Chapter 14
How Design Can (Not) Support Human Flourishing

Anna E. Pohlmeyer

Abstract What role does the design of products, services, and the built environment have on people's psychological well-being? This chapter introduces the emerging field of Positive Design, which studies the mechanisms and manifestations of design that stimulates human flourishing. After a brief account of research on Positive Psychology Interventions, this chapter examines the possibilities and limitations of design for well-being. It is argued that especially the enablement of pleasurable and meaningful experiences and activities in daily life is a promising approach. Four Positive Design examples related to *taking notice* and *savouring* are provided in order to illustrate new forms of Positive Psychology Interventions. These examples range from designs whose explicit core function is the promotion of well-being to common, everyday products that foster determinants of well-being as an additional effect. A number of challenges that Positive Psychology Interventions in practice currently face and the potential benefits of Positive Design are considered. In particular, this chapter discusses the strengths of Positive Design in terms of reach, adherence, and person-context-activity-fit.

Abbreviations

BIT Behavioural intervention technologies
PPI Positive psychology interventions

Introduction

In his book '*Flourish*', Martin Seligman (2011) expressed an ambitious goal for the field of positive psychology: by the year 2051, 51% of the world's population should be flourishing. With this aim in mind, new questions for the field have naturally

A.E. Pohlmeyer (✉)
Department of Industrial Design, Delft University of Technology,
Landbergstraat 15, 2628 CE Delft, The Netherlands
e-mail: A.E.Pohlmeyer@tudelft.nl

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arisen: How can the knowledge gained in positive psychology be shared with people from all walks of life, worldwide? How can empirical evidence on what makes people happy be translated into effective real-world applications? It is clear that a genuine pursuit of Seligman's goal ought to be collaborative and multi-disciplinary in character. Fortunately, concrete efforts of this nature have already begun: new insights have escaped the physical and communicative constraints of labs and scientific publications and found their way into classrooms, board meetings, coaching sessions, public policy agendas, as well as web-based and mobile applications (Bolier and Abello 2014; Calvo and Peters 2014; Linley and Joseph 2004). To support human flourishing worldwide, every means available should be applied. Notwithstanding promising initiatives, including examples of eHealth, reach and adherence of existing solutions remain limited (e.g., Christensen et al. 2006, 2009; Mohr et al. 2013; Ludden et al. 2015). This chapter introduces a new subfield of positive psychology that holds the potential to substantively contribute to Seligman's vision: *positive design*.

Positive design investigates how designs[1] can stimulate human flourishing (Desmet and Pohlmeyer 2013; Pohlmeyer 2012). Research questions include '*What influence does the designed environment have on people's well-being?*' or '*How should products, services, and systems be designed to maximise their potential to foster well-being?*' and '*In what ways can design support positive changes in behaviour?*' Shaping and testing new applications of positive psychology findings within everyday situations is pivotal to these questions; translating lab interventions into daily interactions means that the impact of positive psychology will reach more people in a wider variety of situations. Furthermore, context-sensitive designs can support a good fit with a person's lifestyle, which will make it easier to initiate and sustain the practice of happiness-enhancing activities (Lyubomirsky 2007). Paul Dolan (2014) concisely defined happiness as '*experiences of pleasure and purpose over time*' (p. 3), which closely relates to the core understanding of positive design: to mediate, create, and support meaningful and pleasurable experiences (over time). In addition to designing for pleasure in the present, the positive design framework by Desmet and Pohlmeyer (2013) proposes that in order to foster a feeling of purpose, design can also encourage people to live in accordance with their personal values, and commit to ideally self-concordant goals (Sheldon and Elliot 1999) which supports a life of personal significance. In addition to satisfying subjective desires, positive design also takes a moral stance, by specifically stimulating human virtues (Pohlmeyer and Desmet 2017), and thereby taking the impact one has on the world into account. In sum, positive design is a possibility-driven approach that deliberately stimulates human flourishing through design.

After a brief introduction to research on positive psychology interventions, this chapter examines the possibilities and limitations of how design can support human well-being. Four positive design examples are provided which will illustrate possi-

[1] The term 'design' is used here in a broad sense: it encompasses all forms of tangible and intangible artifacts (e.g., products, services, (digital) systems, visual communications, built environment) that have been created by designers for people.

ble directions of application. Finally, a number of challenges that positive psychology interventions in practice currently face and the potential benefits of positive design are considered.

Is It Actually Possible to Become Happier? And if So, How?

Is it possible to get happy? Or get happier? Some scepticism about the potential to increase one's level of happiness has arisen in light of twin studies (Lykken and Tellegen 1996) that revealed that happiness is, at least to a certain extent, genetically determined. Furthermore, other researchers have suggested that despite increases (and decreases) in happiness levels in the short term, people will eventually return to a baseline level of happiness in the long run (Brickman and Campbell 1971). According to this line of thinking, any attempt to somehow permanently change one's happiness level is doomed to fail, or the equivalent of running on a kind of 'hedonic treadmill' (Brickman and Campbell 1971) that goes nowhere despite great effort and the apparent movement of the treadmill itself.

