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# Keymoment: Initiating Behavior Change through Friendly Friction

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**Abstract**

To initiate new behavior is challenging, but to maintain this new behavior can be even more so. In this paper, we present *Keymoment*, a key holder designed to increase physical activity by raising the frequency of taking the bike instead of the car. To accomplish this, it creates friction, but in a meaningful and light way. *Keymoment* is an example of what we call *pleasurable troublemakers* – a genre of interactive things, designed to help people changing themselves. We discuss variations of the *Keymoment* as well as the general principles, *pleasurable troublemakers* are based on.

**Author Keywords**

Transformational Object; designing for change; persuasion; Aesthetic of Friction; self-regulation; pleasure; Experience Design.

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

**More physical activity**

It is without doubt that an appropriate level of physical activity is positive for one's health and psychological well-being [1,12,17]. The *World Health Organization* (WHO) lists lack of physical activity as the fourth leading risk for mortality. An estimated 3.2 million people

**WHO's recommendations to promote physical activity [17]:**

- reviewing urban and town planning and environmental policies at national and local level to ensure that walking, cycling and other forms of physical activity are accessible and safe;
- providing local play facilities for children (e.g. building walking trails);
- facilitating active transport to work (e.g. cycling and walking) and other physical activity strategies for the working population;
- ensuring that school policies support the provision of opportunities and programs for physical activity

Figure 1. WHO's recommendations of how to increase physical activity in daily life

die each year because of physical inactivity [16]. To counteract this, the WHO issued a list of recommendations of how to promote physical activity in daily life (see figure 1). One presumably simple intervention is active transport to work (e.g. cycling and walking). The daily commute seems a perfect moment for making physical exercise a part of daily routines. In addition, walking and cycling is not only healthy, but also a 'zero carbon' alternative to other forms of personal transport, such as cars [4,17].

Unfortunately, while walking or cycling to work seems straightforwardly beneficial, not many people practice it. In 2008, of the 34.8 million commuters in Germany, 20.7 million (60%) used the car [13]. Obviously, some commutes are too far for walking or cycling. However, there is a general tendency to favor the car even for short distances. For example, 9.5 million Germans (46% of all people commuting by car) use the car regularly for distances less than 10 kilometers – distances quite suitable for cycling.

In Human-Computer Interaction (HCI), the question of how to increase physical activity is already well-discussed. In addition, there seems an abundance of commercially available sports tracking apps and devices, such as *Endomondo* or *NikePlus* (e.g. see <http://quantifiedself.com>). However, Conroy et al. [5] recently reviewed 200 devices or apps and found that none employed much insights from the psychology of motivation. They quantify and track, but not much beyond that. In other words, people, who hold the general goal of becoming more physically active, but have problems in implementing this goal in everyday life, are not supported by the majority of available interactive devices.

From the perspective of motivation psychology, Gollwitzer et al. [8,15] argued that the key to changing behavior is to complement often rather abstract *goal intentions* with concrete *implementation intentions*. An implementation intention is a simple plan, which specifies a particular behavior and conditions for engaging in it. Instead of the goal intention "to become more physically active," one could, thus, specify a concrete implementation intention, such as "each time, I think of taking the car to go somewhere, I take the bike instead." This plan is at the heart of WHO's recommendation and, for example, communicated by a German ad campaign called: "*Use your head, not your car.*" Claims such as: "*Better your weight shrinks than the arctic ice. Go by bicycle*" (see figure 2), hint at both, health and environmental benefits of cycling. Unfortunately, well-established routines, such as choices of personal transport, are rather immune to appeals [15]. Appeals remain abstract and quite detached from crucial situations, such as every morning's choice of how to commute to work.

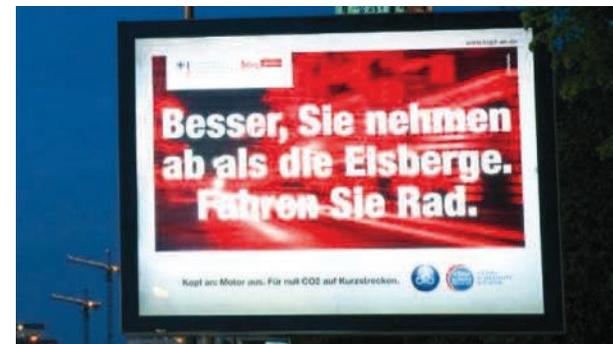


Figure 2. Ad-campaign at the roadside: "Better your weight shrinks than the arctic ice. Go by bicycle."

In this paper, we present an example of an alternative approach to interrupt and reshape routines to create choice and reflection. Instead of *communicating* the simple plan of taking the bike instead of the car, we externalize – or better *materialize* – it in form of an interactive artefact: the *Keymoment*. This bottom-up approach harnesses the power of things to establish and shape everyday practices [6,14].



