LONG-TERM GOALS OR IMMEDIATE DESIRES? INTRODUCING A TOOLSET FOR DESIGNING WITH SELF-CONTROL DILEMMAS

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This paper suggests that designers can frame user behaviour in terms of the conflicts between long-term goals and immediate desires (i.e., self-control dilemmas), and address these conflicts by facilitating the pursuit of long-term goals. A phenomenological study provided an understanding of self-control dilemmas and the strategies people use to deal with these dilemmas. Based on this understanding, this paper proposes a framework for analyzing self-control dilemmas and three supporting design strategies. The framework can act as an analysis tool when distinguishing between long-term goals and immediate desires, and the design strategies can facilitate generation of ideas that can address self-control dilemmas. Understanding these human principles offers novel opportunities for products, services, or policies that contribute to subjective wellbeing.

Keywords: self-control dilemma; user-centred design; design tools; user behaviour; subjective wellbeing

Introduction

Imagine your alarm clock ringing in the morning. On the one hand, you want to get out of bed to head to work, but on the other hand, you are tempted to linger in the comfort of your warm bed. You are now experiencing a self-control dilemma: A conflict between a long-term goal (or personal value) and an immediate desire. We experience these conflicts all the time. Half the time people are awake, they experience a desire, and nearly half of these desires (47%) conflict with other personal goals (Hofmann et al, 2011). Snoozing in bed instead of getting up, indulging in unhealthy food when on a diet, and cleaning the desk instead of working towards a deadline are only a few examples of self-control dilemmas. These dilemmas always involve a trade-off between the size and the delay of an experienced benefit. On the one hand, the long-term goal promises larger benefits (e.g., being a responsible person) than the immediate desire. On the other hand, the benefits of the desire (e.g., lingering in bed) are experienced immediately; while the benefits of the long-term goal are delayed.

Regulating psychological processes, such as thoughts, emotions, moods, and actions, to balance the fulfilment of long-term goals and immediate desires is fundamental for

subjective wellbeing (Sirgy and Wu, 2009). Referring to the work of Deci and Ryan (2008), we define subjective wellbeing (or happiness) as experiencing high levels of positive affect, low levels of negative affect, and a high degree of satisfaction with one's life. Based on this definition, fulfilling immediate desires can be a direct source of positive affect. Alternatively, pursuing long-term goals can be a source of general life satisfaction (see Brunstein, 1993). As a result, happiness requires a dynamic balance between the gratification of both immediate and delayed benefits (Huta and Ryan, 2010). Inspired by these distinct yet overlapping perspectives, Desmet and Pohlmeyer (2013) proposed a framework for positive design, which consists of three main components: pleasure (e.g., attaining immediate desires), personal significance (e.g., achieving long-term goals), and virtue. This framework emphasizes that designing for happiness takes all three components into account and is sensitive to conflicts between any of these components, including the conflicts between long-term goals and immediate desires (Desmet and Pohlmeyer, 2013).

In addition, supporting the fulfilment of long-term goals over interfering, immediate desires has become a topic of interest in design for behaviour change (see Tromp, 2013). Design approaches in this field often respond to behaviours that threaten long-term goals, such as smoking, recycling, or healthy eating. For example, Fogg (2003) suggests that personal motivation, ability to perform, and environmental triggers need to conjoin for successful behaviour change. In addition, nudging interventions implicitly cue acting in socially desirable ways, an example of which is positioning fruit (instead of candy) at an eye-level shelf in a school cafeteria (Thaler and Sunstein, 2008). Social design investigates the theoretical and methodological underpinnings of designing such implicit influences (Tromp, 2013). Finally, Laschke et al (2014) outlines six principles that effective behavioural interventions should possess (e.g., naivety) in order to successfully replace habitual choices (e.g., driving to work instead of cycling). These approaches indicate that various design fields have indeed become sensitive to the behavioural manifestations of self-control dilemmas.

However, self-control dilemmas are more complex than they seem. Most importantly, it is often surprisingly difficult to distinguish long-term goals from immediate desires. The distinction is not absolute, and any goal can be a tempting desire with respect to another goal (Fishbach and Converse, 2011). Consider the previous example of doubtingly pressing the snooze button of your alarm clock in the morning. Here, the immediate desire is to linger in bed, whereas the long-term goal implies starting the day at a prearranged time. However, for an overachieving workaholic, the long-term goal might in fact be to get more sleep. This example illustrates that long-term goals and immediate desires are person and context

dependent, and do not always align with behaviours that are intuitively labelled as 'desirable or 'undesirable'. Therefore, exploring and analyzing the emergent nature of self-control dilemmas is a crucial first step before deciding which behaviour to target for change.