Fortunately, positive psychology researchers have exciting and encouraging news: it is, after all, possible to become lastingly happier (Diener et al. 2006; Boehm and Lyubomirsky 2009; Seligman et al. 2005). While acknowledging a genetic set range as a determinant of happiness, as well as the challenge of adaptation processes, it has been shown that happiness can be lastingly increased through positive intentional activities (Lyubomirsky et al. 2005). We are neither destined to remain unhappy—should we happen to be rather pessimistic, grumpy, or insecure—nor is happiness only found in the realisation of 'ideal circumstances'. Instead, happiness is a *process* that one can influence with one's daily actions.

Rather than merely assessing our potential for change, a wealth of knowledge and evidence-based strategies dealing with *how* to increase well-being has emerged in the form of positive psychology interventions (PPIs) (Lyubomirsky 2007; Bolier et al. 2013; Seligman et al. 2005; Sin and Lyubomirsky 2009). PPIs have been defined as 'treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions' (Sin and Lyubomirsky 2009, p. 468), which, in turn, enhance people's happiness. Some prominent interventions that have been shown to be effective are gratitude letters (Lyubomirsky et al. 2011; Seligman et al. 2005), counting one's blessings (Emmons and McCullough 2003; Lyubomirsky et al. 2005), savouring life's joys (Bryant and Veroff 2007; Quoidbach et al. 2010), practicing random acts of kindness (Lyubomirsky et al. 2005), and using one's strengths in a new way (Seligman et al. 2005). Also, overall, two meta-analyses including 51 (Sin and Lyubomirsky 2009) and 39 (Bolier et al. 2013) randomised controlled intervention studies, respectively, have shown that PPIs can increase well-being and reduce depressive symptoms.

Such interventions open up a promising avenue toward practically empowering people to help themselves (and one another) to flourish, which is at the heart of Positive Psychology (Seligman 2011). Building on the success of evidence-based

strategies, 'the next stage of research requires implementing these strategies in ways to support their use in real-world contexts' (Schueller and Parks 2014, p. 145). As one possible approach, this chapter proposes that design can intentionally support PPIs. For this, it is important to differentiate between the static material value of design on the one hand, and the variable experiential value it provides on the other.

Limitations and Opportunities of Design for Happiness

Unfortunately, people seem to hold dear many myths about where to find happiness that are not necessarily in line with scientific evidence (Lyubomirsky 2013). An overemphasis on enhancing external status, becoming rich, or generally living in affluence in a consumption-driven society, are examples of modern happiness delusions. This focus on material value implies that design can have only a limited impact on people's long-lasting happiness. After detailing two central reservations regarding design for well-being, different ways in which design *can* support well-being after all will be described.

Several studies have documented a relative well-being effect created by experiences and activities versus material goods and changes in circumstances, respectively (Lyubomirsky et al. 2005; Nicolao et al. 2009; Carter and Gilovich 2014; Patterson and Biswas-Diener 2012). For instance, Lyubomirsky et al. (2005) showed that only a small portion of inter-individual differences in happiness can be explained by our demographic and material circumstances (e.g., marriage, income, age, and culture), whereas a substantial influence on well-being can be obtained through performing positive intentional activities such as nurturing relationships, cultivating optimism, and taking care of one's body (Lyubomirsky 2007). One reason that accounts for the relatively low impact of circumstantial changes is the phenomenon of *hedonic adaptation* (Frederick and Loewenstein 1999; Lyubomirsky 2011). No matter how much a bride is overwhelmed with positive emotions on her wedding day or how exciting it is to finally own a car, people eventually get used to these changes, and the initial (positive) affective responses decrease, potentially to a point where one takes the change for granted. Hedonic adaptation processes have been observed in relation to all kinds of changes, including winning the lottery (Brickman et al. 1978), getting a pay raise (Di Tella et al. 2010), getting married (Lucas et al. 2003), and changing jobs (Boswell et al. 2005). The upside of adaptation is that we also adjust to negative changes like accidents, rejections, and losses, and that adaptation followed by rising aspirations is a key driver of personal growth and development (Lyubomirsky 2011). However, adaptation to positive changes poses a serious challenge to increasing overall happiness levels. Although the level and intensity of positive emotions appears to flatten after all kinds of changes, it has been found to happen particularly fast after changes in material circumstances and possessions, in contrast to after changes in activities and experiences (Patterson and Biswas-Diener 2012). The sustainable happiness model (Lyubomirsky et al. 2005) consequently advises investing in positive intentional activities, and how life is lived, rather than in attempts to change circumstances.

In a similar vein, research has shown that when experiential purchases are compared to material ones, the former engender greater well-being effects in participants, who also feel that the money spent on experiences was more wisely invested (van Boven 2005). These findings led to the so-called 'experience recommendation': if you want to increase your happiness level, invest in experiences rather than material possessions (Nicolao et al. 2009). There are many reasons for the superiority of experiences over material objects (see Carter and Gilovich 2014, for an overview). For instance, people are less likely to directly compare different kinds of experiences (e.g., a seeing a concert, travelling, eating out) than they are to compare material objects (e.g., cars, televisions, couches), because our experiences are unique to each of us. Another reason why experiences have a stronger link to people's subjective well-being is associated with the meaning they have for one's self-image. If I were to describe myself, I would try to give an impression of my character, how I typically behave, and perhaps also how I dealt with a critical situation. This information would give you (and myself) a much better picture of who I am than an inventory list of my possessions would. A third reason why the impact of experiences is relatively profound in terms of happiness, is that their performance usually involves other people and is thus usually social in nature. Research has shown time and again that social connections and relatedness are essential for human beings to flourish (Seligman 2011; Huppert and So 2013).

