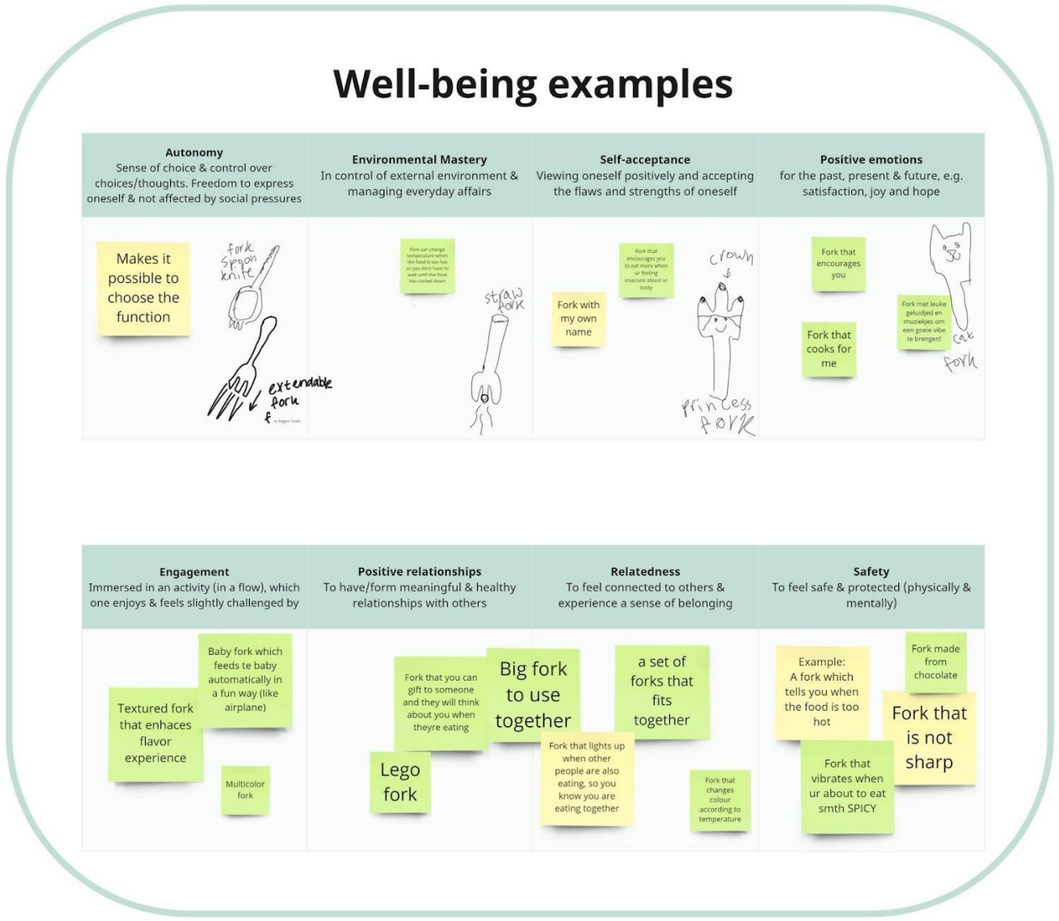


Figure 5.2: Well-being exercise based on Fundamental Needs Typology

Followed by the first segment, participants were presented a set of well-being cards, visible in Figure 5.3. Each card contained an aspect of well-being with a fitting image to represent its meaning. These cards were accompanied by a description derived from the literature research on well-being theories. The presented facets of well-being on these cards are also present in the theoretical model. Participants were assigned to place a specific well-being card underneath the dating app features where they believed their well-being was affected in a specific area (e.g. 'autonomy' was affected by the feature 'Likes Overview').

Relevant features were selected from the comparative analysis and visualised using screenshots, to support users with being aware of what these looked like instead of having them rely on their memories. These features were divided into the phases of dating app usage: profile setup, filters, swiping/liking and online interaction. In addition, functions were added which were believed to increase or decrease well-being. These cards had to be placed on a map, similar to the ones used for emotional user journey maps, which have a division between positive, neutral and negative. This was valuable for indicating what impact the features were expected to have on a certain aspect of well-being. The placement of each card underneath a particular feature had to be discussed between the participants, before making the decision.

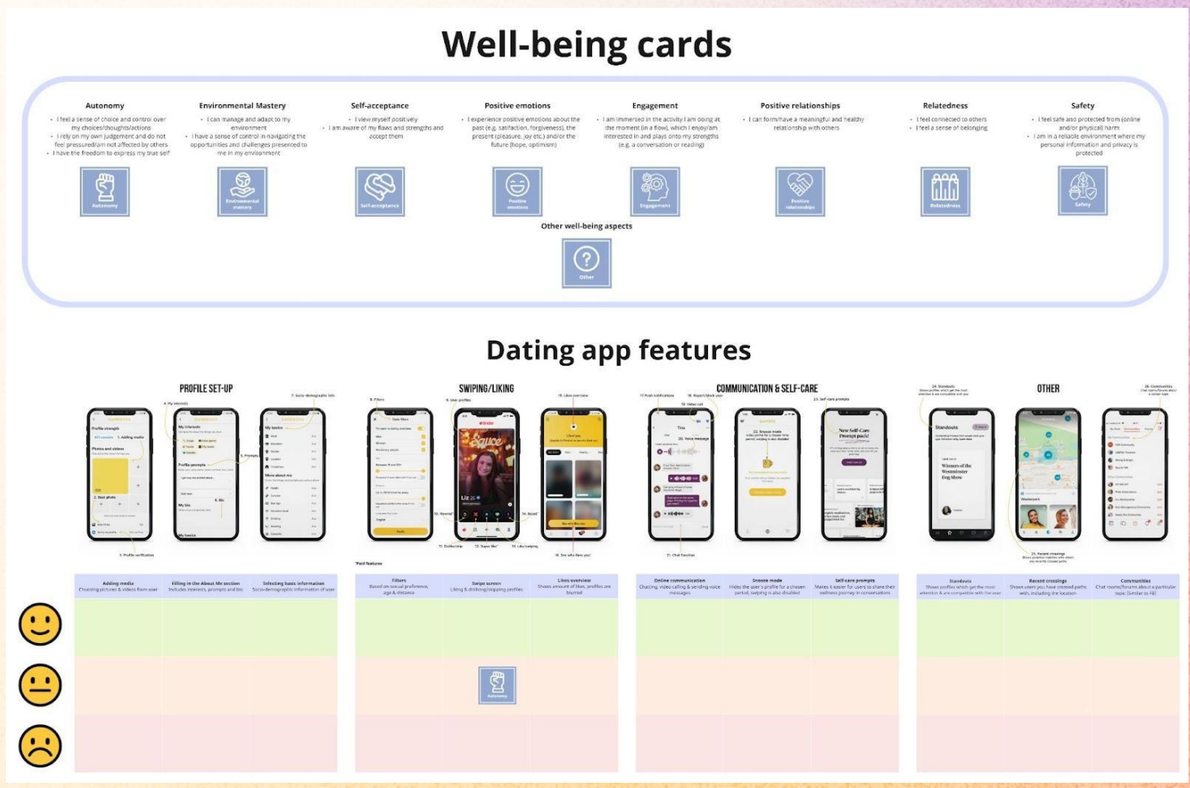


Figure 5.3: Part 2: Linking well-being to features

The concluding part of the workshop involved looking back on the previous task and choosing features to improve on (by removing, adding or enhancing components they liked or disliked). Participants were shown a set of blank wireframes (inspired by the study of Freeman et al. (2023)) where they could add the features they had analysed before and add descriptions for improvement or use different shapes to create their own features. While ideating, they could voice out their thoughts, while others could add on and stimulate creativity within each other. Lastly, users were asked one last question related to how they would like the system to measure their well-being. This was a short discussion where ideas were typed out on sticky notes. The layout of this section is displayed in Figure 5.4.

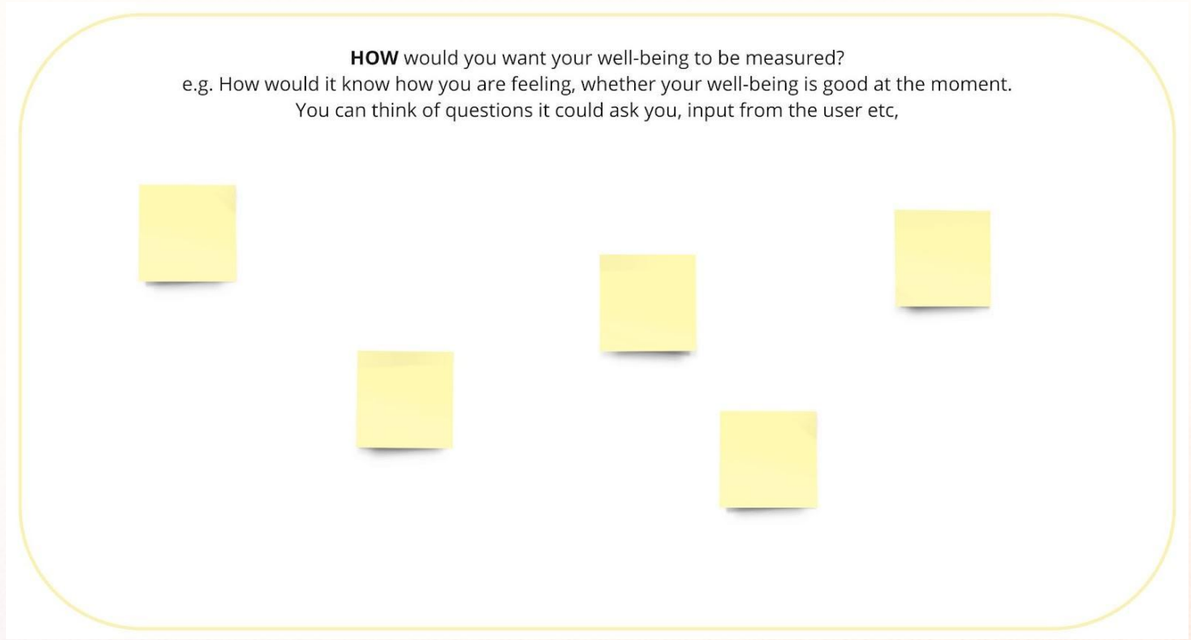


Figure 5.4: Part 3: Improving features for well-being

Data analysis

Before the official start of each workshop session, users were asked for their permission to record the Zoom call. When this recording was started, the researcher shared their screen to record the Miro board and the users' actions. During the workshop, the researcher made notes on the remarkable actions of participants and for taking in feedback to improve the sessions.

5.3 Results

From the outcomes of the workshop, an overview was made of each section of a dating app (profile setup, filters, swiping/liking, online interaction).

5.3.1 Profile setup

For profile creation, users found autonomy and self-acceptance to be the most evident facets of well-being, as seen in Figure 5.5. Features such as 'Adding media' allowed users to express themselves by choosing pictures that showed their 'good' side. In addition, it resulted in self-awareness by enabling users to reflect on themselves as a person (by writing a 'Bio' and choosing interests) along with their past (through photos). However, while these features contributed to increased well-being in some areas, at the same time they created negative experiences. Participants mentioned experiencing pressure to present themselves in a desirable way. Rather than making decisions based on how they truly felt about themselves, they chose options (e.g. interests) that increased their chances of matching or omitted information due to fear of being judged. This finding is in line with the study by Pidoux (2022) who found similar effects with hiding information and choosing more attractive interests during profile setup.

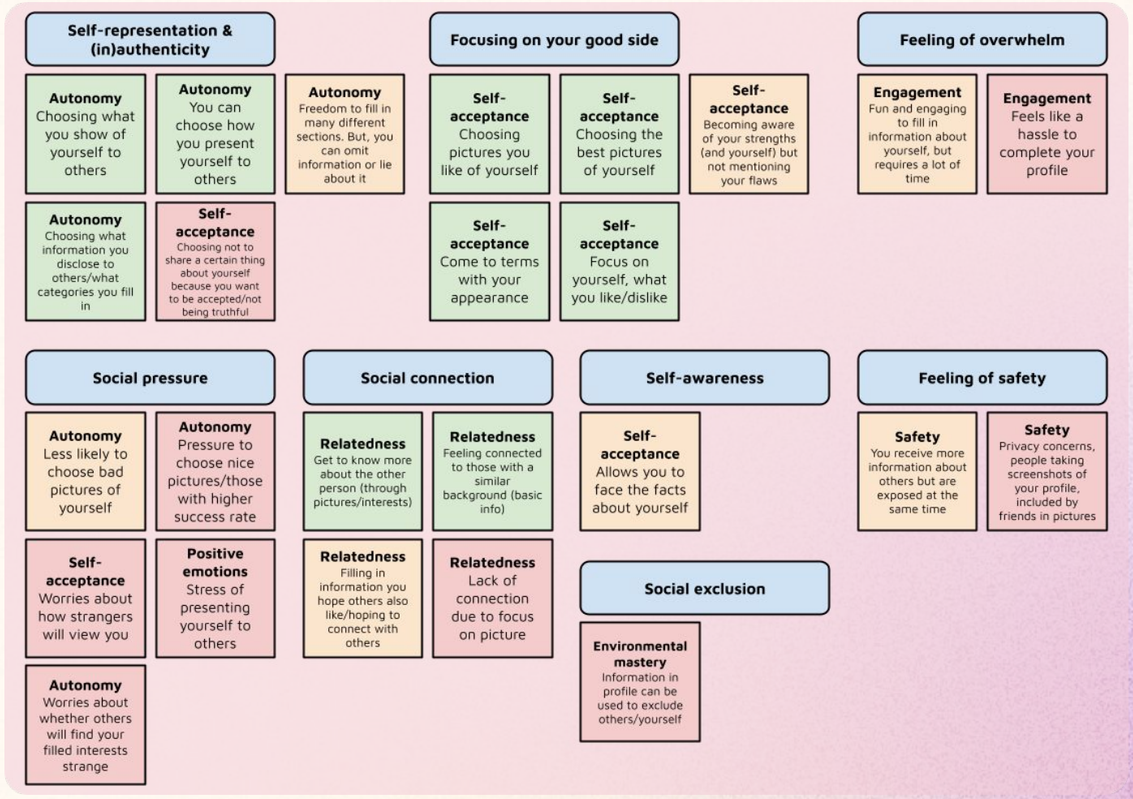


Figure 5.5: User Profile

Filters

With filters, users found that the feature provided a sense of choice and control over what profiles they could view and therefore experienced autonomy and environmental mastery (as displayed in Figure 5.6). Users tended to use the filters to find people similar to them (based on age, ethnicity, etc.) and as a result, could relate more to the profiles (relatedness). Nevertheless, the downside was that users noticed that they were potentially excluding others who did not fit their preferences even though they could still be compatible. This insight was also found in Hutson et al. (2018) where filtering on certain characteristics resulted in exclusion.

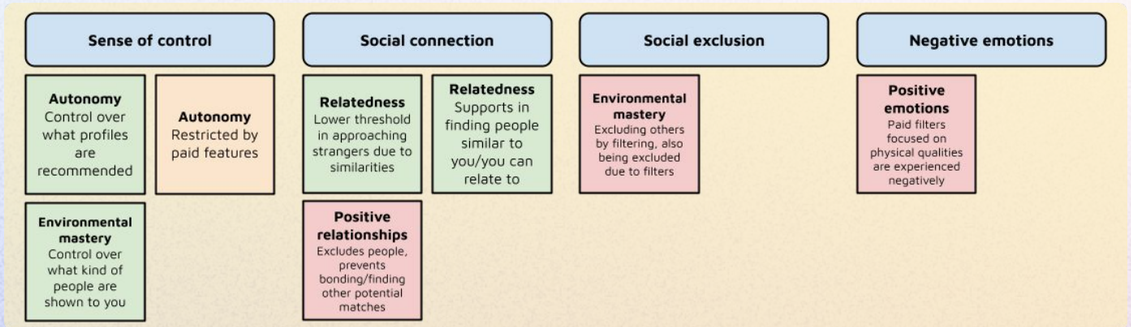


Figure 5.6: Filters

Swiping/liking

Relatedness and positive/negative emotions were confirmed to be the most affected well-being traits during the swiping phase (Figure 5.7). When acquiring a match amidst the swiping, users tended to feel good and experience a 'dopamine hit'. Nonetheless, rejecting users was coupled with guilt. Since the emphasis of these dating apps is heavily put on appearances, it also made users feel shallow. Other influencing factors on emotions included the kind of profile they viewed. When being presented with a profile they liked, users were likely to encounter positive emotions while seeing less interesting profiles had an adverse effect. Negative feelings such as worry were also present throughout the swiping as users feared seeing and being seen by users they knew personally.

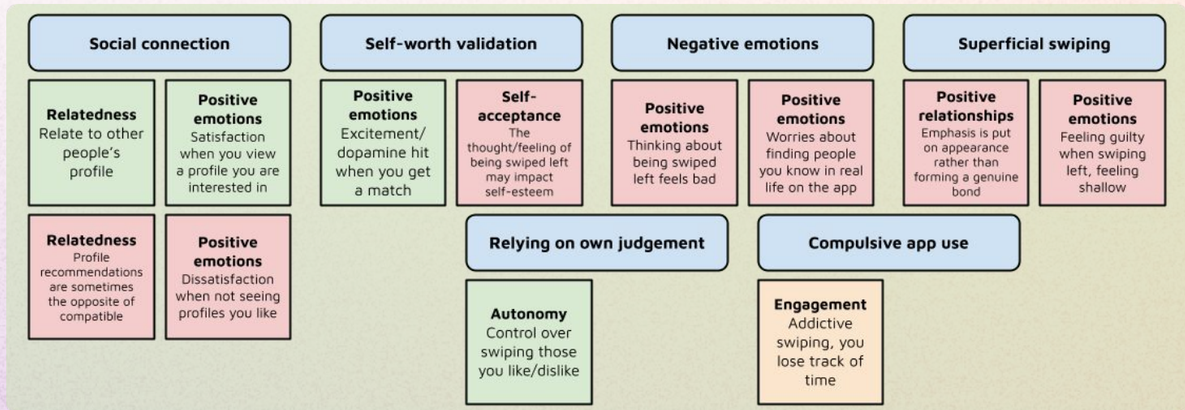


Figure 5.7: Swipe Screen

The use of the likes overview (Figure 5.8) led to the experience of positive and negative emotions depending on the amount of likes received. Participants felt a confidence boost when seeing a large number of likes, but the overview had a detrimental effect on well-being when it was the opposite. When obtaining little to no likes, users were left with a bad mood. In this situation, no feedback was perceived as rejection as reported by Portingale et al. (2022). Environmental mastery also played a role, as the feature limited users through the lack of control over the amount of likes received.

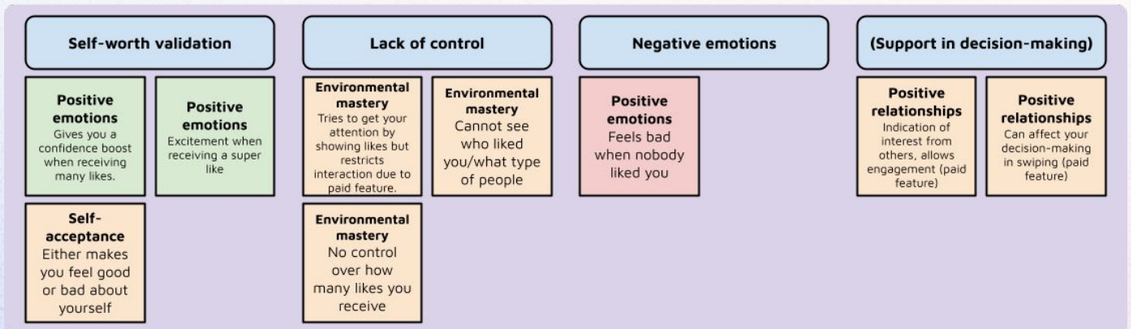


Figure 5.8: Likes Overview

<u>Online interaction</u>

The chat screen which allows online interaction between matches, was investigated to cause a lack of engagement and relatedness, as shown in Figure 5.9. Since the communication was done through chatting, users found it sometimes hard to emphasise with the other party as it was difficult to grasp their real personality through this feature. However, some participants mentioned that chatting was the first step in knowing more about the other party as they did not have to rely on solely a picture anymore in order to create a connection. In addition, users were often unsure of the person's intention or the tone in which they send a certain message, creating another barrier to understanding one another. The conversations were in most cases experienced as static (sometimes due to users not having many social skills), not interactive with short responses and a long response time. This made users feel like it was difficult to keep the conversation going.

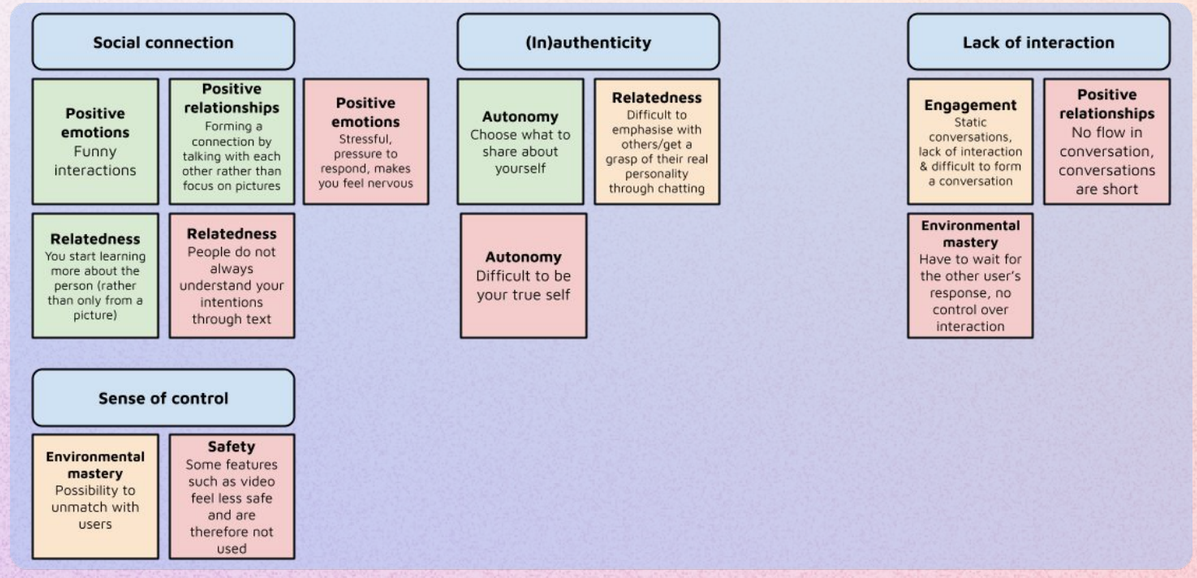


Figure 5.9: Chat Screen

The overview of the other features (which were unique or related to well-being) is located in Appendix C and is deemed as inspiration for ideation when wanting to focus on designing with positive stimulating elements (or avoiding those with negative effects).

Ideation by participants

The ideas on improving features (Figure 5.10) created by the participants were clustered to form potential design directions. An overview was made and is presented in Figure 5.11. Ideation for measuring well-being can be found in Appendix C and was utilised for inspiration.

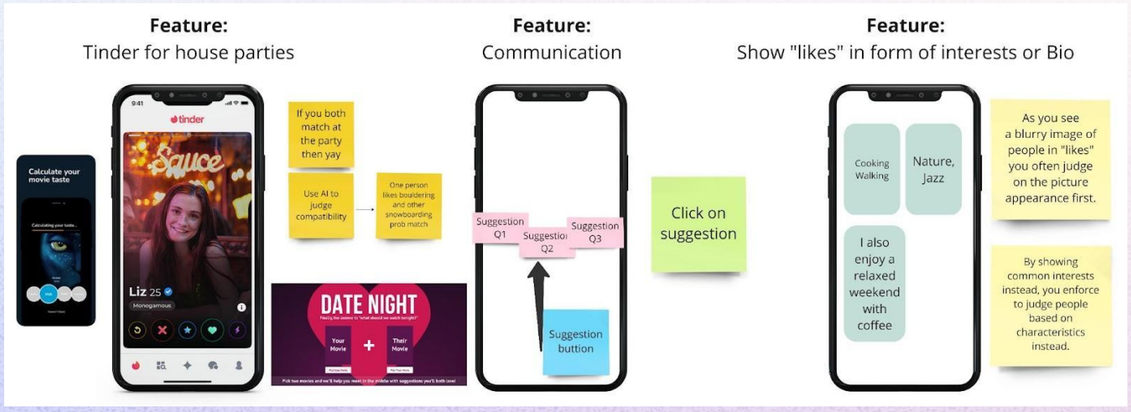


Figure 5.10: Examples of created wireframes

Most ideas concerned using the technology for assisting the user, during the profile setup, swiping and chatting. Importance was also placed on making the interaction between the app and other users more entertaining. For the matching process, users wanted to find potential matches based on similarities between them, previous experiences (e.g.) what type of pictures liked) and by focusing more on content (personality, interests, etc.) rather than appearance. Lastly, as many ideas involved the chat screen, users wanted communication and online interaction to be improved.

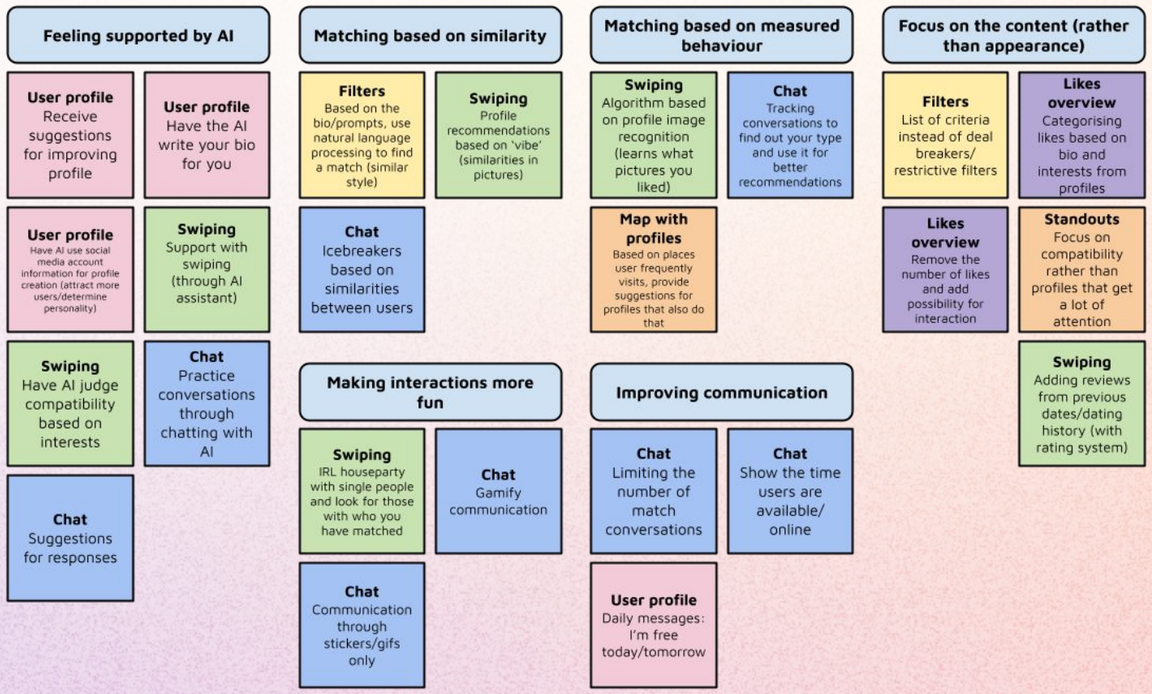


Figure 5.11: Overview Ideation

5.4 Conclusion

The first aim of the research concerned investigating the effect of dating app features on well-being. From the results, it was determined that for each phase of the dating app, certain facets of well-being were more prominent than others.