This paper proposes a framework for analyzing self-control dilemmas. In addition, to illustrate how this framework can be put in practice, we suggest three supporting design strategies. First, we summarize the main self-control theories that inspired this research. Second, we report an empirical study that provides insights into self-control dilemmas through phenomenological interviewing. The framework and strategies are based on the literature on self-control theories and the findings of the phenomenological study. The overall findings of this paper build on the emotion-focused understanding of self-control conflicts suggested by Ozkaramanli and Desmet (2012). Finally, we reflect upon the implications of our findings for design for subjective wellbeing and design for behaviour change.

Understanding Self-Control Dilemmas

The presence of choice alternatives in an environment that simultaneously cue long-term goals and immediate desires might induce a conflict among these goals (Fishbach and Zhang, 2008). For example, while shopping in a supermarket, browsing the fashion magazine section might cue the long-term goal of staying fit, whereas walking down the ice-cream section might cue the immediate desire for indulgence. Achieving long-term goals requires investment to ensure future benefits, even though these benefits are often challenging to predict. In contrast, fulfilling immediate desires is instantly pleasurable and easy to achieve. Because of these differences, immediate desires often interfere with pursuing long-term goals (e.g., wanting both to enjoy ice-cream and to stay fit) (Fishbach and Zhang, 2008). In a self-control dilemma, these 'interfering desires' are termed *temptations* (Fishbach and Converse, 2011).

Approaching self-control dilemmas from an emotional perspective, Giner-Sorolla (2001) made a distinction between hedonic emotions (e.g., satisfaction, excitement, dissatisfaction, frustration, boredom) and self-conscious emotions (e.g., pride, guilt, shame, embarrassment). Based on this distinction, the simultaneous experience of hedonic emotions and self-conscious emotions (e.g., satisfaction and guilt) can be an indicator of a self-control dilemma. Interestingly, however, hedonic emotions are more accessible in memory, and thus, they arise more quickly (i.e., less deliberately) than the more complex, self-conscious emotions. This explains why withstanding temptations is a challenge for effective self-control (Giner-Sorolla, 2001). This analysis is similar to the hot / cool analysis of self-control

dilemmas, which suggests that immediate desires are governed by the hot (emotional) *go-system*, while long-term goals are governed by the cool (cognitive) *know-system* (Metcalfe and Mischel, 1999).

According to Counteractive Control Theory (CCT), people can in fact anticipate situations that might trigger a dilemma and use personal strategies to counteract temptations (Fishbach and Converse, 2011). Such personal strategies include self-imposed rewards or punishments, inhibiting temptations, or activating long-term goals (Fishbach and Converse, 2011). For instance, hiding unhealthy snacks in a kitchen drawer when on a diet decreases their accessibility, which is an example of deliberately inhibiting temptations. Alternatively, stocking the house with fruits and vegetables supports having a healthy diet, which is an example of consciously activating long-term goals. Central to CCT is the asymmetrical motivational effect of personal strategies: the same strategy operates in alternate ways to either demotivate temptations (e.g., self-imposed punishment or inhibiting temptations) or to motivate long-term goals (e.g., self-imposed rewards or activating long-term goals).

Phenomenological Study

Although there is extensive research on the psychology of self-control dilemmas, this research is often fragmented and abstract, making it challenging for designers to obtain a holistic and contextualized view on these dilemmas. To integrate this literature for the benefit of design activities, we adopted a phenomenological perspective to investigate self-control dilemmas. Phenomenology is both a philosophical school of thought and a qualitative research approach that focuses on the individual perception of experiences (Moustakas, 1994). Thus, it can offer a holistic (i.e., free from limitations of theoretical assumptions) and contextualized (i.e., embedded in everyday situations) understanding of self-control dilemmas (Moustakas, 1994).

People's descriptions of an experience often include details such as contextual information, personal motivations, and affective descriptions, across which the investigator can search for common patterns. In phenomenology, these common patterns are called *essential themes* or *essences* (Ehrich, 1996). By examining a series of experiential descriptions of self-control dilemmas, we aim to distil the essential themes that are specific to self-control dilemmas while preserving their contextualized nature. The research questions are:

1. What are the main ingredients of a self-control dilemma that can help designers to obtain a holistic understanding of this phenomenon?

2. What are the design-relevant self-control strategies people use to pursue long-term goals instead of fulfilling immediate desires?

