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Daily doses of wellbeing: How everyday technology can support positive activities

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Abstract: Due to their widespread use, consumer technologies like messaging or video streaming services present a promising opportunity to disseminate wellbeing interventions, such as positive activities, to a large audience. Currently, this potential is primarily leveraged by dedicated wellbeing applications. To broaden the scope of applications, we conducted a student-led case study that explored how positive activities could also be integrated into consumer technologies that are not originally designed for wellbeing. Based on the analysis of concrete design examples, we identified three strategies for integration: 1. addition, 2. enrichment, 3. transformation. We showcase each integration strategy through a specific design example. A variety of design mechanisms were employed whereby particularly prompts to create an opportunity and self-reflection to foster motivation and capability have been observed. Together, our findings demonstrate how positive activities and mechanisms to support behavior change can be woven seamlessly into contemporary technology through minimal redesigns.

Keywords: design for wellbeing; positive activities; behavior change; digital wellbeing; positive design; consumer technology

1. Introduction

Consumer technologies, such as messaging services and social networking platforms, are deeply ingrained into our daily lives. This creates the opportunity to impact people's quality of life and their wellbeing on a broad scale through the design of everyday technology. However, for most contemporary consumer technologies, wellbeing is not an explicit design goal (yet). On the contrary, driven by the financial incentives of the attention economy (e.g., Davenport & Beck, 2001), these technologies often employ techniques like push notifications or video autoplay that exploit human psychological vulnerabilities to maximize the time people spend on their devices (Roffarello et al., 2023). As a side effect, this over-optimization for user engagement can promote unhealthy patterns of behavior (e.g.,

reinforce excessive technology use; van Deursen et al., 2019), distort the way we see ourselves (e.g., lower our self-esteem; Marino et al., 2018), and the world around us (e.g., fuel polarization and spread misinformation; Brady et al., 2017; Vosoughi et al., 2019), ultimately compromising individual wellbeing and proper functioning of society (Cunningham et al., 2021; Haidt, 2022).

To mitigate such negative effects, tech giants like Google (https://wellbeing.google) and Facebook (Ranadive & Ginsberg, 2018), as well as academic researchers (e.g., Kim et al., 2017) developed so-called 'digital wellbeing' tools that assist users in managing their screen time and their online activities (Roffarello & DeRussis, 2022). With some notable exceptions (e.g., Lukoff et al., 2021; 2023), these interventions have primarily concentrated on changing the user, i.e., their ability for digital self-control (e.g., Lyngs et al., 2019) rather than the harm-inducing technology itself (Peters et al., 2020). However, design researchers believe that technology can also be (re)designed to actively support individual wellbeing and positive advancement of society (e.g., Calvo & Peters, 2014; Desmet & Pohlmeyer, 2013; Riva et al., 2012). These design for wellbeing initiatives shift the focus from the prevention of harm to the promotion of meaningful human experiences with and through digital technology.

2. Related work: Design for positive activities

Among other approaches, design for wellbeing has explored the potential of positive psychology interventions (PPIs) to inform the design of consumer technology (e.g., Calvo & Peters, 2014; Pohlmeyer, 2014; Wiese et al., 2020). PPIs comprise a set of intentional positive activities that aim at cultivating positive feelings, behaviors, or cognitions (Sin & Lyubomirsky, 2009, p. 468) which, in turn, promote individual wellbeing in a lasting way (Bolier et al., 2013; Sin & Lyubomirsky, 2009). Typical examples include expressing gratitude (Emmons & Cullough, 2003), savoring life's joys (Bryant & Veroff, 2007), or practicing acts of kindness (Lyubomirsky et al., 2005).

PPIs were originally developed for therapeutic use and disseminated through face-to-face interactions. To enhance their effectiveness, they often follow a clearly defined protocol regarding the content and frequency of practice. However, besides these 'classic' therapeutic PPIs, each category of positive activities, e.g., expressing gratitude, includes a broad variety of other opportunities for practicing the activity, e.g., leaving a 'thank you' note for a friend or giving them a thoughtful gift. To emphasize this broader perspective, which informed our work, we refer to PPIs as 'positive activities' in the remainder of this paper (see also Lyubomirsky & Layous, 2013).

Positive activities can be stimulated by technology in two different ways: First, through Behavioral Intervention Technologies (BITs) (Schueller et al., 2013) that are deliberately built to promote wellbeing-enhancing interventions as their core function (referred to as *Dedicated Design* by Calvo & Peters, 2014). Examples are meditation or gratitude apps. Second, through consumer technology that is not purpose-built to increase wellbeing but

contains specific wellbeing-enhancing features, e.g., a social networking site that encourages kind comments (referred to as *Active Design by* Calvo & Peters, 2014). While BITs are effective means (Bolier & Abello, 2014) to bring positive activities out of the therapy room into real-world applications in a scalable and cost-effective way, they face a number of challenges, including limited reach and high attrition rates (Schueller et al., 2013; Ludden et al., 2015; Pohlmeyer, 2017), that could, in part, be overcome by harnessing consumer technology as additional channel to disseminate positive activities as Active Designs.