For the profile setup, autonomy and self-acceptance were the most noticeable aspects. The features in this section allowed users to reflect on themselves in a positive manner and allowed self-expression. However, due to social pressure and the desire to gain more likes and matches, participants are more likely to present themselves in certain a way that attracted more users rather than representing their true selves.

The next phase involved filters, where environmental mastery and relatedness were mainly affected. Filters allowed control over the profiles viewed and supported users in finding like-minded people. Nevertheless, at the same time, this resulted in the exclusion of other potential partners.

The swipe screen was associated with relatedness and an increase in negative and/or positive emotions. Findings suggested that the type of profiles presented to users affected their experience (feeling connected to the profiles) along with their swiping behaviour (rejecting users and receiving a match).
Similar to the swipe screen, viewing the likes overview was also perceived to influence positive and negative emotions. Users who received a large number of likes, experienced an ego boost while the opposite happened to users with few likes (resulting in a negative mood).

The mentioned facets of well-being during the workshop were also found within the theoretical model. However, for the swiping screen, specifically, relatedness was also found to affect well-being even though this was not discovered during the literature research. This adjustment, therefore needs to be added to the model. Positive relationships and safety were also constructs of well-being that were experienced by users, but the impact of the features in the case of the participants, was less clear compared to the other wellbeing-related aspects.

From the results of the ideation, it can be derived that users want AI to support them in making difficult decisions (such as choosing pictures or talking with strangers) while also placing importance on finding people similar to them. In order to feel more connected to other users, participants want to find users with similarities to them while decreasing the focus on appearance. Furthermore, when it concerns online interaction, users want more interactivity and clearer communication.

By combining determined facets of well-being along with the results of the ideation, promising design directions concern:

- Profile setup: Focusing on authentic self-representation (autonomy & self-acceptance)
- Filters: Increasing relatedness while reducing social exclusion (environmental mastery & relatedness)
- Swipe screen: Being supported in decision-making (autonomy, relatedness & positive emotions)
- Likes overview: Increasing positivity when receiving likes (positive emotions)
- Chat screen: Stimulating communication by enhancing social connection (engagement & relatedness)

5.5 Discussion

Prior to the workshop, literature research was conducted on dating apps and well-being. For this study, a maximum of 8 facets of well-being were considered. Other facets that also could be potentially influenced (like those related to financial well-being) were, as a result, not measured and therefore were left out. For future research, it could be valuable to also consider other constructs of well-being such as financial and physical well-being.

In addition, as convenience sampling was applied, there was little diversity among the participants as all participants were Asian. This could have influenced the results as culture can affect the experience of online dating. Furthermore, there was a gender imbalance among the participants, where the number of female participants exceeded the number of male participants. As men experience dating apps differently from women (due to the success rate), the representation of this group could be less accurate than intended. Moreover, as minorities (LGBTQ+) were also not included in this workshop, this study can only be considered a reflection of heterosexuals rather than a complete representation of the whole society.

Since the workshop sessions were held online, less interaction occurred during the co-creation section where users had to ideate. Physical sessions may have induced more creativity and interaction and are therefore also recommended if future sessions were to take place.

6. Ideation

From the outcomes of the workshop, design directions were defined to use as basis for idea generation. An ideation method was selected that could facilitate the brainstorming of ideas while also linking well-being to possibilities of AI technology. During the idea generation phase, it was decided to narrow the design directions derived from the workshop, to a single design goal that allowed for the features of the concept to become more united (as a whole system). By selecting ideas from the brainstorm sessions, a concept was developed.

6.1 AI Ideation cards

With the aim of ideating solutions that could enhance well-being, an appropriate method had to be selected. The AI ideation cards incorporate the capabilities of AI by providing examples of possible user interactions through the technology and allow the framing of (well-being related) challenges. As this method enables the development of ideas, with possibilities for integrating well-being design directions (which were established previously), this approach was selected.

The AI Ideation cards were developed by AI X DESIGN, a global and self-organised community focused on AI-related research and utilising it for design (*AIxDESIGN Community*, 2023). These cards include 7 different categories related to the technology with many examples of use cases, presented in Figure 6.1. The AI cards were created to support designers in uncovering the opportunities of the technology.

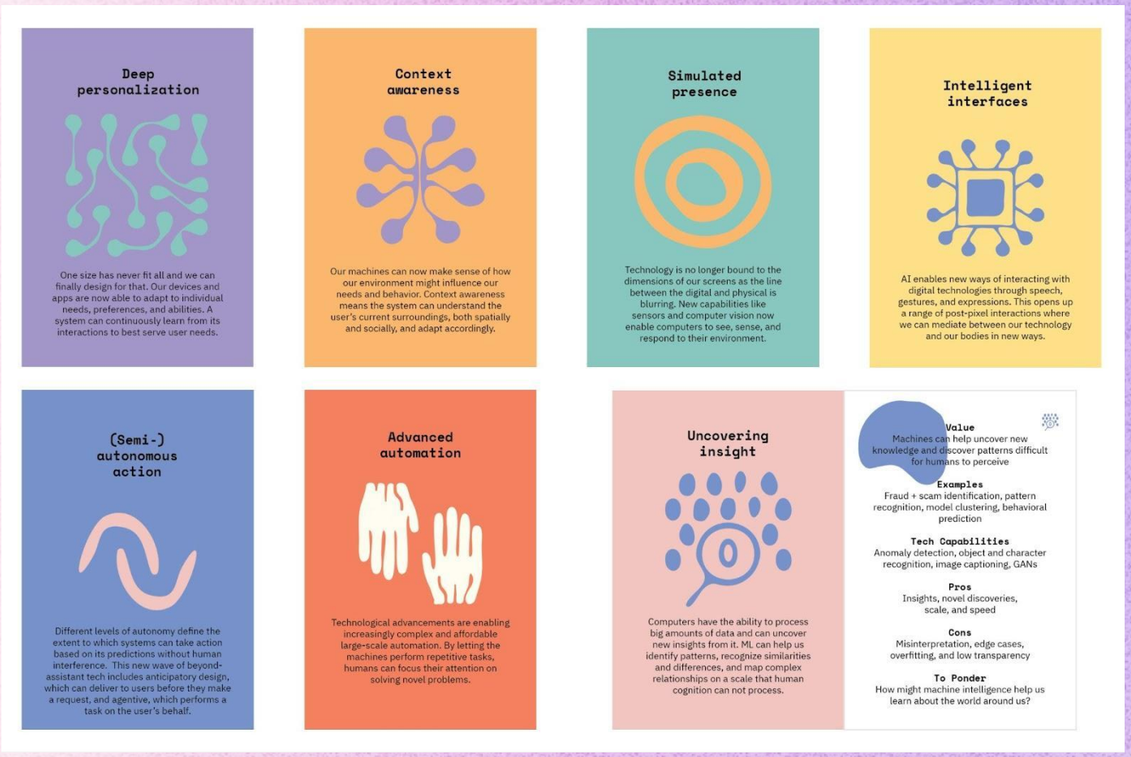


Figure 6.1: AI Ideation cards

In order to use these cards, there are multiple steps to be followed: framing the challenge, picking an AI ideation card, generating ideas, plotting the ideas on an impact matrix and selecting ideas. An overview of the method is visible in Figure 6.2.

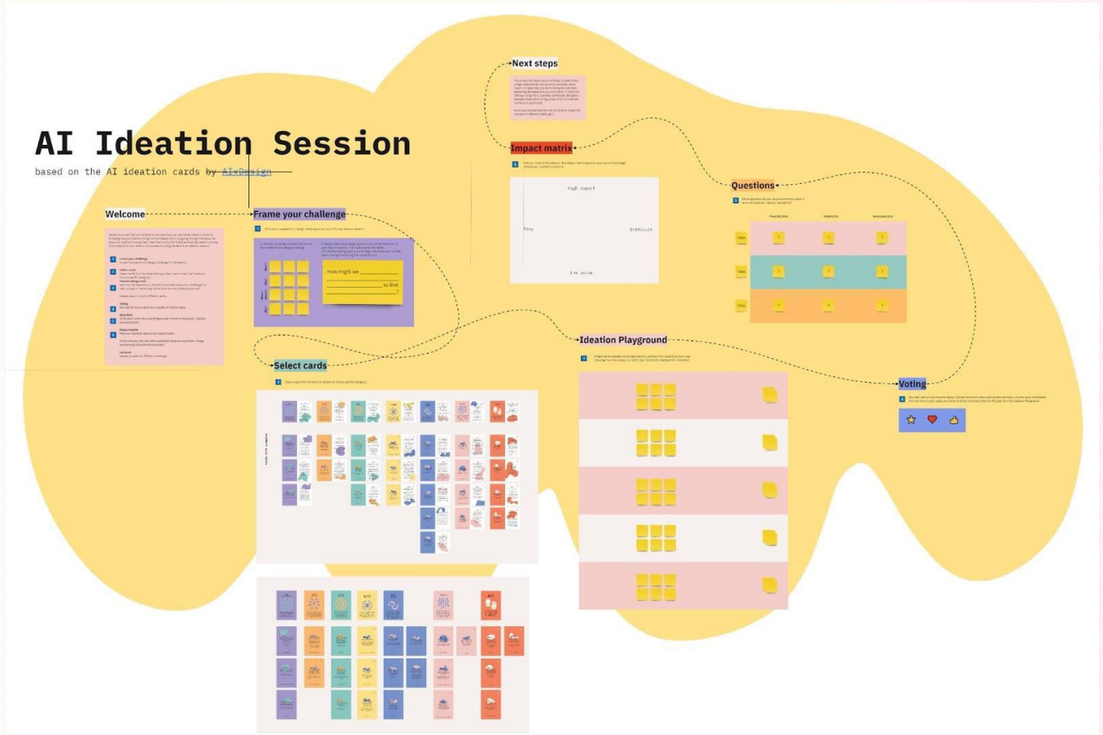


Figure 6.2: AI Ideation Steps Overview

While framing the challenge, relevant well-being aspects that were derived from the workshop were included and combined with the affected dating app feature that was to be redesigned. In addition, ideas regarding measuring well-being were generated.

The design challenges involved:

- **How might we**.. adapt the 'Adding Media/Bio or Interests/Basics' feature **so that** the user can experience more 'self-acceptance'
- **How might we**.. adapt the 'Adding Media/Bio or Interests/Basics' feature **so that** the user can experience more 'autonomy'
- **How might we**.. adapt the 'Filters' feature **so that** the user can experience more 'relatedness'
- **How might we**.. adapt the 'Filters' feature **so that** the user will not exclude other users/potential matches (environmental mastery)
- **How might we**.. adapt the 'Swiping' feature **so that** the user can experience more 'relatedness'
- **How might we**.. adapt the 'Likes Overview' feature **so that** the user can experience more 'positive emotions'
- **How might we**.. adapt the 'Chat Screen' feature **so that** the user can experience more 'relatedness' '
- **How might we**.. adapt the 'Chat Screen' feature **so that** the user can experience more 'engagement'
- **How might we**.. measure 'Well-being' **so that** the system can adapt/react to the user

Additionally, the matrix on which the ideas were plotted was also adapted by changing the axes from impact-focused to psychological well-being constructs such as self-acceptance and relatedness. Snippets of the ideation process can be found in Figure 6.3. An overview of the ideation results is located in Appendix C.

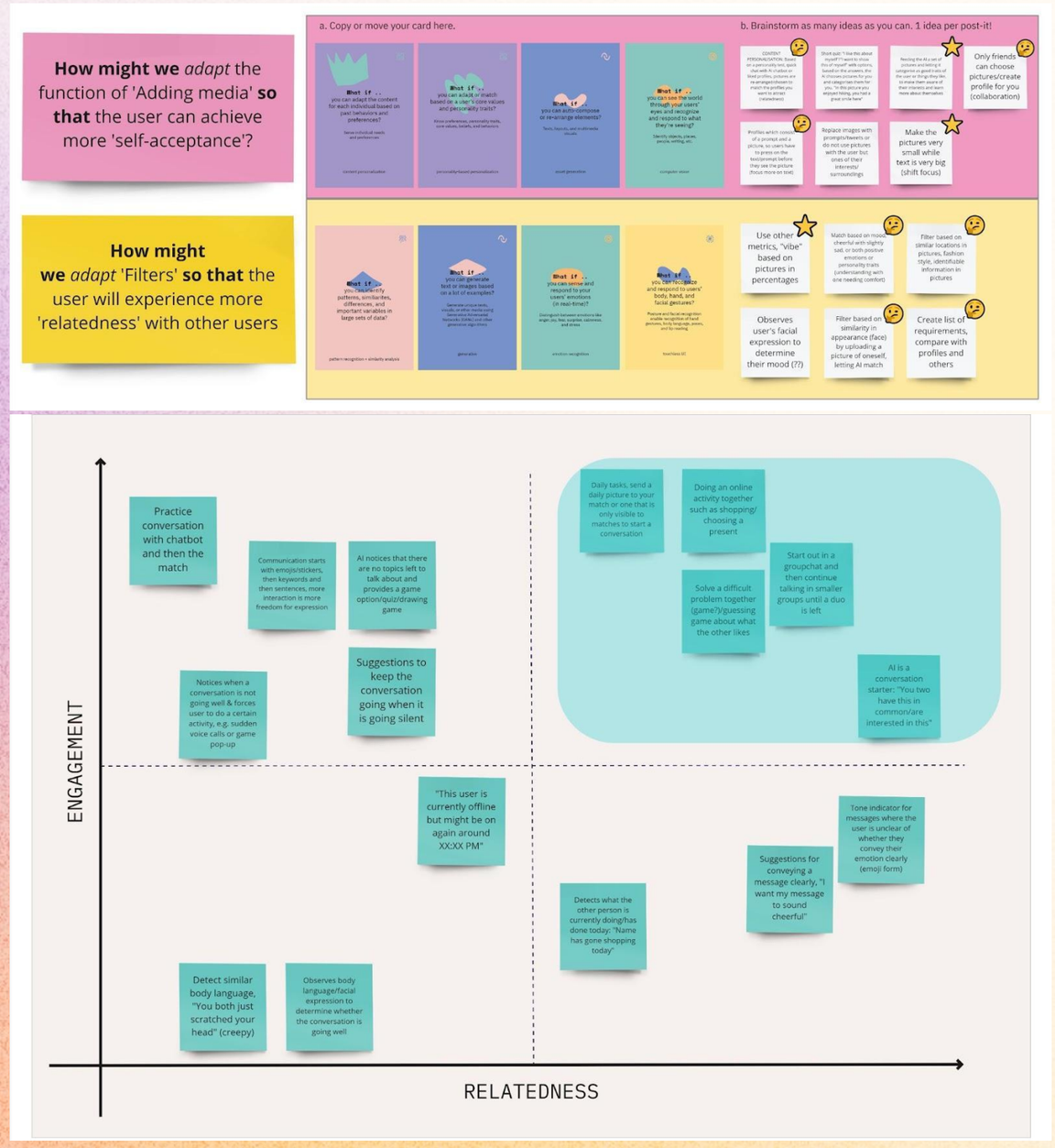


Figure 6.3: Features Ideation (top) and Matrix (bottom)

Following the steps of idea generation and matrix plotting, ideas were selected which were assumed to be most impactful on the well-being-related axes. These ideas were combined to form three concepts (displayed in Appendix D). Nonetheless, since these ideas were later on found to be incoherent due to the lack of one concrete design goal, the concepts were omitted. Elements of the concepts were used for developing one concept after a design direction was developed.

6.2 Design Direction

From the workshop one direction for each feature was determined. However, this resulted in a diverse amount of solutions with little coherence. Therefore, a single design goal was formulated, with a focus on relatedness and autonomy as they were recurring themes from the workshop and the desktop research. In order to define the direction, autonomy and relatedness had to be revised in the context of dating platforms, using previous and new insights.

Autonomy

Previously, it was established that autonomy regards the option to have a choice over own decisions, to rely on own judgement and not feel pressured by others (see Chapter 4.2). In the context of a dating app, this includes self-representation (what one chooses to disclose of themselves to others) and authenticity (making decisions that are in line with their true self (Knee et al., 2013)). From the workshop and literature research, it was determined that dating app users tended to choose desirable qualities and craft an ideal image of themselves to increase their chances of matching, therefore resulting in a lack of autonomy.

Relatedness

According to the self-determination theory (SDT), relatedness can be defined as having a sense of belonging and wanting to feel connected to others. Attachment, felt security and intimacy with others were also found to be part of relatedness (Deci & Ryan, 2000). Desktop research (from Chapter 3.3) indicated that features such as filters enabled users to seek profiles which they could relate to or contained characteristics (such as ethnicity and interests) that were similar to them. Apart from similarity, relatedness also includes the feeling of being understood, for instance, when emotional self-disclosure occurs. In this case, emotional disclosure (showing parts of one's core self) is more important than factual disclosure and can lead to increased intimacy and security (Knee et al., 2013). This aligns with the outcomes of the workshops, where users reported that a lack of relatedness was experienced when the interaction with other users did not feel 'authentic' as they did not get to know the 'real person' behind the screen.

The impact of autonomy & relatedness

Both of these aspects (autonomy and relatedness) are intertwined. This, in the sense that tension between the need for relatedness and autonomy can occur (Deci & Ryan, 2000). One can desire the need to feel connected to others or to be part of a group (relatedness) while wanting to differentiate themselves from others and be unique (autonomy) (Blijlevens & Hekkert, 2019). When there is a need or relatedness, the need for autonomy also needs to be fulfilled and vice versa. Depending on the sense of security either of the well-being facets is prioritised. In the context of dating apps, for autonomy to be fulfilled, relatedness should be present first (in the form of creating a sense of belonging through similarities) before users can be encouraged to be more autonomous (unique).

Balancing these two facets of well-being can lead to a positive effect on relationships. When one expresses their true and authentic selves to others and they are understood and supported by the other party (and vice versa), it can support the development of intimacy and foster genuine and lasting relationships (Knee et al., 2013).

With these insights, it is concluded that a valuable direction for design would be:

Enhancing social connection through individuality within similarity.

6.3 Initial Concept

Within the concept, elements of the previous five design directions of each feature (defined in the workshop) were subtly integrated into the design, along with the AI interactions selected from the AI ideation cards. The main goal of achieving individuality within similarity was also incorporated. In the design this is presented in the form of highlighting unique and shared interests/traits, to evoke connectedness with others while stimulating users to show their unique side.

6.3.1 System Overview

An overview of the system of the design is presented below in Figure 6.1. The black arrows represent the flow of the app while red arrows indicate the data collected by the app and influence a feature based on it. The design of the app is split into six sections: account creation, user profile, filters, swipe screen, likes overview and chat screen.

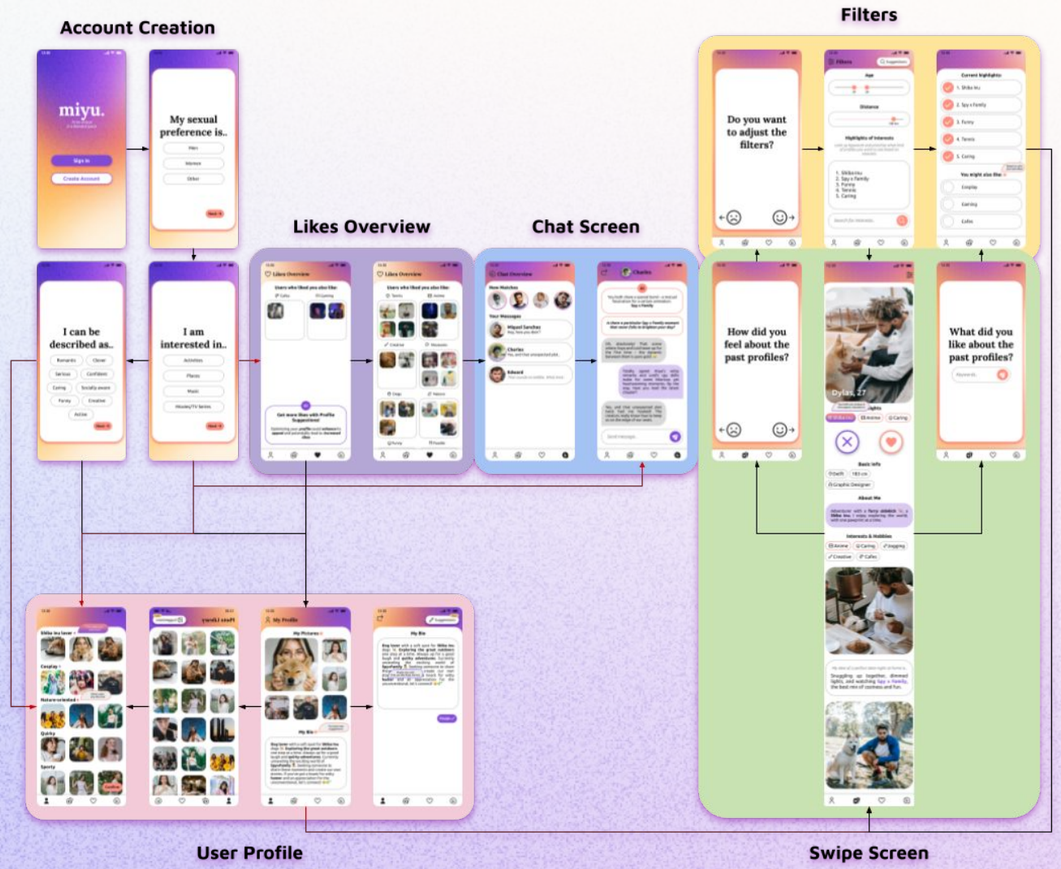


Figure 6.4: System Overview

In the following section, new features within each dating app phase are discussed. The features are explained in three parts, each discussing the User Interface (UI), the actions undertaken by the AI system (AI) and the expected impact on well-being (WB).

6.3.2 Account Creation

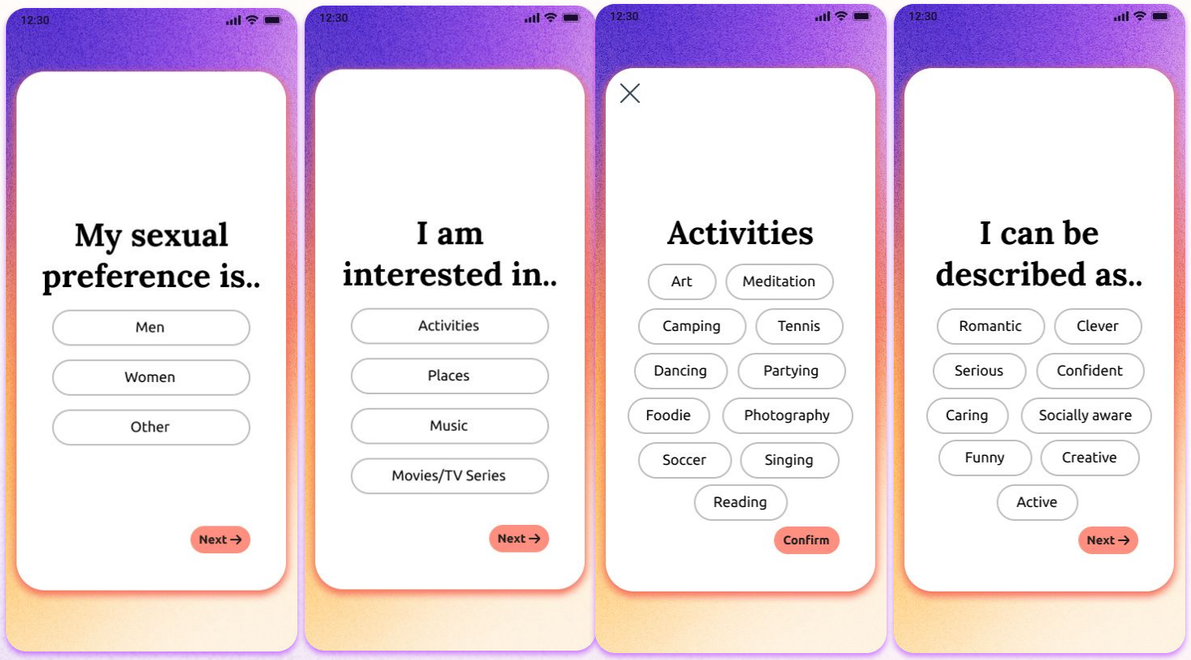


Figure 6.5: Account creation

UI: When opening the app for the first time, the user has to provide personal information about themselves such as name, age and sexual preference. Apart from this, interests and hobbies are asked. An addition to this phase is the personality section, where users are requested to describe themselves by selecting keywords.

AI: The data collected in this section is used for the Photo & Bio suggestions feature (explained in the next section) and for the Filters.

WB: This part allows users to reflect on their likes and dislikes and to think about what kind of person they are, creating self-awareness.

6.3.3 User Profile

Photo Suggestions & Bio Suggestions

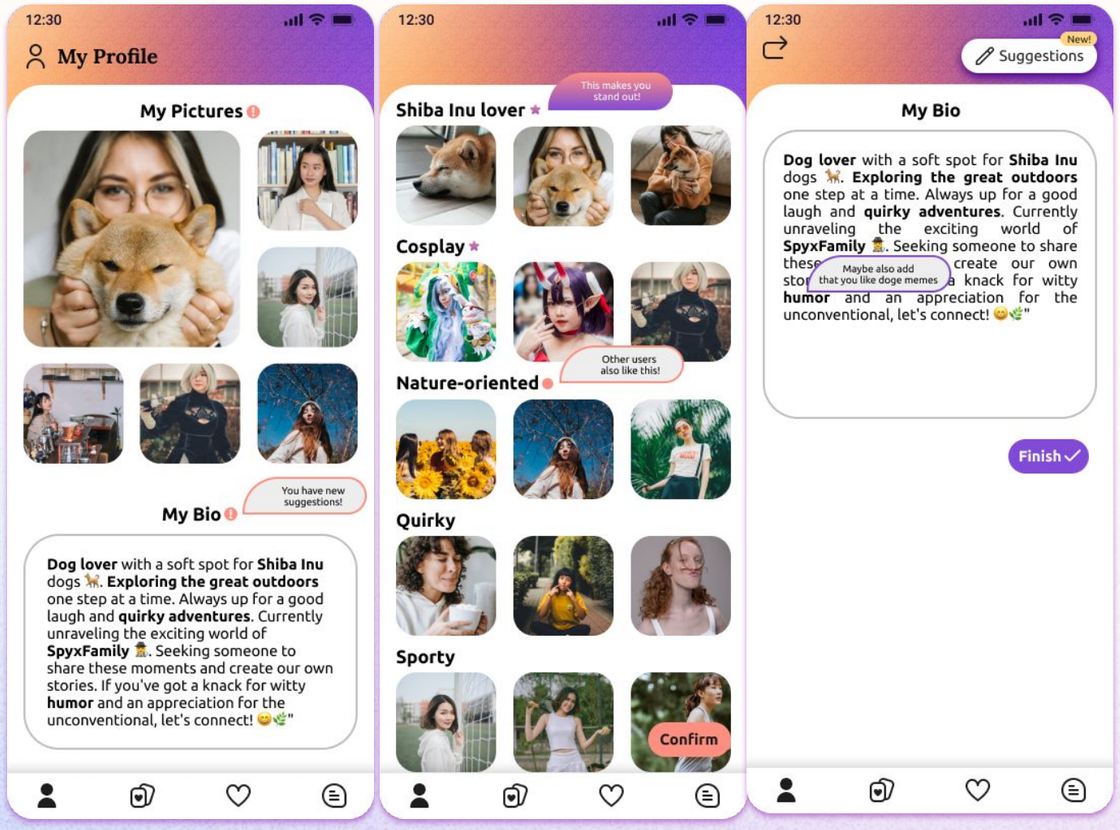


Figure 6.6: User profile (left), Photo suggestions (centre). Bio suggestions (right)

UI:

After creating an account, users have the option to verify their account which can be done through photo verification. When opening up the photo library to add photos, users can choose pictures on their own or utilise the Photo Suggestions feature. With the Photo suggestions, the user can select pictures from a set of categories. They can pick a combination of photos that make them feel connected to others and pictures which show what they are specifically interested in (and could make them stand out from other profiles). For writing the bio, suggestions will appear related to their interests to support them in writing. The Bio suggestion feature can also be applied to prompts.