Figure 3. The *Keymoment* with both keys side by side

### **The *Keymoment***

The *Keymoment* is a simple box-shaped key holder mounted on the wall next to the front door. It holds and presents the bike and the car key, side by side, but on separate hooks (see figure 3). The spatial configuration frames the moment of grabbing the keys when leaving the home as a choice: bike or car? If the bike key is taken, nothing much happens. From the *Keymoment's* point of view, one made the "right" choice. But in case the car key is taken, *Keymoment* makes a suggestion. It chucks out the bike key, which then drops to the floor (see figure 4). Obviously, one can just leave it there. But most people do not like

things, especially keys, lying on the floor. Holding the car key in one hand, they pick up the bike key with the remaining free hand. Through this, they literally "pick up" their intention to ride the bike more often. With both keys in hands, *Keymoment* creates a carefully designed, quite tangible moment of choice (for a detailed video figure see <https://vimeo.com/86994036>). This choice, however, is deliberately created by disturbing a routine. Interestingly, dropping the key creates a moment of choice *after* a routine has already been executed (i.e., to take the car key). This is a bit as if turning back time.



Figure 4. The bike key falls down when taking the car key

*Keymoment* is certainly a slight nuisance in daily life. It creates friction, which seems necessary for change, but friction can lead to reactance [3]. That's why the *Keymoment* not only consists of an implied behavior, a choice, and friction – it also deliberately tries to make the friction more bearable. First of all, the bike key can always be put back on its hook. Once the choice is made, even if it was not as hoped for by the *Keymoment*, it accepts this and holds the bike key until the next potential choice situation. Second, the space on



Figure 5. The bike key on top to pause the mechanism



Figure 6. Changed keys enables cheating the system

top of the box deliberately offers a way to circumvent the choice for a while (see figure 5). Just put the bike key there. It still has a place, but without the nasty dropping. Third, one can simply interchange the places of the keys and quite ironically *Keymoment* will throw your Porsche keys at you, when you actually planned to take the bike (see figure 6). All these ways of (mis)use are deliberately inscribed into *Keymoment* to make the friction more bearable.

### Underlying design principles: pleasurable troublemakers

*Keymoment* is what we call a *pleasurable troublemaker*, based on principles of an *aesthetic of friction* [9,11]. On one hand, this aesthetic aims at creating situated friction to highlight and suggest behavioral alternatives to well-established routines. *Pleasurable troublemakers* create and reframe moments of choice by suggesting a viable alternative, a simple plan. The choice is left to the people themselves and is meant as the beginning of an explicit process of meaning-making. Since friction can lead to reactance [3], which actually lowers the likelihood of engaging in the target behavior, friction needs to be delivered in a particular way. Thus, on the other hand, the aesthetic of friction attempts to make the friction more bearable by making the *troublemakers* more likeable. To do so, we propose that they have to be understanding, should be naïve or even slightly ironic. While a *pleasurable troublemaker* actually knows what is good for you, and confronts you with this, it also understands all those moments, when changing a routine seems simply out of question. It is neither especially smart or strict, nor infallible. It even deliberately offers opportunities to cheat. At the end of the day, it is a little bit like its users – who in principle

know what is good for them, but fail to implement this knowledge in daily live.

*Keymoment* is an application of these principles. It clearly materializes a simple plan. It creates friction and choice to initiate change. In addition, it counters potential reactance by including understanding, naïve or ironic features. Obviously, different variants of understanding, naivety and irony are possible. For example, *Keymoment* could show some more understanding by detecting rain and pausing its mechanism. Bad weather seems an acceptable reasons to favor the car. Another variant could acknowledge that you are already too late. In both cases, the bike key wouldn't drop to the floor. One could also develop the irony a little further. If you take the bike too often, *Keymoment* every now and then drops the car key. Proudly, you will put it back on the rack, realizing the changes in routines you already implemented, basking in warm feelings of self-efficacy and environmental consciousness. Obviously, research is needed to better understand how to strike the optimal balance between friction and understanding. Neither a pure troublemaker, nor a weak, all accepting pansy would do the trick. In addition, especially the notion of ironic features to actually create change seems an interesting topic in need for a better understanding.

### Conceptual strength

*Keymoment* is a conceptual piece. While form is certainly important, it is derived from a clear understanding of the interaction(s) needed to convey the intended meaning. In fact, a strong, conceptual understanding of an artefact liberates from its particular, tangible materialization. Thus, while the *Keymoment's* form and technology as presented in figures 3 to 6 was carefully chosen, it is in a good part independent of this.