However, it is neither obvious nor trivial to integrate positive activities into consumer technology. While BITs can tailor the whole application to their promotion, embedding them into consumer technology that serves a different overall purpose supported by its own user flows and functionality, requires a creative reinterpretation of positive activities in the design process. In this paper, we explore the potential of consumer technologies to promote positive activities in the form of Active Design solutions. Specifically, we ask the following research question:

- **RQ:** How can design support positive activities integrated in consumer technology?

To explore this question, we conducted a case study, embedded in an Interaction Design Master course, in which we briefed students to design for positive activities. Throughout the course, we observed how students approached challenges in the design process. In addition, we analyzed the final design concepts regarding which strategies and design mechanisms students used to support positive activities. In the following, we describe details of the methodological approach taken. In the results section, we present our analysis of the final design concepts. We then discuss the main insights from this analysis regarding implications for the design (for wellbeing) research community as well as for stakeholders from design practice.

3. Method

The case study was carried out as part of the 'Design for Interaction' course at TU Delft teaching the Vision in Product Design method (Hekkert & Van Dijk, 2011) to students. The course was chosen because the Vision in Product Design method, like design for positive activities, aims to create a longer-lasting positive impact. It also puts a strong emphasis on the quality of the interaction which we consider crucial in the context of wellbeing interventions.

Fourteen design students (7 female, 7 male) participated in the two-month course (10 sessions of 4 hours). At the start of the course, positive activities were introduced as a design domain through a) a 45-minutes talk and b) a self-guided literature study (Pohlmeyer, 2014; Pohlmeyer, 2017; Wiese et al., 2020).

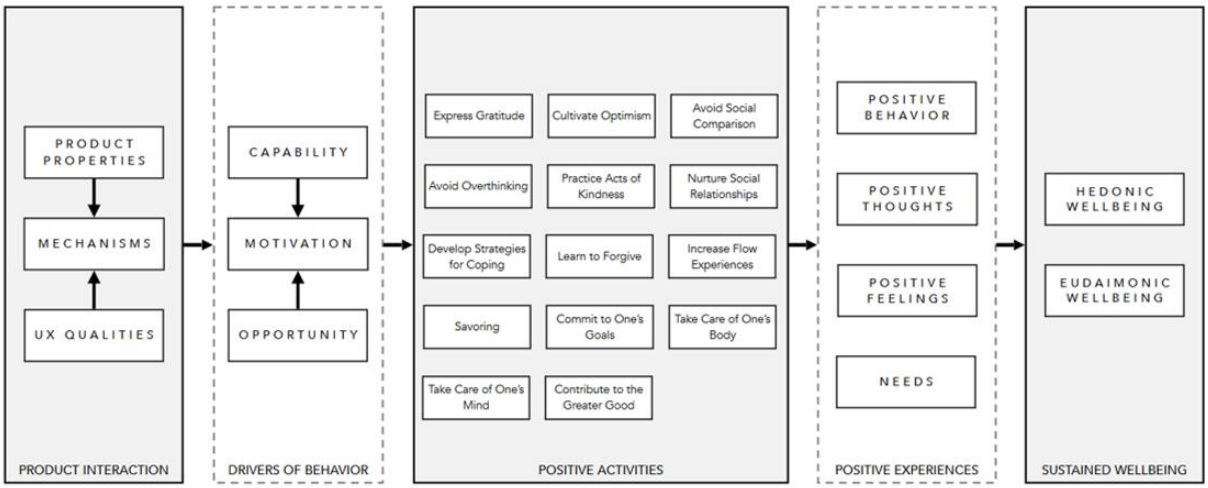

Figure 1 The Design for Sustained Wellbeing framework (adapted from Wiese et al., 2020)

The Design for Sustained Wellbeing framework (Figure 1, see Wiese et al., 2020) served as a theoretical basis for the course. The framework describes a multi-stage process through which digital technology can promote positive activities and ultimately sustained wellbeing. It specifies a set of fourteen positive activities (stage 3) that can be targeted by design and a taxonomy of sixteen design mechanisms (stage 1) to support them. This taxonomy comprises common behavior change techniques such as feedback, prompts, and social support (Michie et al., 2011; 2013). Design mechanisms represent specific strategies to stimulate psychological drivers of behavior (stage 2) that can promote positive activities. On an interface level, they are realized through combinations of product properties (i.e., tangible aspects of a technology) and UX qualities (i.e., people's subjective experience of the interaction). Technologies can support positive activities in multiple ways, e.g., by inspiring (e.g., personalized content), triggering (e.g., context-dependent, well-timed cues), motivating (e.g., feedback on task performance) or facilitating (e.g., clear guidance) engagement in these activities (see Pohlmeyer, 2017). For a full list of design mechanisms, positive activities, and technology examples see Wiese et al. (2020).

