

Touchpoints: designerly perspectives on persuasion

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Abstract

Our approach builds on both the design traditions of participatory design and embodiment. We attempt to connect these traditions to the existing body of knowledge on persuasion. First we describe some basic theoretical concepts and infer how they influence persuasive design. Then we present a basic framework with which we intend to address the different abstraction layers involved. Finally, we discuss the principal differences and meeting areas between the disciplines of design and communication, ending up with some considerations for a persuasion toolbox that is intended to help communication professionals and designers effectively design behavior change interventions that fit the messy lives of people in the real world

1. Introduction

In this position paper we put forward our vision for the design of persuasive, interactive technology. Persuasion is currently a hot topic in interaction design. We are involved as co-designers in several ‘persuasive technology’ projects, ranging from designing a mobile app that stimulates outdoor activities for independent living seniors, to the development of smart grid services that help people to match their energy consumption with the available locally generated energy.

This position paper forms part of the first phase of the *Touchpoints* project, a research project in which applied universities, universities and SME partners collaborate to create a ‘persuasive design’ toolbox. This toolbox is intended to provide hands-on design principles to support both designers and communication professionals in developing systems, products and services. One of the goals of the project is to make sure the toolbox is grounded in solid theory from both behavioral/social/cognitive psychology and design research. This position paper aims to support this grounding from the perspective of design and design research.

Our approach builds on both the design traditions of participatory design and embodiment. We attempt to connect these traditions to the existing body of knowledge on persuasion.

The Scandinavian tradition of *participative methods* in the development of information technology has seen a recent revival in *co-design*. Recognizing that a rich understanding of the context of people is essential in developing new products and services. Co-design invites those people into the process that are experts of the context: the users themselves.

Applied to persuasion, participatory design also suggests that in order to technologically mediate a change in a person's behavior in a sustainable way, this person should experience co-ownership of that objective. In order to ensure co-ownership and intrinsic motivation, people that will use a system (product, service or combination of both) need to be involved in the design of that system. Ethically, this also asks for a critical reflection on the idea of persuasion as such: participation in design suggests that the person whose behavior is assumed to be changed should himself be involved in deciding what behavior needs to be changed and in what desired direction.

A second grounding of our project is rooted in theories of *embodiment*, as developed in cognitive science. This theory states that people's behavior is affected not purely by 'cognitive' interactions (such as messages, explanations, knowledge, facts, ideas), but often arises from the ongoing interactive interplay between a person's body and the local environmental structure. Think about what makes you eat that candy bar you see lying on the table, opening the wrapper is hardly ever a conscious, rational choice. For persuasive design this means:

1. A renewed focus of participatory design as a means to tackle behavior change challenges.
2. A renewed focus on how technology can mediate/intervene in ongoing, embodied action, as opposed to designing static, visual information displays.

The purpose of this paper is to help designers and communication professionals in designing for behavior change in the messiness of the real world, acknowledging that timeline, context, other stimuli, other people are an integral part of a person's behavior, and her ability or willingness to change this behavior. This is especially the case if we aim for long-term change. We propose a layered framework of desired aims, designerly approaches and operational means to help structure the persuasion toolbox. With this framework we deliberately focus on 'designing for below the surface', addressing the strategies and tactics to design for hidden, unconscious, parts of people's behavior.

What designers could contribute to behavior change

According to Driver et al. *"Designers can also stimulate the creation of new knowledge by producing artifacts to test ideas and aid understanding (Driver, 2011)"*.

Besides the production of an artefact, designers are used to work within the messy reality and they have been pragmatic in using theory to investigate how users behave in it. Designers deal with 'wicked problems': problems with so many conflicting perspectives of stakeholders that they can not be adequately addressed or modeled by reduction (Rittel, 1973; Zimmerman, 2007). Design researchers are believed to contribute to science through their methods unique to design and design processes in an approach called Research through Design (RtD) which is close to action research (Zimmerman, 2007). Zimmerman et al. argue that especially unanticipated effects of research artifacts embodying "what ought to be" point out gaps in existing theory and models e.g. for behavioral scientists (Zimmerman, 2007). Coming from the field of interaction design, Zimmerman argues that validity is not so much at stake in design research since the creative work of a designer can not be repeated. Relevance however should be at work: "This constitutes a shift from what is true -the focus of behavioral scientists, to what is real- the focus of anthropologists."