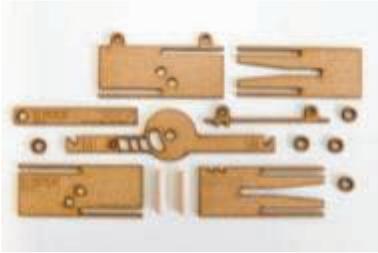


Figure 8. Laser cut components of the kit



Figure 9. Laser cut components of the kit

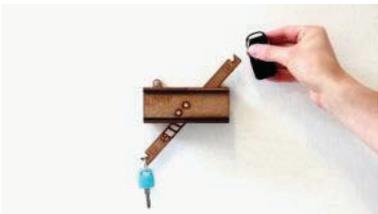


Figure 10. Cheating the system by taking the car key slowly and with caution

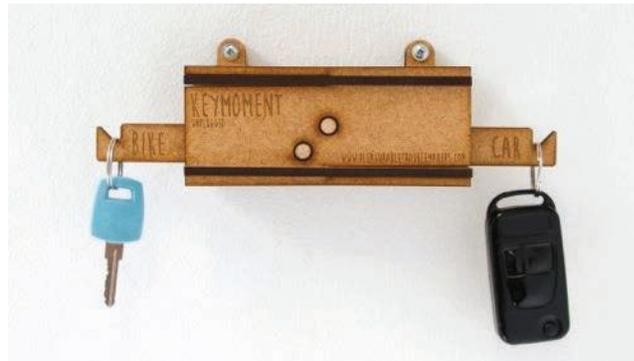


Figure 7. Keymoment unplugged with a bike key (left hook) and a car key (right hook)

Triggered by the wish to further simplify *Keymoment*, to let it tell its story as straightforwardly as possible, we designed a *Keymoment (unplugged)* (see figure 7). While the original *Keymoment* used an electronically controlled mechanism to chuck out keys, the new *Keymoment* relied on simple mechanics, delivered through a box made of several laser cut components (see figure 8 and 9). Note, however, that the general concept of *Keymoment* remained unchanged – it just got a different representation. Of course, a change in representation has effects. Cheating, for example, was made possible by picking the car key very slowly and with caution. This version of cheating the system, by taking the car key intentionally, slowly and carefully is a different variant, yet, derived from the same underlying concept (see figure 10; for a detailed video figure see <https://vimeo.com/95723021>). While material, form and technology was changed, and with this some interactions, the strong and clear conceptual model ensured that crucial elements of the design were neither lost nor inappropriately altered.

## Conclusion

*Keymoment* embodies a detailed understanding of everyday situations as well as beneficial practices. It attempts to change peoples' behavior by highlighting their daily personal choices. Placing the bike key and the car key side by side is already a clear message. Dropping the bike key to the floor just takes it a little further. *Keymoment* creates friction, potentially every morning before leaving home. But choice and reflection is left to its users. While many technical systems appear infallible and strict, we assume that friction needs to be counteracted to some extent by understanding, naivety, and a little (self-)irony. *Keymoment's* advice is friendly – at best it is mischievous. The combination of materialized, situated simple plans, the emphasis on breaking routines through choices, the friction created through this, and the balancing of friction with understanding, naivety and irony are the ingredients of our proposed *aesthetic of friction*.

In addition, *Keymoment (unplugged)* illustrates the importance of strong concepts independent of their particular representation. While *Keymoment (unplugged)* is based on the same concept, it differs in material, form, technology, and interaction. In HCI, the partial independence of concept and materialization is not always accepted. Certainly, some members of the HCI community may even doubt that *Keymoment (unplugged)* is an interactive technology since it neither features sensors nor servos. We believe that a major merit of HCI as a discipline lies not in the C for computer, but in the I for interaction. It is the interaction and the underlying concepts and principles, which count, not the particular technology used to materialize and shape concept and interaction.

The present design case's purpose was to give an example of how to apply the notion of designing for friction to a relevant scenario. Its focus was on the conceptual quality of the design, not on its particular effectiveness. We strongly believe in the merits of careful conceptual exploration and justification in itself. Of course, future studies will certainly explore whether *Keymoment* will hold its promise to change behavior and if, under what circumstances. Nevertheless, carefully designed concepts are of value even without an outcome-oriented evaluation.

Easing friction through understanding, naivety, and irony to create a lasting, pleasurable, meaningful and changing interaction clearly differentiates our approach from others, such as Persuasive Technologies or Sustainable Interaction Design [2,7]. This notion must be further explored through more design cases (see [9]) and qualitative/phenomenological as well as quantitative research (e.g., [10]) to deepen our understanding of friction, its power to change, and ways to make it bearable, yet efficient.

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