Students were briefed to redesign existing consumer technology to support one of seven self-selected positive activities specified in the framework (see also Lyubomirsky, 2008): 1) practice gratitude, 2) cultivate optimism, 3) avoid overthinking, 4) avoid social comparison, 5) practice acts of kindness, 6) nurture social relationships, and 7) commit to one's goals. For each activity, a brief definition, technology examples, and references to academic papers were provided. In addition, students received a detailed taxonomy of design mechanisms. Students were given the freedom to utilize these design mechanisms in their projects and were also encouraged to explore additional design mechanisms they found suitable.

The design process was based on the Vision in Product Design method (Hekkert & Van Dijk, 2011). This method was thought to guide design students step-by-step towards developing a personal perspective (i.e., a new frame) on the domain of positive activities by considering both scientific and popular knowledge. Only after students have clearly articulated a) the

effect they aimed to achieve, i.e., which specific aspect of the activity they intend to foster, and b) the interaction qualities they wish to promote, i.e., how the intervention is supposed to be experienced by the user, they started thinking about specific technologies into which the activity could be integrated. At the end of the course, students submitted and presented their final design concept.

To address the research question, the first author (LW) analyzed the final fourteen design concepts. The analysis focused on a) how the concepts integrated the positive activity, b) which design mechanisms were employed to support the activity, and c) how these design mechanisms were implemented. LW created a codebook from the framework's taxonomy, incorporating any additional mechanisms applied by the students (see Wiese et al., 2024). LW then analyzed all design concepts using this codebook. The resulting classification was reviewed and discussed with the second author (AP). Any disagreements in coding were resolved through discussion. In addition, the course organizers (LW, PH) reflected on any observations they made throughout the course.

4. Results

4.1 Strategies for integration

All fourteen design concepts incorporated positive activities as Active Design solutions, with different levels of disruption to existing user flows. Table 1 provides an overview of the final design concepts (for more details, see Wiese et al., 2024). We recognized three distinct strategies that students used to integrate positive activities into consumer technology:

- **Addition (4 out 14 concepts):** Active designs that add a self-contained feature that addresses the positive activity but does not change the core function or user experience of the technology otherwise. Additions can be interpreted as small, dedicated solutions disseminated within a consumer technology that follows a different overall purpose. Prompts for charity donations (D12) during one's daily commute are an example of such additive integrations.
- **Enrichment (6 out of 14 concepts):** Active designs that aim to rebuild the way an online activity is carried out or experienced. This can comprise positive activities that are already supported by a technology, e.g., donations or related activities that can be enhanced to (also) foster wellbeing, e.g., an interface that fosters kind communication. An example from our study is sharing one's LinkedIn account with others to create career opportunities for them (D3).**Transformation (4 out of 14 concepts):** Active Designs that aim at transforming known or suspected negative usage patterns into "less damaging" or even positive ones. Some students used this integration strategy to foster optimism (D5-D7) and mitigate unfavorable social comparison (D11).

Table 1 Overview of the design concepts including the supported positive activity, the (re)designed feature, the product category of the selected technology, and the chosen integration strategy.

Design ID	Positive Activity	Feature Description	Product Category	Integration Strategy
D1	Practice Gratitude	An extra tab on a petitions page displaying supporters' reasons for backing the petition with a voice message and a photo.	Productivity	Enrichment
D2	Practice Gratitude	An add-on to a task management tool reminding users to express gratitude after the completion of certain tasks.	Productivity	Addition
D3	Practice Gratitude	The ability to contribute to others by temporarily sharing one's business network account to provide business opportunities to them.	Business	Enrichment
D4	Practice Gratitude	A module on the checkout page of an online shop that emphasizes the frequently overlooked convenience benefits of online shopping.	Shopping	Addition
D5	Cultivate Optimism	A visual feedback system reflecting the emotional impact of one's social media posts on one's followers.	Social	Transformation
D6	Cultivate Optimism	An alternative way of organizing the feed of a news website that emphasizes shared identity between users.	News	Transformation
D7	Cultivate Optimism	A pop-up notification encouraging users to reflect on their technology use and/or pursue alternative activities.	Social	Transformation
D8	Cultivate Optimism	An adaptive alarm clock inspiring users to reframe	Tools	Enrichment

		their outlook on each day in a positive way.		
D9	Avoid Overthinking	An add-on to a notetaking app encouraging users to recognize and reflect on ruminating thoughts.	Productivity	Enrichment
D10	Avoid Overthinking	Comment and search features in a video streaming platform encouraging users to explore and reflect on movies related to personally relevant topics.	Entertainment	Enrichment
D11	Avoid Social Comparison	A prompt on a social media platform triggering users to reflect about how they have been impacted by social comparisons in the past.	Social	Transformation
D12	Practice Acts of Kindness	A prompt for charity donations during daily commute checkouts.	Transportation	Addition
D13	Practice Acts of Kindness	A dynamic badge on a business network profile reflecting the user's frequency of kind actions on the platform.	Business	Enrichment
D14	Commit to One's Goals	Customizable graphic elements floating on the smartphone home and lock screen for setting and pursuing personal goals.	Productivity	Addition

