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Designing for well-being: A case study of keeping small secrets

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ABSTRACT

To a good part, well-being depends on individual engagement in beneficial activities. The present paper draws attention to the potential of encouraging and shaping well-being-enhancing activities through interaction with everyday objects and technology. Our case study started from the activity of keeping 'small' secrets as a way to experience autonomy and privacy. We situated this activity in an office and 'materialized' it through a digital picture frame, holding a secret picture. Inspired by seven interviewees' detailed descriptions of interacting with secrets, we designed an especially secretive interaction to consume the picture and compared it to a more technical interaction. In a first empirical exploration, using video prototypes (N = 276), the secretive interaction was rated as more positive and providing more intense feelings of privacy and autonomy. This hints at the potential of objects and the careful design of interaction with this objects to intensify the positive experiences gained from mundane activities.

Introduction

Happiness and well-being crucially depend on the activities we engage in. About 40% of variance in chronic happiness scores can be explained by activity, i.e. 'the wide variety of things people do and think in their daily lives' (Lyubomirsky, Sheldon, & Schkade, 2005, p. 118). As well-being is a multifaceted construct, activities can impact well-being through increasing positive emotions, behaviors, thoughts, and fulfilling important psychological needs (Layous & Lyubomirsky, 2012). Given this, a critical question is how to involve and keep people engaged in well-being-enhancing activities. A popular approach in positive psychology is devising special well-being-enhancing activities, trainings and interventions (e.g. Seligman, Steen, Park, & Peterson, 2005). In contrast, this study investigates the impact of objects and mundane, everyday activities as creators and mediators of well-being. Many of our activities are profoundly shaped by objects. For example, morning rituals depend on the coffeemaker used, or intimate communication on the apps installed on smartphones. Therefore, product design enables deliberately encouraging and shaping people's activities, and, in turn provides a chance for enhancing their well-being.

The object-mediated nature of activity is at the heart of Human-Computer Interaction and Interaction Design (HCI/ID). Activity is understood as inseparable from materiality (Dourish, 2001). Humans are 'acting with technology' (Kaptelinin & Nardi, 2006), and each activity is inevitably shaped by the opportunities and limitations imposed by the designed objects (Dunne, 2005, p. 69). In other words, objects can create and mediate positive and meaningful experiences and those experiences become explicit objectives of design (e.g. 'experience-driven design' (Hekkert, Mostert, & Stompff, 2003), 'experience-centered design' (Wright & McCarthy, 2010; Wright, Wallace, & McCarthy, 2008), 'experience design' (Hassenzahl, 2010; Hassenzahl et al., 2013). While psychological research on well-being started from the need to better understand and improve well-being and then identified activity as a viable means, HCI/ID started from the need to design object-mediated activities and only later identified positive and meaningful experience and ultimately well-being as a viable design objective (Calvo & Peters, 2014; Desmet & Pohlmeyer, 2013; Hassenzahl et al., 2013).

Of course, there are efforts within positive psychology to exploit the power of objects (i.e. technology, interactive devices), such as behavioral intervention technologies (Schueller, 2014); see Parks (2014) for an overview. However, computer-based multimedia stress management and resilience trainings (Rose, 2014), for example, use technology foremost as an alternative way of delivering and distributing content, but it essentially remains a training. In

contrast, *JuicyMo*, a centrifugal juicer, which aims at intensifying the positivity and meaning derived from the mundane activity of juicing (Grosse-Hering, Mason, Aliakseyeu, Bakker, & Desmet, 2013), is an HCI/ID example of how the power of an object can be used to shape an activity and the consequent experience. Overall, the opportunities of technology with respect to well-being seem twofold: On the one hand, carefully designed objects can establish novel, well-being-enhancing everyday activities, thereby increasing the likelihood of experiencing positive and meaningful moments throughout the day. On the other hand, objects and interactions can be carefully designed to intensify the experiential outcome gained from existing activities (such as juicing).