AI: Data collected in the previous section such as interests and personality are used for sorting pictures into categories. Through photo verification, the system can compare the picture with the ones found in the photo library and recognise the user before sorting. These categories such as 'Shiba Inu' are compared with other users. Popular categories will be labelled as "Others are also interested in this" while interests or hobbies that are less common will be highlighted as "This makes you stand out!". The chosen pictures are rearranged on the profile when viewed by other users. The order of the pictures depend on what picture the viewer has on their profile.

Similarly to the Photo Suggestions, suggestions for the bio will be provided based on the interests and pictures the user has chosen before. The keywords will be extracted from the bio, be used for filtering and will be highlighted on their profile for other users.

WB: This feature allows users to see what common interests they share with others (to create a sense of relatedness) while also becoming aware of their unique traits that can be used to their advantage to stand out (autonomy). In addition, by providing suggestions, users will experience a sense of support from the system.

6.3.4 Filters

Highlights & Highlight Suggestions

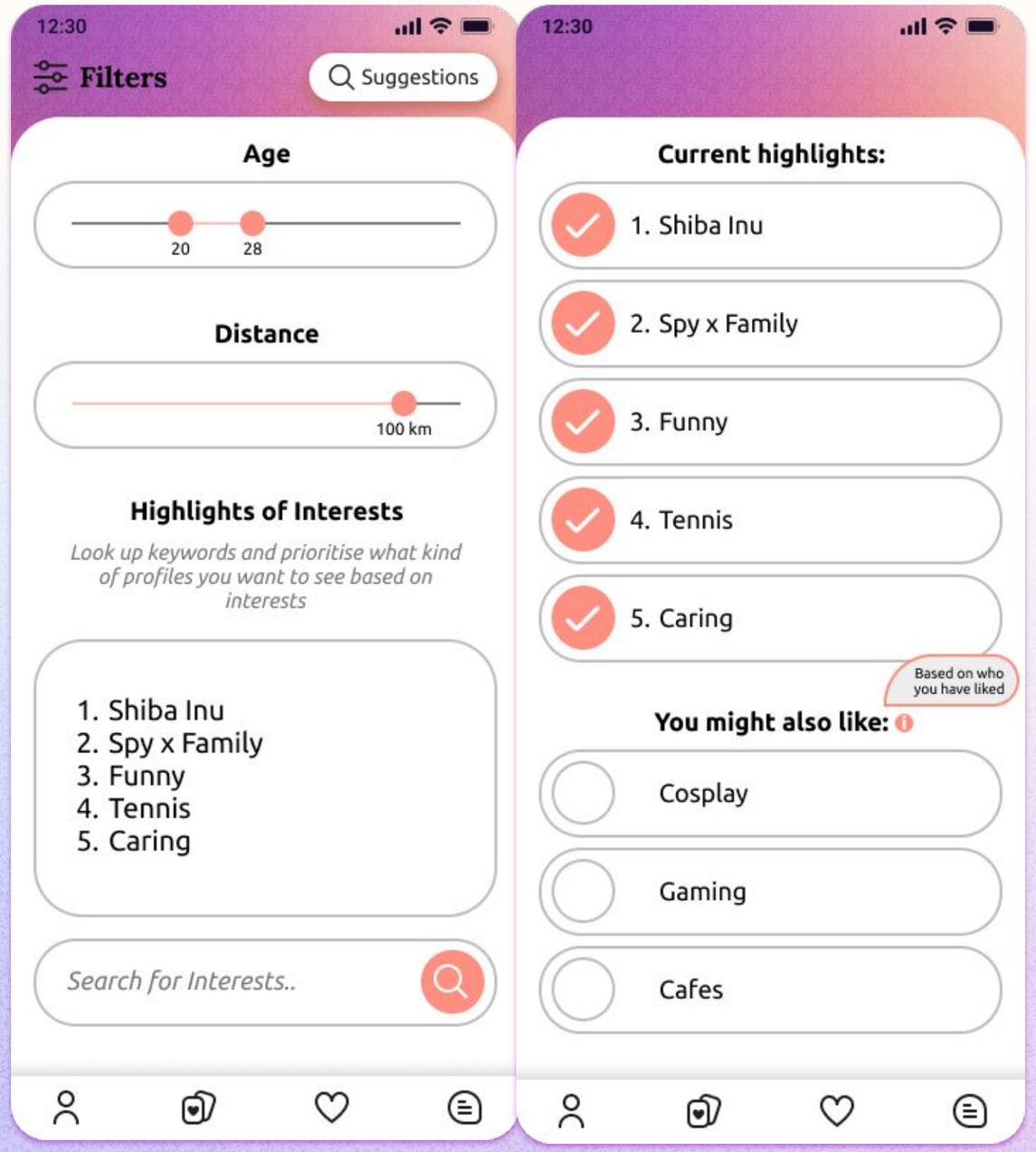


Figure 6.7: Highlights (left) and Highlight suggestions (right)

UI: With the filters, users can adjust the recommendations to their preferences such as age and distance. With the 'Highlights' feature, users can prioritise seeing certain profiles based on keywords (that are either common interests or something different). Users are limited to choosing five filters. Highlight suggestions enables users to adjust their filters through the recommendations of other search filters they might like.

AI: Based on the data from the profile, the user's swiping behaviour and the received likes, Highlight suggestions are presented to the user. Chosen highlights will appear on recommended profiles. The extent to how specific the typed keywords are, affect the results of the highlights and thus also the filter. Keywords such as 'sports' will therefore result in broader searches while 'basketball' will be more definite.

WB: Users are not limited to static filters (factual information) such as distance and age (or for paid filters like height and education) and can receive recommendations on specific interests or characteristics from a person. By using a ranking to prioritise what users want to view and by limiting the highlights to five keywords, users are encouraged to keep adjusting their filters. In this way, they can keep seeing new people and reduce te possibility of excluding people who do not fit their preferences.

6.3.5 Swipe Screen

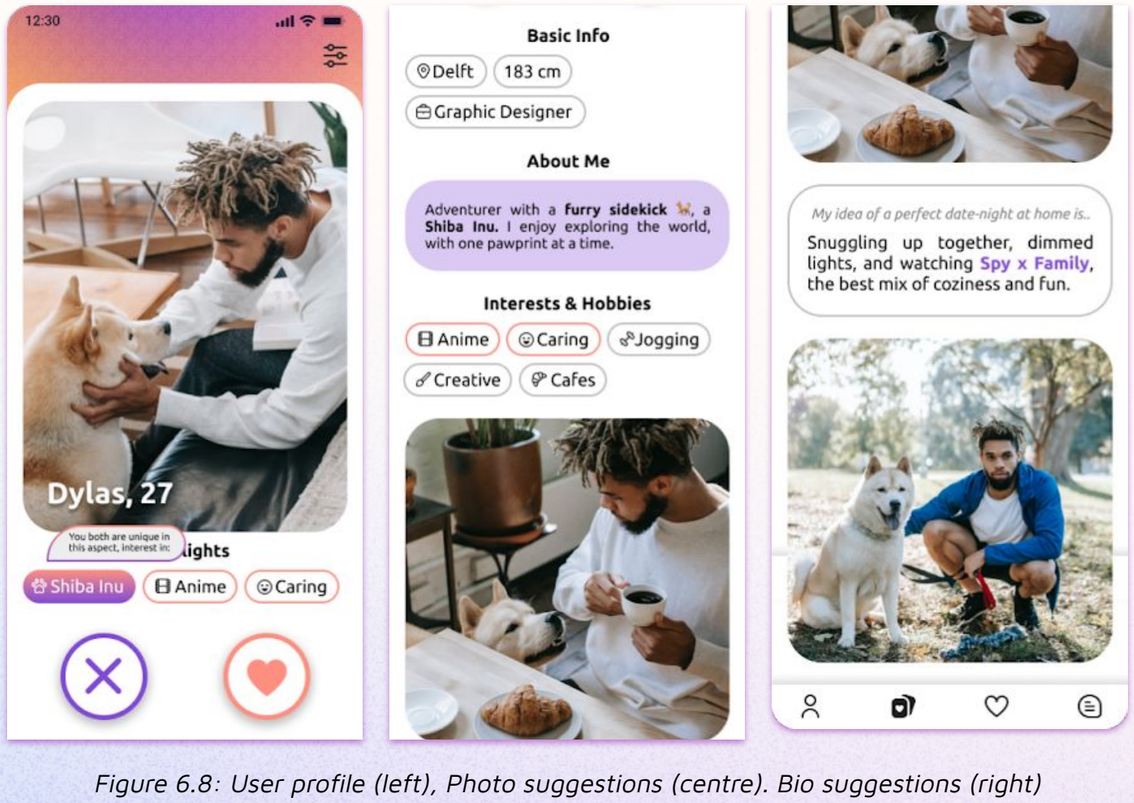


Figure 6.8: User profile (left), Photo suggestions (centre). Bio suggestions (right)

UI: While scrolling through the profiles, keywords that were chosen in the 'Highlights' section will contain a solid colour and will be displayed at the top of the profile. Shared interests will be highlighted throughout the profile and be visible in as bold keywords in prompts and the bio. In case of an uncommon trait, this will be presented in a noticeable gradient with a pop-up mentioning that it is an unique characteristic of both users.

AI: Shared interests, hobbies or personality traits are highlighted by the system in a solid colour. The data is retrieved from pictures, bio and prompts. Characteristics of the user that are found to be unique, are highlighted in a gradient colour. The gradient highlight will show up regardless of whether they filled this in the Highlights section. Common or unique interests will be used in the chat screen after matching.

WB: Highlighting shared and unique characteristics is done to catch the user's attention and make them reconsider swiping left before looking at the content of the profile. Furthermore, it can lead to a feeling of connection when users see that others have the same interests. By distinguishing between common and unique traits, users become encouraged to show a different side to them since the feature allows them to find other users that share the same specific passion (which can result in a sense of belonging).

6.3.6 Measuring well-being

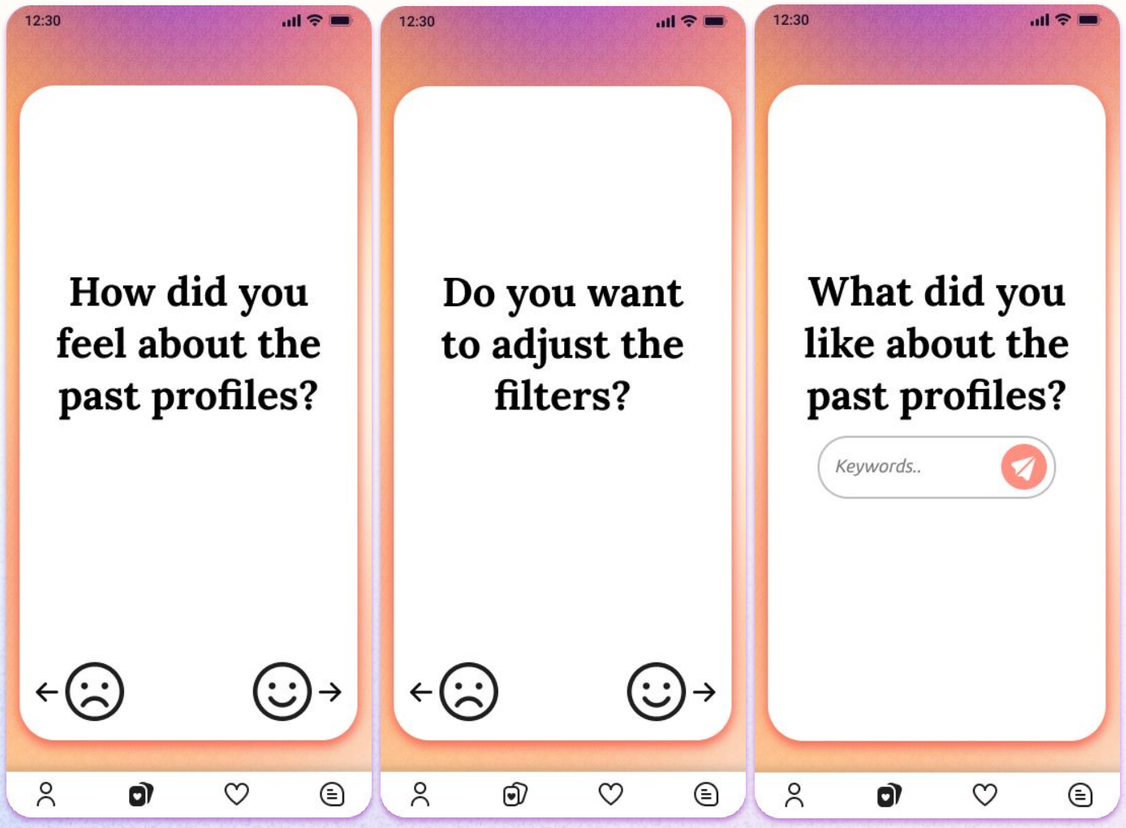


Figure 6.9: User profile (left), Photo suggestions (centre). Bio suggestions (right)

UI: When users swipe a certain amount of profiles to the right (like), a pop-up will appear. This pop-up contains a question regarding what the user liked about the past profiles. As a response, users can type this in, in the form of keywords. Swiping many profiles to the left (dislike) will result in another message. If users are dissatisfied with the recommendations, they are advised to adapt the filters again. The filter section will contain new Highlight Suggestions based on the profiles that were liked.

AI: The system will measure the direction of swipes as a form of relatedness (feeling satisfaction or connected to the profiles they view). With the right swipes, the system will analyse the users preferences and use the provided keywords for recommending new Highlight Suggestions that were not activated by the user yet. Left swipes are utilised for reminding the user of adjusting filters to match their preferences more accurately.

WB: By measuring the level of relatedness, users will inform the system when they experience a lack of relatedness. The system will adapt to their experience, resulting in better recommendations that might increase the feeling of relatedness.

6.3.7 Likes Overview

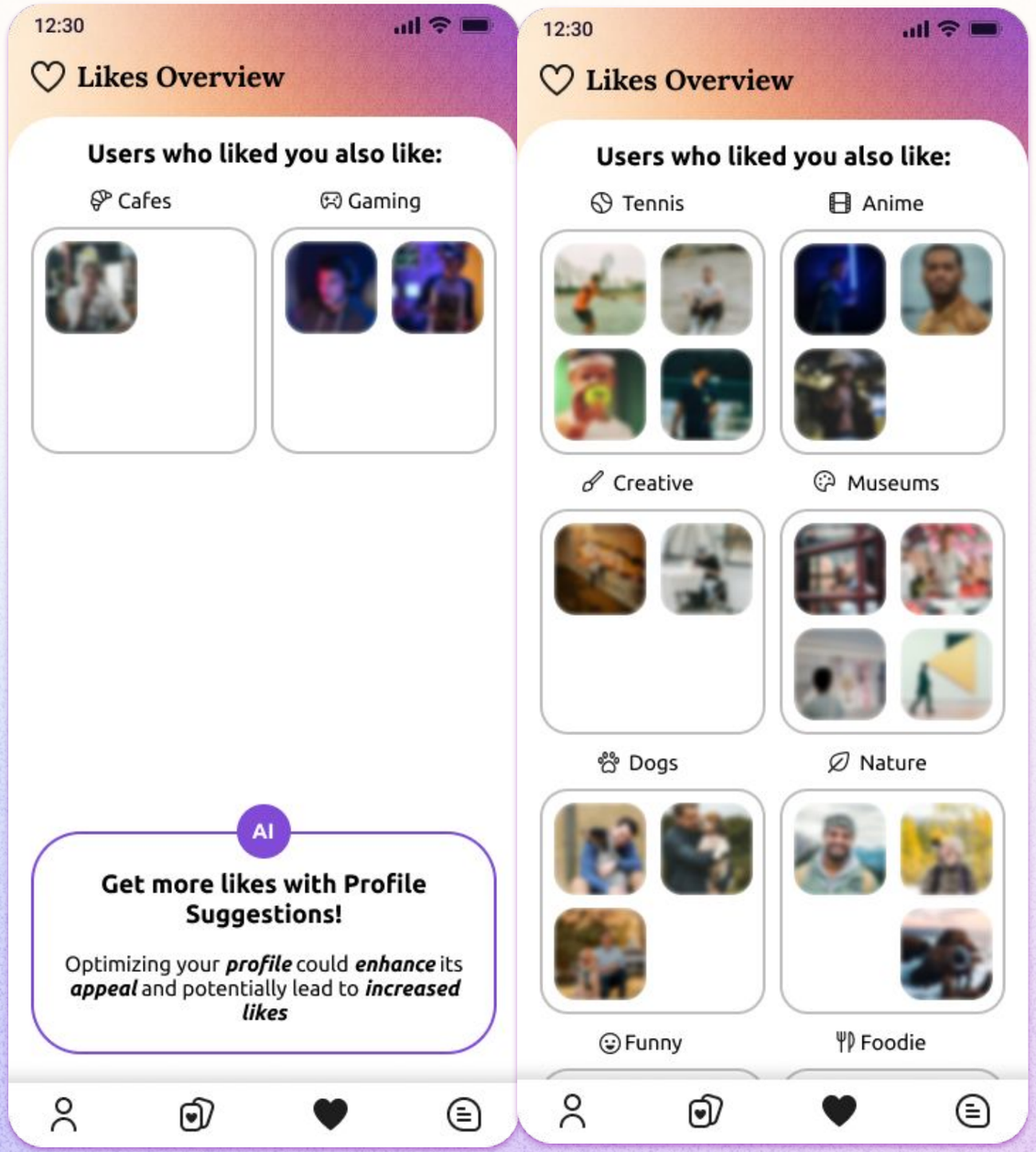


Figure 6.10: User profile (left), Photo suggestions (centre). Bio suggestions (right)

UI: Instead of seeing a number and blurred profile photos in the likes overview, likes from other users are categorised based on matching interests. When receiving little likes, they are advised to adjust their profile.

AI: Users who gave out a like are sorted into categories in the likes overview. This is based on the data of their profiles (their selected interests or hobbies) and is used for comparison with the profile of the user obtaining the like. Shared interests are categorised, with the more uncommon ones at the top.

WB: Instead of a numerical value, users are provided with more information on what type of users like them and whether they match on interests. In this way, users can gain awareness on what interests are shared among others and potentially experience more relatedness.

6.3.8 Chat Screen

Conversation starters

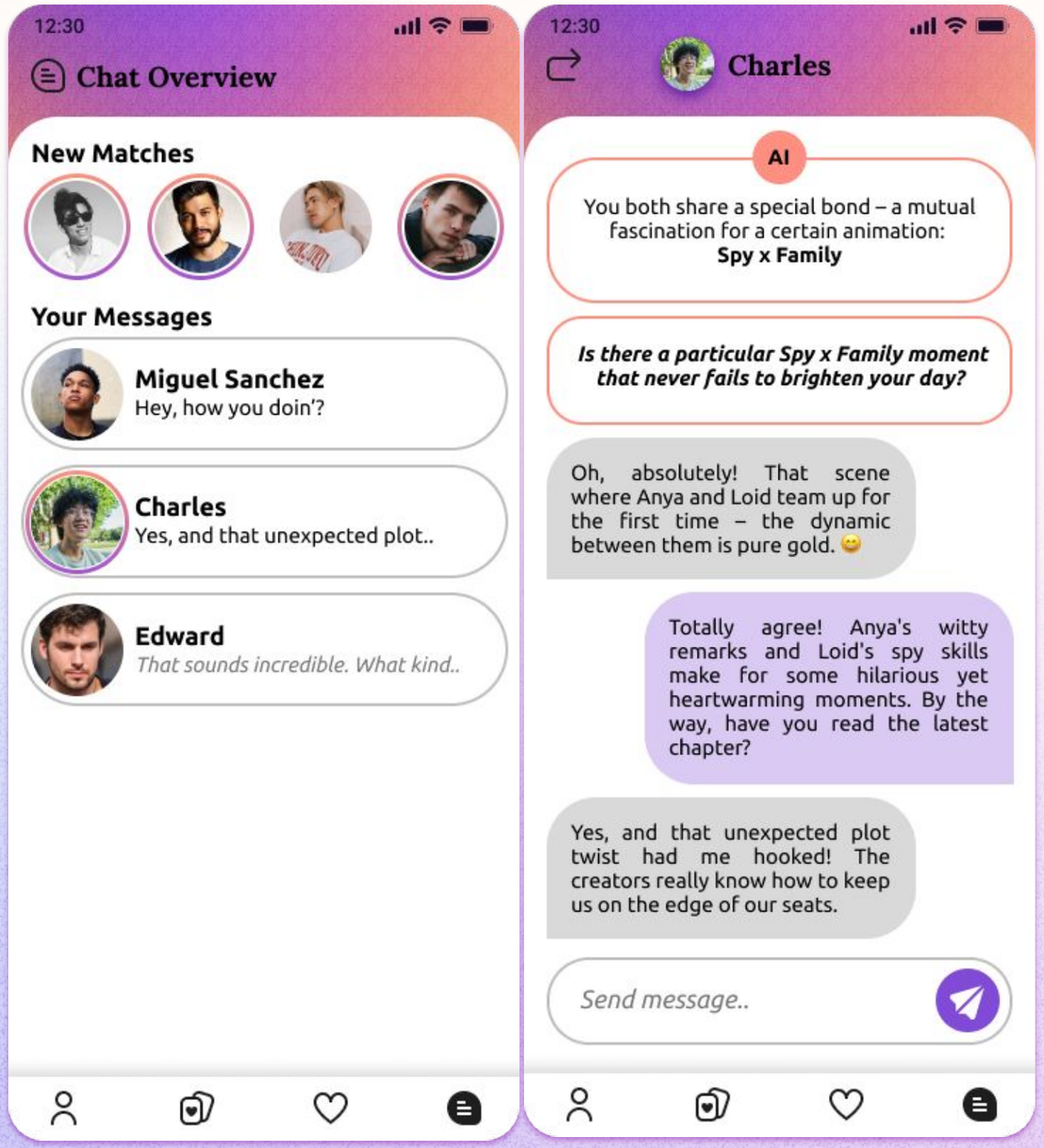


Figure 6.11: Match overview (left) and Chat (right)

UI: After matching, users can start interacting with their match. When clicking on their profile icon, a conversation is started. Pop-ups will show up automatically and contain messages about what the two users have in common. After pinpointing the unique trait, a message with a conversation starter related to the shared interest will appear.

AI: A conversation starter is based on the trait, interest or hobby that both users share. This information was extracted from the user profiles.

WB: With this feature, users can bond over a topic they both are interested in which can result in a sense of belonging or feeling of connectedness as it is an uncommon topic to discuss about. In addition, it reduces the pressure of coming up with an original opener as the message is sent instantly.

7. Concept Evaluation

A concept was developed from the ideation phase. Since the design is primarily built on the concept of autonomy and relatedness, it is necessary to evaluate whether these facets of well-being are indeed experienced by users as intended. In order to measure this, a user study was executed for testing the prototype with dating app users and measuring well-being, specifically for autonomy and relatedness.

7.1 Research aim

Prior research focused on which aspects of well-being were most prominent and were affected in the context of dating platforms. In accordance with the literature research and previously conducted workshop, autonomy and relatedness were found to be impacted both negatively and positively during dating app usage. Thus, it is relevant for this research to measure whether the concept enhances well-being, particularly in this area, while mitigating undesirable consequences of dating app usage. Moreover, since usability affects the overall product experience, this was evaluated along with the desirability of the design to find out whether the user's needs are fulfilled.

Therefore, the objectives of this user study were to measure the extent of autonomy and relatedness experienced by users while also assessing the usability and desirability of the concept.

As a result, three research questions were formulated:

- To what extent do the designed features affect a dating app user's experience of autonomy and relatedness?
- To what extent are the designed features understood by dating app users?
- What is the level of desirability achieved with the designed features?

Pilot Study

Before the user test was conducted, a pilot study was performed with a user who had briefly used dating apps. Following this test, adjustments were made to the scenarios presented in the survey and the number of questions was reduced. Questions that were not relevant to specific features (related to autonomy or relatedness) were removed.

7.2 Method

Participants

For this study, 5 participants were recruited (2 male and 3 female participants). Participants were selected based on whether they had any dating app experience (current users and those who have used dating apps before) and whether they fit in the age range of 18-34 years old (who were found to make up the majority of the current dating app user base). For the recruitment of users, convenience sampling was applied to find test subjects within a short time frame. Most of the participants also participated in the workshop.

Tools & Equipment

The user test sessions were held offline and online (through Zoom). During the offline sessions, a laptop was available to users, containing a survey. The survey consisted of three sections. The first part required basic information (age and gender) to be filled in by the participants, including providing consent for participation.

In order to introduce the designed features and to communicate effectively to users how these can be utilised, a scenario-based design method was applied (Rosson & Carroll, 2002) and a short scenario was prepared in the second section of the survey. Lastly, Likert scales regarding autonomy and relatedness were presented to users for rating their experiences with the designed interface. These Likert scales (TENS-Interface) were derived from the METUX (Motivation, Engagement & Thriving in User Experience) model developed by (Peters et al. (2018) which is utilised for measuring the impact of the technology, in this case, the designed features, on well-being (precisely the three psychological needs, autonomy, competence and relatedness). In this model, autonomy concerns, having options and a sense of control. However, since in the

Figure 7.1: Participants

context of dating apps, autonomy also regards a form of competence and relatedness). In this model, autonomy concerns, having options and a sense of control. However, since in the context of dating apps, autonomy also regards a form of self-disclosure to others (Knee et al., 2013) (the extent to which one shows their authentic self to others and is understood), the authentic & inauthentic expression scale (Al-Khouja et al., 2022) was adapted and applied to measure the designs possible influence on it.

Lastly, questions related to competence, derived from the METUX model, were asked to measure the overall usability of the app. In addition, questions concerning desirability were also presented. The

prototype was created in Figma and contained wireframes that followed a controlled path to fit each scenario. The prototype could be used on the phone and was handed over to participants before the user test. The test setup is visible in Figure 7.2 and the survey questions and scenarios can be found in Appendix D.