4.2 Design mechanisms

Students employed a broad range of design mechanisms to support positive activities (Table 2, see Wiese et al., 2024, for a definition and analysis). Design mechanisms 1-15 were originally specified in the framework (Wiese et al., 2020). Our analysis revealed two additional mechanisms: self-reflection and self-expression. Self-reflection can be defined as reviewing and making sense of (past) experiences to provide insight and inspire future action (Baumer et al., 2014). Self-expression refers to people's ability to communicate and share personal feelings (Gonsalves et al., 2023), which can, in turn, trigger social support. The most frequently employed design mechanisms were a) prompts (13 concepts), b) self-reflection (9 concepts), and c) joy of use (6 concepts).

As specified in the framework (Figure 1), design mechanisms can activate three drivers of behavior: opportunity, capability, and motivation (see Table 3, for a definition). Table 2 shows how design mechanisms can be mapped onto drivers of behavior based on the COM-B model of behavior change by Michie et al. (2011; 2013).

Table 2 Overview of a) employed mechanisms, b) corresponding drivers of behavior, and number of concepts the mechanism was integrated in. For a definition of the mechanisms, see Wiese et al. (2024).

Design Mechanism	**Driver of Behavior**	**# Concepts**
1. Optimal Challenge	Capability	1
2. Focus Attention	Capability	2
3. Education	Capability	2
4. Goal Setting	Capability, Motivation	2
5. Action Planning	Opportunity	2
6. Social Support	Opportunity	2
7. Prompts	Opportunity	13
8. Persuasion	Motivation	2
9. Rewards	Motivation	2
10. Feedback	Motivation	5
11. Self-Monitoring	Motivation	2
12. Personal Relevance	Motivation	5
13. Modelling	Motivation, Capability	2
14. Variation	Motivation	1
15. Joy of Use	Motivation	6
16. Self-Reflection	Motivation, Capability	9
17. Self-Expression	Motivation	2

In our analysis, we coded which driver of behavior was supported by each identified design mechanism. Table 3 shows how frequently each driver of behavior was supported by the fourteen design concepts. The concepts laid a strong focus on motivating engagement in the activity (50.8%).

Table 3 Drivers of behavior (change): a) definition and b) frequency of support in design concepts.

Driver of Behavior	Definition	Frequency
Opportunity	External or context factors that enable or prompt behavior. Examples: having enough time, access, and social support.	28.6%
Motivation	Intrapersonal processes, including goals, values and deliberate decision making that stimulate or encourage the activity. Examples: relation to personal goals, belief in positive outcomes.	50.8%
Capability	A person's psychological or physical ability to perform the activity. Examples: having relevant knowledge and attention capacity.	20.6%

4.3 Design examples

In the following section, we present three design examples, one for each integration strategy (4.1). For each example, we briefly describe a) the chosen positive activity, b) the design vision, i.e., which aspect of the activity the student project focused on and how the interaction was intended to feel, c) the technology context, and d) the specific implementation, i.e., which mechanisms were applied and how they were realized on an interface level.

It is important to note that these examples were not tested with users regarding their effectiveness nor discussed with tech companies regarding their feasibility. The examples are intended to illustrate the specific ingredients students have chosen to translate positive activities into corresponding online activities.

Addition: Practice gratitude (D4)

Positive Activity. Gratitude is often conceptualized as a two-step process: To feel grateful, a person needs to a) recognize that a positive event, e.g., a gift, a benefit has occurred in one's life and b) acknowledge that someone or something, e.g., nature, a spiritual power outside of oneself has contributed to this positive event (Emmons & McCullough, 2003).

Design Vision. D4 focused on the first step of the process: fostering awareness of one's blessings. It aimed at creating a revealing "moment of realization", in which a person suddenly comprehends how blessed they are. This design goal was inspired by factors that hinder gratitude such as taking one's blessings for granted in a world of materialistic consumption (e.g., Richins & Dawson, 1992; Dunn et al., 2019). Accordingly, the design reminds people to appreciate their blessings by pointing out "how different life would be without them". Hence, the interaction was envisioned to feel eye-opening, confronting, and grounding, but at the same time not overly negative or guilt-inflicting.

Technology Context. The context of online shopping was deemed fitting as it directly relates to materialistic consumption, identified as one obstacle to gratitude. The design augments the standard online checkout by adding a 'free benefits module'. The module highlights overlooked perks when ordering online such as saving time and avoiding inconveniences (Figure 2). It thus intersperses an opportunity for reflecting on one's blessings into a moment of potentially mindless materialistic consumption.

Design Mechanisms. The concept applies the following mechanisms:

Prompts, Self-Reflection: The unexpected nature of the 'free benefits module' is thought to capture users' attention and act as a prompt triggering reflection.