The present paper explores the latter. We focus on the interaction with an object and explore the possibility of deliberately designing the interaction to intensify the experience. Specifically, we present an empirical case study of 'keeping secrets' as a way to support autonomy needs in daily life.

Design praxis: from well-being and needs to activities, contexts, objects, and interaction

Designing for well-being by shaping activities through objects is a multilayered endeavor. It involves choosing an activity, a context for the activity to take place, and an object, which plays a central role in the activity and acts as a mediator or 'carrier'. Having clarified these aspect, detailed interaction design addresses the questions of how to access the functionality provided by the object. The present research focuses on the final step, that is, the particular interaction. Specifically, we suggest that the interaction needs to *fit* the intended activity and experience.

An interaction can be described with some basic attributes, such as *slow/fast or gentle/powerful* (Diefenbach, Lenz, & Hassenzahl, 2013). In the present design case, we first conducted an interview study to reveal interaction attributes, which particularly fit the intended experience. These insights then inspired the interaction design. In the following, we first describe the chosen activity, its context, and the involved object. We then discuss the interaction design in more detail.

Activity, context, and object: keeping and consuming secret digital pictures in an office

Activity
We start from the idea of creating well-being through the activity of keeping and consuming 'small' secrets. Keeping secrets, that is, the intentional concealment of personal information from others, is a ubiquitous social

phenomenon (Frijns, Finkenauer, Vermulst, & Engels, 2005; Kelly, 2002). Most psychological research refers to serious secrets, such as extramarital affairs or suicides in families, and the negative consequences of secrecy (e.g. Afifi & Caughlin, 2006; Richards & Sillars, 2012; Vangelisti, 1994). However, less serious, 'small' secrets may have beneficial effects. As Frijns et al. (2005, p. 138) argued: 'Because secrecy, by nature, separates those who know from those who do not know, it may promote independence and autonomy.' Autonomy, in turn, is a crucial psychological need, essential to well-being (Ryan & Deci, 2001). Thus we considered experiences of mundane secrecy (e.g. sneaking out for contemplation, taking breaks from work, secretly indulging in soap operas) as a potential source for everyday well-being. The purpose of 'small' secrets is not to conceal the extremely delicate, but to create a moment just for oneself, a brief retreat from the rest of the world. Besides autonomy, small secrets may thus promote additional facets of privacy (Pedersen, 1997, 1999), such as contemplation (self-discovery, feeling free to express oneself) and rejuvenation (moments of reflection for oneself).

Context
After choosing an activity ('keeping a secret' to fulfill autonomy needs), we looked for a context to situate the activity and decided for an office setting. Autonomy and privacy in the office are recurrent themes, especially in open plan offices (Kim & de Dear, 2013). Office environments further offer limited opportunities to surround oneself with private objects in the sense of personalization.

Figure 1. A picture frame holding a secret (source: Hassenzahl, 2010).

Table 1. Secrecy-related interaction attributes, related associations, and examples.

Interaction attributes	Associations, given reasons	Examples, sample statements
Slow, gentle, continuously	Something valuable, to be handled with respect and care	Grabbing the last ice cream from the fridge and then eating it privately in one's room: 'Behind the closed door, I slowly opened the package. An extra boost of anticipation. I ate with much pleasure and all the time of the world' (P4)
		Using a special salad bowl brought from Turkey, hiding it from the flat mates: 'I always place some other dishes in front, like a barrier. In fact, I feel a little guilty about wanting to keep it for myself …. But I also really appreciate it and handle it very gently.' (P1)
Direct, physical contact/ tangibility	Full attention and complete appreciation for the object of secrecy; connectedness to thoughts or memories	Opening secret memory box: 'It already starts with opening that box, lifting the lid, touching it. It makes me feel in direct contact with all that memories' (P1)
		Writing a secret diary: 'The diary is like a secret room … the moment the pen touches the paper, thoughts enter directly into that room.' (P3)
Focused, targeted	Importance, value for the secret keeper (external perspective: natural, incidental)	Flipping a sheet of paper as if it was some irrelevant work-related document and *not* a secret planning list for holidays
		A tension between outward appearance and inner state, e.g., 'When someone enters the room I try to act natural, seemingly fully relaxed. But in fact it is the opposite. Of course my full attention is on covering that list and making it disappear between the other documents lying on my desk.' (P3)
Covered, concealed, invisible	Easily concealable, no cues or visible tracks for others	Eating spoons full of chocolate spread and then covering the tracks of indulgence: 'Directly from the glass – totally forbidden – nobody must see me … after that, nobody would think any spoon had ever entered that glass of Nutella.' (P4)
		Covering non-work related activities at the office: 'As soon as I hear the door is opened, I quickly click on something work-related – and not – ehm – eBay' (P1)