The findings above underscore the value of using positive activities as a way to lastingly increase one's well-being. At the same time, one might be sceptical about whether design and consumer products can lead to sustainable increases in happiness at all. I would, however, like to argue that designed artefacts do have the potential to markedly support people's efforts to increase and maintain their happiness levels. Importantly, I do so without trying to nullify the above recommendations—on the contrary, I will argue in support of them: Design for well-being can play a pivotal role in facilitating activities and enabling experiences.

On August 7th, 1974, Philippe Petit fulfilled a dream he had cherished for many years. On that day, he dared to do something illegal, unprecedented, and truly beautiful: he walked (and danced) for nearly an hour on a wire that he and his companions had affixed between the Twin Towers of New York's World Trade Center, fully aware that he could be arrested (see James Harsh's 2008 documentary '*Man on Wire*'). Now, while his balancing act certainly required remarkable physical agility and the courageous mind of an enthusiast, the experience would not have been possible without one key element: that very ordinary wire. The physical properties of the wire and the rigging made the whole spectacle possible. Hence, the *design enabled an experience* that was singularly pleasurable and meaningful to its user. While walking on a tightrope between two skyscrapers is obviously an extreme example, there are countless everyday activities and experiences that are facilitated or even made possible in the first place by design. Think about telecommunication technologies that bring friends and families closer together, or consider sporting equipment like bicycles, skis, and sailboats, or social network platforms that connect people who did not know each other beforehand.

Positive design is a matter of perspective. Should an object derive its value from its material worth or from what it enables us to do? In a laboratory study, a wire

would undoubtedly not have scored particularly high on a well-being scale. Yet the experience of walking in the sky meant the world to Philippe Petit. The potential of design to enable experiences has been largely neglected in the studies above: the strict dichotomy between experiences and material goods observed was effective in uncovering general differences in relative well-being effects, but overlooked the potential 'means to an end'—happiness, that even mundane design can present. Recently, Guevarra and Howell (2015), as well as the work we have been doing in our own lab, has found that 'experience enablers', such as sporting equipment and musical instruments, turn out to have rather similar effects on need fulfilment and well-being as experiences do. Both have a greater impact on people's happiness than 'purely' material acquisitions. These findings highlight that design can be far richer and more meaningful than the simple appreciation of its material properties, and that it can, in fact contribute to happiness, if designed and perceived as an experience enabler, that is with a clear emphasis on its intangible rather than its material value.

In addition to enabling experiences, there are at least two further ways that designs might serve as resources for well-being: (1) as *symbolic* representations of someone or something meaningful, for example a wedding ring, and (2) as *support* for desirable behaviours, for example planners and feedback loops (Pohlmeyer 2012). As to the former, we all have something we consider precious, not because it has resale value, but because it means something to us personally. It might be irreplaceable like a stuffed toy that has been at your side since you learned how to walk, it might be the brooch inherited from a deceased grandma, or it might be a Buddha statue that represents deeply felt spiritual beliefs. All of these objects illustrate examples of meaning attached to an object (Csikszentmihalyi and Rochberg-Halton 1981; Fournier and Richins 1991; Casais et al. 2015). Such physical representations remind us of what, or who, is important to us. Yang (2015) ascertained that sentimental value can decelerate hedonic adaptation to objects, and that while feature-related utility wears off over time, sentimental value does not.

Finally, design can also *support* positive endeavours, without directly enabling experiences. Famously, Benjamin Franklin used a 'virtue table' to track his weekly progress toward a consistently virtuous life. The table itself did not enable specific experiences or behaviour, yet it is said to have supported his commitment to the goal. A more widely used, recent example of this kind of perspective is activity trackers, which monitor physical activity via wearable or portable sensors and tracking software. It is, however, important to note that design is not merely a matter of technology, but of a user-centred, context-sensitive orchestration of interactions. In addition to providing users with relevant information and feedback in a timely fashion, design can prompt the initiation of a favourable, for example happiness-enhancing, behaviour, help users plan and make decisions (e.g., by suggesting choice alternatives), commit to goals, and recover from relapses.

In sum, there are multiple ways that design can stimulate well-being. As shown, the most promising impact on well-being can be expected if designs are used as facilitators of experiences and activities, and not as sources of well-being itself (Pohlmeyer 2012; see Kasser 2002 for an overview of the negative relationship between materialism and well-being). By mediating and creating pleasurable and meaningful experiences that enhance happiness, design stimulates PPIs in practice.

Two main possibility-driven approaches in this regard can be differentiated, that Calvo and Peters (2014) have called 'active' and 'dedicated', respectively.

- *Active*: the (re)design of interactions that are part of existing devices or services. In addition to its core function, determinants of well-being are actively stimulated by the design, for example, an alarm clock designed in such a way that the wake up sound is a personal message by one's grandchildren as a sign of relatedness.
- *Dedicated*: a design whose core function is the promotion of well-being, for example, *Tiny Task* (Ruitenberg and Desmet 2012): colourful key chain tokens suggest small, original, and fun experiences to engage in, each of which relates directly to one of the 12 happiness-enhancing strategies suggested by Lyubomirsky (2007).