Joy of Use: The module resembles a shopping basket item list, displaying "items" and their "price tags" (none or 0€ for free benefits). Since the item list usually shows what one owes rather than what gains, this reverse logic adds a joyful element to the interaction.

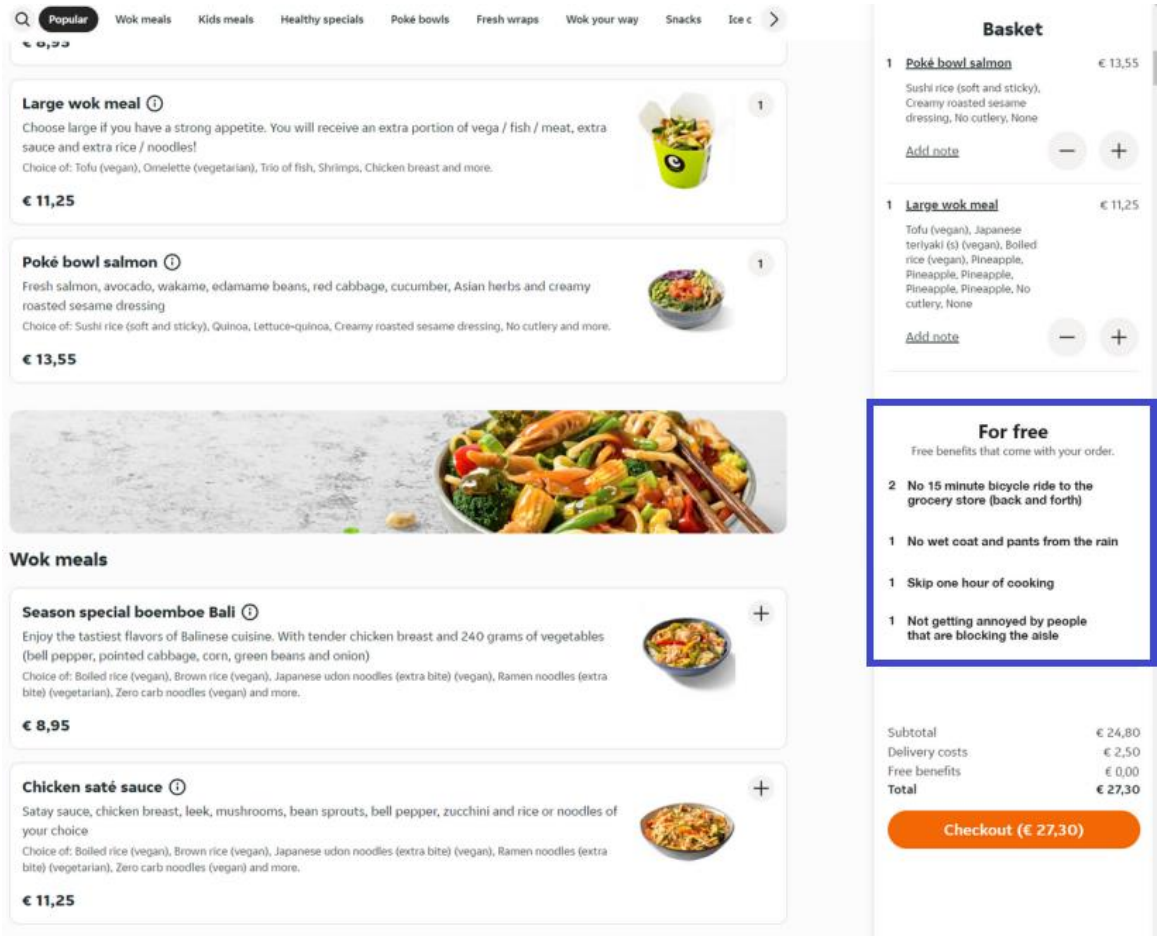

Figure 2 Screenshot of a gratitude-inspired online checkout that integrates a 'free benefits module' (highlighted in blue). Design by and image courtesy of Heleen Sinnige.

Transformation: Cultivate optimism (D6)

Positive Activity. Optimism can be a powerful antidote to crisis as it promotes healthy ways of coping with stress (e.g., Carver & Scheier, 1985). Like the practice of gratitude, cultivating

optimism aims at identifying positive aspects of a given situation which, in turn, encourages people to take action to improve their circumstances (Lyubomirsky, 2008).

Design Vision. D6 drew inspiration from the idea that individuals are more confident to tackle a problem when they feel supported by others, enabling them to work on it as a group. However, increasing societal polarization undermines this collective spirit, leading to pessimism regarding the prospects of addressing current crises. The project thus attempted to rebuild trust in a better future by fostering empathy for those holding different perspectives, thereby increasing social connection. In line with this goal, the interaction was envisioned to feel inviting, respectful, and open-minded.

