# DESIGN4 HEALTH

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# 567. Design model for health behaviour change

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*ABSTRACT A conceptual framework is proposed that addresses sub- and preconscious aspects of design features that might affect health related patterns of behaviour. Building onto Schwarzer's Health Action Process Approach (HAPA; Schwarzer 2004) this model attempts to bridge the gap between design and health psychology. Applying methods and principles from consumer research (e.g. priming) the design model for health behaviour change (DMHBC) is proposed to focus on established concepts and transfer these to the scientific area of design research for health and well-being.*

*Studies from fields such as consumer research or neuromarketing show that design features can affect various aspects of social behaviour and judgment (e.g. Kay et al. 2004; Lockton et al. 2010). This applies in particular to the bodily perceptions that design elements can convey (Lobel 2014). In this regard, design features can act as primes and even placebos (Rehn and Schuster 2017) affecting emotional, cognitive and behavioural outcomes. This offers potential for changing health behaviour by addressing mental concepts such as self-efficacy, outcome expectancies and risk perception, which are according to HAPA (Schwarzer 2004) significant elements of the pre-intentional motivation phase and key aspects of a successful health behaviour change process.*

*Additionally to these pre-intentional influences, design features can as well act as situative barriers and opportunities that affect the post-intentional volition phase. Using knowledge from fields such as universal design (Erlandson 2008) and behavioural economics (e.g. Thaler and Sunstein 2011) design can play a key role in supporting the maintenance of positive health behaviours.*

*This article introduces the DMHBC and illustrates its chances and limitations as a link between transdisciplinary knowledge and design problems. Case studies support the use of the DMHBC as a conceptual design framework. Further research is needed to analyze the effect of various design elements on particular mental concepts such as self-efficacy.*

Keywords: Design research, health behaviour, priming, self-efficacy, health design, psychosocially supportive design, salutogenic design, design methods, evidence-based design, prevention

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## Design methodology and health behaviour

In many cases design as a practice is commonly associated with creative unplanned processes and the application of chaos and chance as a tool to create new and innovative concepts. However, both design and design research increasingly follow up a tendency of the seventies (see Rittel 1973; Cross and Roy 1975) and make use of theoretical models and structured methodologies in order to conduct a planned design process (e.g. Kumar 2013; Hamilton 2003; Rehn 2017). Most of these methods and models aim at creating concepts, products or systems that suit a certain briefing or have a high likelihood of financial success on the market.

Paradoxically, when it comes to analysing or predicting the effects certain design concepts might have on the behaviour of users or identifying aspects that promote a certain behaviour, fields such as marketing and economics (e.g. Bloch 1995; Bittner 1992; Lobel 2014) as well as social psychology (e.g. de Kort et al. 2008) offer a much broader scope. Only view exclusions in design and architectural research focus on behavioural effects as a goal of design interventions (Lockton et al. 2010; Fogg 2003; Tromp et al. 2011; Zimring et al. 2005), while others still include behavioural dimensions, but rather as a side effect that should be controlled in order to reduce risk (e.g. Norman 1988).

## Health behaviour as a key concept in health promotion

With regards to health and wellbeing the concept of health behaviour is of particular importance as Kasl and Cobb describe it in their seminal paper: 'Health behaviour is any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage' (1966: 531). While this notion mainly takes into consideration the behaviour of healthy people, Gochmans refers with his updated definition to a more holistic perspective on health behaviour as

> 'those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behaviour patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement.'
>
> (Gochman 1982: 169)

By this, he follows the health paradigm of salutogenesis in which health and disease are seen as two opposite extremes of a continuum and 'which sees each of us, at a given point in time, somewhere along a 'healthy/disease continuum' (Antonovsky 1996: 14).

Health promotion is ultimately linked to health behaviour as it describes among other aspects the daily routines and habits, preventive behaviours and how people seek and use health related information. While many theoretical models have been created to explain health behaviour (for an overview see e.g. Schwarzer 2011), Schwarzer's Health Action Process Approach (HAPA) (Fig. 1;

Schwarzer 1992; 2008) proved to be particularly feasible as a basis for developing a design model for health behaviour change. Among other reasons this is caused by its transdisciplinary setup and its focus on self-efficacy.