Both approaches have their strong points, and should be pursued with equal vigour. While dedicated designs might show a greater increase in well-being, active designs might be used more frequently, and by a greater audience, and thus have a greater reach.

In the following, a selection of design examples[2] will be used to illustrate challenges relative to PPIs in practice, and the benefits that positive design might provide.

Four Design Examples: Taking Notice and Savouring

A considerable amount of theoretical and empirical work has been published on the benefits of taking notice, savouring, and gratitude, for example, 'counting one's blessings' (Bryant and Veroff 2007; Emmons and McCullough 2003; Seligman et al. 2005). Consequently, diary-like journals and digital apps are recommended as they offer users the chance to turn reflecting on positive events into a daily ritual. However, despite their low threshold of engagement, not everyone is fond of putting thoughts into words, and some might find it difficult to establish such rituals.

Memoriam Tea, designed by Max Tak, subtly transforms the existing practice of making and drinking a cup of tea into a ritual opportunity to reflect upon a positive achievement or quality. Specifically, Memoriam Tea takes advantage of the brief, everyday moment while the tea is steeping to stimulate positive thinking. The typical interaction of tea brewing was redesigned in such a way that teabags are wound around a wooden stick; once unwound, the stick is placed across the cup, and serves as a tea bag holder. A half-completed sentence is engraved on the stick that invites the user to reflect on achievements and positive events while the tea is releasing its aroma (see Fig. 14.1). Sentence examples include '*three good things that happened today…*', '*I feel proud of…*', *and* '*…are skills that I have*'. Although Memoriam Tea is similar to classic PPIs, it actually exemplifies an 'active' design for well-being,

[2]The four examples are design concepts developed under my supervision by students taking the course called 'Exploring Interactions', as part of TU Delft's 'Design for Interaction' Master's degree program.

Fig. 14.1 Memoriam Tea (reprinted with permission)

where the main function is still the tea bag, but the re-design has added a well-being component. This was a conscious choice made during the design process, in order to reach people who might be hesitant to acquire products that are dedicated to boosting happiness, but might be open to a cup of tea.

An example of a 'dedicated' design for well-being is the smartphone application *Huddle*, designed by Frank Stemerding. Interestingly, despite being a dedicated design, Huddle also has the potential to reach an audience beyond 'happiness seekers' (Bergsma 2008; Parks et al. 2012), because it has been tailored to suit the personal interests of a target demographic: amateur sport teams. While such teams might bond strongly on the field, this feeling can abruptly end once members leave the clubhouse. After losing a match, players might tend to perceive everything as negative, although there might have been several high points during the game. A

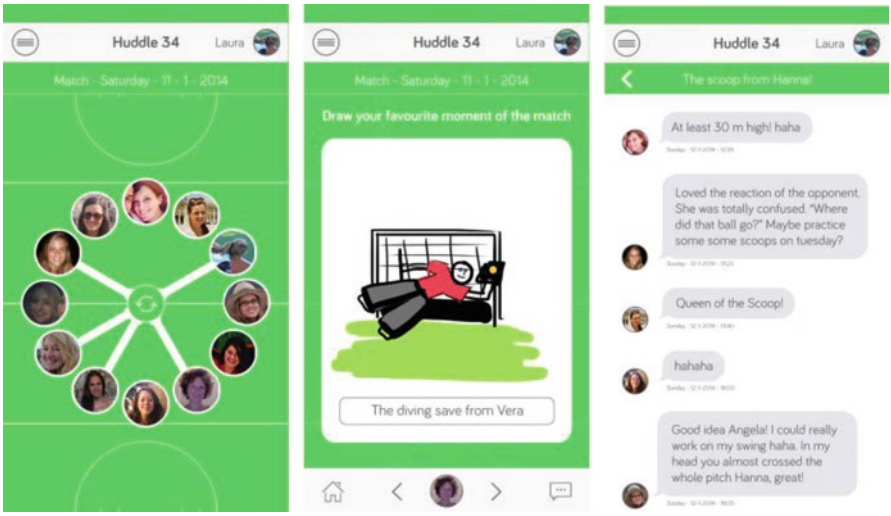

Fig. 14.2 Huddle (reprinted with permission)

huddle is the circular formation of a team to agree on a joint strategy and to motivate each other. The Huddle app (see Fig. 14.2) adopts this metaphor by inviting players to savour the things that went well during a session, and prolong the feeling of connectedness. The principle is quite simple: after a training session or a match, an administrator posts a question or assignment, for example '*Draw your favourite moment of the match*', *or* '*Give a team member a compliment*'. Teammates join the huddle by posting a reply. Importantly, users can only see (and comment on) others' responses if they have also contributed. It is thus a voluntary task driven by curiosity rather than obligation. After all, the task suggested should not be perceived as an inconvenient chore. This app supports the attendance to, reliving, sharing and thereby the prolongation of positive moments. In other words, it is an application dedicated to savouring, which has been shown to increase well-being and counteract hedonic adaptation (Bryant and Veroff 2007; Lyubomirsky 2011).