Object

Finally, we chose a digital picture frame as mediator of the activity. Specifically, we created the concept of a digital picture frame, which holds a secret picture, only revealed by a particular, secretive interaction (see Figure 1, see also (Hassenzahl, 2010, p. 71)).

Interaction: designing a secretive interaction with a digital picture

For the interaction design, we first explored the phenomenology of interacting with a secret and derived typical interaction attributes. We carried out semi-structured interviews with seven participants (five female, two male; age: 24–65 years) about their consumption of autonomy-supporting, 'small' secrets in daily life. A convenience sample was recruited via email and personal communication. To collect a wide variety of secrecy examples, not tied to a particular profession or workplace, we accepted participants from diverse professional backgrounds (e.g. doctor, actor, advertising, film business).

The interview sessions started with briefing the participants about our particular interest in 'small' secrets (as opposed to serious, self-threatening secrets) by short examples, such as secretly spending a lunch break in a café in another district, just to get some private time away from colleagues. In the remaining session time, participants reported about their personal 'small' secrets. The interview focused on related practices, objects and interaction, and participants' feelings about what constitutes

a 'good', 'enjoyable', secretive way of revealing, consuming and concealing a tangible secret (e.g. *How* do you open the secret chocolate box? *How* do you sneak into the kitchen to steal the last ice cream from the fridge?).

Data analysis included a clustering of general reflections about small secrets and their value in daily life by inductive category formation (Mayring, 2004) and an analysis of relevant interaction attributes. The latter built the basis for the here presented interaction design. In the raw transcripts, we first marked all descriptions of interacting with the secrets for further elaboration. We summarized synonyms and attributes with similar connotation (e.g. *gentle, tender, moderate, soft*) into categories. It showed that despite the variety of secrets presented, specific interaction attributes and related associations were frequently mentioned. As such, approaching the secret was repeatedly described as a *slow*, *gentle*, and *continuously*, a moment of anticipating the secret, before finally consuming it. *Directness* and *physical contact/tangibility* was mentioned frequently, emphasizing the keepers' full attention and complete appreciation of the object of secrecy. While from the secret keepers' perspective, the interaction should feel *focused* and *targeted*, for others, the interaction should appear *incidental* and *natural*, hopefully *not* attracting any attention. Participants further emphasized that the secret must be easily *covered* and *concealed* to guarantee that there are no cues or visible tracks left for others. Another important insight was the general difference between interaction attributes for approaching/uncovering vs. covering the secret. While the former asks

for slow interaction, allowing the secret keeper to anticipate and celebrate the secret in private, the latter is also a protection of the secret from others. Hence, covering the secret should be either fast, or slow but incidental, to be performed 'invisibly' before the eyes of others. Table 1 gives an overview of associations, examples and sample statements for the different interaction attributes related to interaction with secrets. In sum, an interaction should appear slow, gentle, direct, precise, and focused for the secret keeper, but rather incidental and inconspicuous for others.