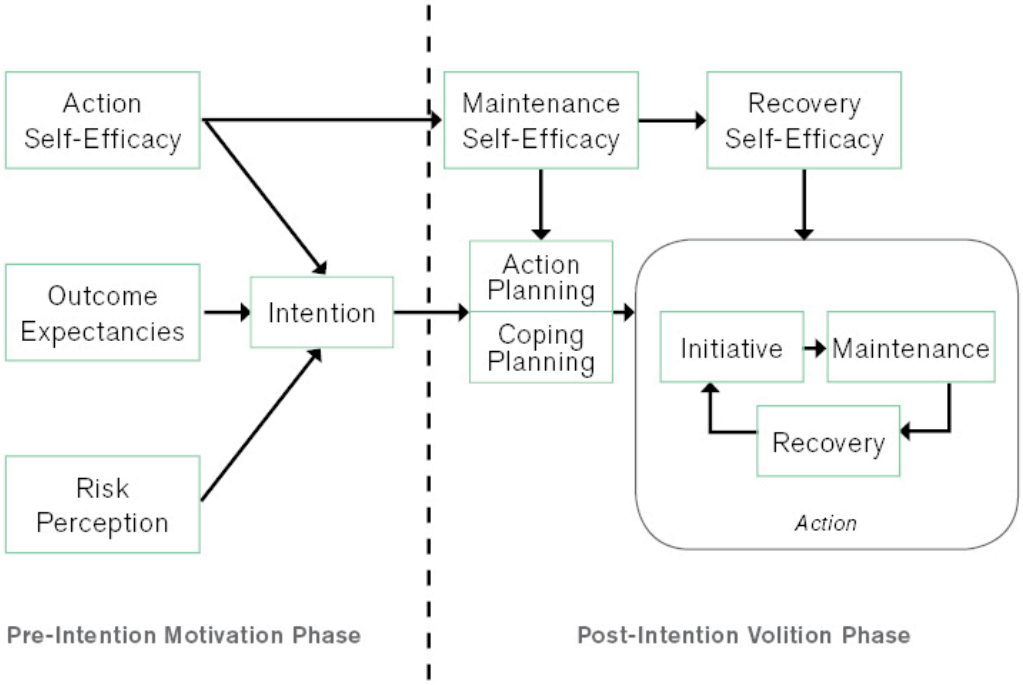


Figure 1: Health Action Design Approach (HAPA; Schwarzer 2004: 90)

The HAPA is divided into a pre-intentional motivation phase and a post-intentional volition phase. According to Schwarzer, during a process of health behaviour change three aspects are relevant for the development of intention in the motivation phase. (1.) Self-Efficacy describes one's 'conviction that one can successfully execute the behaviour required to produce the outcomes' (Bandura 1978: 141). (2.) Risk perception refers to the degree of one being aware of certain risks related to, for instance, the maintenance of a certain behaviour (such as smoking). (3.) Outcome expectancy describes one's assumption about which measures can be taken and which likelihood is related to these actions with regards to minimizing the before mentioned risks. If an obese patient is convinced that losing weight will reduce his or her risk of coronary heart disease he or she still must be convinced that a certain diet will lead to the weight lost (outcome expectancy) and that he or she is capable of complying with the dietary guidelines over a longer period of time (self-efficacy) in order to create intention.

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## Design model for health behaviour change (DMHBC)

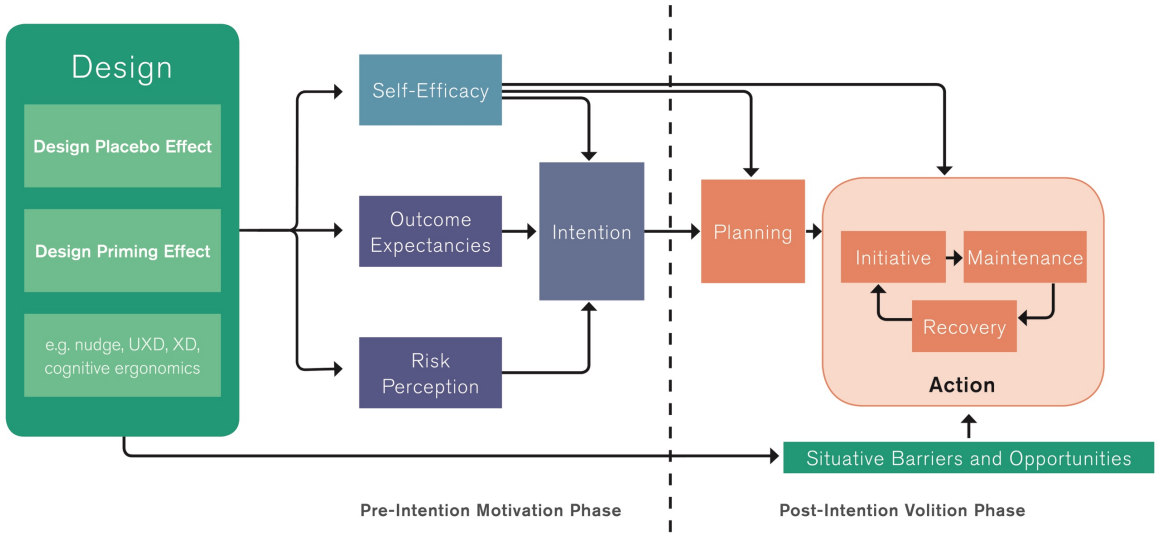


Figure 2: Design model for health behaviour change (DMHBC)

The herewith proposed design model focuses on design features that lead to or support health behaviour change or promote the maintenance of positive health behaviour. By doing this, the model follows a salutogenic (Dilani 2006) and psychosocially supportive (Ulrich 1997) design approach. This is rooted in an evidence-based (Stichler and Hamilton 2008; Malkin 2008) and research-driven understanding of design (Visocky O'Grady and Visocky O'Grady 2006).