Figure 7.2: Test setup

The online sessions were carried out in a similar manner. The survey containing the scenarios was sent to the participants along with a link to the prototype which users could access on their laptop or computer.

Procedure

The offline user tests took place in a quiet and isolated space.
The reason for doing both offline and online sessions was due to the availability of the participants. Since the only difference between the offline and online environment was that a laptop had to be used instead of a phone for the prototype, it was assumed that this would not have a significant impact on the outcomes.

At the start of the user study, the subjects were informed of the project's brief and the content of the test. In addition, permission was sought regarding the recording of the sessions and taking pictures. When starting the test, participants were requested to read the scenarios carefully before using the app and also to voice out their thoughts (about why they were taking a specific action and what their opinions were on the features) while doing so. Questions were asked when users were seen struggling, to pinpoint possible areas for improvement. After finishing one scenario, users were assigned to fill in the survey and moved on to the next section where the process was repeated for a different feature with a different scenario. The user test was finished upon the completion of the survey.

Data Analysis

The survey was one of the tools for collecting data on measuring the impact of the features on well-being. In addition, each test was voice recorded in the offline sessions while pictures were also taken to document the participants' actions. Online evaluations were executed similarly. The Zoom calls were recorded and included the shared screens of the participants which showed them using the designed interface.

7.3 Results

Likert scale questions in the survey were displayed as 'normal' and inverted questions. The scores of the reversed questions were inverted and rephrased to ensure coherence.
The results are presented in a bar chart where the x-axis represents the frequency of the chosen answers ((strongly) disagree/agree and neutral). The mean and standard deviation (SD) were calculated and can be found in Appendix E.

7.3.1 Account Creation

Before the new features were introduced, users had to select interests and personality traits (as the options influenced the new features). The manner in which these questions were presented in the app was found to affect the user experience. Most users found the provided options limiting while others felt that the question regarding personality was rather confronting.

> *"The question 'I can be described as..' is limiting as it refers to characteristics of a person, and you only have a few options now, so if there is one missing that might fit you, you might want to describe yourself in your own way. The list is too limiting as of now."* - Participant 1

> *"It is difficult to describe yourself (in terms of personality) and feels a bit awkward to write about yourself. This is a step where you really have to think about what kind of person you are. Maybe I would prefer a Skip button, but I would still fill in this section."* - Participant 5

7.3.2 Photo & Bio Suggestions

Privacy

Viewing this feature, some participants were concerned about privacy. Since the AI would have to scan through their photo library to sort their pictures, they were unsure what would happen with that particular data.

> *"It sounds useful (the feature), when I have to choose profile pictures I have to look for very old pictures and scroll for a long time to find one, but when I consider privacy I would not want to use it."* - Participant 3

> *"I think that you have to add a section about consent before the sorting occurs as it otherwise might feel not legal. Since my photo verification will be used for sorting pictures, I am not so sure whether I would use such a feature (without thinking it through)."* - Participant 4

7.3.2 Photo & Bio Suggestions

The Photo & Bio Suggestions feature was measured on autonomy (sense of control & choice, and self-expression) and relatedness (sense of belonging and connection) as seen in Figure 7.3. In the case of autonomy, all users found the feature to provide 'useful options and choices' but some experienced the feature as 'controlling', giving it an average rating of 4.4 and 3.2 respectively. The latter resulted in an SD of 1.3, indicating that the opinions were mixed.

> *"Wow, the app is smart if it can filter the pictures for me, maybe a bit controlling but not necessarily in a negative way."* - Participant 2

In terms of self-expression, results indicate that it supported users in 'expressing their true self' (rating it a 4 on average) but still caused some of them (SD 1.30) to act in a certain way to appeal to others (resulting in a mean of 2.2). Users were found to feel more encouraged to choose photos containing unique interests since they believed that with this feature they could find people with similar (unique) interests. Furthermore, it increased their self-awareness in terms of who they are as a person.

> *"When I choose a picture, for instance with Shiba Inu, I can already filter out people who do not have the same interest. If I find cosplay important, then I would choose a picture of that, as I will not come across users who have a judgement towards it."* - Participant 2

> *"I think it would allow self-expression as the AI would remove the bias and detect patterns about what kind of person you are, which you might not have noticed yourself. But, I do think it would cause a conflict between wanting to be unique and being similar to others. Therefore, I would choose a blend of pictures, to show what makes me unique but also to let others know I am still a normal person."* - Participant 5

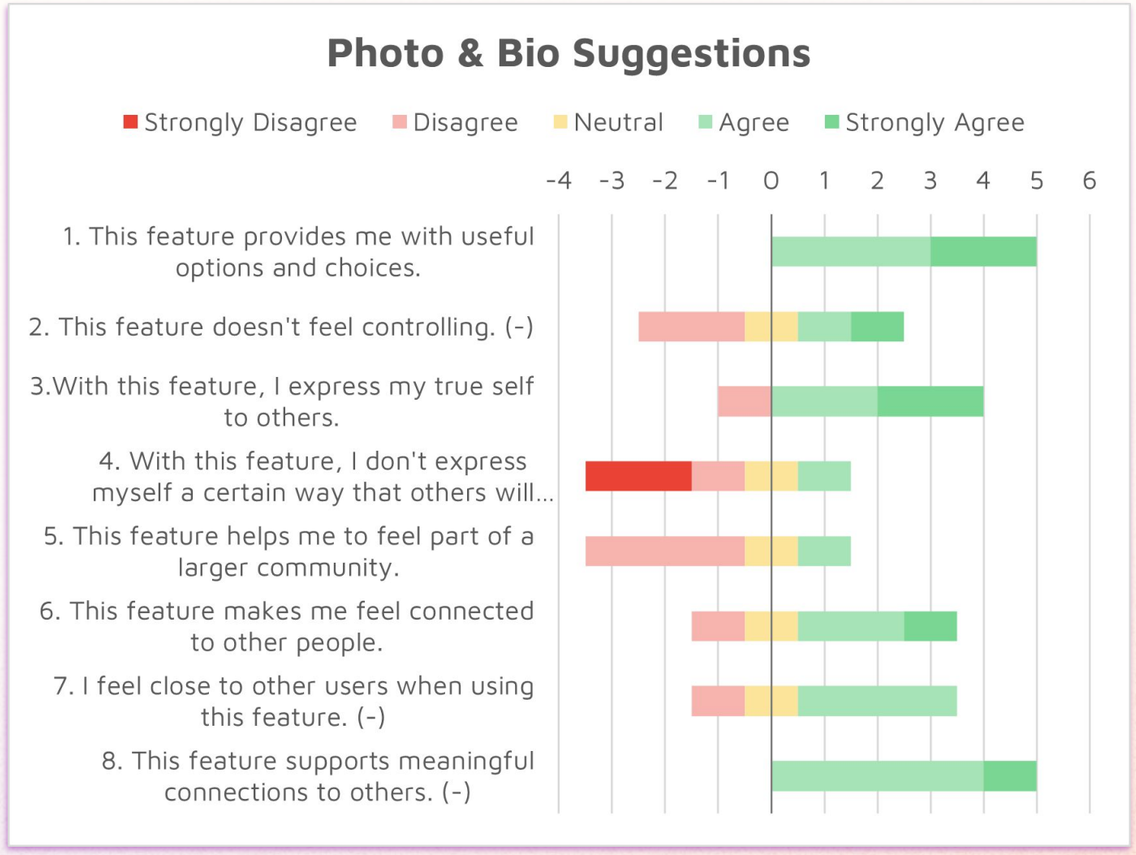


Figure 7.3: Bar chart - Photo & Bio Suggestions

The feeling of 'being part of a larger community' was rated 2.6 on average with an SD of 0.89 and this particular feeling was, therefore, less evident during the app use.

Regarding 'feeling connected to others', the feature scored quite positively for both the direct and inverted questions, specifically 3.6 and 4.2. However, for the former (question 6), the SD was only 1.14 therefore indicating some variability, while for the latter (question 8), it resulted in a low SD (0.45).

> *"Yes, I think it would help with feeling more connected because of the same interests. It will also make it easier to talk with one another when you have matched."* - Participant 2

7.3.3 Highlights

All participants rated the Highlights feature mostly positively when it concerned autonomy (sense of choice and control) and relatedness. All questions were rated a 4 or higher with a low SD (indicating they agreed with the statements), with the exception of the statement 'the feature helps with forming or sustaining relationships that are fulfilling' which scored slightly lower, with a mean of 3.8.

Participants voiced that the highlights on the user profiles affected their decision-making, it allowed them to focus a bit longer on the content and the profile and experience less relatedness when seeing few shared interests.

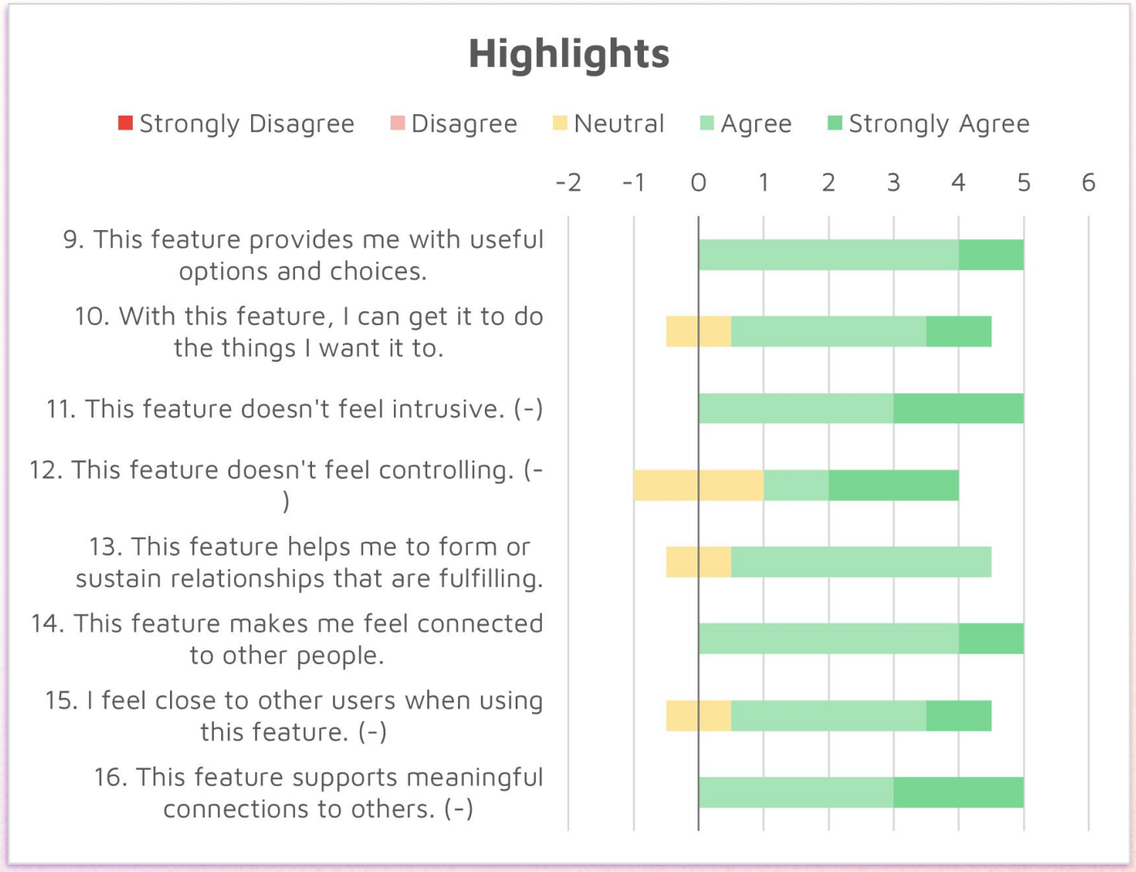


Figure 7.4: Bar chart - Highlights

"*I am intrigued when I see a highlight on a profile and may spend a bit more time on the profile (instead of immediately swiping left).*" - Participant 1

"*I do think the feature would help with feeling close to others because of the highlighted similarities I see. If I did not see them, I would not feel close and feel a bit sad.*" - Participant 2

"*When you have less in common (see fewer/no Highlights and coloured interests), you get less stimulation and are less likely to like the profile.*" - Participant 5

Although the majority of participants valued finding users similar to them, one participant mentioned the importance of not only searching for those who are identical to them (in terms of interests) but also that the uniqueness of the individual should still be present.

"*I am not looking for a copy of myself, but it is nice if you can have a common ground with one another. Sometimes you want to share the same hobbies and sometimes you don't so it is nice if you both have your unique attribute.*" - *Participant 3*

7.3.4 Highlight Suggestions

Similar to the Highlights feature, the Highlights Suggestions feature was overall rated positively in terms of relatedness. The survey questions related to 'feeling connected to other users' scored an average of 4 and 4.4. However, when it concerned autonomy, although it provided the users with 'enough options and choices', and allowed users to 'get the feature to fulfil their needs' which all received a mean of 4 or higher, the Highlights Suggestions feature was still experienced as 'controlling' by some of the participants, resulting in a score of 3.4. The standard deviation of this question was quite high, signifying that the opinions are varied. Some participants found that the feature made them doubt their own choices.

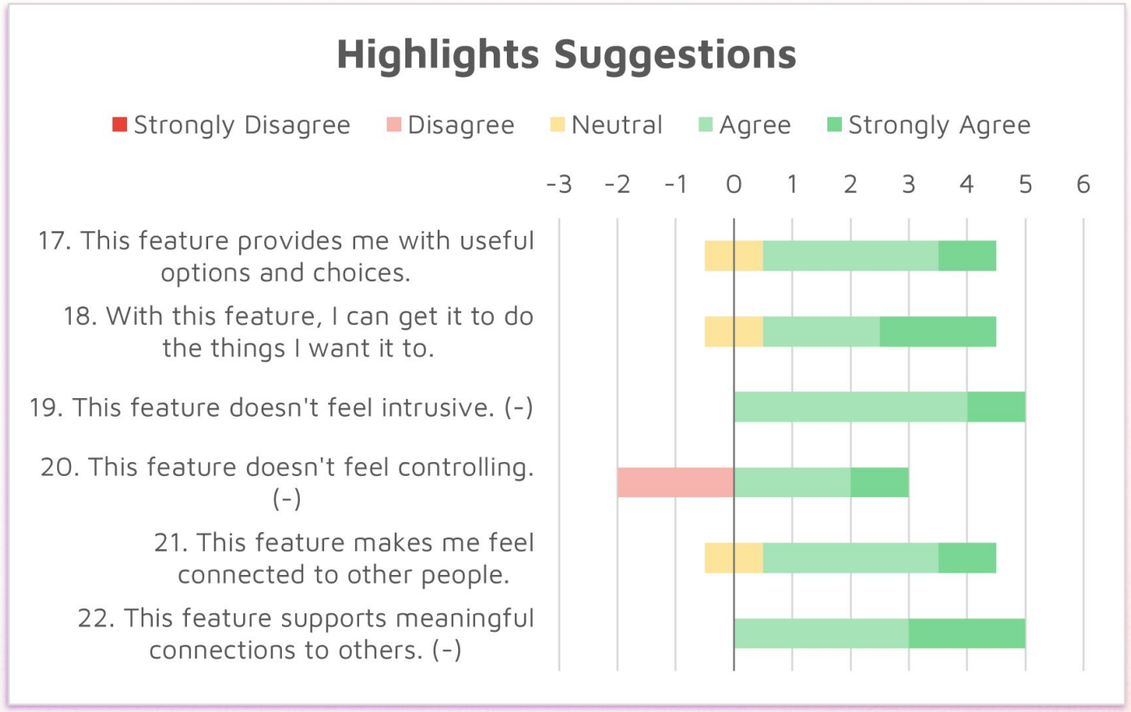


Figure 7.5: Bar chart - Highlights Suggestions

> *"Cool that it can provide suggestions, but it does make me wonder whether that means I do not know myself well enough to be aware of my own interests." - Participant 3*

Nevertheless, one participant saw the feature from a more positive standpoint.

> *"It stimulates you to adapt your preferences, but it is not controlling." - Participant 1*

7.3.5 Categorised Likes

The Categorised Likes were perceived quite positively for both autonomy (sense of control and choice) and relatedness but overall were not rated high. All statements received a mean between 3 and 4. When summarising the participants' reactions, the responses were mostly 'neutral' while some leaned towards 'agree'.

The questions regarding 'feeling part of a larger community' and 'feeling close to others' were scored slightly more neutral compared to the other questions, receiving a score of 3.4 and 3.2. These numbers indicated that these features did not have a significant positive effect in these specific areas.

Participants reasoned that the lack of community feeling was due to the limitation of possible actions with the provided information (the categories) and the fact that users could not see who those interests belonged to (because they are blurred).

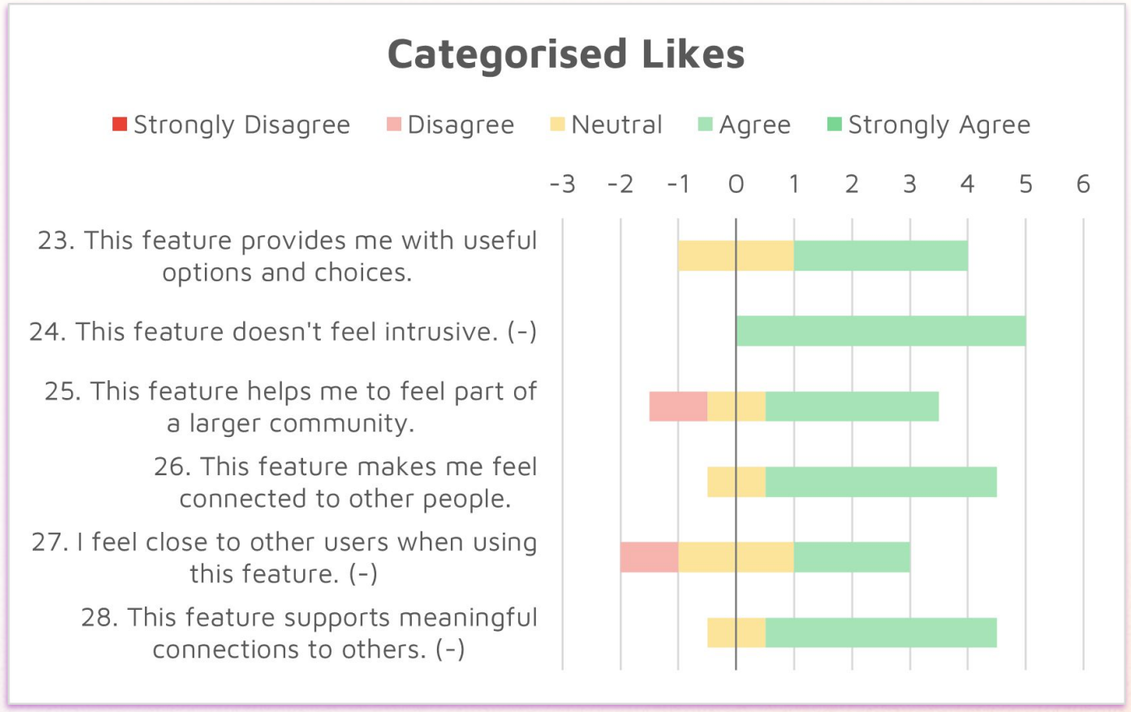


Figure 7.6: Bar chart - Categorised Likes

"I find it unclear what the user can do with this feature as it does not allow many options (such as interaction). You cannot see the person's pictures which affects its usefulness. The information doesn't say a lot, in my opinion." - Participant 1

"You can't really do much with it except for receiving information. It would be more valuable if you can view the profile and judge it (by liking/disliking)" - Participant 5

Other participants, however, did find it helpful when considering 'support for forming connections' as they rated it an average of 3.8.

"Amusing to see what kind of people like me, provides me with an alternative." - Participant 3

"I think it could support fulfilling/sustaining relationships because of the focus on categories instead of only pictures. It seems more valuable if you are looking for a serious relationship compared to when you don't." - Participant 2

7.3.6 Conversation Starters

For the feature, Conversation Starters, autonomy-related (sense of control and choice, and self-expression) statements obtained more negative responses compared to the relatedness questions. Users found that the feature provided 'useful options and choices' and did not find it very 'intrusive' to some extent but only rated these questions with 3.6. Participants mentioned that this was due to not having the option to choose (whether they receive a Conversation starter), therefore affecting their autonomy. In addition, it did not evidently support 'not expressing yourself in a certain way that others will like' as it only received a score of 3.2, therefore indicating a more neutral opinion. The statements 'helps the forming of relationships' and 'feeling close to others', users rated the features with 3.8 and 4.2 on average. As for 'feeling connected', it received a 4 and 4.2 on both questions. Both these types of questions (nr. 33 to 36) gained a relatively low SD between 0.45 and 0.84).

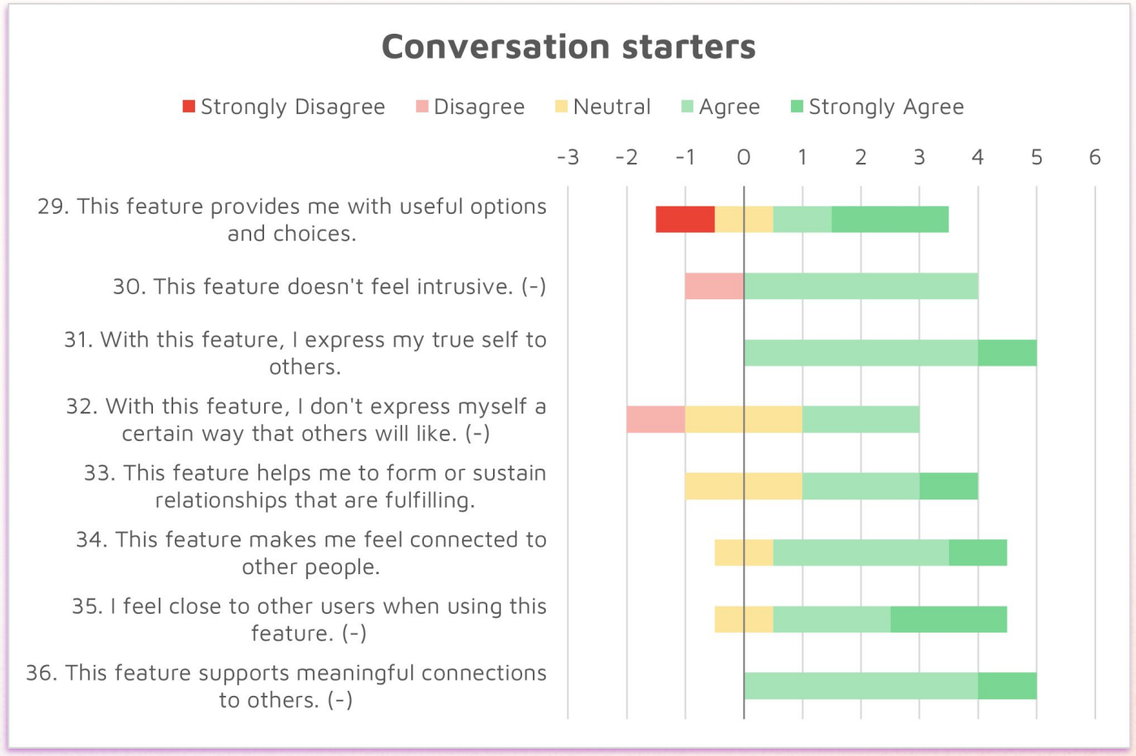


Figure 7.7: Bar chart - Conversation Starters

Overall comments on the feature, were quite positive, in the sense that it supports users before the actual interaction starts.

> *"Fun prompt! It stimulates people to say something if they don't know what to say. I would find it very nice." - Participant 1*

> *"I think it is a very good feature, better than just a hey or hi, you get more of a conversation." - Participant 2*

> *"Personally, I don't have any issues with starting a conversation, but others might need this feature." - Participant 3*

7.3.7 Overall App Use

The scale for competence was used to determine the usability of the app's features. In addition, the desirability was measured. In general, participants found the features desirable as they rated the questions with a mean of 4.4 on both the direct and inverted questions and a low SD of 0.55. However, when taking the scores of usability into account, it was determined that in terms of ease of use, it received mixed reactions. Some users experienced confusion when trying out the features while others had no problems. The first two questions (37 and 38) had a mean of 3 (and were rated negatively by the majority of users) while question 39 scored slightly higher with a 3.6.

The lack of interactivity of the prototype contributed to this result, as it left no room for making mistakes (since they had to follow a designated path).

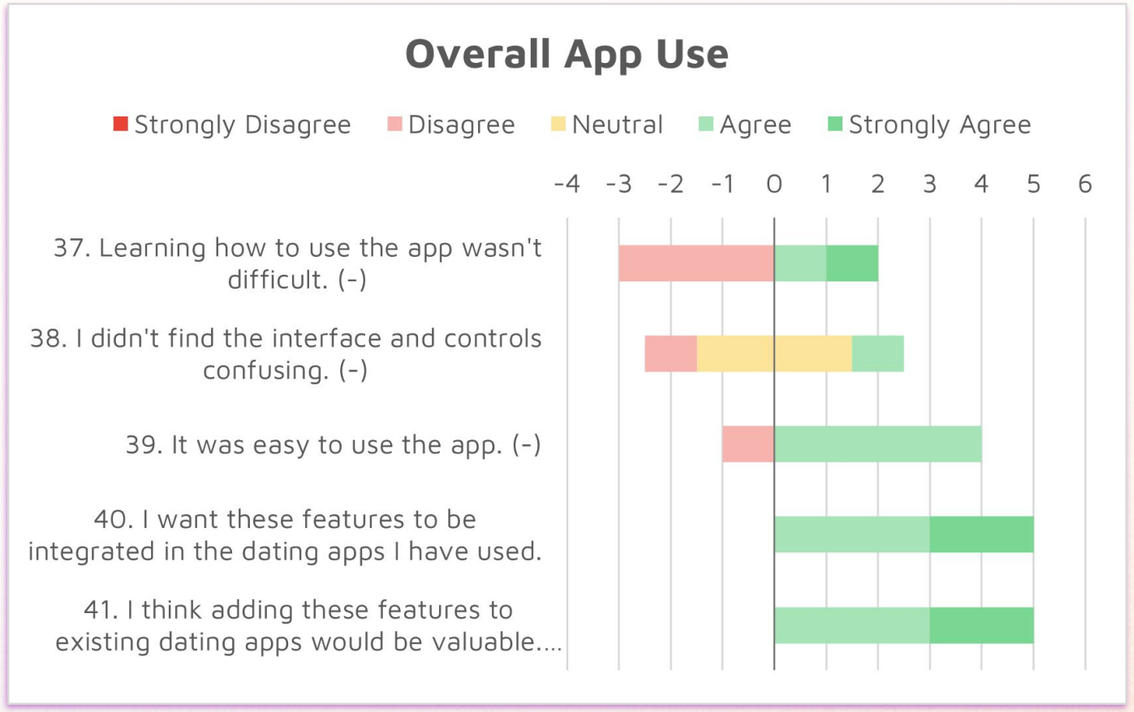


Figure 7.8: Bar chart - Overall App Use

"Some features were less straightforward as you could not press on certain buttons/interact with them." - Participant 4

Others found the phrasing of certain features unclear. Sentences such as 'Users who liked you also like', were interpreted as, the users who liked the user had a certain interest, which was not necessarily shared by the liked user.