Method

Ten interviews were conducted to investigate the subjective experience of self-control dilemmas across three life domains, namely unhealthy eating, procrastination, and unsafe sex. The study was limited to three domains to obtain a manageable variety of dilemmas when comparing common patterns. The mentioned domains were selected as they are among the most studied domains in self-control literature (see Baumeister and Heatherton, 1996).

Participants

Ten participants (five male, five female, age ranging between 21 and 59 years) voluntarily took part in the study and received a stationary gift for participation. Participants were of different ethnic origin (seven Dutch, one Portuguese, one German, and one Chinese).

Materials and Procedure

The study lasted four weeks and consisted of a preparation and an interview stage (see Fokkinga and Desmet, 2012). In the preparation stage, participants received an experience booklet to be completed over two weeks. The goal of the booklet was to bring past dilemmas into awareness as input for the interviews. The booklets also served as sensitizing material (Visser et al, 2005).

The booklet started with a confidentiality statement to ensure anonymity. Next, participants reported their long-term goals related to three domains of study. On the following days, they completed nine exercises (three in each domain), with questions that asked for examples of self-control dilemmas. To avoid directive examples, questions were phrased around a hypothetical experience such as ‘sometimes we eat or drink foods that we think we should not have. Can you think of a recent situation that you ate or drank something you should not have?’ The questions were not centred on human-product interaction to maintain a holistic view of the phenomenon (see appendix for an example exercise). In the second stage, participants were interviewed to detail the experiences in their booklets. Each interview lasted approximately one hour and was conducted in an informal and open way, and in an environment familiar to the participants (see Moustakas, 1994).

Data Analysis

All interviews were voice-recorded and fully transcribed. Descriptions from the booklets were also added to the transcripts. Following Ehrich (1996), we used four procedural steps to analyze the results: (1) Reading the entire transcription to get a sense of the whole statement, (2) Preparing 59 cards each representing a personal narrative about a self-control dilemma, (3) Analyzing the cards to discriminate between the essential information and accidental information, which resulted in 48 cards, and (4) Reviewing the remaining cards to identify the main ingredients (or essences) of self-control dilemmas.

Findings

The phenomenological study resulted in three ingredients for self-control dilemmas (i.e., mutually exclusive choices, conflicting goals, and mixed emotions) and three self-control strategies people use to deal with their dilemmas (i.e., seeking new information, creating barriers and enablers, and self-imposed punishments and rewards).

Ingredients of Self-Control Dilemmas

The common patterns captured across participants' experiences enabled us to formulate a structure for self-control dilemmas that represents its three essential ingredients, namely mutually exclusive choices, conflicting goals, and mixed emotions. To summarize, when people have to choose between two alternatives that are mutually exclusive (choices), and they are aware that each choice is associated with potential losses and gains which touch upon their personal goals (goals), each choice will inevitably elicit both positive and negative emotions (emotions).

Table 1 gives an overview of all choices, underlying goals, and mixed emotions identified in the analysis of participants' self-control dilemmas. The first column indicates the number of personal narratives associated with each self-control dilemma. Each choice alternative corresponds either to an immediate desire or a long-term goal and a pair of mixed emotions.

Table 1 Overview of choices, goals, and emotions involved in participants' self-control dilemmas

No. of cards	Immediate desire			Long-term goal		
	Choice	Goal	Emotions	Choice	Goal	Emotions
8	Relaxing (e.g., doing something easy)	I want to be relaxed and carefree	Relief / relaxation, and guilt / shame / regret	Finishing a task for work/school	I want to be successful at work/school	Pride / confidence and distress
10	Socializing (e.g., going out with friends)	I want to have fun	Excitement and guilt / shame / regret	Finishing a task for work/school	I want to be successful at work/school	Pride / confidence and boredom
14	Indulging in unhealthy food/snacks	I want to enjoy my food	Satisfaction and guilt / shame / regret	Controlling portions	I want to have a healthy and balanced diet	Pride / confidence and dissatisfaction
10	Relaxing (e.g., watching TV)	I want to be relaxed and carefree	Relief / relaxation, and guilt / shame / regret	Doing health-promoting activities	I want to be slim / physically fit	Pride / confidence and distress
4	Skipping using a condom	I want to enjoy the moment	Satisfaction and guilt / shame / regret	Using a condom	I want to be safe	Pride / confidence and dissatisfaction
2	Postponing talking about using a condom	I want to show intimacy and trust	Intimacy, and guilt / shame / regret	Talking about using a condom	I want to be safe	Pride / confidence and isolation

While Table 1 gives an overview of the main results, it says little about the lived experience of self-control dilemmas. Table 2 provides three elaborate personal narratives that include contextual details, affective descriptions, and personal anecdotes. These personal narratives correspond to the first, third, and fifth rows in Table 1, and they will occasionally be used as reference points in the rest of this article.