Technology Context. The concept targets the Twitter (now X) newsfeed (Figure 3). This context warrants an optimism intervention because frequent exposure to disturbing news can cause significant psychological distress (APA Psychological Association, 2022). In addition, by prioritizing engaging content in their ranking algorithms, social media platforms are suspected to fuel the spread of misinformation and hate speech (e.g., Brady et al., 2017; Vosoughi et al., 2018), further deepening social and political divide. Consequently, the concept aims at transforming the Twitter news feed from a polarizing (negative) into a connecting (positive) experience by emphasizing what unites people (here: their taste in music) rather than what divides them (here: their political opinion).

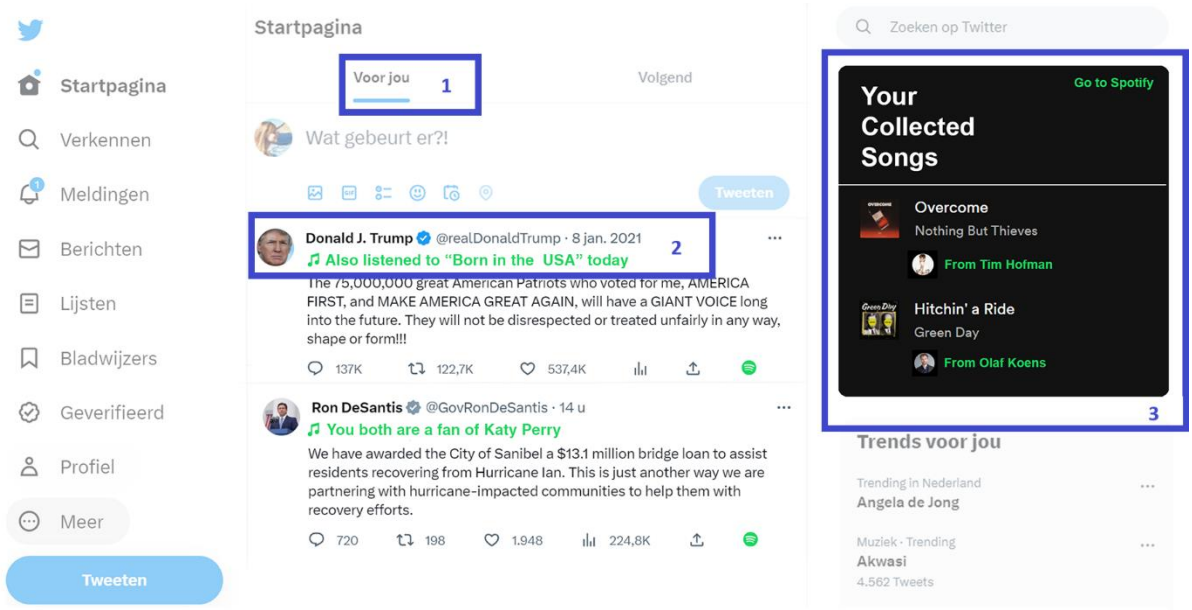

Figure 3 Screenshot of a Twitter newsfeed optimized for cultivating optimism by adapting the ranking algorithm. Design by and image courtesy of Iris de Lange.

Design Mechanisms. The concept builds on the following mechanisms:

Personal Relevance: In a personalized 'For You' tab (1), the redesigned news feed ranking is determined by similarities in users' music taste.

Prompts: Below the user's Twitter name, a prominent label (2) indicating similarities in music taste is displayed, e.g., 'also listened to' or 'you are both a fan of'.

Joy of Use: Users can collect songs (3) related to a tweet by clicking on the Spotify logo (bottom right) and add them to their Spotify playlist ('Your Collected Songs'). This lighthearted activity of creating a music playlist adds an amusing element to the interaction.

Enrichment: Avoid overthinking (D10)

Positive Activity. Overthinking involves passive, repetitive dwelling on one's problems rather than taking proactive steps to solve them. To combat overthinking, a person can apply several strategies including distraction, mindful acceptance, confiding in others, solving the underlying problem, and identifying triggers for one's overthinking (e.g., Lyubomirsky, 2008; Nolen-Hoeksema et al., 2008).

Design Vision. D10 drew from these strategies to reduce overthinking. Specifically, it aimed to help individuals to become more self-aware about the maladaptive nature of their ruminating thoughts by assisting them to recognize similar patterns in other people's life experiences. In addition, the project sought to promote healthy ways of coping by encouraging self-acceptance and seeking support from others. The designer thus wanted the interaction to feel personal, empathy-inducing, inspirational, and thought-provoking.

Technology Context. He decided to turn passive entertainment on Netflix into an opportunity for active introspection, coping, and personal development (Figure 4).

Design Mechanisms: The concept involves the following mechanisms:

Personal Relevance: In addition to conventional genre-based browsing, e.g., action, romance, thriller, the main menu guides users to discover movies related to their specific mental health concerns, e.g., loss, anxiety, perfectionism (Figure 4, left), allowing them to explore these topics through the eyes of movie characters.