"Sometimes I found the interface confusing due to a different interpretation of the questions and icons." - Participant 5

7.3.8 Pop-ups

The pop-ups were not measured on well-being as they were not designed with a facet of well-being in mind (even though it can be applied). Therefore, the users' opinion on the measuring method (swiping and pop-ups) was prioritised. From the comments on the pop-ups it was derived that:

> *"The pop-ups are kind of sudden, I would like to see an explanation of why I get to see this and what the value is of filling this in." - Participant 4*

In addition, if it concerned 'giving a reason for liking the profiles', users preferred options presented by the system (extracted from previous profiles) rather than filling in their own. However, some participants also wanted an option to type out their own reasons.

> *"I prefer options so you don't have to think as much, but I do want an option where I can add my own input. Also since I see this as a moment to reflect, I do not mind clicking instead of swiping." - Participant 5*

When it concerned the frequency of pop-ups, participants found 3 to 5 right swipes (likes) a good balance as they were less likely to swipe right. This mainly applied to female participants.

7.4 Conclusion

The aim of the user study was to measure well-being (specifically for autonomy and relatedness), usability and desirability.

In particular, for the profile setup (choosing pictures and writing a bio), autonomy concerning self-disclosure and authenticity, and relatedness (feeling connected) were the most relevant facets of well-being to be measured. The results indicate that while the Photo Suggestions feature allowed users to express their true selves (with quite a positive impact though not strong), participants were also more likely to choose options that were popular among others and would make them feel connected, therefore reducing autonomy. However, since the design's purpose was to provide a balance between relatedness and autonomy, to a certain degree it can be concluded that this was fulfilled.

The Highlights feature was in general received very positively. It enabled users to pay more attention to the content of the profiles and allowed them to easily view the shared interests with a user. Similarly, the Highlight Suggestions were rated positively on relatedness. Only autonomy was affected somewhat negatively when it comes to 'feeling controlled'.

For the Categorised Likes, there was potential for increasing the experience of connectedness, but this was limited due to the lack of interactions with the pictures. Conversation starters were found to positively influence relatedness (through providing support for starting a proper conversation) but impacted autonomy (sense of choice) in some cases. The primary reason for this was the absence of an option to hide the pop-ups. Thus, it is relevant for these features, in particular, that the level of autonomy should be increased through providing more options.

Overall, usability was rated negatively by most users. During the user tests, it was noticeable that some parts of the interface were experienced as confusing due to the lack of interactive buttons, phrasing of certain sentences and the fact that their actions (choosing certain options) had little influence on the results (what suggestions were presented). For this reason, it is important to make changes to the descriptions of the features (to provide clarity) while clearly presenting the effect of a chosen option (like the interests or highlighted keywords).

In terms of desirability, most features were considered useful and were found to provide enough options and choices. Features such as Categorised Likes and Conversation Starters were overall regarded as valuable to some extent but with a minority disagreeing. Some iterations therefore need to be made to these features, mainly concerning the interactivity of the categorised likes and the option to remove the conversation prompts for users who can easily converse with strangers. When asking users whether they would want such features integrated into other dating apps and use them, all participants responded positively indicating that the features are, in general, desirable.

7.5 Discussion

Since only one pilot study was performed, scenarios created for the user test were also only reviewed once. This could have influenced the results regarding usability as some participants may not have understood the features properly due to the provided scenarios. The scenarios should therefore have been judged by more people, to ensure that participants during the study would fully understand the situation.

Other aspects that contributed to the low results in terms of usability, were due to the limitations of the Figma prototype. As users experienced a lack of interactivity with the prototype, mistakes could not be made as the prototypes followed a restrictive path where going back was not an option. This, therefore, did not allow them to learn from the errors and fully understand how the app interface was intended to work.

To measure self-expression, the authentic and inauthentic expression scale was used. This scale reflected the self-expression and representation aspect that was found to be part of autonomy from previous desktop research. However, a Likert scale could not be found in the context of an online environment, therefore this scale was used and adapted to fit the user test. Since this measurement tool was not validated for online contexts, the results are only an indication of the possible impact rather than factually supporting it.

Also, since the user test consisted of only one trial of the app, the measured results only apply in the short term. To determine long-term effects on well-being, the prototype would need a working system and involve dating app profiles from real users. Furthermore, since the sample size consisted of five participants, it frequently resulted in high standard deviations. For a more accurate depiction of the measured impact on autonomy and relatedness, more users should be recruited if a follow-up study were to be conducted.

7.6 Concept Iteration

Based on the results of the user test, adjustments were made to the concept. These changes affected all the features.

Account Creation

The personality section from the Account Creation phase was considered limiting and confronting. Therefore, a ‘skip’ button and an option to add their own keywords were added to increase the feeling of autonomy.

Photo & Bio Suggestions

Since some participants mentioned feeling concerned about their privacy, a pop-up message was added before the Photo Suggestions feature was activated. This message informs the user of what the data is used for and requests consent before proceeding to the next step. In addition, the descriptions regarding the unique and common categories (when pressing on the star/circle symbol) were considered vague or misunderstood. Therefore, these descriptions were also adapted.

Highlights

In order to adapt the level of specificity on filtering profiles, suggestions are provided when typing in keywords. This varies from broad categories such as ‘sports’ to more detailed search terms like ‘ball sports’ and ‘tennis’.

Pop-ups (Measuring well-being)

For the pop-ups, users wanted an option where they could provide their input if it concerned the reason for liking the profiles. Furthermore, usability issues were detected when participants pressed on the emoticons instead of swiping them in a certain direction. The smileys were thus decreased in size while more descriptive text was added to increase understandability.

Categorised Likes

Instead of only showing the categorised users under each type of interest, the option to view the picture of the user was included. This was decided to increase the feeling of relatedness, by enabling the user to reconsider a profile during swiping when having encountered it before (in the likes overview).

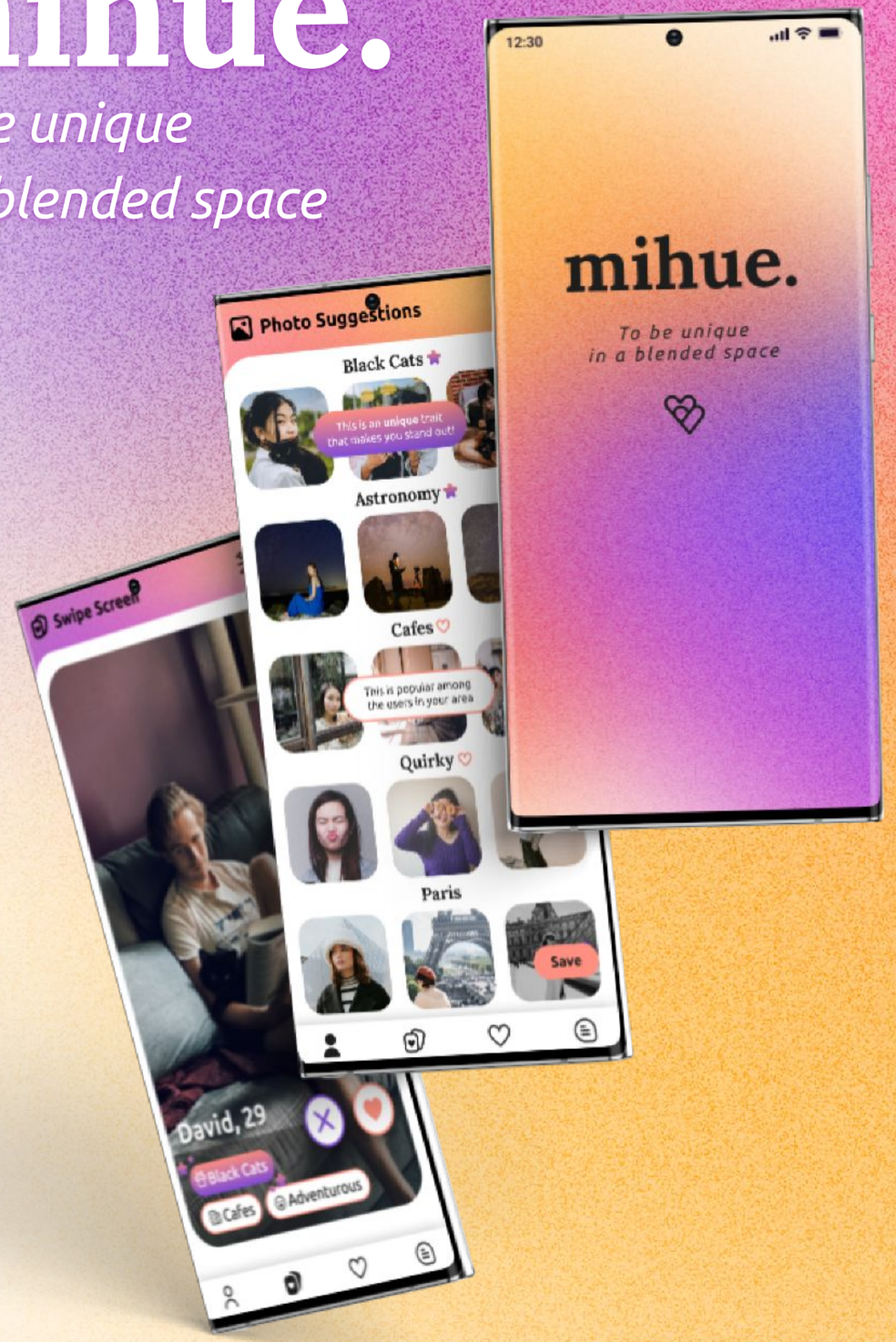
Conversation Starters

Although most users reported the feature as being supportive for starting conversations, one participant revealed that they did not need such a feature. They implied that users with good communication skills would find such features less useful. Therefore, the possibility to remove the pop-up prompts was implemented. For participants, who wanted the feature to be present also during the conversation, a button was included for supplying new conversational prompts.

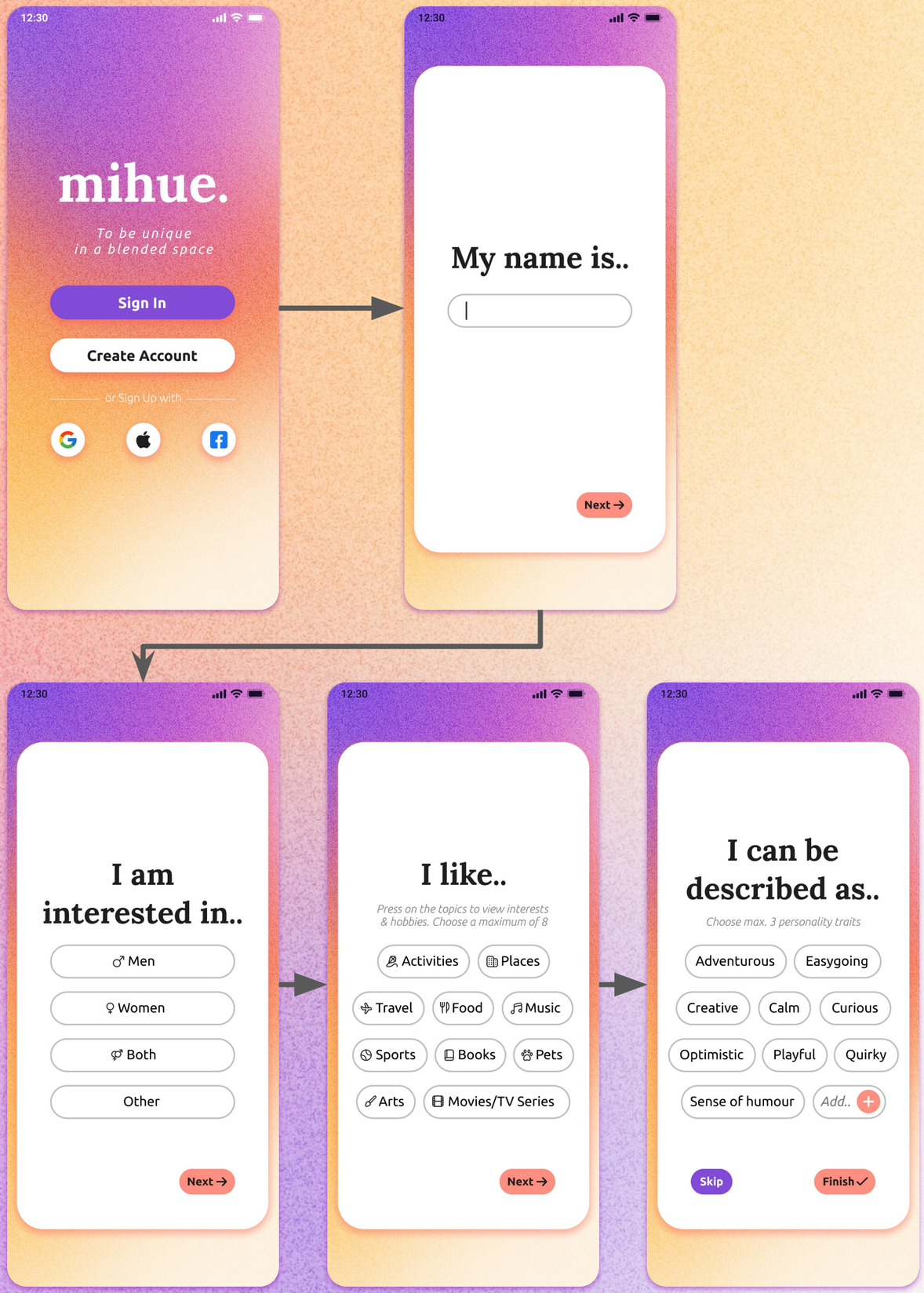
8. Final Concept: mihue.

mihue.

To be unique
in a blended space



MiHue is a dating app that incorporates aspects of well-being into its system. While most dating platforms put emphasis on profile pictures and therefore attractiveness, people who are disadvantaged also shy away from showcasing less desirable qualities in fear of reducing their chances of matching even more. MiHue sets itself apart by accentuating this individuality and actively encourages users to portray a more authentic self-image. In addition, the app ensures that users can still foster connections by highlighting unique similarities.



Account creation

MiHue follows the usual steps of a dating app. During account creation, the user is asked questions related to their sexual preference, interests & hobbies and their personality. Options for interests and hobbies include: places users like to visit, sports, preferred type of vacations etc. This category provides users with a variety of choices.

Self-reflection

Most dating apps tend to cluster personality-related options along with the interests and hobbies, MiHue highlights this by prompting users to think about their personality in a separate question. Users can choose from a set of personality traits and also have the ability to add in their own input. This section facilitates self-reflection within the user, as it allows them to ponder about what type of person they are, before they present themselves to others. For users who find such questions confronting, a 'skip' button is present where this part can be disregarded.

Photo Suggestions

In order to complete the user profile, users have to perform certain tasks such as choosing media, answering prompt questions and writing a bio. MiHue has special features which support the users in carrying out these activities. For instance, when users are struggling with selecting photos, the Photo Suggestions feature is available to provide assistance on decision-making.

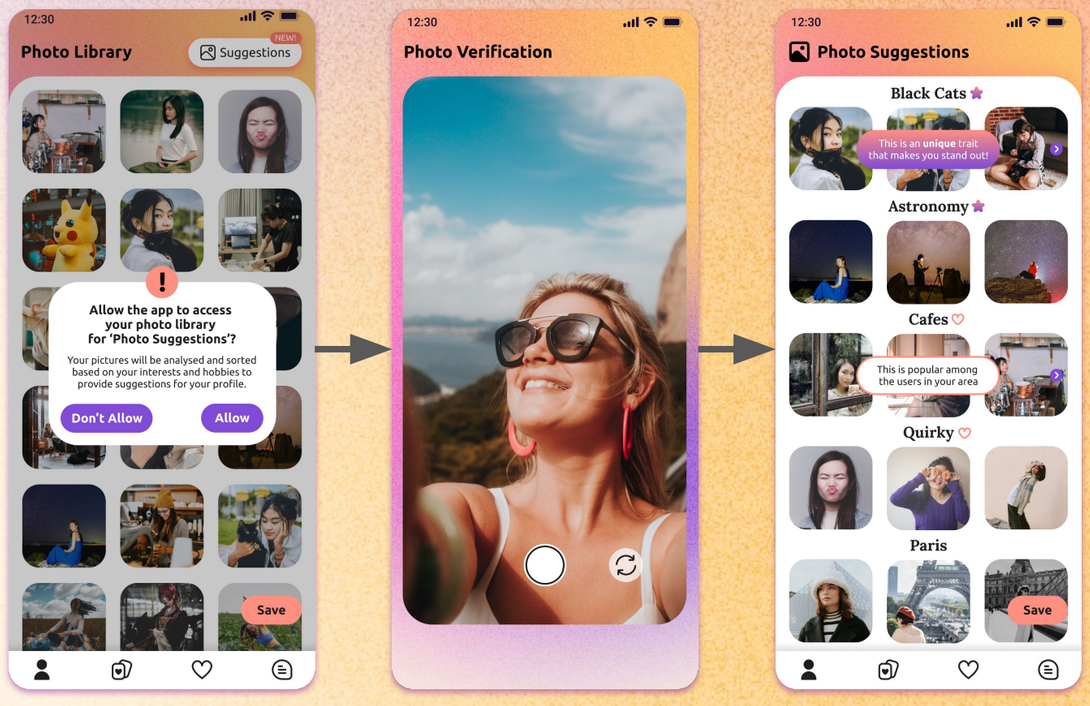
Transparency on privacy

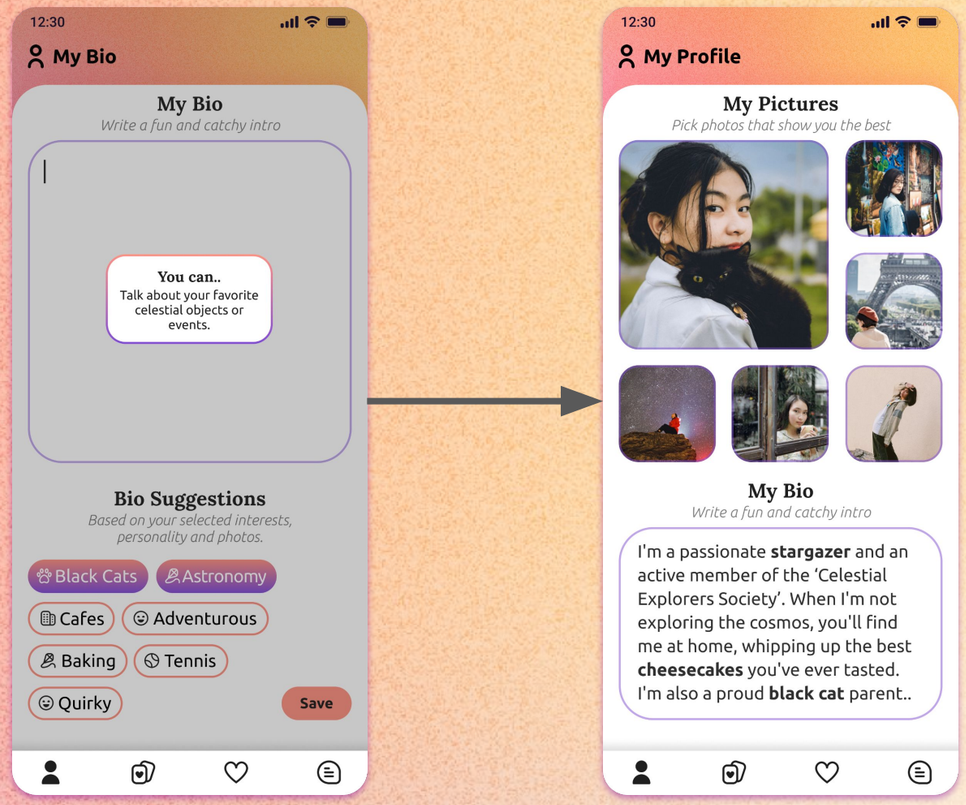
To activate this feature, users are requested to allow access to their photo library. Users will receive a pop-up informing them on what the authorization on their gallery signifies, and how the analysed data will be used. Photo verification is then required for the system to recognise the user within the pictures. When these steps are fulfilled, a variety of categorised pictures are suggested.

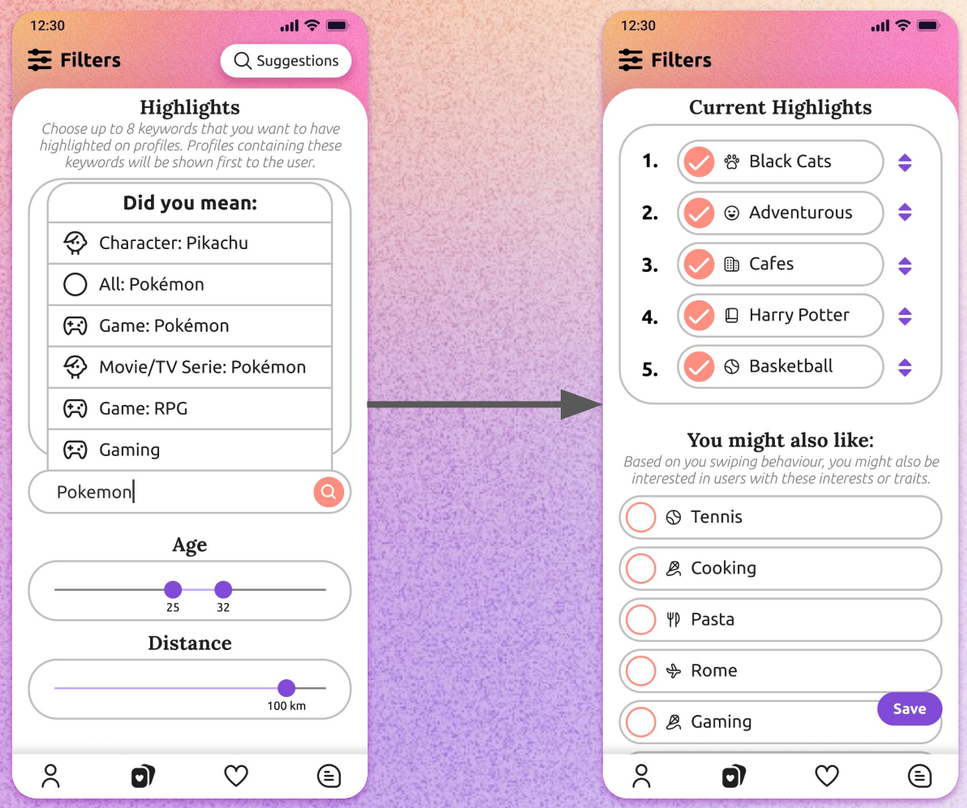
Unique vs. popular interests

At the beginning of the app, users were asked to pick from a diverse amount of options (regarding interests, hobbies and personality), these choices are reflected in the suggested categories. Through image recognition, photos of the user are sorted into topics (either interest, hobby or personality-related). With this feature, users are able to view pictures that convey their passions and personality within a quick glance. In addition these categories are labelled with either a star or heart.

The star indicates whether a particular interest, derived either from the selected interests/hobbies or from the photo album itself, are an unique attribute of the user. This allows users to identify their unique qualities and feel encouraged to pick certain pictures as it can help in differentiating themselves from other users (and therefore stand out). The heart symbol signifies interests or traits that are frequently selected by other users (and are therefore popular). Through this feature users are ensured that they can find people with commonalit by opting for popular interests while also maintaining individuality when choosing less common attributes.







Bio Suggestions

Similarly to the Photo Suggestions feature, bio suggestions are provided based on the data that was collected previously during the account creation phase. If the Photo Suggestions feature has already been activated, then suggestions regarding unique traits will also be displayed. These suggestions are shown beneath the text field, in the form of buttons. Pressing on these buttons will show prompts related to the chosen topic. In this way, users can integrate their interests, hobbies or personality into their bio through inspiring prompts.

Highlights

Enabling the search for relatedness

In addition to the typical filters found in dating apps, MiHue allows soft filtering on profiles based on the keywords that are typed in. Depending on the level of specificity the user searches on, the amount of profiles recommended is also affected. Users can filter on broad categories to very niche subjects such as a favourite movie title or dog breed. These search terms can be used to find like-minded people or if desired, people that are the totally opposite. Profiles containing these keywords in the form of pictures or text are prioritised and shown to the user first. The keywords are highlighted on the user profiles through a pink colour. Unique shared interests or traits are displayed in vivid hues to notify the user of their special connection with one another. These gradient highlights will pop-up even if they are not selected in the Highlights feature.