Table 2 Personal narratives

1 – Just get it over with
I am a lawyer. That day, I had to make the final decision for a case. I could choose to start with a new case or to make this decision and finish the case I was working on. At that moment, I told myself 'this poor woman will lose the case, I really do not want to make this decision now.' But it was useless to wait, because I had already finished most of the work. I told myself 'Come on! Just get it over with!' If

you postpone important tasks to the last moment, you continue to stress about it. But I want to do my work well.
2 – My eyes are bigger than my tummy *I was in London for holiday, which is a very exciting place. We had just had a nice dinner, and we were on our way to a play when walking by this patisserie. The window was filled with beautiful cakes. I felt tempted to have one. I knew it was over the top, because we were already full. But I was so tempted that I could not resist it. I told myself 'you are in London only once, you should do it! And it was delicious. But, when I was sitting there eating the pie, I suddenly felt really full and regretted it. I thought to myself 'this is really stupid, you were already full!' I recognize this in myself: my eyes are always bigger than my tummy.*
3 – Getting the condom is always a bit weird *Getting the condom is always a bit weird; the person is just waiting there. If you are comfortable with somebody, it is fine to have these moments. But it should be smoother with someone you do not know. Imagine that you just met with someone in a bar, and there is a connection. You go home together, you walk up to the same house, and you enter the same room… You have been building up to this moment. If you stop to say something, you may offend the other person. Instead, I created the illusion in my mind that I would be safe.*

Self-Control Strategies

We defined self-control strategies as systematic patterns of thoughts or actions that participants used to deal with the conflicts between immediate desires and long-term goals, and categorized them according to the themes that emerged from the data. This resulted in three strategies: seeking new information, creating barriers and enablers, and self-imposed punishments and rewards. Seeking new information increases the level of awareness about the consequences of fulfilling immediate desires or pursuing long-term goals. 'Creating barriers' increases the physical or cognitive effort needed to fulfil immediate desires, while 'creating enablers' decreases the effort needed to pursue long-term goals. Finally, 'self-imposed punishments' make fulfilling immediate desires less enjoyable, and 'self-imposed rewards' make pursuing long-term goals more enjoyable. Table 3 explains each of these strategies. Note that the second strategy (barriers and enablers) is divided into three sub-strategies.

Table 3 Participants' self-control strategies

Definition of the self-control strategy	Variants of the self-control strategy	Example (taken from the interviews)
Seeking new information	Increasing one's awareness about the losses of fulfilling temptations	*I read this book that explains the nutritional value of everything. If I know these simple things, I can really improve my health.*
	Increasing one's awareness	*I imagined myself wearing my favourite*

	about the gains of pursuing long-term goals	*bikini on the beach and that helped me on several occasions to not ruin my diet.*
Creating barriers or enablers	Modifying the environment to remove cues for temptations.	*I put away all the distractions, like my guitar and my mobile, when I need to prepare for an exam.*
	Modifying the environment to create cues for long-term goals.	*I keep textbooks on my night table to remind myself of doing some extra reading for work before going to bed.*
	Increasing the physical distance to temptations.	*If I buy chips as a snack, I usually hide them in the cupboard to forget about them.*
	Decreasing the physical distance to long-term goals.	*I buy a lot of fruit to encourage myself to eat more fruit every day, because it helps me to be more energetic.*
	Making concrete plans to forgo temptations.	*After a week full of social occasions involving wine and beer, I told myself: no alcohol next week!*
	Making concrete plans to pursue long-term goals.	*This morning I told myself: I am going to eat 6 pieces of bread today, because I want to gain more weight.*
Self-imposed punishments or rewards	Making temptations less enjoyable through associating them with the violation of another goal.	*It is easier to do my homework with a friend. It makes me feel the pressure to study, because if I don't, I look like someone with no self-control.*
	Making long-term goals more enjoyable through associating them with the fulfilment of another goal.	*When I had a deadline for an important paper, I gave myself two hours to write and two hours to watch a movie.*

Discussion

The content of participants' personal narratives can be traced back to the battle between the hot/cool (go-/know-system) analysis of self-control dilemmas (Metcalfe and Mischel, 1999). In the third personal narrative, the go-system advises the person to focus on the present and skip using a condom: *stopping to get the condom could ruin the moment – why bother?* On the other hand, the know-system advises the person to focus on the future and use a condom: *skipping the condom could mean contracting a disease – why be a fool?* The remarkable differences in the characteristics of these two systems are helpful in understanding why people have the tendency to give into immediate desires – and more importantly – why it might be a good idea to support the pursuit of long-term goals in such situations.