While many design models refer to design elements that work in a direct visible way to support health behaviour (e.g. ergonomics to prevent harmful body movements) the DMHBC emphasizes subtle design cues that work rather indirectly based on principles from fields such as behavioural economics (Thaler and Sunstein, 2009), social psychology (e.g. Cialdini et al. 1990) and neuromarketing (e.g. Kay et al. 2004; Berger et al. 2008). While the HAPA can be described as a rather cognitivistic model the DMHBC adds sub- and preconscious elements.

Following the HAPA four links have been identified in order to use design features as a efficient tool for health behaviour change. Three of these four aspects, namely (1.) self-efficacy (Bandura 1978), (2.) risk perception and (3.) outcome expectancy are located in the pre-intentional phase. It is assumed that design features might influence these three aspects already before conscious cognitive processing concerning these aspects has been taken place. The fourth link 'situative barriers and opportunities' is located in the post-intentional volition phase. Here both on a functional pragmatic as well as subtle cue-wise level design features act as environmental stimuli.

## *Design features as direct and subtle cues*

Various design elements can affect the three pre-intentional aspects separately. Among others formal-aesthetic as well as conceptual features can act as a (a.) design placebo (Rehn and Schuster 2017) that create certain expectations that influence the perception of a given situation or (a.) prime (e.g. Kay et al. 2004; Berger et al. 2008) that activate certain mental representations.

With regards to (1.) self-efficacy, design features can for instance promote the impression of ease of use or the actual effectiveness of a certain behaviour. This creates an experience of mastery which in turn can support self-efficacy (see 'performance accomplishments', Bandura 1978: 143). In a more direct way, interactive systems that provide instant feedback of the effects a behaviour has can strengthen motivation and self-efficacy. Popular activity trackers can visualize for instance reached training goals and burned calories (see also Fogg 2003: 256).

In a similar way the design of an artefact or system can raise awareness for risks that are associated with certain behavioural patterns or emphasize the safety of an environment. Medical devices that are visually less complex, produce little noise and appear in a softer and more positive manner might reduce the subjectively (2.) perceived risk that a patient associates with the treatment. In a more playful way, concepts such as the 'HIV-Roulette' (Fogg 2003: 64-66) or 'Keymoment' (Laschke et al. 2014) try to point the users' attention to a particular aspect of health or risk behaviour.

In various ways design elements can influence the (3.) outcome expectancy. Virtual systems that simulate scenarios of different health behaviours can visualize the utility of a particular behaviour. Interactive visual systems, for instance, that simulate the use (or not use) of dental floss (c.f. Li et al. 2015) might change one's outcome expectancy by linking a certain behaviour to a particular result.

## *Situative barriers and opportunities*

Both in a formal-aesthetical way as well as a pragmatic functional way design elements and features can act as situative barriers or opportunities. Situative barriers refer to objects or configurations that inhibit a certain health behaviour. An office canteen that only serves junk food displays situative barriers for healthy eating as it is not impossible but more complicated to eat healthy in such a setting. On the other hand, offering for instance free open access sporting devices in a public space (fig. 1) creates the situative opportunity and thus offers little threshold to become physically active.

Figure 3: Public open access sport devices as situative opportunities for physical activity in Singapore (Foto: Jonas Rehn, 2016)

Furthermore, these situative opportunities work on a mental level as well. With regards to spreading-activation theory (Collins and Loftus 1975) they can be seen as environmental cues (see e.g. Berger and Fitzsimons 2008) that activate a cognitive concept (see Bargh and Chartrand 2014: 317). By this, the concept of sport and physical activity has a higher accessibility (Higgins 1996) which might affect future planning and intention building.

## Conclusion

Objects, systems and configurations affect health related thinking and behaviour in various ways. Thus, design decisions can directly and indirectly change a person's health behaviour. Focusing on aspects such as self-efficacy, risk perception and outcome expectancy during an early stage of the design process can be beneficial for health promotion. Understanding design elements and features as subtle cues that affect these three parameters as well as situative barriers or opportunities offers new potentials for designers of various specialties. With regards to a salutogenic (Dilani 2006) and psychosocially supportive design approach (Ulrich 1997) more research is needed to investigate practical applications of these effects for various settings.

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