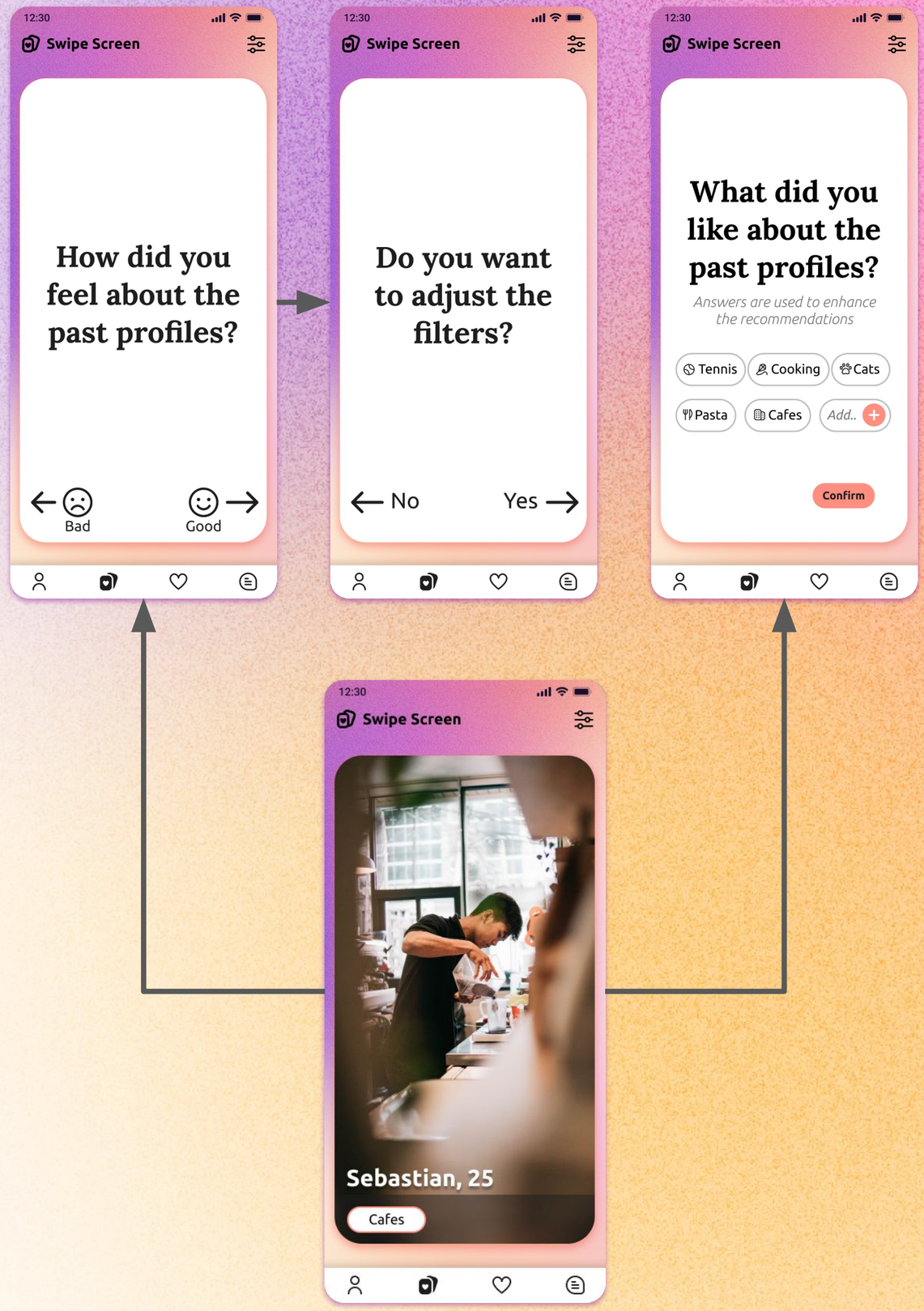
Reducing exclusion

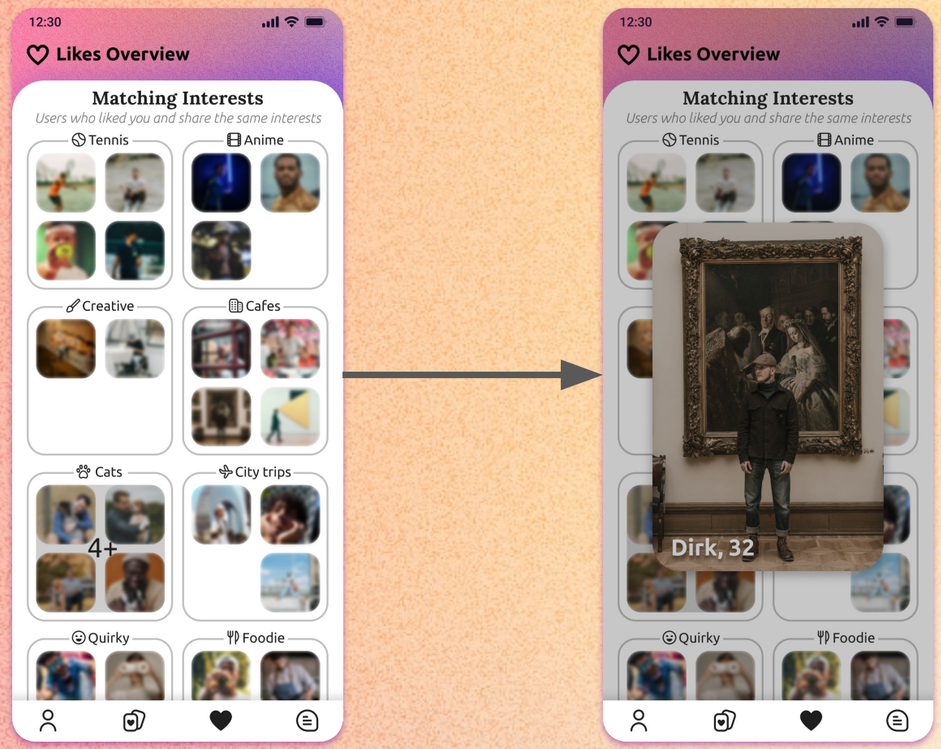
Based on the user's swiping activity, new Highlight Suggestions are derived (explained in the next paragraph). By frequently presenting users with different types of search terms, users will be stimulated to filter on a more diverse group of people, reducing the possibility of excluding others.

Measuring well-being

The app also measures your swiping activity. After liking a certain number of profiles, the system will show a pop-up asking users what they liked about the profiles they swiped right. Users can choose from options that were identified by the system, but also add their own input if a particular reason is not available. The responses are used to improve the recommendations but also for formulating new suggestions on filtering, which can consist of certain interests or traits they have liked which they may not have been aware of.

However, when the user experiences a lack of connectedness with the profiles, by swiping many profiles to the right, the app will advise the user to adjust their filters and will provide suggestions based on previous reasons for liking a profile, to broaden the user's search scope.





Categorised Likes

Relating to likes

Compared to other dating apps, where the number of likes is shown, MiHue presents likes from other users in a different format. Instead of showing a number, likes from users are sorted based on the interest you share with them. You can view these users by clicking on their blurred picture and give the profile a more thorough consideration when coming across it during the swiping. By removing the numbers, the focus shifts from gaining a large number of likes to sparking interest on what kind of people have liked the users and what they have in common.

Conversation Starters

Enhances social connection

To ease the pressure of making a great first impression, users receive conversation prompts related to their shared interests at the start of each chat. With this feature, users can talk about topics that genuinely interest both parties and thus feel more connected to each other. In case the user runs out of topics to talk about, a Conversation Prompt button is present in the top right corner. Pressing on this, will result in another conversation starter concerning another subject. Users who do not feel the need to rely on prompts can remove the pop-up message after it has appeared by pressing on the cross.

Conclusion

The aim of this project was to design interventions on the existing AI system within dating apps that could enhance well-being.

During this project, a design direction integrating two aspects of well-being, autonomy and relatedness, was formulated and used as basis for improvement:
Enhancing social connection through individuality within similarity.

Following this design direction, the MiHue app was created. This app focuses on individuality through showcasing unique attributes of the userand using this for highlighting a shared connection with others.

The app was prototyped and autonomy & relatedness were measured during an user study. The outcomes of the user test revealed that autonomy and relatedness were indeed experienced through these features, though in some cases, the effect was more positive for certain features than others.

Desirability

During the concept evaluation, desirability was measured. The overall outcomes indicated that the designed features provided useful options and were able to support the user during their app use. Participants (dating app users) also confirmed that they would want such features integrated in existing dating apps.

Viability

With the rapid integration of AI in daily settings, it will only be a short amount of time, before AI is used in dating platforms for another purpose than solely as a recommendation system.

Therefore, investing into other potential directions of utilising AI could be valuable for the future in the long run. Although MiHue is presented as an individual app, its features can also be transferred to existing apps as the infrastructure of the system (on which it was based upon) is similar to most apps, therefore requiring no major changes to the current systems (with the exception of adapting the current privacy policies). However, viability should still be investigated further in terms of finding the right balance between sustaining revenue from paid subscriptions and its adverse effects on well-being, as this aspect was less prioritised during the study but still relevant for the research.

Feasibility

The AI ideation cards highlighted the possibilities of the technology and were integrated into the design. In this design, relevant capabilities of the features concerned image recognition, pattern recognition, similarity analysis and personalised content (these were showcased in the ideation cards but not mentioned explicitly). Though this was not explored extensively in this project, for future studies, the accuracy of sorting pictures should be investigated. In terms of providing suggestions, this project already has proved its ability to come up with interest-related prompts as the examples presented in the design were formulated by ChatGPT.

9. Recommendations: Next Cycle

From the literature research on dating apps and well-being, a theoretical model of well-being was created. This model included multiple facets of well-being and these aspects of well-being were validated through a participatory workshop. Through gained insights from the workshop, the model was narrowed down to two main components of well-being: autonomy and relatedness. Other aspects of well-being such as self-acceptance, environmental mastery, positive relationships and engagement were still included in the design but were shifted to a lower priority to maintain a coherent design. In Figure 9.1, the final theoretical model for this project is displayed.

Greyed-out areas indicate the well-being aspects of the original theoretical model that were not included in the research after obtaining the results of the workshop. While the workshop's outcomes did not indicate that these facets are as prominent as the selected ones during dating app use, these can still be considered relevant for future research.

Excluded facets of well-being

Seeking self-validation was considered one of the key motivators for dating app use and was found to affect the user's autonomy through inauthenticity and a lack of self-disclosure. However, self-worth validation was also found to impact other aspects of well-being which were not covered in the concept. When the need for self-validation is not fulfilled, negative effects on well-being

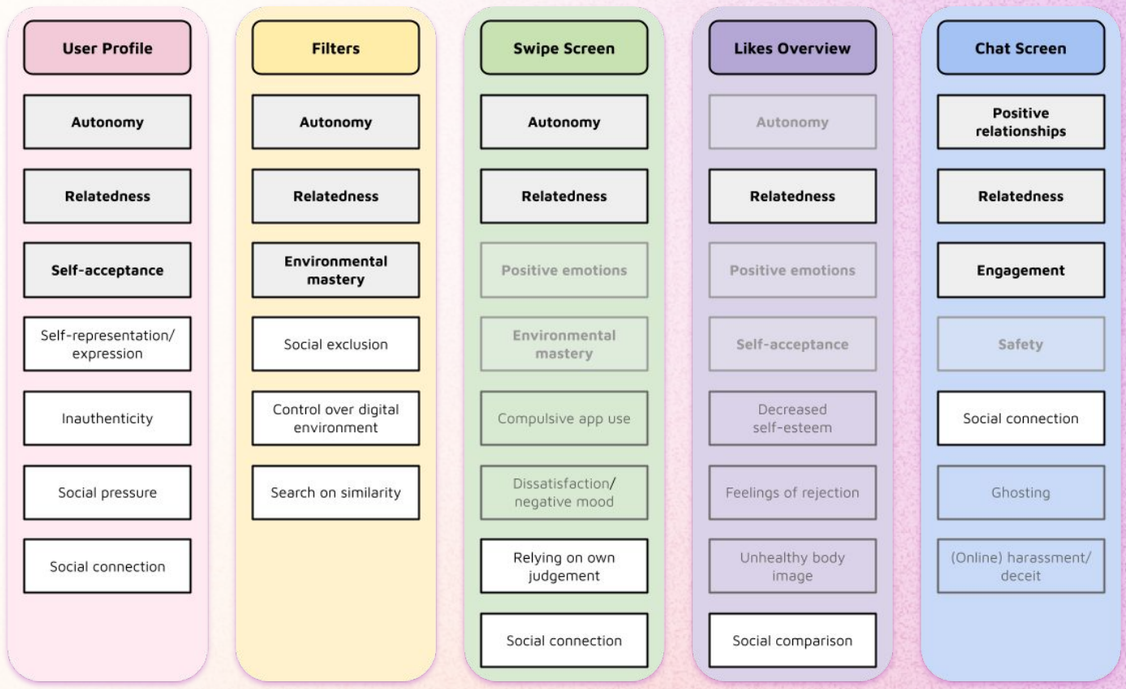


Figure 9.1: Updated theoretical model

can occur such as decreased self-esteem, feelings of rejection and an unhealthy body image, which as result can impact self-acceptance, positive emotions and even physical health. Incorporating these facets of well-being could therefore be an interesting direction to pursue for the next cycle.

Another component of well-being which was not considered during the project, concerned safety. This includes both online and physical safety as desktop research indicated that harassment can occur both in an online environment and a physical setting.

9. Recommendations: Next Cycle

For minorities in particular, it was found that these unsafe conditions happen more frequently (Albury et al., 2019). Furthermore, since this study has only targeted heterosexuals (due to convenience sampling and them being part of the majority of the user base), an affected user group was left out. Future investigations should therefore also take members of the LGBTQ+ community into account.

Limitations

As mentioned before, for the past workshop and user study, a similar sample of participants was recruited. This group lacked diversity in terms of cultural background and gender, which could possibly have influenced the results. During the research, gender differences in the experience of dating apps and their effect on well-being were briefly covered. Men were more likely to experience dating apps negatively due to the gender imbalance within these apps (by receiving fewer likes). Since the majority of participants were female in this research, the opinions and experiences of male users were less reflected in the design. For the following cycle, this difference demands a more thorough investigation (and more male participants should be recruited for validation), to create a design intervention that can be beneficial to both groups.

As for the final design itself, although the design stressed the importance of balancing autonomy and relatedness to foster positive relationships, 'positive relationships' itself was not measured during this study. If the design interventions were to be implemented and the effects on well-being would be measured in the long-term with real users, this aspect should also be integrated. Overall, the measured experience of autonomy and relatedness were mostly positive but did not result in a strong measured impact. Conducting the study with more participants could result in more significant results and provide a clearer perspective on the design's influence.

Privacy and data collection within dating platforms were explored in the research to a certain degree. However, as a few participants were hesitant in granting access to their photo libraries, changes have to be made to the photo suggestions feature. Possible solutions could include providing more transparency regarding the data analysed through privacy policies, which is currently partly integrated in the concept (through the consent pop-up). Other options could consist of enabling the user to choose from specific picture folders (composed by themselves) where photos with sensitive data are withheld. Another approach could include changing the categories to prompts where users have to pick or take pictures for a selected interest (e.g. "choose a picture where you are hiking"). Even though privacy concerns were not explored in detail in this particular project, it is advisable to prioritise this when designing for the next cycle if it involves sensitive data such as pictures.

10. Personal Reflection

Before researching the topic, I had always viewed well-being as simply the experience of negative emotions or states such as stress and anxiety. Through this project, I gradually became more informed on what well-being actually included. To my surprise, as I was starting, I found the topic to be quite challenging as it was much broader than I had expected. This often resulted in moments where my progress was hindered due to my slow understanding of the subject. As research is not one my greatest strengths, I felt that by being continuously involved in this task, I was able to improve my research skills to some extent.

In addition, this project allowed me to learn a variety of design methods such as the Positive AI Design method and AI ideation cards, but also on how to facilitate a workshop to gain valuable insights. As an IPD student, I did not have the opportunity to perform such a user-centred study before, where the user was deeply involved. Through this study, I feel that I gained a better understanding on how effective and insightful user tests can be performed.

Apart from this, I was also able to achieve some of my learning goals. At the start of the project, I had defined that I wanted to learn new programs such as Figma (as this was a common required skill for most UI/UX design agencies/companies) or be involved in making slightly more complex prototypes through coding.

Even though I was unable to create a working and interactive prototype (where certain input of the user could result in different outcomes/reactions), being able to master the Figma program was still an useful experience to me.

When looking back on my own work and progress, I would say it sometimes was a rough journey. While learning a lot about doing research, I realised that I could easily get lost in a certain task. This resulted in some parts of the project being explored too extensively while less attention was paid to other components (even though this was also relevant). However, since I have gone through this once, I believe that for the next time I will do better and not make the same mistake again.

Overall, I want to say that this was a valuable learning experience for me. I am thankful towards my supervisory team, Paul and Willem, for guiding me in my journey and by showing patience during the moments I experienced setbacks.

Though at the start I found it slightly embarrassing to talk about dating apps (or even mention them at all), throughout the project I was slowly able to grow out of it. By hearing about other people's experiences and diving deep into the research, I learned a lot about people and that, in particular, was an enjoyable moment for me.

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Appendix A: Project Brief

DESIGN FOR our future

TU Delft

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name: Wang
initials: G given name: Gigi
student number: 4656563
street & no.:
zipcode & city:
country:
phone:
email:

Your master programme (only select the options that apply to you):

IDE master(s): ★ IPD ○ DfI ○ SPD
2nd non-IDE master:
individual programme: - - (give date of approval)
honours programme: ○ Honours Programme Master
specialisation / annotation: ○ Medisign ○ Tech. in Sustainable Design ○ Entrepeneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair: P. P. M. Hekkert dept. / section: HCD/DA
** mentor: W. van der Maden dept. / section: HCD/DA
2nd mentor:
organisation:
city: country:

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

comments (optional): This project will be part of Willem's PhD project and contribute to his research regarding Positive AI. Prof. Paul was asked since he has a lot of knowledge in design for well-being and has done similar graduation projects in the past.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

TU Delft

Personal Project Brief - IDE Master Graduation

Enhancing well-being through positive AI on dating platforms — project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 20 - 03 - 2023 28 - 08 - 2023 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

In the past decade, the internet and social media have significantly changed how people form and have social relations, especially for casual or romantic relationships (Bryant & Sheldon, 2017). Platforms have been introduced to create a shift from offline dating to apps for mobile devices and are widely used all over the world. Well-known dating applications such as Tinder, Bumble and Badoo have accumulated around 118 million users in 2022 (Ceci, 2023), with Generation Z and Millenials making up the biggest user base, ranging from the age 18-35. These apps have created a space where meeting a large number of potential partners is much faster and easier. The use of these platforms has resulted in an increasing number of long-term relationships that have started online (Holtzhausen et al., 2020) and it is predicted that in 2040 approximately 70% of relationships will begin online (eHarmony, 2015). Within these apps, artificial intelligence (AI) is used, where users are recommended to other users who are geographically nearby (Datey et al., 2022) and have similar interests. Although AI has supporting applications in dating platforms, negative implications on well-being also have been found (Pew Research Center, 2020).

The systems of dating platforms are currently designed in such a way (through gamification elements (Garda & Karhulahti, 2021)) that the user keeps swiping (to approve or reject another user's profile), where the user has a chance to gain a match with each swipe, similar to a slot game. Due to the fear of possibly missing out on finding the 'dream match', users are kept engaged in continuous use of the app (Harris, 2016). Moreover, due to access to a high number of profiles and the algorithm classifying them based on categories such as height, sexuality and race, users portray a more attractive image to appeal to more users. Along with the algorithm sorting them based on the number of swipes, the focus ends up shifting from finding a potential date to filtering out the undesirable ones (Pidoux, 2022).

One of the key motivations of dating app users is seeking self-validation (Sumter et al., 2017). According to Strubel & Petrie (2017), swipe-based dating apps put emphasis on the users' profile images, enhancing sexual objectification while also putting users in a vulnerable position to others' acceptance or rejection. This, depending on the outcome, promotes a negative body image and social comparison, resulting in psychological distress. In addition, it was measured that dating app users were more likely to experience anxiety, depression and distress compared to non-users (Holtzhausen et al., 2020). As of now, dating apps are found to have a detrimental effect on well-being.

Currently, few actions have been taken by these platforms to tackle this issue. Most solutions to supporting well-being have resulted in more reactive measures rather than preventive ones (Datey et al., 2022). At present, examples of well-being in apps consisted of providing well-being guides, (Bumble, 2022) and in some cases, collaborations with mental health institutes in a limited amount of countries (Tinder, 2022). However, this approach still requires users to be aware of their own state and to take action following this. Improvements should therefore be made to the current system, for dating platforms to become a space for building meaningful and close connections rather than negatively influencing well-being. This is important, since the purpose of dating apps, in the first place, is to provide a place to find love.

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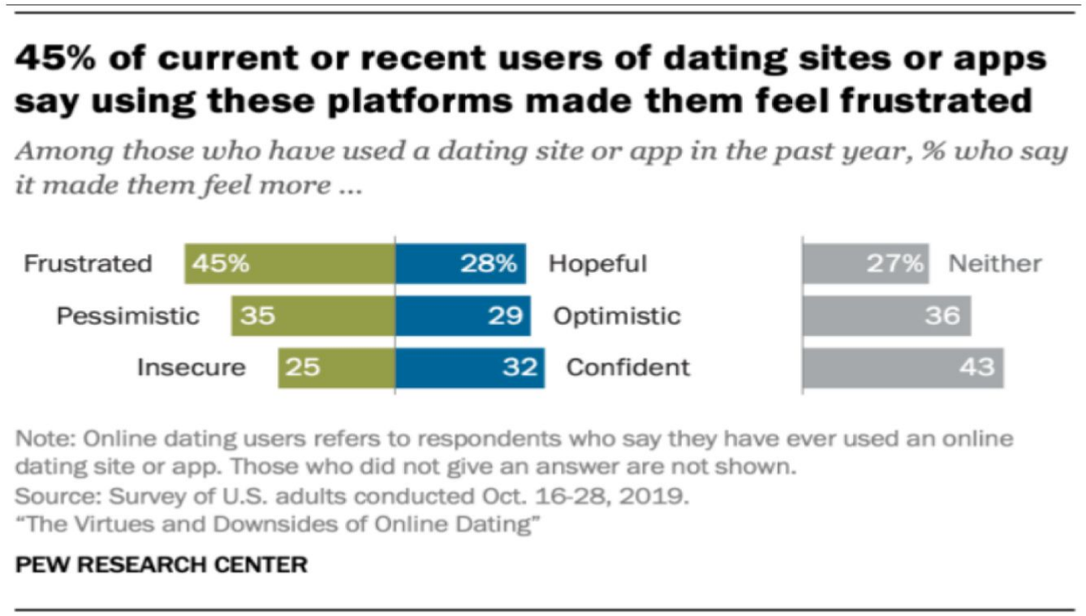


image / figure 1: Positive and negative experiences of dating site/app users (Pew Research Center, 2020)

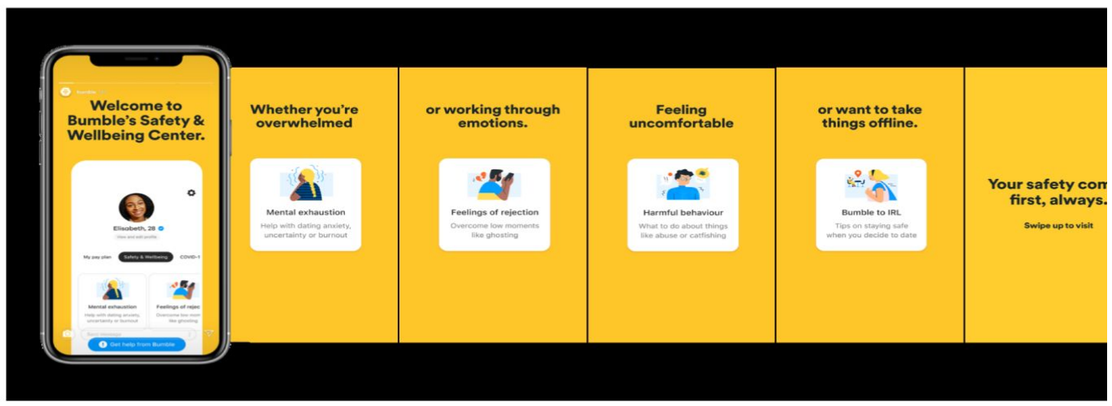


image / figure 2: Well-being guides (Bumble, 2022)

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Current research has focused on the negative effects of technology (such as AI) on interactive systems, but little on how to improve these systems to enhance the well-being of their users (Gaggioli et al., 2017). This, while AI has the potential to support individuals when it concerns well-being (D'Alfonso, 2020). In order to progress in AI technology positively, human well-being should be considered the main objective (Ozmen Garibay et al., 2023).

As of now, AI has few use cases and examples of being integrated for it to contribute to well-being. In this particular case, the chosen context consists of dating platforms where barely any attention has been paid to well-being even though it causes negative experiences among users in the form of ghosting, harassment and addiction (Stoicescu, 2020). Nonetheless, even though it is necessary to detect the harmful effects of the current system, it is also relevant to focus on the beneficial influences it has on well-being, as the intention of dating apps is originally also positive: to contribute to finding love.

In order to assess and support well-being in dating apps, the project has to tackle how well-being can be measured in the first place. Unlike with behaviour for which multiple standards of measurement exist, there is still no consensus over such an instrument when it concerns well-being (Cooke et al., 2016). Therefore, a form of metrics will be established in the research and used to optimise well-being in dating platforms. Following that, suitable actions for the AI system will be identified and designed. For this, it is important that this system meets the needs of the user and that rather than be autonomous, works together with the user (van der Maden et al., 2023). By following the Positive AI method (which is being validated), it will be explored how the system within dating apps could positively contribute to well-being.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

In this project, the potential risks affecting well-being caused by the existing AI system will be identified and mitigated. Moreover, a design intervention will be created to leverage dating platforms and as result enhance well-being. In order to do so, a Positive AI method from (van der Maden et al., 2023) will be used.

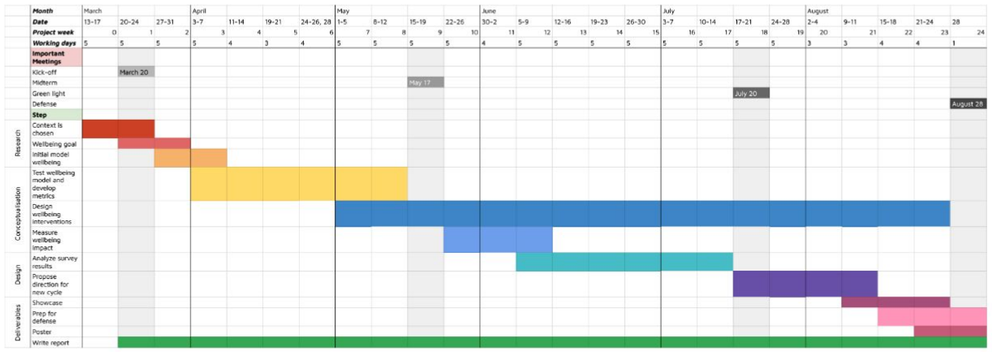
The research will answer the following questions:
- What is well-being and how is this currently included in the context?
- How will AI measure well-being in this particular context?
- What part of the system will AI intervene in?
- What will AI do with the measurements?
- How will the design intervention optimise well-being in the chosen context?

The expected outcome:
- A plugin or a (new) third-party app which will intervene in existing apps & support well-being (showcased in a video)
- Research knowledge on the research questions
- Recommendations on how to improve the design
- Poster summarizing the project

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 20 - 3 - 2023 28 - 8 - 2023 end date



For this project, a total of 110 working days are planned with around 10 days of holiday. The reason for extending the project to 110 instead of 100 is to also take into account a few days of delay due to for instance illness, lack of productivity and the chair and mentor being unavailable due to summer break. The graduation date will therefore preferably be around the end of August.

In the weeks before the midterm, the focus will be on literature research to understand well-being itself and how it is affected in the context. Furthermore, a (theoretical) model of the expected influencing factors on well-being will be developed and validated through user studies, which will result in metrics for measuring well-being. These outcomes will be presented during the midterm presentation.

Following this, until the defence, there will be constant ideation on designing interventions and these will be further developed. These design interventions will be assessed by the users and the impact of these on well-being will be measured. These results will then be analysed, and the gained insights will be presented during the green light.

Lastly, the deliverables will be finished in the remaining time and a proposal for a future focus will be introduced.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

As my final project I wanted to do something related to well-being since I believe that in my future occupation, the chances of dealing with this topic will be lower when I focus solely on product development in product design consultancies. Furthermore, I wanted to use this as an opportunity to understand more about well-being and the way I myself am dealing with it. In addition, as artificial intelligence is a fast-growing technology, I thought that it would be a relevant subject to explore. The reason for specifically choosing dating platforms as the context was due to the fact I noticed people in my surroundings in some way or another also have been affected by the use of such apps. Therefore, I am interested in diving deeper into this topic and finding out what could be improved.

As an IPD student, I have dealt with several topics from culture, ergonomics and technology to project management. In most of my projects such as ACD and AED, I had to test with users for a designed interface and enjoyed focusing on product experience the most. For this project, I would like to improve my user testing skills (possibly through the use of new methods such as Context Mapping), by facilitating workshops and design with more focus on the user rather than only the product as I believe that through this I can gain the most insights to create a positive experience. During my electives, I already gained some expertise in digital product design through the elective eHealth (where the purpose was to improve an app in a specific design direction), and I am interested in developing this further.