What constitutes a long-term goal or a temptation requires deliberation. For example, one might skip using a condom to enjoy the moment (temptation) *or* to express trust and intimacy towards his partner. Here, enjoyment seems like a typical temptation, whereas expressing trust indicates a more reflective stance. However, in either case, not using a condom threatens the goal of safety (long-term goal). Could, therefore, expressing trust also be a temptation in this specific situation? We argue that any goal, which promises immediate comfort as an escape from investing in a goal with valued future benefits, can be considered a temptation. Therefore, expressing trust might, in this specific situation, be a temptation with respect to the goal of safety. Because of such implicit nuances, designing with self-control dilemmas requires conscious exploration and careful analysis of the motivations underlying specific behaviours.

The emotions experienced in self-control dilemmas can give clues on the differences between long-term goals and immediate desires. In line with the work of Giner-Sorolla (2001), many participants reported guilt or shame for compromising a long-term goal, even though they simultaneously experienced satisfaction for fulfilling an immediate desire. When participants were able to maintain the pursuit of a long-term goal, they reported emotions such as pride and confidence, as well as emotions such as dissatisfaction and frustration for forgoing a desire.

Finally, we identified three different self-control strategies that people create to maintain the pursuit of long-term goals. By supporting long-term goals, these self-control strategies can decrease the motivational strength of immediate desires, which is in line with the proposition of Counteractive Control Theory (CCT) (Fishbach and Converse, 2011). For example, self-imposed punishments and rewards are among the strategies proposed by CCT (see Fishbach and Converse, 2011). Additionally, creating barriers or enablers work in a similar manner as strategies such as pre-commitment to pursuing long-term goals (or forgoing temptations) (see Fishbach and Converse, 2011).

Opportunities for Design Tools

This section builds on the findings of the phenomenological study to propose a toolset for designers: framework for analyzing self-control dilemmas and an overview of design strategies to address these dilemmas.

Framework for Analyzing Self-Control Dilemmas

The phenomenological study revealed that dilemmas are compounded phenomena with motivational, emotional, and behavioural ingredients. The framework of dilemmas provides a structured way of thinking when exploring the richness of these ingredients, and thus, it can support making informed decisions about the nuances between long-term goals and immediate desires. Figure 1 shows the graphical representation of the framework based on the first personal narrative, 'just get it over with', in Table 2. Although the content of the ingredients might change based on the specific dilemma being analyzed, the proposed structure of the framework remains intact.

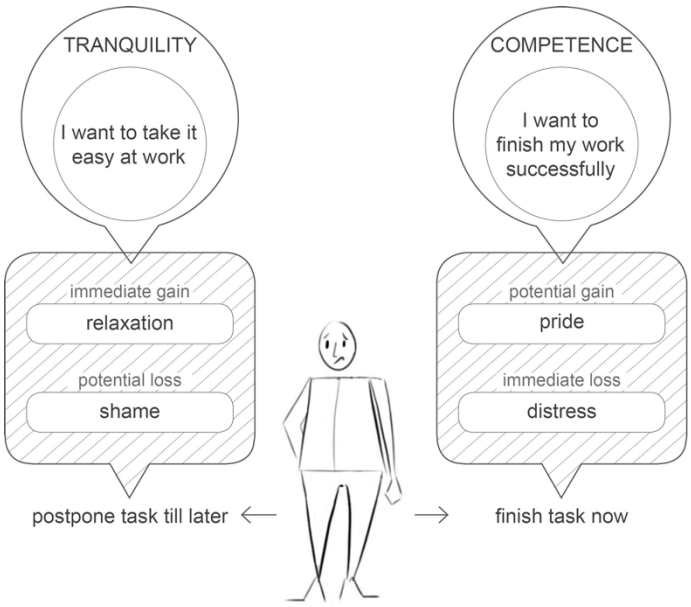

Figure 1 Framework of self-control dilemmas showing three main ingredients of dilemmas

Three features make the content of this framework specific to self-control dilemmas:

1. The framework illustrates an immediate gain versus a potential loss (or potential gain versus immediate loss) associated with the choices made. This distinction implies inter-temporal choice and encourages exploring the consequences of both choices.
2. One of the conflicting goals is an interfering immediate desire (i.e., a temptation) with respect to the other goal (Fishbach and Converse, 2011).
3. The simultaneous experience of self-conscious emotions (e.g., pride, guilt) and hedonic emotions (e.g., satisfaction, boredom) is an indicator of self-control dilemmas (Giner-Sorolla, 2001).