We assume that the interactions described in the interviews subsumes the way that interaction feels 'right' in the context of small secrets. We thus used this information as a 'blueprint' for the design of an interaction to reveal, consume, and conceal the secret picture in the digital picture frame (see Figure 2(a) and (b)). Touching the visible 'public' picture reveals the underlying hidden picture at the place of the finger. By moving the finger to other parts of the picture, it is revealed further, bit by bit. As soon as one removes the finger from the display, the secret picture contracts back to the initial point of touch and disappears, like an elastic strap. This 'stroking' interaction supports the gentle revealing of the secret, further intensified by the necessity to 'touch' it. The revealing further emphasizes familiarity. In a way, the keeper of the secret picture may already 'see' the secret picture 'through' the public picture on display. Concealing is fast and instantaneous. Quickly drawing back the hand is a typical gesture, when in danger to be caught in the act.
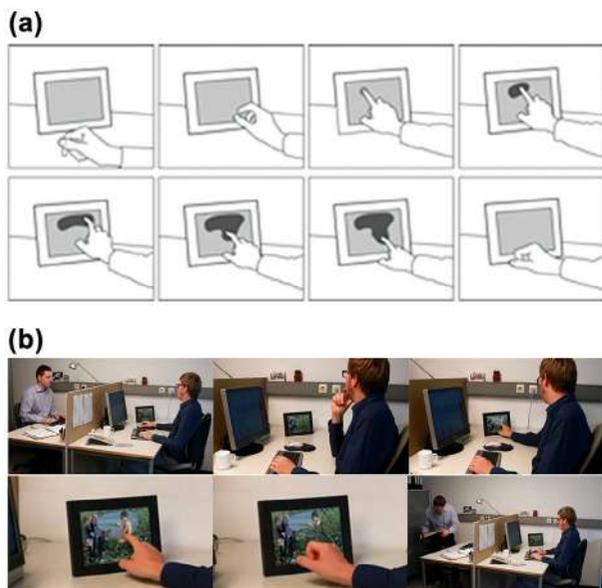

Figure 2. (a) A 'stroking' interaction to reveal the secret picture (conceptual sketch) and (b) stroking interaction to reveal the secret picture (stills from video prototype, https://vimeo.com/103701159).

Preliminary comparison of two interactions: stroking vs. remote interaction

For a first empirical exploration of different ways to interact with the picture frame and the assumed relevance for experience, we compared the 'stroking' interaction outlined above with an alternative, presumably less secretive interaction. In a second variant, the secret picture was revealed and concealed by pressing the button of a tiny remote control (see Figure 3 and https://vimeo.com/103700137). Compared to the stroking interaction, whose design was led by interaction attributes expressing secrecy, the remote interaction was deliberately designed to contradict this (e.g. stepwise rather than fluent, powerful rather than gentle, instant rather than delayed response, spatially separated rather than 'tangible').

Our preliminary comparison explored three questions: First, will participants perceive the attributes of the stroking interaction as intended by the designer (e.g. slow, delayed)? Second, will the differences between stroking and remote interaction be reflected in ratings on the level of interaction attributes? Third, will there be differences between the two interactions on the level of experience ratings? More specifically, we were interested in ratings on general positive experience and facets of privacy experience, as targeted by the design of the stroking interaction.

Method

Participants and procedure

Two-hundred and seventy-six individuals (148 female, 128 male) aged between 18 and 49 (mean age = 24 years) took part in the study. The study was conducted online with SurveyMonkey (www.surveymonkey.com). All materials were in German. A link to the study was distributed via students union representatives of various universities in Germany, Austria, and Switzerland. Ten 30€ gift vouchers were raffled as an incentive. The two alternative interactions (stroking, remote) were presented as video prototypes, featuring a scene in an office and showing the detailed interaction with the picture frame (stroking interaction: see Figure 2 and https://vimeo.com/103701159, remote interaction: see Figure 3 and https://vimeo.com/103700137). All participants were confronted with both interactions in counterbalanced order. Note, that the use of online video prototypes instead of functional prototypes has certain limitations, especially with regard to perspective (third person vs. first person) and