Moreover, I want to broaden my skillset (to the direction of UX/UI designers) by learning a new program such as Figma or Adobe XD to create interface prototypes. Furthermore, if there is enough space and time, I would like to improve in prototyping whether it is physical or digital by perhaps learning basic coding in, for instance, Javascript to test out a small part of the interface or AI algorithm.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Appendix B: Overview Dating App Features

	Profile setup						
	tinder	bumble	badoo	Hinge	happn.	Grindr	HER
Add Media	✓	✓	✓	✓	✓	✓	✓
Smart Photos	✓	✓					
About Me	✓	✓	✓	✓	✓	✓	✓
Profile verification	✓	✓	✓	✓	✓	✓	✓
Location Detection	✓	✓	✓	✓	✓	✓	✓
Prompts	✓	✓	✓	✓			
Dating Intention	✓	✓	✓	✓	✓	✓	✓
Hide Information	✓			✓	✓	✓	
Social Media Account	✓	✓	✓	✓	✓	✓	

Appendix B: Overview Dating App Features

	Swipe screen & App use						
	tinder	bumble	badoo	Hinge	happn.	Grindr	HER
Filters	✓	✓	✓	✓	✓	✓	✓
Swiping/Liking	✓	✓	✓	✓	✓	✓	✓
Profiles Map					✓	✓	
Missed Match	✓	✓	✓				
Rewind	✓	✓	✓	✓	✓		✓
Lookalikes			✓				
Standouts	✓	✓		✓			
Popularity Meter			✓				
Most Compatible				✓	✓		
People Nearby		✓	✓			✓	✓
I'm free to.. (activity)					✓		
Share your Mood			✓				
Likes Overview	✓	✓	✓	✓	✓	✓	✓

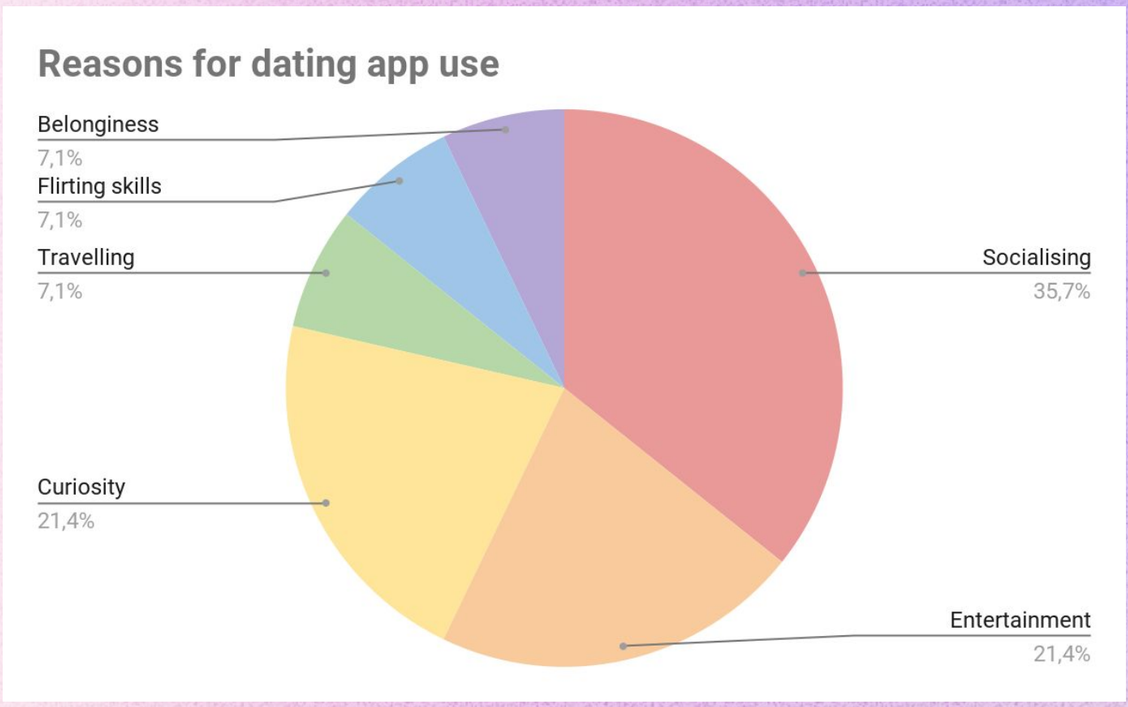
Appendix B: Overview Dating App Features

	Online interaction						
	tinder	bumble	badoo	Hinge	happn.	Grindr	HER
Chatting	✓	✓	✓	✓	✓	✓	✓
Message instantly	✓		✓		✓	✓	
Send Compliment		✓		✓	✓		
Communities/Group chats						✓	✓
Events							✓
Match Queue	✓	✓	✓				
Ice Breakers		✓	✓		✓		
Audio Notes		✓	✓	✓	✓	✓	
Video call	✓	✓	✓	✓	✓	✓	?
Albums						✓	
Anti-ghosting			✓	✓			
Add as Friend						✓	✓
Inappropriate language detection	✓	✓	✓			✓	|
Block users	✓	✓	✓	✓	✓	✓	✓
Push Notifications	✓	✓	✓	✓	✓	✓	✓
Invisible Mode	✓	✓	✓	✓	✓	✓	✓
Hub	✓				✓		
Games	✓	✓	✓		✓		
Speed Dating		✓					
Safety Center	✓	✓	✓	✓	✓	✓	?

Appendix C: Workshop - Additional Results

Reasons for dating app use

Socialising, meeting new and more people (to increase their chances for finding a match), entertainment (out of boredom) and curiosity were found to be the biggest motivators as seen in the figure on the right.



Dating app experience

Positive experiences included meeting new people along with the funny interactions either through chatting or profile elements. In addition, Some users gained more confidence when they received positive attention (likes from others) and in some cases ended up with a long-term (romantic) relationship.

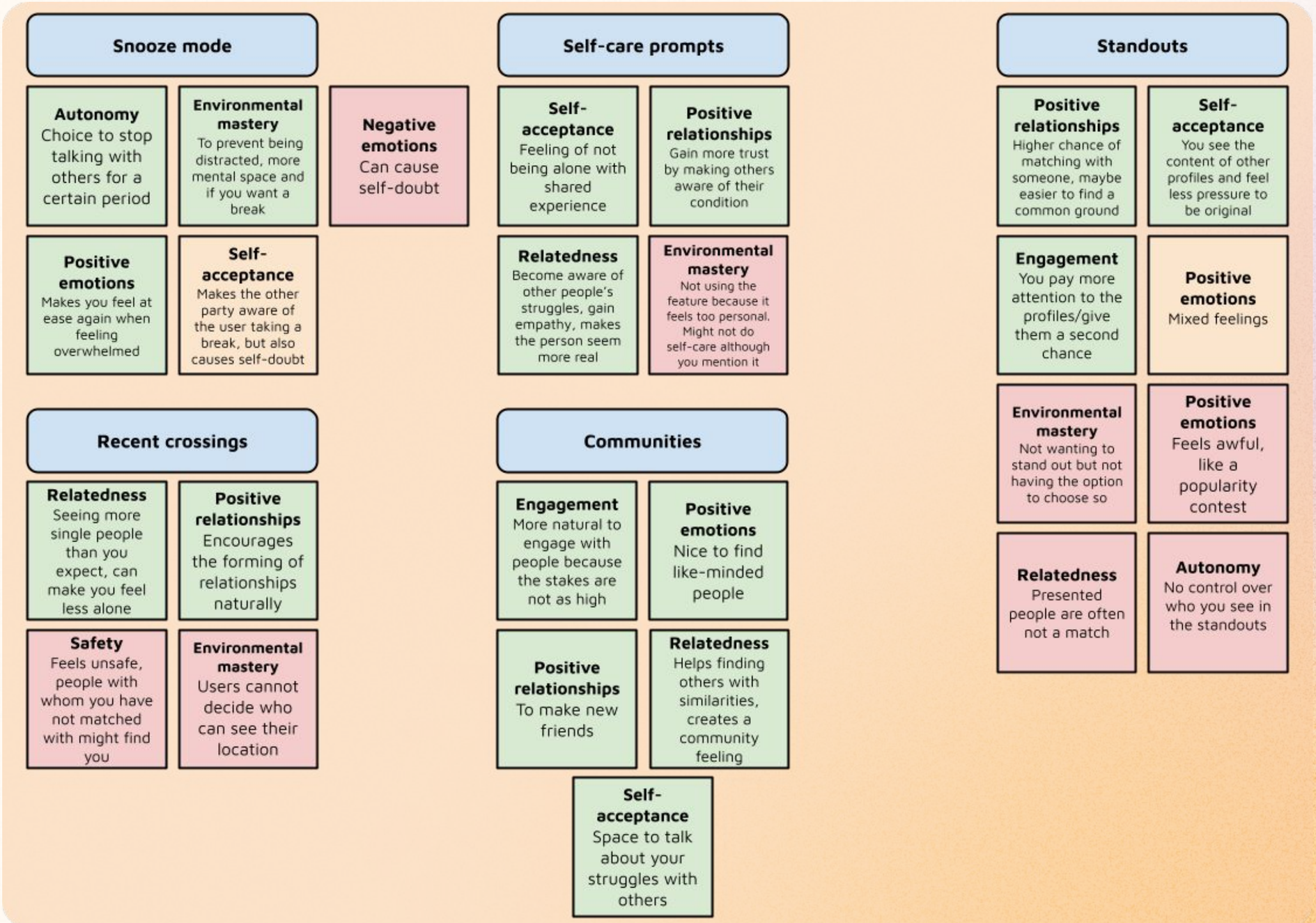
Negative experiences concern worries about how one was perceived by others, and whether they would come across profiles of people they know in real life (who do not know the user also uses dating apps). Other negative situations involved interactions with other users where they were ghosted, received little or lacklustre responses or felt incompatible with the profile recommendations or matches. Overview of the good and bad experiences can be found on the next page.

Appendix C: Workshop - Additional Results

Good experiences	Bad experiences
• Meeting new people (interesting/exciting) (P1, P4, P7) • Funny interactions (P1, P2, P3) (e.g. opening lines, funny profile pictures, interesting hobbies) • Gaining confidence from receiving a lot of positive attention (P3, P6) • No creepy people (P5) • Easy to stop online contact (P6) • Resulted in a good outcome (found a lasting relationship) (P6) • Supports in finding out what you like/dislike/better understanding of oneself (P6) • Ease of use (go through profiles/using filters) (P6) • Improves understanding of what kind of people use dating apps (P6) • Resulted in relationships (but never long-term) (P8) • Resulted in (long-term) friendships/relationships (P6, P7, P8)	• Need to keep checking messages (P1) • Other users boasting about themselves (P2) • Boring dates (P1) • Finding people you already know (awkward feeling) (P2, P6) • Disturbing content on profiles (e.g. creepy voice prompts, users without/with little clothing) (P2) • Racist comments (P1) • Realisation of fear for social interactions (P3) • Rejection (P3) • Online harassment (on other platforms) (P3) • Disappointing real-life meetups (different physically and personality-wise) (P1) • Differing intentions between yourself and others (e.g. wanting a serious relationship vs. not) (P4) • Ghosting (P4, P7) • Not getting any matches (discouraging) (P4) • Dull conversations, little interactions, difficulty with holding a proper conversation due to speed in response (P4, P5) • Not experiencing a ‘click’ with a match (P5) • Not finding any interesting people (P6, P7) • Worrying about how other users react on my profile (like or dislike) (P6) • Wondering about how many other people your match is talking with (P6) • Unclear tone behind texts (self-doubting) (P6) • Feels forced to buy premium features (P7) • Feelings of guilt from push notifications (P8) • More than 90% of swipes are not matches (P8)

Appendix C: Workshop - Additional Results

Dating app features linked to well-being (unique & well-being related features)



Appendix C: Workshop - Additional Results

Possibilities for measuring well-being

- Speed of swiping
- Interactions with others/negative tone of texting
- HP bar based on interactions between two people (decreases when little interactions, or bad responses/insults)
- Choosing emojis during chat
- Questions
    - "What's on your mind?" when it measures a certain behaviour (swiping)
    - Analysing your mood based on questions
    - Pop-ups on how a user is feeling, e.g. emojis (or PREMO chart) or keywords like 'happy'
        - With a reward system to encourage users to answer the questions
    - Catching up: "How did you feel about this person?"→ answer in emojis (once a week?)
        - Do you like your matches, are the recommended profiles users you really want to see?
        - Why did you not continue talking with this person/How did you like the people you talked to?
    - **Asking too personal questions might be a turn-off to users**
    - **Low threshold to conveying user's feelings**
    - **It might feel like that providing information does not feel rewarding as the app's purpose is only to recommend profiles to you**

Difference between genders

- Women get more likes, men give more likes/are more on dating apps (more users)
- Men really notice the imbalance in gender distribution
- In some apps, the women have to send a message first which can be nice but also provides the men with less control, so they cannot attempt to win a person over because the other has to respond first
    - "When women initiated, the relationship lasted longer" - P8
- Filter feature was experienced as not nice by men as they felt it excluded others while women liked the feature due to convenience

Additional comments

- AI causes them to be at the bottom of the stack due to lack of likes/matches and lack of exposure makes it worse
    - Idea: people with similar exposure are shown to each other
- Users like the filter feature
- Some users dislike the likes overview (& recent crossings)
- P7 liked the profile setup as you can show who you are and what you like

Appendix D: Ideation - HMW: Profile Setup

How might we *adapt* the function of 'Adding media' **so that** the user can achieve more 'self-acceptance'?

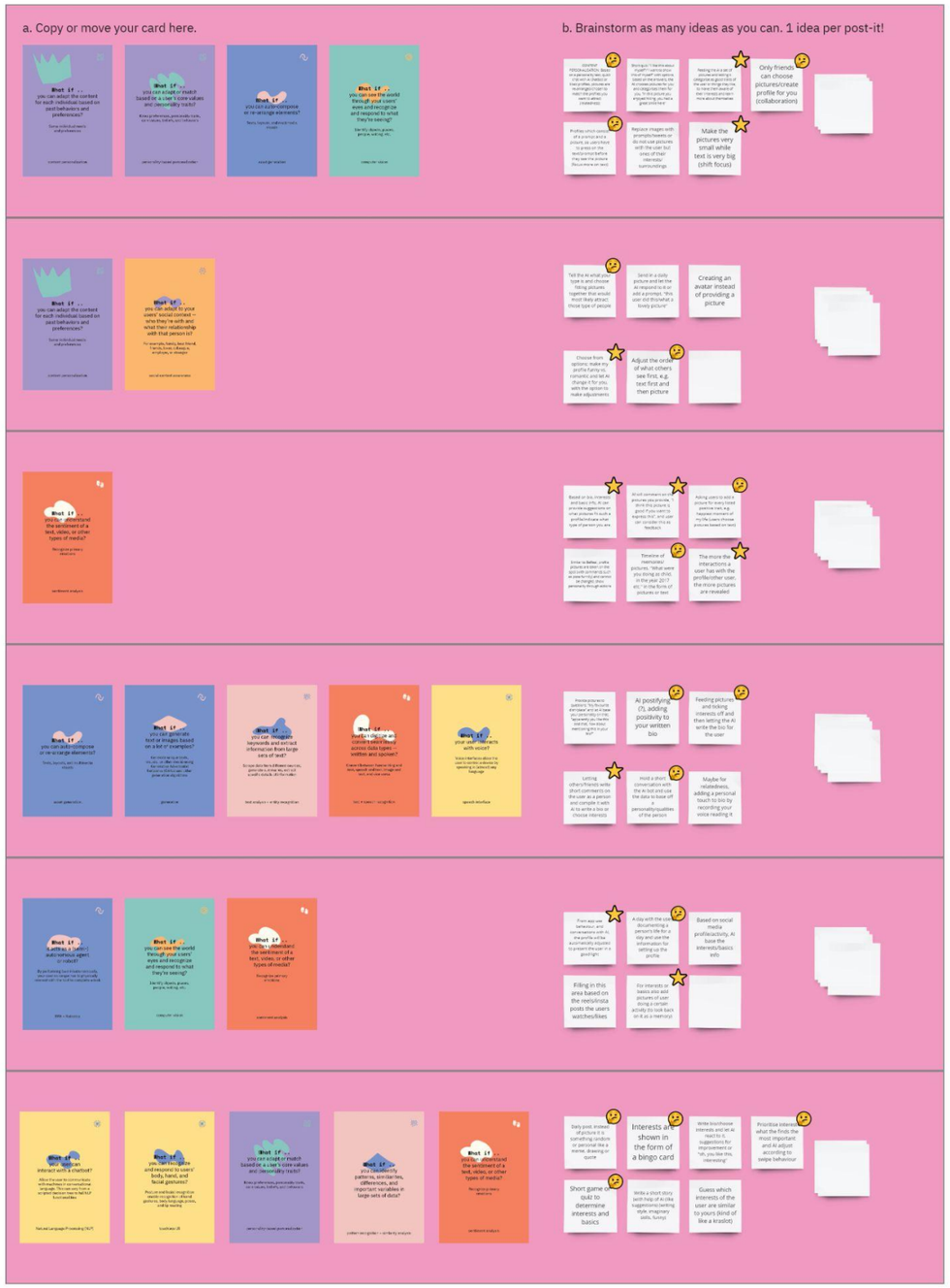
How might we *modify* the function of 'Adding media' **so that** the user can experience more 'autonomy'?

How might we *put* the function of 'Adding media' *to another use* **so that** the user will become more aware of their strenghts/positive experiences

How might we *combine* the function 'Bio' **so that** the user will become more aware of their strenghts/positive experiences

How might we *adapt* the function 'Interests/Basics' (& bio) **so that** the user will become more aware of their strenghts/positive experiences

How might we *adapt* the function 'About Me' **so that** the user will experience more 'engagement' with their task

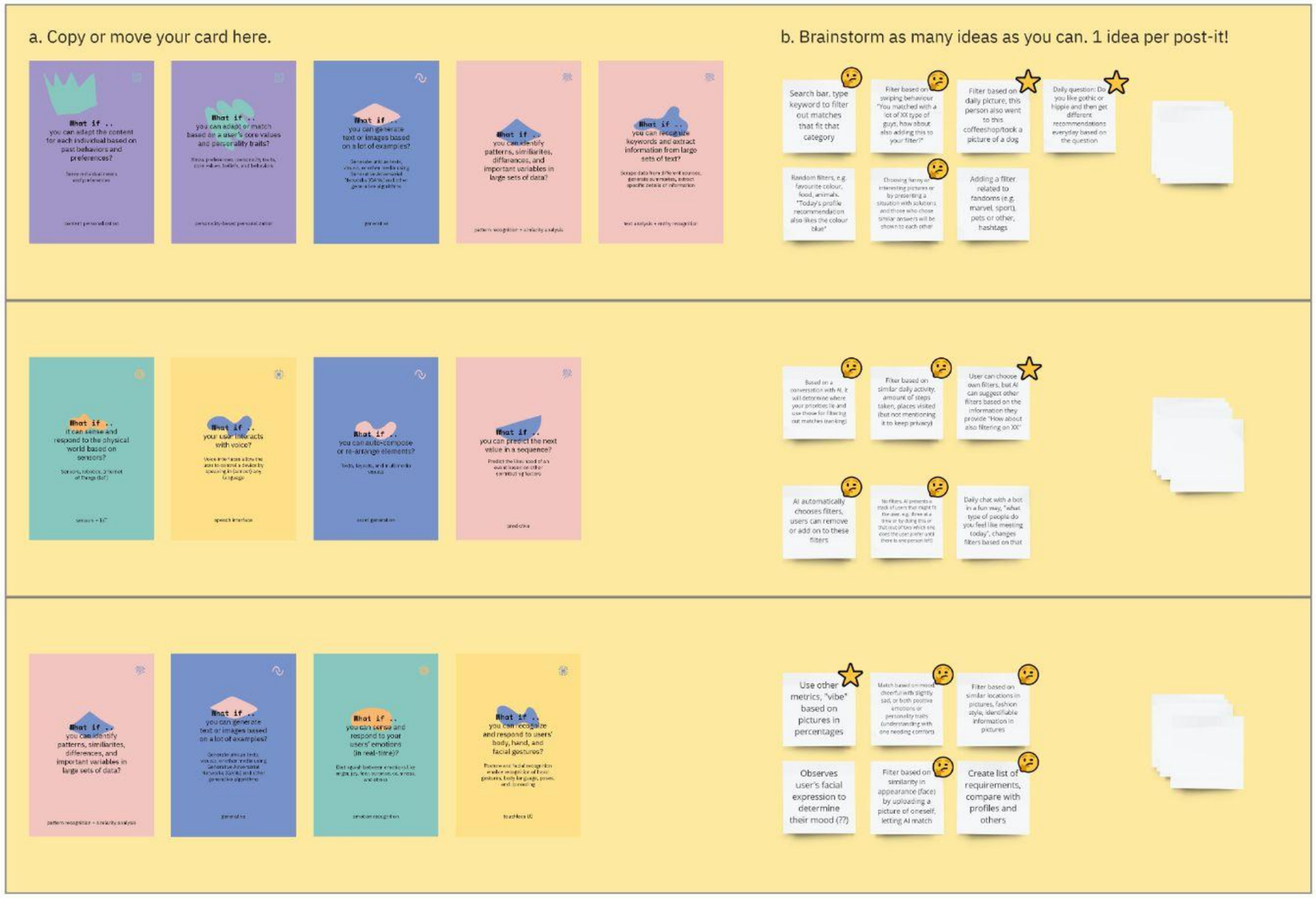


Appendix D: Ideation - HMW: Filters

How might we *modify* 'Filters' **so that** the user will not exclude other potential matches/users

How might we *substitute* 'Filters' **so that** the user will not exclude other potential matches/users

How might we *adapt* 'Filters' **so that** the user will experience more 'relatedness' with other users



Appendix D: Ideation - HMW: Swipe Screen

How might we *modify* 'Swiping' **so that** the user will feel assured on their choices

How might we *adapt* 'Swiping' **so that** the user will feel more 'relatedness' with other users

How might we *substitute the* 'Likes overview' **so that** the user experience will more 'positive emotions'

Appendix D: Ideation - HMW: Chatting

How might
we *adapt* 'Chatting' **so that** the user will experience more 'relatedness' with their matches

How might
we *modify* 'Chatting' **so that** the user will experience more 'engagement' with others

How might
we *reverse* 'Chatting' **so that** the user will experience more 'relatedness' with their matches

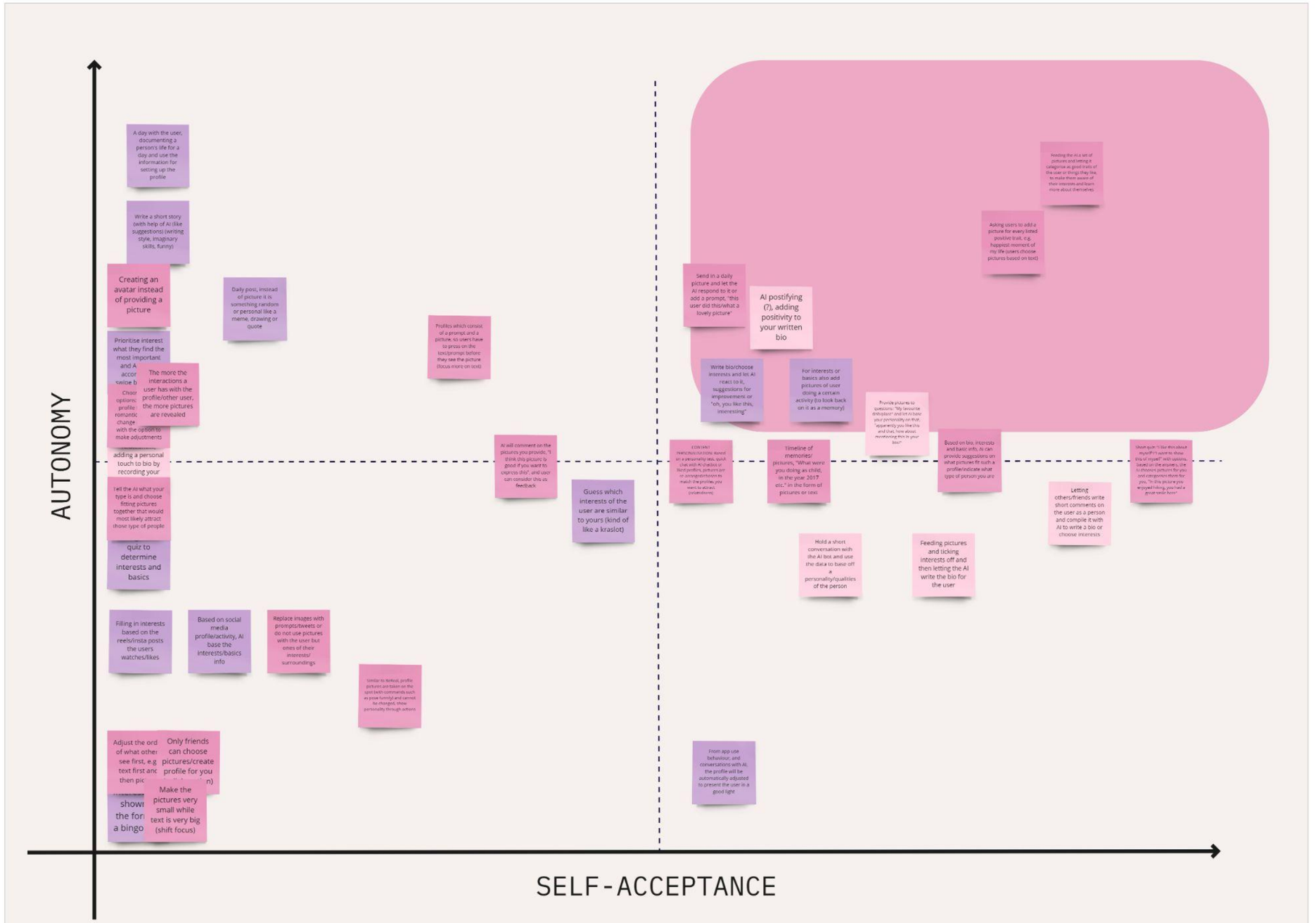
Appendix D: Ideation - HMW: Swipe Screen

How might
we *adapt* 'Chatting' **so that**
the user will experience more 'relatedness' with their matches