The rest of this section uses the same narrative ('just get it over with') as an example to explain the three main ingredients of self-control dilemmas

Mutually Exclusive Choices

Each choice in a self-control dilemma comes with a gain and a loss (see Figure 1). On the one hand, postponing the task guarantees temporary relief (immediate gain), but it risks being on time (potential loss). On the other hand, finishing the task promises being on time (potential gain), but it costs time and effort in the present moment (immediate loss). Note that there might be many choices associated with temptations or long-term goals in a given context; however, for simplicity, the framework is limited to two choices representing a *di*-lemma.

Conflicting Goals

The gain and loss of each choice in a self-control dilemma are determined by the underlying motivation (see Figure 1). In the previous example, the participant wanted to postpone her work because she wanted a temporary relief from the pressure of having to make a difficult decision (immediate desire for tranquility). However, she also wanted to do her work well (goal of competence).

Finding the true motivation behind a choice is critical for designers in gaining a nuanced understanding of a dilemma. For instance, the person might have wanted to complete the task on time to achieve good results (goal of competence), *or* to leave work on time to join a family dinner (goal of belonging). To accurately formulate goal statements based on users' self-reports, designers can use the goal taxonomy of Ford (1992), which provides a complete yet compact overview of twenty-four universal human goals.

Mixed Emotions

Due to the gains and losses associated with each choice, settling on any one of the choices will evoke mixed emotions regardless of the choice. In the previous example, the participant anticipated *pride* for finishing the task on time, while wanting to avoid the *distress* of having to finish it. She also reported wanting to start a new task, which could evoke *relaxation* for avoiding the stressful task, as well as *shame* for demonstrating incompetent behaviour. Note that the framework is limited to *anticipated* mixed emotions, which are evoked by the *anticipated* gains and losses of each choice.

Design Strategies to Address Self-Control Dilemmas

Inspired by the self-control strategies in Table 3, the design strategies aim to encourage activities that motivate long-term goals when they conflict with immediate desires. The end-goal here is to either *demotivate immediate desires* by (1) adding new sources of displeasure to temptations, (2) making potential losses of temptations tangible, and (3) creating barriers to temptations; or to *motivate long-term goals* by (1) adding new sources of pleasure to long-term goals, (2) making potential gains of long-term goals tangible, and (3) creating enablers for long-term goals. 'Creating barriers', 'adding displeasures', and 'making losses tangible' are design strategies that actively lessen the motivational strength of temptations. In contrast, 'creating enablers', 'adding pleasures', and 'making gains tangible' are design strategies that actively increase the motivational strength of long-term goals.

Consider the dilemma between lingering in bed and getting up on time in the morning. Here, the designer can either demotivate the goal of tranquility (lingering in bed) or motivate the goal of responsibility (getting up on time). Figure 2 shows six designs of existing clocks that align with the proposed design strategies.

Figure 2 Product examples that align with the proposed design strategies and that can address the dilemma between lingering in bed and getting up on time

Adding New Sources of Displeasure or Pleasure

This design strategy is inspired by self-imposed punishments and rewards (see Table 3). Designers can introduce new sources of displeasure to make temptations less enjoyable. For example, evoking negative hedonic emotions, such as annoyance, (e.g., Dumb-bell alarm clock in Figure 2) or enhancing negative self-conscious emotions (e.g., imagine an alarm clock that humiliates you for snoozing in bed by posting this behaviour on your Facebook profile) can demotivate temptations. Similarly, introducing positive hedonic emotions to long-term goals (e.g., Philips Wake-up Light in Figure 2) or enhancing positive self-conscious emotions (e.g., imagine an alarm clock that appreciates you for being on time) can motivate long-term goals.

To give another example, consider the dilemma between the goal of tranquility (i.e., doing something easy) and the goal of mastery (i.e., finishing up a challenging task). StickK.com in Figure 3 is an online platform that invites users to publicly set a goal. It also provides the option to designate a set amount of money that the user will lose if he procrastinates (adding new sources of displeasure to the temptation). This feature might demotivate temptations by violating another personal goal (i.e., saving money). Alternatively, StickK.com allows the user to invite friends to the platform, who could support the user in being productive (adding new sources of pleasure to the long-term goal). This feature might motivate the long-term goal by fulfilling another personal goal (i.e., belonging).