When you walk your typical route back home after a long day at work, do you still take notice of the small details in your surroundings? *Explordinary*, designed by Julia Mattaar, is a Smartphone application that allures people into (again) becoming aware of their immediate environment, by giving theme-related photo assignments to users on their way home. A theme could be, for example: '*Find something green*' (see Fig. 14.3). The user's focus is drawn to features in the surrounding area that he or she might normally not notice. After taking and posting a picture with a smartphone, users can then see pictures that others took on the same route, related to the same theme. This sharpens the eye even more to look around attentively. After a fixed number of completed assignments, users can order a selection of their favourite pictures as postcards. Familiar surroundings are instantly transformed into pieces of amateur artwork that can be collected or shared with others. Surprisingly, exploring the ordinary can turn it into something extraordinary.

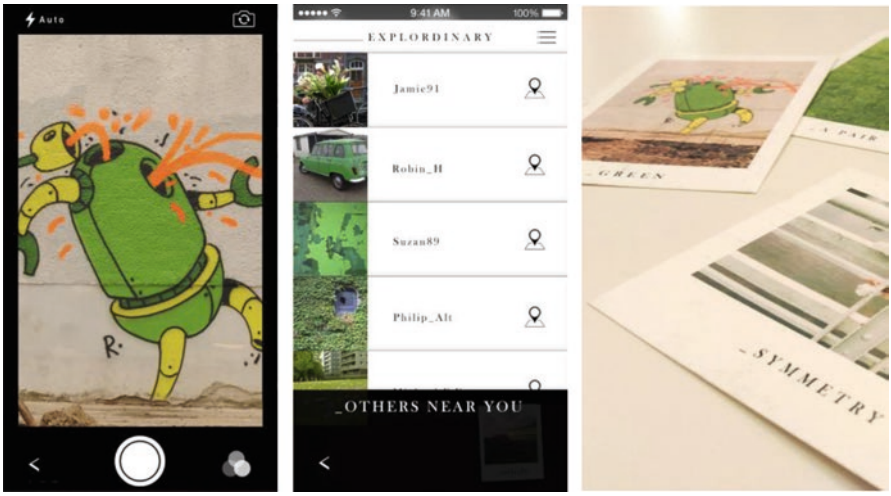

Fig. 14.3 Explordinary (reprinted with permission)

Oftentimes, design seeks to optimise (personal) processes by increasing efficiency. However, one effective savouring technique explicitly focuses on being in the present moment (Quoidbach et al. 2010; 'absorption' in Bryant and Veroff 2007), which can be a challenge at times, considering the hectic pace many people have chosen to maintain. *TeaShell*, designed by Lisa van de Merwe, is a counterexample of design that strives for maximum efficiency: due to the shape and absence of a handle (as shown in Fig. 14.4), TeaShell is a mug that must be held with both hands to ensure balance. It is also rather inconvenient to use while standing or walking, as both hands are fixed in the centre. Moreover, when holding the mug, the hands appear to be cherishing something precious. These features invite the user to focus on the moment of drinking tea, and physically hinder multi-tasking, for example making a phone call. The goal of this project was to stimulate a moment of mindfulness and absorption in the present. Ultimately, this is achieved by kindly forcing users to pay attention to the warm beverage in front of them—and nothing else. Imagine the impact positive psychology will have if more everyday items were designed with well-being-relevant principles in mind.

Challenges of Positive Psychology Interventions and Added Value of Design

Ultimately, the aim to gain a better understanding of what constitutes psychological well-being is not an end in itself, but the sound, scientific foundation to help as many individuals and communities as possible to thrive (Seligman 2011). To achieve this goal, positive psychologists stress the potential to extend knowledge applicable

Fig. 14.4 TeaShell (reprinted with permission)

in the context of *self-help* to also include populations who might otherwise not receive care, that is, expanding a therapist-centred care model to encompass self-administration and prevention (Mohr et al. 2013; Schueller et al. 2013; Schueller and Parks 2014). Yet the reach of, motivation for, and adherence to PPIs remains limited. In the following sections, these challenges will be considered, alongside the overall importance of achieving a good fit with personal preferences and lifestyles. Opportunities that positive design can create will be explored.

Reach

For the effectiveness of PPIs to truly unfold, they have to actually weave themselves into people's lives. So in order for them to have any impact at all, they have to be both useful…and actually *used*. While their utility has been demonstrated in numerous studies (Bolier et al. 2013; Sin and Lyubomirsky 2009), the resulting knowledge and tools have yet to reach people as a minimum prerequisite. Of course, if these interventions do find their way into the everyday, another hurdle is to elicit users' willingness to adopt and adhere to these new practices.

Original and engaging PPIs, made available outside the context of professional guidance, can enlarge the number and diversity of people that can be reached. One prevalent means of self-administered training is the self-help book. Many renowned scientists have published their work in books intended for the general public, in addition to the academic articles which safeguard the scientific basis of their recommendations (e.g., Lyubomirsky 2007, 2013; Seligman 2011). Unfortunately, hard evidence supporting the effectiveness of reading growth-oriented psychology books is still lacking (Bergsma 2008). A first step in this direction is the study by Parks and Szanto (2013) that documents the effectiveness of reading a positive psychology-based book (i.e., Lyubomirsky 2007) to improve depressive symptoms and slightly improve life satisfaction in a sample of college freshmen. Still, more work is needed in this respect. Some of the benefits offered by so-called 'bibliotherapy' are its affordability (compared to guided therapy), its fairly low threshold of engagement (including a greater degree of privacy), and the fact that it is far more accessible to the general public than scientific journals. Yet, it appears that despite this potential, the genre attracts only a limited audience. For instance, the readership of the monthly '*Psychology Magazine*', presumably representative of this segment of the population, is predominantly female and well-educated (see Bergsma 2008).