Social Support: This personal 'My Space' (Figure 4, center) also contains a 'Community' tab (Figure 4, top right) in which users can explore the watch history and 'mental health reviews' from trusted others. These reviews mimic the layout of standard movie reviews but contain personal reflections about how the movie helped others cope with their mental health and possibly related personal movie recommendations.

Prompts, Self-Reflection: By prompting users to write 'reviews' (Figure 4, bottom right), the interface triggers active processing and reflection of the content. To respect their privacy, users can either watch a movie privately or share their watch history and 'mental health review' with the community.

Modelling, Self-Expression: The mental health reviews can model healthy cognitive reappraisals (Morris & Picard, 2012; Schueller et al., 2013) or function as encouraging peer testimonials that foster motivation to address one's own problems (Layous, Nelson, & Lyubomirsky, 2013).

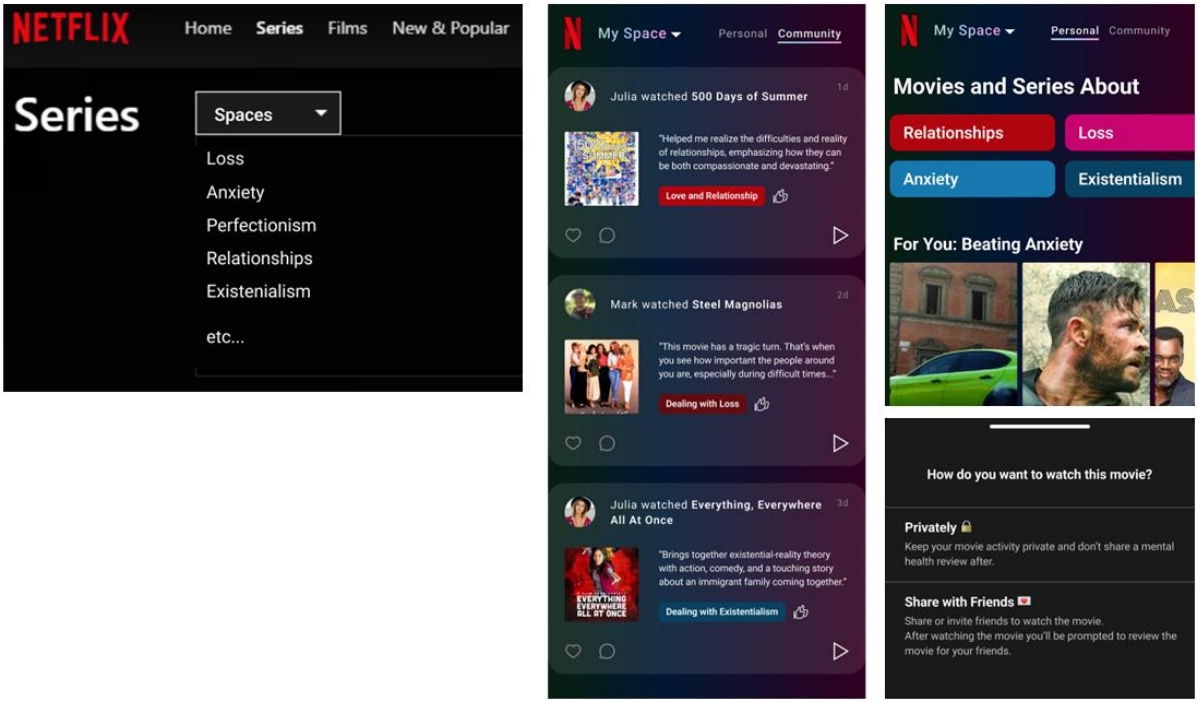

Figure 4 Screenshots of Netflix optimized for reducing overthinking. Design by and image courtesy of François Prévot.

5. Discussion

Our case study demonstrates that, when properly methodologically guided and fueled with relevant theoretical knowledge, designers are perfectly capable of integrating positive activities into consumer technology by way of Active Designs. It further shows that there are various integration strategies and concrete mechanisms to do so. In the following, we discuss concrete implications of our findings for the design (for wellbeing) research community as well as for stakeholders from design practice.

5.1 Integration strategies as design guidelines

The main goal of the case study was to understand how positive activities can be incorporated into everyday technology. We discovered three strategies for integration (4.1), that can serve as guidelines for designers working on the implementation of positive activities as Active Designs. In the following, we discuss advantages, disadvantages, and recommendations for each integration opportunity.

Addition: Additions can be used to connect a positive activity to an unrelated online activity (e.g., prompts for donations during one's daily commute). However, since additions are limited to small-scale interventions, it is crucial to select (few) highly effective design mechanisms. Adding a self-contained feature may represent low-hanging fruit, as this approach carries relatively low risk: small additive features are non-disruptive, cost-effective, and can be rolled back with little effort.