Figure 3 StickK.com: an online platform to prevent procrastination

Making Potential Losses or Gains Tangible

This design strategy is inspired by seeking new information about the consequences of one's choices (see Table 3). For example, Life Counter (see Figure 2) vividly emphasizes the loss of time, which might demotivate time spent sleeping. Similarly, HabitClock (see Figure 2) visualizes the steps of a healthy morning ritual predetermined by the user, which might motivate repeating this ritual every morning.

Using a similar strategy, the Condom USB flash drive (Figure 4) uses a metaphor that might remind the user about the consequences of having unsafe sex (making losses of temptations tangible). If one does not pay attention to being safe, the body, similar to a computer, can get infected with viruses. Alternatively, 'where did you wear it?' (Figure 4) is an online platform that lets users log into a website (www.wheredidyouwearit.com) using the QR-code on a condom packaging, where they can explore the benefits of having safe sex (making gains of long-term goals tangible).

Figure 4 Condom USB by Evgeny Filatov and a snapshot from the website of 'where did you wear it?' by Planned Parenthood

Creating Barriers or Enablers

Similar to the self-control strategies on barriers and enablers in Table 3, designers can modify the physical or mental effort associated with temptations or long-term goals. Scribble alarm clock in Figure 2 decreases the mental effort needed to recall activities to be a responsible person, and thus, it acts as an enabler for this long-term goal. Similarly, Clocky in Figure 2 increases the physical effort needed to linger in bed, and thus, it acts as a barrier to the temptation.

In addition, KitchenSafe (Figure 5) is an appliance with a time-controlled lock mechanism, which, for a desired amount of time, prevents access to tempting food (e.g., candy). In this way, it creates a barrier to indulging in sweet snacks. Similarly, ChiquiSafe (Figure 5) is a banana holder that can act as a cue for eating fruit as a healthy snack. In this way, it creates an enabler for maintaining a healthy diet.

Figure 5 KitchenSafe by David Krippendorf and ChiquiSafe by David Dos Santos

General Discussion

The purpose of this paper was to explore how design can support people in withstanding temptations when pursuing long-term goals. The phenomenological study generated insights in the manifestations of self-control dilemmas, which were supported by the theory in self-control literature. The proposed design tools (i.e., the framework and the design strategies), which were based on existing self-control theories and the findings of the phenomenological study, aim to encourage critical thinking (versus immediate judging) when designing with self-control dilemmas.

The framework of self-control dilemmas can provide design teams with deeper understanding into users' mindset and context, which enables making an informed decision about what a long-term goal and an interfering desire might be. For instance, failing to use a condom (see example on Table 2) can be interpreted as a temptation, but it can also be interpreted as an instance of expressing trust to a potential partner. Being wary of offending a potential partner might in fact convey a reflective stance towards the situation, and thus, skipping using a condom might also be interpreted as a future-oriented goal. By providing a platform for exploring such nuances when analyzing self-report measures, the framework can support making informed decisions about what constitutes a long-term goal or a temptation in a specific situation.

We argue that, with the aforementioned characteristics, the framework can be a complementary tool to behavioural change approaches, such as persuasive technologies (e.g., Fogg, 2003), nudging (Thaler and Sunstein, 2008), social design (Tromp, 2013), pleasurable troublemakers (Laschke et al, 2014), and the stages of change perspective (Ludden and Ruijter, 2016). These approaches often select an individually or socially undesirable behaviour to change, such as smoking, unhealthy eating, littering, or physical inactivity, respectively. Although the direction of change may seem obvious in these examples (e.g., quitting smoking), the framework can support design teams in consciously examining what might motivate users to adopt this change (i.e., their long-term goals) as well as what the barriers to change might be (i.e., their temptations). For instance, in the case of smoking, a motivation to quit smoking might be to avoid shortness of breath when exercising *or* to have whiter teeth. Alternatively, a barrier to quit smoking might be the joy of socializing with other smokers. In short, filling in the framework might act as a reflective lens when identifying the true motivations that might fuel behaviour change, as well as the motivations that underlie the resistance to change.