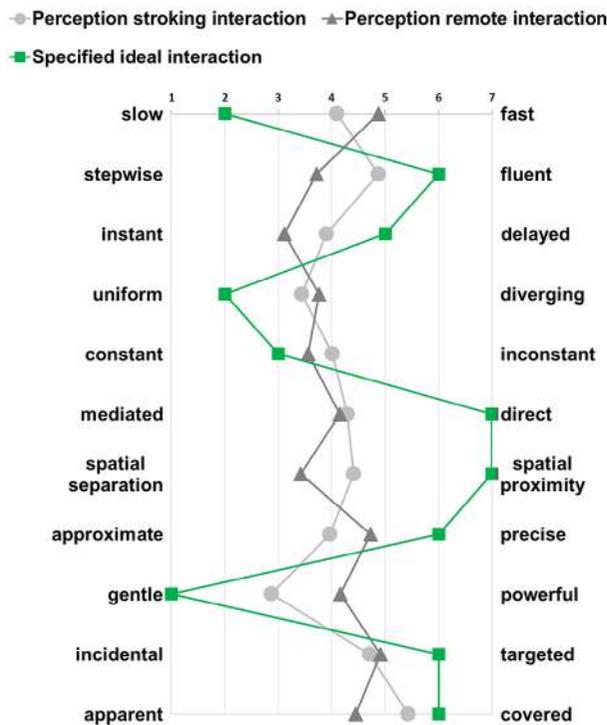**Figure 3.** Remote interaction to reveal the secret picture.

Figure 4. Participants' perceptions of the 'stroking' and the 'remote' interaction as compared to the designer's intended impression.

haptic sensations (no sensations vs. the actual experience of touch). To counteract the first, we asked participants to image themselves as vividly as possible being the main protagonist (see experimental vignette methodology, (e.g. Aguinis & Bradley, 2014). The lack of haptic sensation seems less problematic, given the fact that touch-based interaction (i.e. with tablet computers) is common nowadays. After each video, participants provided ratings on interaction and experience.

Measures

Perceived interaction attributes

We used the *Interaction Vocabulary* (Diefenbach et al., 2013) to measure *perceived interaction attributes*. It consists of 11 seven-point semantic differential items to describe interaction: slow-fast, stepwise-fluent, instant-delayed, uniform-diverging, constant-inconstant, mediated-direct, spatial separation-spatial proximity, approximate-precise, gentle-powerful, incidental-targeted, apparent-covered. Since the interaction designer (third author) used the vocabulary to specify the stroking and the remote interaction, this provided a comparison between the designer's intentions and participants' actual perceptions.

Positive experience

A single rating on a five-point scale ('positive', 1 = not at all, 5 = extremely) served as measure of positive experience.

Privacy experience

Adapted from the privacy function rating scale (Pedersen, 1997, 1999), we assessed the three privacy facets autonomy, contemplation, and rejuvenation, each one comprised of four items, on a five-point scale (1 = not at all, 5 = extremely). Sample items are 'I felt that I could''… do things that don't fit my usual role' (autonomy), ' … take refuge from the outside world' (rejuvenation), or ' … meditate and reflect' (contemplation). Scale values were computed by averaging the according item values. Cronbach's Alpha ranged from .79 (rejuvenation) to .82 (contemplation).

Findings

Interaction

Figure 4 shows the participants' perception of the 'stroking' and the 'remote' interaction as compared to the designer's intended impression. For the stroking interaction, the profile correlation between participants' ratings and designer's intended impression was positive and significant, $r(9)$ = .72, $p < .05$. The perception of the 'remote' interaction was clearly different from 'stroking', $r(9) = .18$, $p > .05$, and uncorrelated to the designer's intentions, $r(9) = -.03$, $p > .05$. This indicates that participants perceived the 'stroking' interaction the way we intended, whereas the alternative interaction (i.e. 'remote') created a substantially different impression.