Enrichment: Enrichment is a promising strategy when features of digital technologies already support positive or related online activities. To identify promising starting points, designers can analyze the context in which their technologies are embedded and the specific online activities they support. For example, technologies that support social interactions (e.g., messaging services, team collaboration, social networking platforms, customer support) could be enriched based on principles to optimally nurture social relationships or foster kind communication. **Transformation:** Transformational designs pose the potential to scaffold new (positive) ways of using or experiencing a technology. Transformation is a sensible approach in cases when negative effects are known or suspected to arise from technologies. Knowledge on positive activities can, for instance, directly inform design interventions to combat negative social comparisons or reduce cyberbullying by fostering kind interactions. Features like 'reflect before sharing' on Instagram, nudging users to have healthier conversations online (e.g., Bryant, 2019), indicate a business need for that.

These strategies highlight various opportunities for actively incorporating positive activities into consumer technology. It is important to note that distinct features within a platform may be suitable for different positive activities and corresponding integration strategies.

For instance, in the context of social networking sites, addressing offensive comments may involve strategies to foster kindness, while direct messaging could be enhanced through strategies to nurture social relationships. Identifying potential starting points for integrating positive activities should, therefore, be approached at a feature level, aligning with the definition of Active Designs.

Active Designs presented here can resemble 'small, dedicated solutions' similar to BITs. Both active and dedicated approaches to designing for positive activities have their own strengths and challenges. While Active Designs may lead to smaller increases in wellbeing, they can on the other hand reach large user groups and may initiate behavior change more easily since they are distributed 'along the way' to highly engaged users of the core technology, e.g., an email client or video streaming platform. By promoting positive states, Active Design for positive activities complements digital wellbeing approaches that aim to prevent or reduce harmful user behavior. Active Design can also inform the design of consumer technologies that do not create harm in the first place (i.e., addition, enrichment) and explores options to transform negative experiences into positive ones (i.e., transformation).

5.2 Combining design mechanisms with and for behavior change principles

The study also aimed to discern which design mechanisms designers choose to support positive activities, and how they implement them. The design concepts employed a broad variety of design mechanisms, demonstrating that despite the seemingly limited scope of Active Designs, consumer technology can promote positive behaviors in multiple ways. The taxonomy of design mechanisms introduced in the framework (Wiese et al., 2020) proved to be useful in supporting the design process, affirming the application of the framework. This suggests that common behavior change techniques can support positive activities within consumer technology. While designers of BITs may be familiar with these techniques, UX

designers working on consumer technology may not be as familiar. Therefore, introducing the taxonomy as a (digital) design tool to UX designers may be beneficial. To further increase the applicability of the framework in design practice, knowledge on positive activities can be translated into targeted design strategies for each positive activity.

5.3 Implications for the design process

We anticipated three major challenges when integrating positive activities into existing consumer technology. Designers need to a) acquire knowledge on positive activities, b) identify a fitting technology context, and c) select well-suited design mechanisms to support positive activities.

Based on our observations, students derived a good understanding of the wellbeing literature and perceived positive activities as an interesting design target. Each positive activity led to a variety of design goals, integration strategies, supporting mechanisms and could be incorporated into different technology contexts. Most design concepts addressed emotional and motivational aspects of the behavior change process that are often underrepresented in BITs (e.g., Conroy et al., 2014; Yang et al., 2015; Diefenbach, 2018). In our view, this was likely promoted by encouraging students to explicitly specify the intended effect and quality of the interaction prior to the implementation (Hekkert & Van Dijk, 2011). Future design tools or methods to support the design for positive activities could build on these findings by emphasizing this aspect. Our findings illustrate that thoughtful Interaction Design can target the support of positive activities (see also Ludden et al., 2015; Pohlmeyer, 2017).

The biggest challenge students faced in the design process was to find a matching technology to implement their design vision, i.e., mapping positive activities to possible technology contexts. Future work could systematically map out opportunities to incorporate positive activities into major technology branches such as communication, entertainment, and social networking platforms. The mapping could consider the context of use (e.g., seeking entertainment for relaxation), supported online activities (e.g., communication, time-management), or negative effects associated with a specific technology or feature (e.g., cyberbullying, misinformation).

Lastly, we would like to point out that design scenarios in industry settings may differ from our study set-up. In our study, students initially selected a positive activity to design for and next identified a suitable technology context to embed it into. However, in most industry settings, these steps are reversed. Practicing designers usually work on a given technology, e.g., an ecommerce platform, and would need to identify positive activities that fit into this context of use. Challenges encountered in this scenario could be different from those experienced by students in our course. We can imagine that starting from a deep understanding of a given technology could even facilitate the selection of suitable positive activities.

6. Limitations & future work

Due to the exploratory nature of the study, insights are based on only a small sample of examples and are mostly illustrative in nature. Nevertheless, in our view, even this limited selection of examples shows the broad applicability and potential of the approach. Given the time-intensive nature of the design process (literature study, design method), future work could focus on developing actionable design tools that break down research-based knowledge on positive activities into manageable chunks and develop (activity-specific) design guidelines.

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