The proposed design strategies aim to facilitate the creation of products and services that guide prioritizing long-term goals over immediate desires. Here, it is important to emphasize that designing for the fulfilment of both long-term goals *and* immediate desires is important for subjective wellbeing (Sirgy and Wu, 2009; Desmet and Pohlmeyer, 2013). The main contribution of distinguishing between long-term goals and immediate desires is to encourage sensitivity towards situations in which immediate desires interfere with long-term goals. Such situations, unless managed constructively, can threaten subjective wellbeing (Riediger and Freund, 2004). The design strategies proposed in this paper intend to balance the motivational strength of temptations with that of long-term goals, which might result in products that align with the self-control strategies people create to counteract temptations.

The suggested design strategies are analogous to user-agentive strategies discussed in the literature on design for sustainable behaviour (e.g., giving feedback, enabling, encouraging, seducing) (see Wilson et al, 2015). Specifically, 'making potential losses and gains tangible' can be compared to feedback strategies for behaviour change, 'barriers and enablers' to constraints and affordances, and 'adding new sources of displeasure or pleasure' to penalties and incentives (see Bhamra et al, 2011). Although similar strategies already exist in design literature, the contribution of this paper is to provide an overview of these strategies that is complementary to framing user behaviour through the lens of self-control dilemmas. This perspective expands the solution space to motivating long-term goals (e.g., energy-conscious living), as well as demotivating temptations (e.g., comfort-oriented living).

Evaluating the proposed tools (i.e., framework and strategies) to evaluate their contribution to analysis and synthesis in the design process is a critical topic for future research. Another important research direction is to compare the experiences with products that result from these strategies (e.g., an alarm clock that puts a barrier to snoozing in bed) to experiences with other products in the same category (e.g., a regular alarm clock). As products resulting from these strategies intend to motivate long-term goals, we anticipate that they will enable people to adopt a more reflective stance towards their everyday choices. Finally, the proposed framework, due to its focus on individual experiences, poses a number of limitations that might be considered in future research. First, the framework does not account for some of the important factors that influence human decision-making, such as the role of personal and cultural values or personality traits. Second, the framework conceptualizes self-control dilemmas as snapshots of experiences, which, in that snapshot, assert that immediate desires are less preferable when pursuing happiness. Therefore, future studies can focus on understanding how people balance the fulfillment of immediate desires

and long-term goals *over time* in order to extend the framework in a way that it can accommodate a dynamic set of values and tools to aid designers in a more objective manner.

Appendix

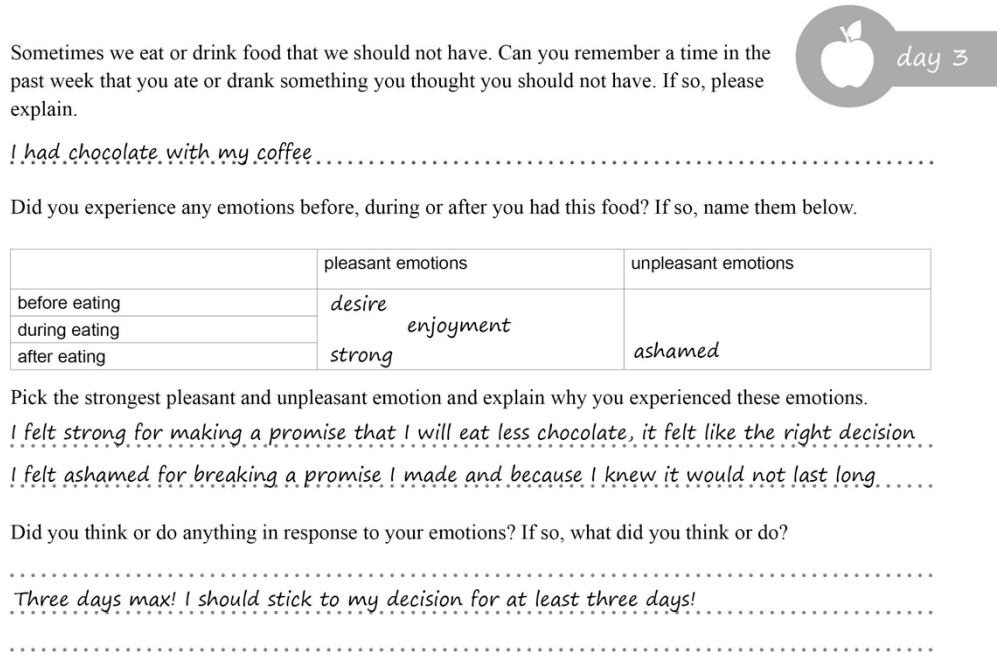

Figure 6 Example exercise from the booklet used in the phenomenological study

List of Captions

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