Additional *t*-tests revealed significant differences between the two interactions for nine of the eleven attributes. The 'stroking' interaction was perceived as slower ($t(274) = 5.39$, $p < .001$, $d = .33$), more fluent ($t(274) = 7.67$, $p < .001$, $d = .46$), more delayed ($t(274) = 5.48$, $p < .001$, $d = .33$), more uniform ($t(274) = 2.82$, $p < .001$, $d = .17$), more inconstant ($t(274) = 4.06$, $p < .001$, $d = .24$), spatially more proximate ($t(274) = 8.39$, $p < .001$, $d = .51$), more approximate ($t(274) = 6.15$, $p < .001$, $d = .37$), more gentle ($t(274) = 12.18$, $p < .001$, $d = .73$), and more covered ($t(274) = 7.20$, $p < .001$, $d = .43$) than the 'remote' interaction; according to Bonferroni correction, only *p*-values < .004 were interpreted as significant.

Experience

A 2×2 analysis of variance with *interaction* (stroking, remote) as within-subjects factor, *order* (stroking-remote, remote-stroking) as between-subjects factor, and positive experience as the measure revealed a highly significant main effect for *interaction*, $F(1265) = 22.05$, $p < .001$, $\eta^2 = .08$. Experience ratings for the 'stroking' interaction were more positive ($M = 2.70$) than for the 'remote' interaction ($M = 2.37$). There was neither a significant main effect of *order* nor an *interaction x order* interaction.

We then analyzed participants' ratings for privacy experience in terms of autonomy, rejuvenation, and
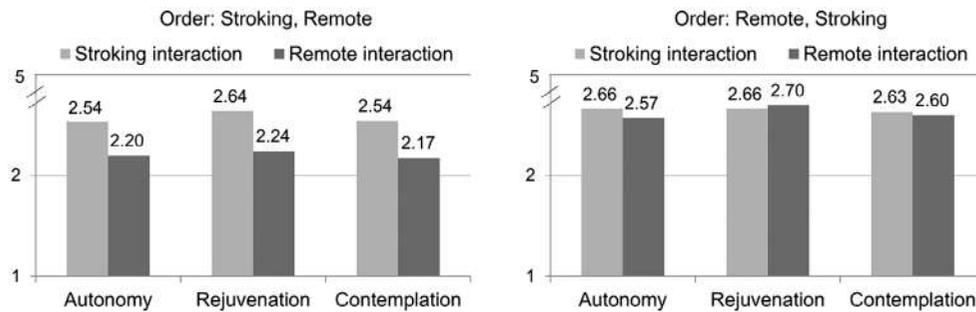
Figure 5. Mean values of privacy experience for stroking interaction and remote interaction for the two *order* conditions stroking-remote (left) and remote-stroking (right).

contemplation. A 2×3×2 analysis of variance with *interaction* (stroking, remote) and *privacy facet* (autonomy, rejuvenation, contemplation) as within-subjects factors, *order* (stroking-remote, remote-stroking) as between-subjects factor, and intensity as the measure revealed a significant main effect of *interaction*, $F(1542)=25.28, p < .001, \eta^2 = .09$. Overall, the experience of privacy was more intense for the 'stroking' interaction ($M = 4.58$) compared to the 'remote' interaction ($M = 4.42$). However, there was a significant *interaction × order* interaction, $F(1542) = 12.40, p < .001, \eta^{2=}.07$. Only if the 'stroking' interaction had been the first presented concept, and thus introduced as a standard of comparison, ratings for all three privacy facets were significantly higher for the stroking than for the remote interaction (autonomy: $t(134)=4.58, p < .001, d = .39$; rejuvenation: $t(134)=5.78, p < .001, d = .50$); contemplation: $t(134)=4.99, p < .001, d = .43$). Figure 5 shows mean values of privacy experience in the two *order* conditions. There was no main effect or interaction of *privacy facet*.

Discussion

Summary and contributions

Primarily, the present research wants to draw attention to objects as a starting point for increasing people's everyday well-being. Our study forms an example of how 'stuff' shapes activities and experiences through interaction, and offers the opportunity to deliberately design for more need fulfillment and ultimately well-being. We understand this as an extension of positive psychological interventions: Lyubomirsky and colleagues (Lyubomirsky & Layous, 2013; Lyubomirsky et al., 2005) just as others already drew attention to the general importance of 'healthy practices' and activities as well-being-enhancing interventions. Based on the philosophy of Experience design (e.g. Desmet & Pohlmeyer, 2013; Hassenzahl et al., 2013), the present research directs attention to the potential of objects as an additional opportunity to increase well-being.