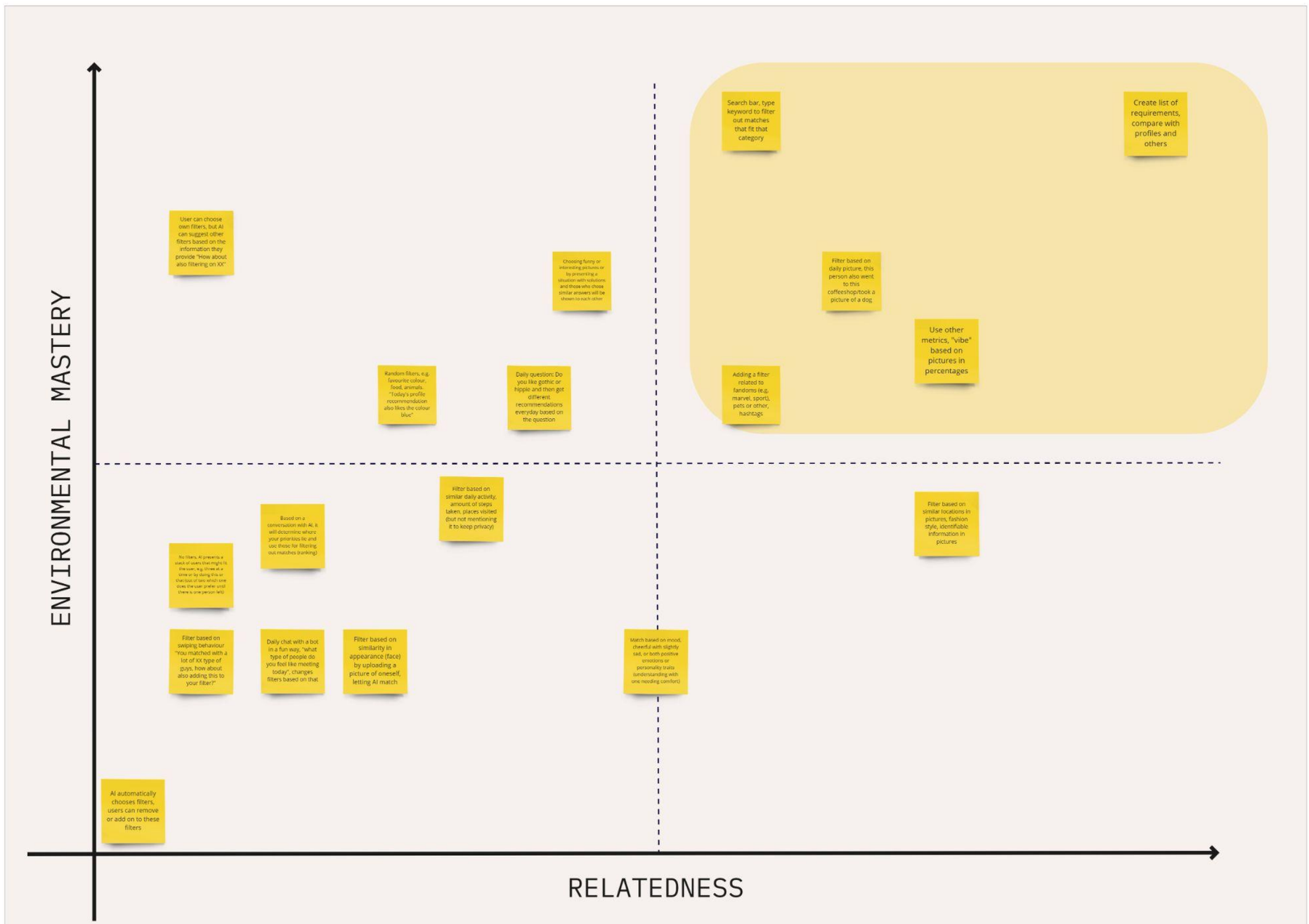
How might
we *modify* 'Chatting' **so that**
the user will experience more 'engagement' with others

How might
we *reverse* 'Chatting' **so that**
the user will experience more 'relatedness' with their matches

Appendix D: Ideation - Matrix: Profile Setup

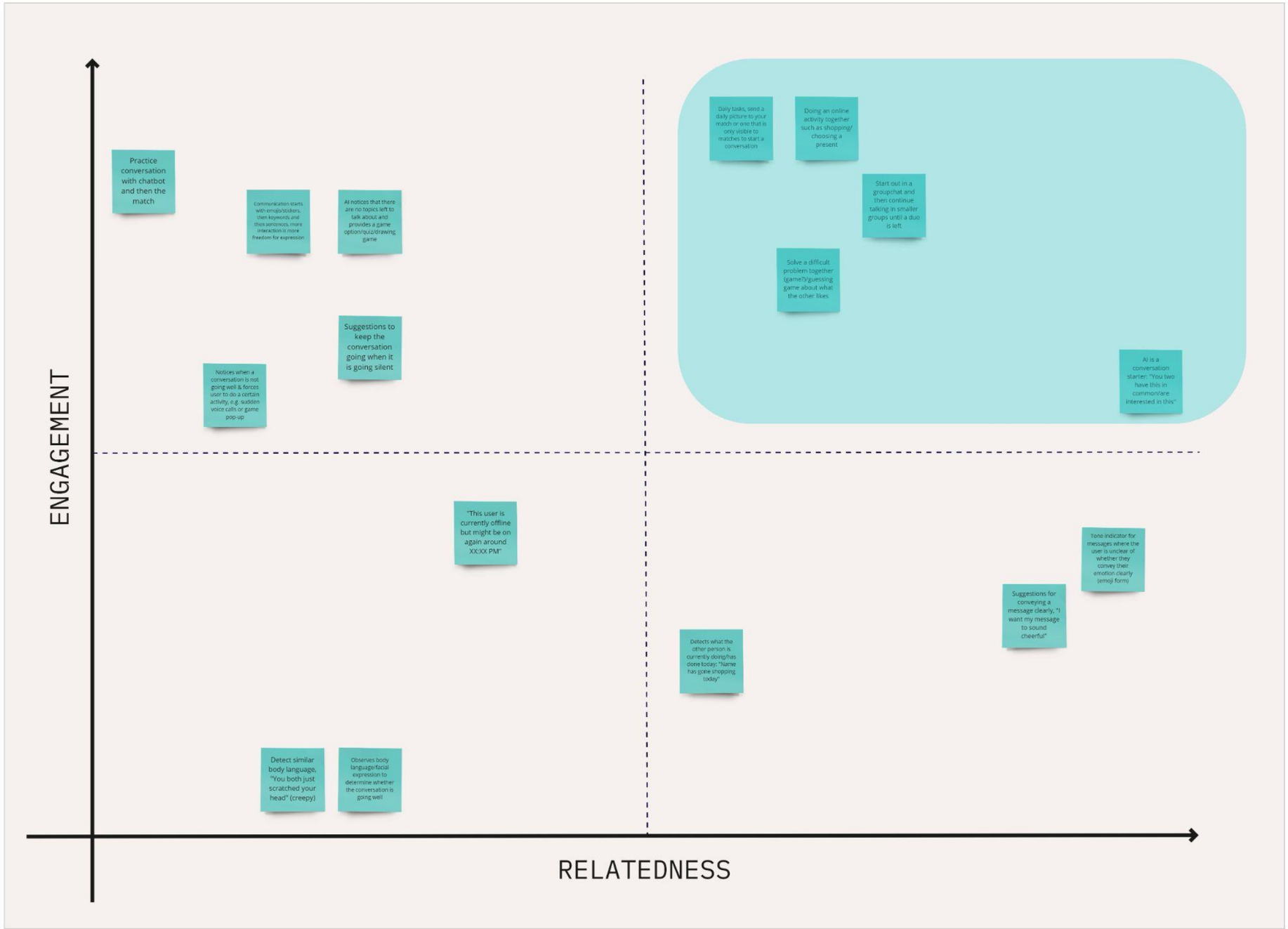


Appendix D: Ideation - Matrix: Filters

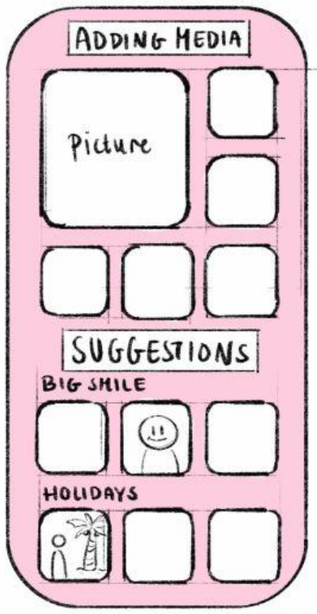
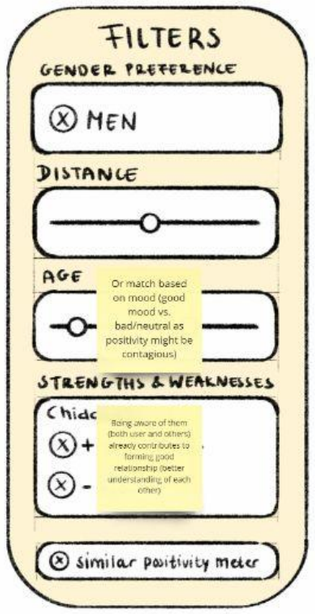
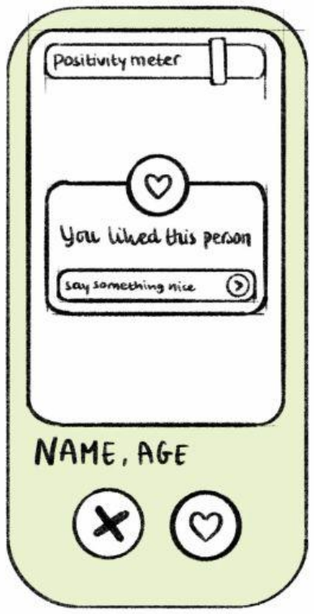
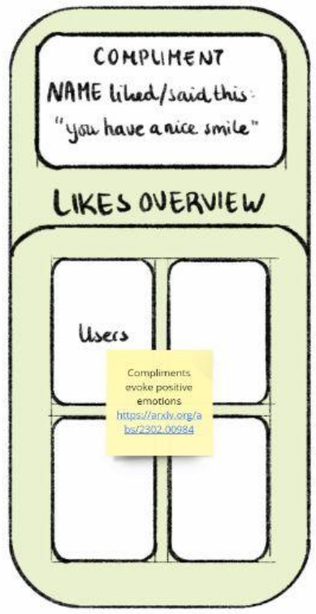


Appendix D: Ideation - Matrix: Swipe Screen

Appendix D: Ideation - Matrix: Chatting



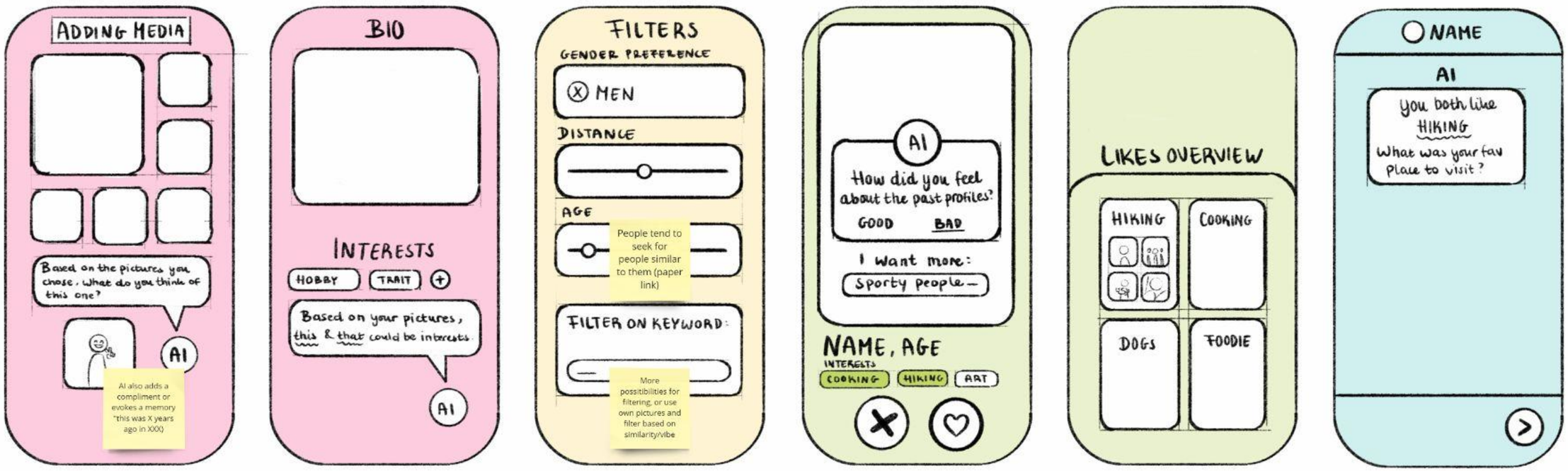
Appendix D: Ideation - Concept Ideas

App phases	Adding media	About me	Filters	Swipe screen	Likes overview	Online communication
Wireframes (UI)						
Actions User (UX) What does the customer do? What information do they look for? What is their context?	Provides access to photo gallery Chooses pictures	Writes bio Chooses from suggestions	Fills in personal strengths & weaknesses (+ what users think would match well with their strenghts/weaknesses)	Likes user Sends compliment		
Actions AI What data does the AI use? How does the AI react?	Sorts pictures on positive traits/moments (e.g. smile, holiday, activity)	Analyses text Provides suggestions for improvement (positify)	Matches on criteria for strengths and weaknesses (or mood) (similarities & compatibilities)		Measures mood based on bio Displays compliment from unknown user when mood is bad Based on compliment provided prior to matching Displays reason for like	

Appendix D: Ideation - Concept Ideas

App phases	Adding media	About me	Filters	Swipe screen	Likes overview	Online communication

Wireframes (UI)



Actions User (UX)
What does the customer do? What information do they look for? What is their context?

- Provides access to photo gallery
- Chooses whether to apply the suggestion
- Feeds AI pictures
- Chooses from suggestions
- Feeds AI pictures/Type keywords related to traits/quotes/ interests
- Answers question

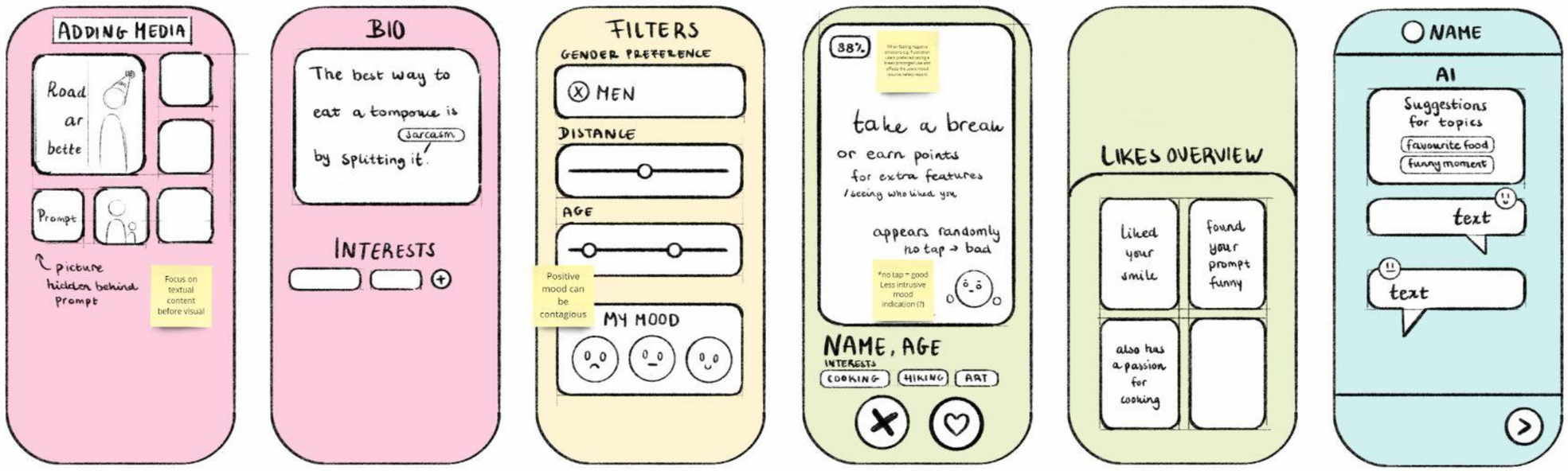
Actions AI
What data does the AI use? How does the AI react?

- Analyses pictures chosen
- Suggests pictures based on similarity
- Analyses pictures
- Provides suggestions for bio & interests
- Analyses content
- Finds similar users or ones that fit the criteria
- Based on a certain left swipes, displays a question related to filtering
- Uses the same filter vs. adjusts according to answer
- Sorts likes from users to similar interests/hobb ies etc.
- relatedness
- Starts conversation by indicating similarities between users

Appendix D: Ideation - Concept Ideas

App phases	Adding media	About me	Filters	Swipe screen	Likes overview	Online communication

Wireframes (UI)



Actions User (UX)
What does the customer do? What information do they look for? What is their context?

Chooses prompt

Add fitting picture

Writes bio

Can change accordingly

Chooses own mood

Does not tap on "blob" character

Taps on "blob" character

Chooses from topics

Chats with other user

Chooses desired tone indicator

Actions AI
What data does the AI use? How does the AI react?

Analyses the tone of the text

Indicates what kind of tone it creates

Filters on similar or oppositive mood or one the mood the user choses

Registers no tap as good mood

Registers tap as bad mood

Displays reason for likes instead of blurred picture

Formulates topics based on interests/bio

Analyses text

Indicates possible tones

"blob" character turns from happy to sad/angry & vice versa

Pop-up for taking a break appears

Calculate... rate (based on similar pictures/interests)

...ges pictures based on ...ilarity

Indicates what they liked about the profile

Appendix E: User Test

Scenarios

Photo & Bio Suggestions:

You have been out of the dating scene for a few years and are currently looking for a serious relationship. While creating your account, you are not sure what kind of information to include in your profile and how to convey who you are. Furthermore, you feel a bit hesitant to choose pictures that show your interests and personality, for fear of being judged while at the same time, you want to stand out from the crowd on the dating app.

While looking through your photo library, you see a feature 'Photo Suggestions and press on it. The feature shows you your categorised pictures.

Highlights

You come across the 'Filters' section and want to use the 'Highlights' feature to find potential matches who share similar interests and values, but more specifically. In addition, you want to find people who live nearby and are around the same age as you. When you have adjusted the filters, you start swiping and see the 'Highlights' on user profiles.

While swiping, you see highlighted keywords on the user profiles which include those you put into the filters along with special keywords (which have a different colour). These highlights indicate what makes you and the other user unique. These special keywords were derived from what you filled in your bio, chose to highlight and the content of your chosen pictures.

Swipe Screen

While swiping a few profiles to the right, you suddenly receive a pop-up asking you about your reason for liking the previous profiles. You answer the question and continue swiping thereafter. After a while, you notice that the recommendations do not align with your preferences resulting in you swiping many users to the left. You suddenly get another pop-up, this time asking you about your satisfaction on the recommended profiles. When indicating your dissatisfaction to the app, you are directed to the filters again. This time, you see you have new suggestions for filtering.

Likes Overview

After having swiped through some profiles for a while, you close the app. During the day, you receive a few notifications from the dating app. Thinking that you received plenty of likes, you open the app in excitement only to see that you only received a scarce amount of likes. You see another pop-up advicing you to adjust your profile to gain more likes. After making changes to your profile according to the new suggestions provided, you leave the app for a while. A few days later, you check your app again and see that the likes have increased.

Matches Screen/Chats

While swiping, you see one profile that catches your attention and swipe right. You receive a message that it is a match. You are excited to start a conversation with them, but you are not sure what to say. When you press on their profile icon, the chat opens along with a pop-up from the app.

Appendix E: User Test

Survey questions

Autonomy

1. This feature provides me with useful options and choices.
2. With this feature, I can get it to do the things I want it to.
3. This feature feels intrusive. (-)
4. This feature feels controlling. (-)

(In)authenticity

5. With this feature, I express my true self to others.
6. With this feature, I express myself a certain way that others will like. (-)

Relatedness

7. This feature helps me to form or sustain relationships that are fulfilling.
8. This feature helps me to feel part of a larger community.
9. This feature makes me feel connected to other people.
10. I don’t feel close to other users when using this feature. (-)
11. This feature doesn’t support meaningful connections to others. (-)

Competence

12. Learning how to use the app was difficult. (-)
13. I found the interface and controls confusing. (-)
14. It wasn’t easy to use the app. (-)

Desirability

15. I want these features to be integrated in the dating apps I have used.
16. I think adding these features to existing dating apps would not be valuable.

	Photo & Bio Suggestions	
	Mean	Standard Deviation
1. This feature provides me with useful options and choices.	4.4	0.55
2. This feature doesn't feel controlling. (-)	3.2	1.30
3. With this feature, I express my true self to others.	4	1.22
4. With this feature, I don't express myself a certain way that others will like. (-)	2.2	1.30
5. This feature helps me to feel part of a larger community.	2.6	0.89
6. This feature makes me feel connected to other people.	3.6	1.14
7. I feel close to other users when using this feature. (-)	3.4	0.89
8. This feature supports meaningful connections to others. (-)	4.2	0.45

	Highlights	
	Mean	Standard Deviation
9. This feature provides me with useful options and choices.	4.2	0.45
10. With this feature, I can get it to do the things I want it to.	4	0.71
11. This feature doesn't feel intrusive. (-)	4.4	0.55
12. This feature doesn't feel controlling. (-)	4	1.00
13. This feature helps me to form or sustain relationships that are fulfilling.	3.8	0.45
14. This feature makes me feel connected to other people.	4.2	0.45
15. I feel close to other users when using this feature. (-)	4	0.71
16. This feature supports meaningful connections to others. (-)	4.4	0.55

Appendix E: User

	Highlights Suggestions	
	Mean	Standard Deviation
17. This feature provides me with useful options and choices.	4	0.71
18. With this feature, I can get it to do the things I want it to.	4.2	0.84
19. This feature doesn't feel intrusive. (-)	4.2	0.45
20. This feature doesn't feel controlling. (-)	3.4	1.34
21. This feature makes me feel connected to other people.	4	0.71
22. This feature supports meaningful connections to others. (-)	4.4	0.55

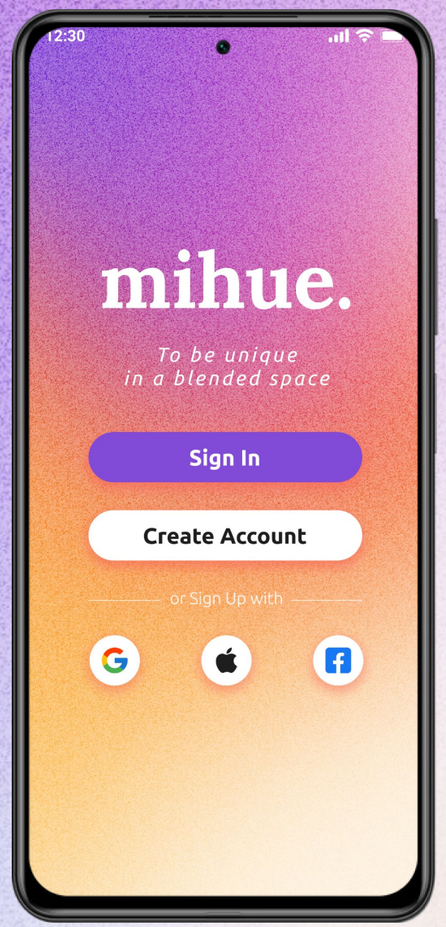
	Likes Overview	
	Mean	Standard Deviation
23. This feature provides me with useful options and choices.	3.6	0.55
24. This feature doesn't feel intrusive. (-)	4	0.00
25. This feature helps me to feel part of a larger community.	3.4	0.89
26. This feature makes me feel connected to other people.	3.8	0.45
27. I feel close to other users when using this feature. (-)	3.2	0.84
28. This feature supports meaningful connections to others. (-)	3.8	0.45

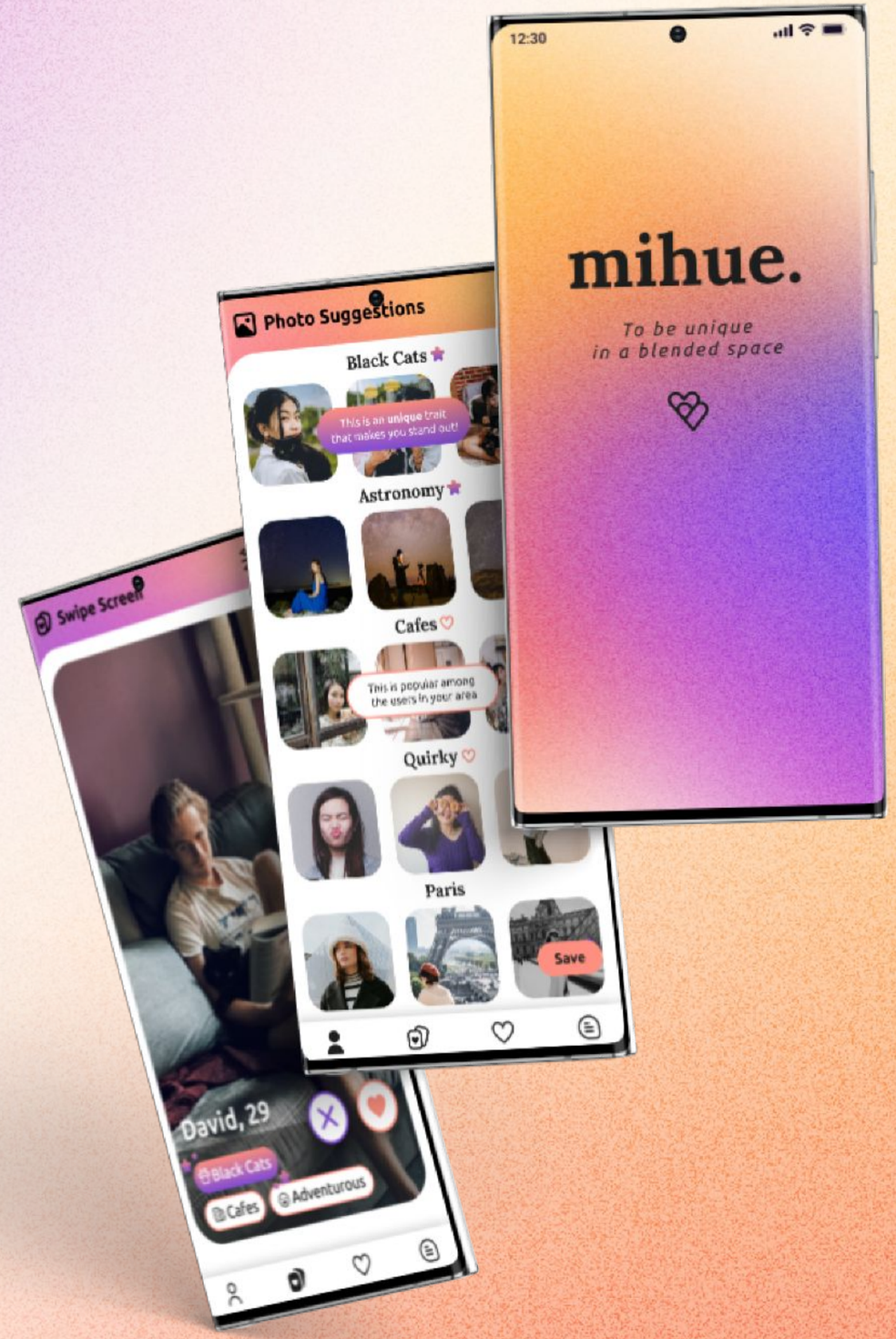
	Conversation Starters	
	Mean	Standard Deviation
29. This feature provides me with useful options and choices.	3.6	1.67
30. This feature doesn't feel intrusive. (-)	3.6	0.89
31. With this feature, I express my true self to others.	4.2	0.45
32. With this feature, I don't express myself a certain way that others will like. (-)	3.2	0.84
33. This feature helps me to form or sustain relationships that are fulfilling.	3.8	0.84
34. This feature makes me feel connected to other people.	4	0.71
35. I feel close to other users when using this feature. (-)	4.2	0.84
36. This feature supports meaningful connections to others. (-)	4.2	0.45

	Overall App Use	
	Mean	Standard Deviation
37. Learning how to use the app wasn’t difficult. (-)	3	1.41
38. I found the interface and controls confusing. (-)	3	0.71
39. It wasn’t easy to use the app. (-)	3.6	0.89
40. I want these features to be integrated in the dating apps I have used.	4.4	0.55
41. I think adding these features to existing dating apps would not be valuable. (-)	4.4	0.55

mihue.

To be unique in a blended space





The dating app that lets you express your true colours while allowing you to blend in with others.