A second promising means of disseminating (knowledge of) PPIs exists in the domains of positive technology (Riva et al. 2012) and positive computing (Calvo and Peters 2014; Sander 2011). Behavioural intervention technologies (BITs) are an emerging field to support people's physical, social, and mental health by administering evidence-based interventions through technologies, such as smart mobile devices, the web (including social media), virtual reality, and sensors (Mohr et al. 2013). An example of an online PPI, that is BIT, is the iPhone application *Live Happy,* developed by Signal Patterns and Sonja Lyubomirsky. The app is based on Lyubomirsky's book '*The How of Happiness*' (2007), and includes exercises for a variety of positive activities, for example, it suggests capturing a moment with the phone's camera to savour it and establish a savouring album. In theory, BITs have enormously compelling potential in terms of reach, accessibility, and integration into everyday life. Moreover, Bolier and Abello's (2014) review of randomised controlled studies of online PPIs demonstrated that these can also enhance subjective psychological well-being and reduce depressive symptoms in the short and long term. Given the omnipresence of technology in many societies, BITs seem to have the remarkable capacity to increase well-being in a scalable, sustainable, and cost-effective way (Bolier and Abello 2014; Sander 2011; Schueller et al. 2013).

In practice, however, there remains a discrepancy between the encouraging potential of BITs on the one hand, and on the other, not only their real-world reach, but also the adoption of and adherence to what they propose (Mohr et al. 2013). Similar to self-help books, many online solutions are sought by only a distinct user group—for instance, some studies have reported audiences of predominantly higher-educated women (see Ludden et al. 2015 for an overview). Moreover, despite widespread availability, not everyone has access to the necessary technologies, is able to use them, for example due to a lack of technology literacy, or feels comfortable using technology for the purpose of a PPI, for example due to privacy concerns

(Mohr et al. 2013). Hence, in some cases, BITs might even introduce barriers. Although internet access around the world is spreading by the minute, and especially digital natives can be expected to embrace and integrate the digital into all areas of life, it is still worth considering additional channels of dissemination and application of PPIs in practice.

As explained, although ordinary books and technology may be highly promising vectors for PPIs, they typically appeal to specific user groups, for example 'readers', or those with access to and expertise with technology. Moreover, initial data suggests that people who actively seek ways to work on their happiness might also not be 'representative for all mankind', but can rather be assigned to one of two clusters: 'distressed', that is people with heightened depressive symptoms, and 'non-distressed', that is people who are neither remarkably happy, nor show signs of clinical depression (Parks et al. 2012). One solution for greater reach is certainly a combination of different approaches, for example education, coaching, and technologies. Positive design holds the promise of being a key contributor in this equation, as it can offer additional means of interactions that might speak to, and get through to, more people than regular books and BITs do. The Huddle app, for example, does not specifically target happiness-seekers, but rather amateur sport teams. Yet it supports the positive activity of savouring. Furthermore, design has already entered most households and public places worldwide through ordinary commodities (available to millions of people) including solutions for mobility, health care, and telecommunication. Imagine what might happen if concomitant practices and products (e.g., how we interact with others in traffic or stay in touch with loved ones far away) were (re)designed in such a way that they not only make our lives easier and faster, but actually create opportunities for us to flourish. As demonstrated by TeaShell, products as simple as a teacup can be redesigned with well-being principles in mind. If more designs deliberately took well-being effects into account by emphasising positive emotion regulation (Pohlmeyer 2014), eliciting a combination of pleasure, personal significance, and virtue (Desmet and Pohlmeyer 2013), or addressing psychological needs like competence, relatedness, and autonomy (Ryan and Deci 2000) as suggested by Hassenzahl et al. (2013), more and more people could be reached in the real world and, importantly, also in a preventative manner (see Jimenez et al. 2015 for an overview of different design approaches).

Happiness-seekers tend to engage in multiple positive activities at one time (Parks et al. 2012), which may be more effective than engaging in only one activity (Sin and Lyubomirsky 2009). Yet, much happiness-related research focuses on studying the effectiveness of a single intervention at a time (Bolier et al. 2013). Fortunately, happiness-enhancing activities mediated through design can be introduced in a multitude of ways, on a variety of occasions, as well as in specific combination. This can reach more people and increase variety, which can in turn reduce hedonic adaptation (Lyubomirsky 2011) and thereby ideally also lead to an activity being maintained.