Objects provide particular promising opportunities to engage people in (well-being-enhancing) activities. Through their material presence in daily life and their inherent relation to activities, objects can trigger new healthy activities or bring back activities that people already experienced as beneficial, but failed to remember and maintain in daily life. For example, we can carry a secret picture in our wallet and occasionally peek at it during the office hours. However, the wallet does not explicitly suggest this. It requires us to appropriate the wallet accordingly, to gain well-being from secret pictures. By deliberately 'inscribing' this activity into an object, just as we did with the picture frame, the activity becomes constantly available, even to people, who have not thought about it before. Hence, objects can make beneficial activities more accessible through the mere fact that they explicitly provide corresponding functionality. Furthermore, objects provide the opportunity to shape the activity itself, through designing a particular way of interaction. As our research revealed, there are more or less secrecy fitting interaction attributes, and the same may be applicable for other needs and experiences. Designing objects to deliver well-being requires not only thinking about the right functions, but also about the right interaction.

Our interview study and the comparison of the stroking interaction with a less experientially designed interaction reflected the general relevance of the way of interaction for the consequent experiences, and, in turn, illustrates the possible starting points for design. Participants' perception of the designed secretive interaction (i.e. 'stroking') corresponded to the intended interaction profile, whereas the remote interaction was uncorrelated. Moreover, the 'stroking' interaction was rated as offering the overall more positive experience. Within the positive psychology paradigm and well-being, our research highlights the potential subtleties of how artifacts create and mediate positive experiences through interaction and the responsibility of careful interaction design.

Limitations and future work

The present study has a number of limitations to be addressed in future research. Obviously, the present concept of the picture frame only underwent a preliminary empirical evaluation so far. A potentially critical point may be the use of video prototypes, because participants could see, but not actually *feel* the interaction. Especially the 'stroking' interaction builds on gestures, whose qualities may reveal itself better by hands-on experience through a functional prototype. Futures studies based on first-hand experience will certainly deliver additional insights.

More importantly, our study did not yet explore the effects of the picture frame as such. It remains the question whether its functionality and interaction will create meaningful moments of privacy and autonomy in everyday life. The present case is only a first, but yet interesting and necessary step within the gradual transformation from a concept to fully functional picture frame, which then could be submitted to longitudinal field studies.

Finally, further experimental studies should examine the suggested fit hypothesis, i.e., more need fulfillment and well-being, if the interaction has attributes in line with the activity as compared to contradicting ways of interaction.

Besides further exploration of the relationship between interaction, experience, and well-being, future research should also explore more systematic ways to transform insights from the description of activities (e.g interactions related to consuming a secret) into an actual interaction design (e.g. the 'stroking' interaction). While the interaction vocabulary supports the clarification and specification of interaction, it does not suggest how to materialize this knowledge in a particular interaction and object (e.g. a picture frame). A more systematic transformation process would certainly be helpful.

Conclusion

To conclude: The present case demonstrates the complementary nature of positive psychology and design. On the one hand, design for well-being is impossible without the psychological understanding of well-being, positive experience and activity. Our design case reflects this by applying psychological concepts and knowledge about need fulfillment, autonomy, and secrecy. On the other hand, enhancing well-being requires design to become 'situated'. To have an effect in the real world, any model and concept have to be transformed into the concrete. The present case shows just how many steps are needed to translate the abstract goal of enhancing well-being into a concrete activity, situated in a specific context and shaped by functionality (a picture frame with a secret picture for an office environment), and, even more subtly, through interaction, that feels private and secretive. Quite naturally, psychological research rarely considers the profound role 'stuff' could play in mediating activities and creating positive experience. By taking the best of both fields, the desire to make, the need to prove, and the urge to change, we hope to unlock the powers of 'stuff' to enhance happiness and well-being.

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