Adherence to New Behaviours, and Maintaining Them

Despite the (temporarily) rosy outlook that positive activities may foster, no one said that to act accordingly, moreover, in a self-guided manner was going to be easy—sustained individual effort and commitment are essential to an intervention's effectiveness in stimulating human flourishing (Lyubomirsky et al. 2011; Sin and Lyubomirsky 2009). Unfortunately, several studies of (online) PPIs have seen low compliance and high dropout rates (Christensen et al. 2006, 2009; Farvolden et al. 2005; Ludden et al. 2015; Kelders et al. 2012). For instance, Farvolden et al. (2005) observed an alarmingly high attrition rate while testing a freely available, web-based programme for panic disorder and agoraphobia: only 1% of over 1100 registered users completed the full 12-week program. Preventative programmes that focus on the promotion of well-being do not have the outward urgency that treatment-oriented programmes do. Uptake and adherence is thus expected to be a challenge of comparable relevance also in PPIs for prevention. A recurring theme that may be partially responsible for the observed high attrition rates is low motivation and engagement (Mohr et al. 2013; Morris and Picard 2014; Schueller and Parks 2014). While motivation can be expected to be high when starting a new activity, it is at risk of decline over time. The challenge is thus to sustain user motivation for longer periods.

It comes as no surprise that dropout rates from open access sites are distinctly higher than dropout rates from randomised controlled trials (Christensen et al. 2009). One limitation of findings based on experimental research that should therefore be taken into consideration is the imperfect resemblance of motivational factors in real-world and scientific settings: without the dedication and potential incentive that participating in a research study entails, people might not be sufficiently committed in everyday life.

When the aim is to sustain health benefits and feelings of happiness, reduced long-term engagement underscores a real need for interdisciplinary collaboration when designing for behaviour change: engineers can, for instance, write valuable algorithms for data collection and feedback, or build mobile and/or web-based platforms, for example, for social sharing. Yet, a considerate design is still needed to keep users motivated, engaged, committed, and interested. For this, designers build on findings from the behavioural and social sciences with regards to motivation, volition, and habit formation. They translate these into design strategies, and manifest solutions in their final form and context.

Increasingly, researchers in the field realise that meticulous attention needs to be paid to the design of PPIs and BITs (e.g., Bolier and Abello 2014; Mohr et al. 2013; Morris and Picard 2014; Schueller et al. 2013). How a system is designed will affect how (and whether) it is understood, accepted, and used by people. Established design principles of interface design, user experience design (ISO 2010), and persuasive technologies (Fogg 2003), are valuable starting points to make PPIs and BITs easy to use and engaging, which can positively affect adherence (Kelders et al. 2012). At the same time, a profound comprehension of user context and the

identification of design principles that foster behavioural change for well-being (Jimenez et al. 2015) is needed to conceptualise (novel) interactions that are relevant, appropriate, and effective for people in their everyday lives.

Fogg (2003) proposes that three elements are needed at the same time for behaviour to occur: a trigger, motivation, and ability. If a person is not motivated at all, he or she will not act. Likewise, if the person lacks the necessary skills, despite possibly being motivated, the behaviour will also not manifest. Finally, an external or internal trigger elicits a behaviour, for example the smell of a freshly baked cake draws me to the kitchen for a snack. All three elements can be supported through design. Design can actively support execution and skill building (*ability* and self-efficacy beliefs), it can add incentives, for example through optimal challenges, social collaboration or competition, and personal relevance, as well as lower the threshold of engagement (*motivation*), and it can be the *trigger* itself, give sensibly-timed cues, or be integrated to existing practices that in turn serve as triggers.

In contrast to a 'one size fits all' solution, Ludden et al. (2015) propose personalisation, the use of metaphors, and ambient information as valuable design strategies, and emphasise positive affect elicited by the designed solution to increase adherence. Desmet and Pohlmeyer (2013) also discuss the potential of pleasure-evoking design, not only as a direct approach to increasing happiness, but also as an instrument of motivation to stimulate well-being effects in the long-term. Simply put, design can make positive activities fun and personally relevant so that they feel less like a chore. The effort of initiating an activity is thereby perceived as less strenuous. If, as a consequence, a user is more engaged with a positive activity over a longer period of time, delayed well-being effects can come about. Short-term pleasure and the ease of the individual exercises is one of the crucial mechanisms of Tiny Task to reach long-term well-being (Ruitenberg and Desmet 2012).

Maintaining an activity through positive affect can also be achieved by linking the activity to something rewarding. While Huddle and Memoriam Tea celebrate the good, that is personal achievements, Explordinary celebrates the everyday. The primary motivation to engage with Explordinary is not necessarily to become more attentive, but to have fun, meet the challenges of a photographer, and take pride in the details one discovers and shares. Furthermore, linking a positive activity to an existing practice, or embedding it within that practice as in Memoriam Tea and TeaShell, can sustain positive activities, since the practice itself already occurs 'naturally'.

Although adherence is particularly crucial for medical programmes with a progressing syllabus, PPIs do not automatically have to be full programmes that run over the course of several weeks. Small, positive activities can also effectively increase well-being (Lyubomirsky and Layous 2013). People prefer to engage in multiple activities in parallel, rather than sticking to one single intervention (Parks et al. 2012), and this preference can be supported by multiple small activities mediated through everyday design. Lyubomirsky and Layous (2013) suggest that positive activities increase happiness to the extent that they stimulate positive thoughts, feelings, behaviour, and psychological need satisfaction. There are compelling examples of how designed artefacts can create meaningful experiences of even

mundane practices by stimulating psychological needs, such as autonomy, competence, and relatedness (Hassenzahl et al. 2013). Do you feel connected when watching TV; do you feel autonomous when using public transport; do you feel competent when cleaning your room? If the answer is no, the future might have exciting prospects for you.

Person-Context-Activity-Fit

It is important to note that not all positive activities are an optimal fit for everyone. Fortunately, there are numerous activities to choose from—the point is to engage in the ones that suit you best. A good fit takes personal strengths, weaknesses, goals, needs, and lifestyle into account (Lyubomirsky 2007). The greatest happiness impact can be expected from activities that feel natural, are enjoyable, and are related to self-concordant goals and beliefs (Lyubomirsky 2007; Sheldon and Elliot 1999). Furthermore, different features of the activity, for example variety, dosage, and of the person, for example self-efficacy beliefs (whether one believes that one is able to do the activity), as well as the interaction between these all impact the resultant well-being effects (Lyubomirsky and Layous 2013).

The implementation of PPIs in the real world thus necessitates a careful understanding of the context itself, the individuals pursuing the activity, and their lifestyles, in order to determine how an intervention can be tailored accordingly. Mapping a user's context and understanding their underlying needs and values is a strength of a user-centred design approach (e.g., Sleeswijk Visser et al. 2005). Activities can be selected and/or optimised for specific contexts and user groups. For instance, reminders might only be sent when the situation allows, for example not during an opera visit. However, the opposite is also possible: a context can be tailored to and integrate positive activities, as shown with TeaShell. In addition, activities can be made more enjoyable, and abstract recommendations can be translated into concrete interactions, which lower the threshold of initiation.

Furthermore, design can provide an appropriate (possibly physical) medium for interventions. In laboratory experiments, interventions are mainly communicated via instructions. For instance, participants of an intervention group might be asked to count blessings (vs. hassles) for a couple of weeks (Emmons and McCullough 2003; Lyubomirsky et al. 2005). One way to disseminate results is simply to report their effectiveness, for example on websites or in self-help books, and to invite people to do the same. Information and instructions are, however, not necessarily sufficient, and might therefore not be the best options.

In line with this, Shawn Archor (2010) pointed out a crucial paradox of human behaviour: 'common sense is not common action' (p. 146). So even if we all agree that it would be better for our happiness if we, for instance, learn to forgive, it is easier said than done. Similarly, a 2012 survey (Kaplan 2012) with over 2000 participants illustrated a 'gratitude gap', which illustrated the difference between the perceived value of experiencing gratitude on the one hand, and demonstrating

gratitude on the other: while 90% considered themselves to be grateful people, only 52% of female and 44% of male respondents outwardly expressed gratitude on a regular basis. Hence, despite strong beliefs about the benefit and value of positive activities, self-guided behaviour change does not necessarily come easily. Positive design proposes supplemental interactions as means to communicate and facilitate positive activities. It can trigger, recommend, enable, enhance as well as represent relevant experiences and moves beyond the cognitive and verbal to the tangible, multi-sensory, and interactive.

Tiny Task (Ruitenberg and Desmet 2012) is a good illustration of added value through tangibility. The key chain tokens not only provide instructions; they are also reminders of the experience that one has committed to, that is every time one uses the key, he/she is reminded to plan or do the assignment right away. This also extends to the social realm—friends might ask what the token is about. And once a task is completed, the token serves as a piece of memorabilia for the user to reminisce over, or as a prompt to share the story with others. Even more, the token itself (and thereby the task) can be passed on during a social encounter. Hence, giving a positive activity a tangible representation stimulates adherence as well as a snowball-effect of dissemination.

By materialising the findings of positive psychology, explicit well-being intentions might even become obsolete. For instance, as shown in the examples above, amateur sports players might simply enjoy reflecting on a match in a playful way with their peers, without necessarily having decided to 'work on their happiness'. Likewise, instead of reading about the advantages of counting one's blessings, of being absorbed in the moment, of taking notice, design solutions serve as prompts that encourage the behaviour in situ. Positive design provides opportunities to engage in pleasurable and meaningful experiences, both explicitly *and* implicitly.

When implementing PPIs in real-world contexts, positive design can easily and effectively make use of the fact that design is already part of today's real-world context. It would be a missed opportunity (and a shirked responsibility) if designed products, services, systems, and environments that surround us were not refocused using the lens of well-being.

Conclusion

Positive psychologists have developed a wealth of evidence-based interventions and strategies that boost hopes that perhaps Seligman's (2011) vision that the majority of people are flourishing can come true. In addition to parallel approaches, the ways design can support this goal range from reducing sources of discomfort and ill-being to crafting digital and physical solutions that intentionally promote well-being.

Design can optimise the design of existing BITs and PPIs. Additionally, it can introduce (and facilitate) new, 'dedicated' design interventions, or embed well-being

principles into products and services used as part of everyday practices that have a different core functionality, that is 'active design'.

As a result, PPIs can become increasingly and seamlessly integrated into our lives. People would be able to opt for well-being solutions everywhere—in the privacy of their homes, at work, online, in exchange with others, and even in public spaces. Such reach, creating new means with which to act and interact, as well as offering a sensitive fit to the respective context, all demonstrate the clear benefits of positive design for PPIs in practice. Ideally, more people will be reached, on more occasions, and in such a way that positive activities will be sustained.

Design has been, to date, underestimated as a resource to implement the invaluable insights provided by positive psychology research. The impact such design solutions would have on people's well-being far surpasses the negligible effect of their potential material value; the true impact results from the effects it achieves by stimulating experiences of pleasure and meaning. This kind of design is positive design.

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