Within design research we see two beneficial theoretical domains that can be used in a Research through Design approach to point out gaps in existing theory on changing behavior. Both domains acknowledge the messiness of reality and move beyond cognitive processes. First we will discuss these domains, then we will attempt to

scaffold a framework for persuasive design, utilizing these perspectives. Finally we will discuss opportunities to bridge the gap between communication science and design research.

Theory

Persuasive design

Persuasive design is aimed at changing or transforming behavior users. The field draws from theory rooted in philosophy, psychology and sociology, but also economic theory. Classic theoretical models describe behavioral change in terms of intentions, cognitive information processing and changing attitudes (e.g. Ajzen, 1985; Chaiken, 1980; Petty, 1986). Sheeran indicates that there is a big gap between intentions and behavior (Sheeran, 2002). Contemporary theory thus involves notions on automated behavior, social influences and self-regulation (e.g. Fogg, 2003; Pratkanis, 2007). Two dominant approaches to changing behavior are found in persuasive design. The first approach is called *landscaping* or *pre-persuasion* which is defined by Pratkanis as “Structuring the situation in such a way that the target is likely to be receptive to a given course of action and respond in a desired manner”. In this approach options for behavior are manipulated in terms of prominence, visibility and attractiveness. The second approach is called *self-regulation*, where a user continuously compares and changes own behavior with a norm which is either one's own or a social norm.

Participatory design

For designers, the starting point of the investigation why a state is to be preferred over others, is an appreciation of the richness of a persons life, acknowledging that people go through a path in life, within a context. Both earlier experiences, thoughts about future experiences and their contextual situations (surroundings, other people, shared norms, beliefs, etc) heavily influence the users' experience of a product, service or other design intervention. Design research is heavily influenced by ethnography in that it aims to understand the richness of peoples' lives and utilizing this as a source

of empathy and inspiration (Sleeswijk Visser, 2005). Techniques related to ethnography such as context mapping, customer journeys, touchpoints (service design), stakeholder maps, persona's, probes and prototyping are used to gain a deep understanding and they are already used for persuasive design. Here we will briefly explain a few of the basic concepts.

Contextmapping

Contextmapping (Sleeswijk Visser et al, 2005) is an inductive research method that combines generative techniques (Sanders & Dandavate, 1999) with a grounded theory research approach (Glaser & Strauss, 1967). Contextmapping applies creative assignments such as collage-making to help customers to reflect on their own lives and express themselves, thus allowing them to contribute in a design team as 'experts of their own experiences' (Sanders & Dandavante, 1999). The basic mechanism in a generative technique is to evoke memories and to have people be creative, make designerly artifacts (such as collages, prototypes and models) and subsequently explain their artifacts by means of the stories behind them. The designerly artifacts function as a scaffold to reconstruct experiences, thus allowing participants to relive situations or give shape to their dreams. Through analysis and interpretation, structures, relationships and patterns are identified and developed that give meaning to the results in a specific context.

Personas

Personas are profiles of imaginary prospective users, created out of real user data. Personas are created to enable designers to maintain a rich view of the user while making design decisions. They provide a user-centered common understanding among team members. The basic premise is that designers/engineers cannot design for statistical target groups, so it is better to keep a limited group of individual users in mind. Cooper introduced persona's in the process of designing ICT services. According to Cooper a persona is 'a precise description of our user and what he wishes to accomplish (Cooper, 1999)'. For him, such a description remains task oriented. We mostly adhere to the perspective of Grudin & Pruitt who, at Microsoft introduced rich persona descriptions. According to them, personas are '*Fictional people who have life stories, goals and tasks (2003)*'. Personas are a way to

structure insights from user research by means of a personal narrative. People are better at remembering people, rather than statistics. The objective of a set of personas is to provide a good variation over the population of users, they explicitly do not aim to provide a complete overview.

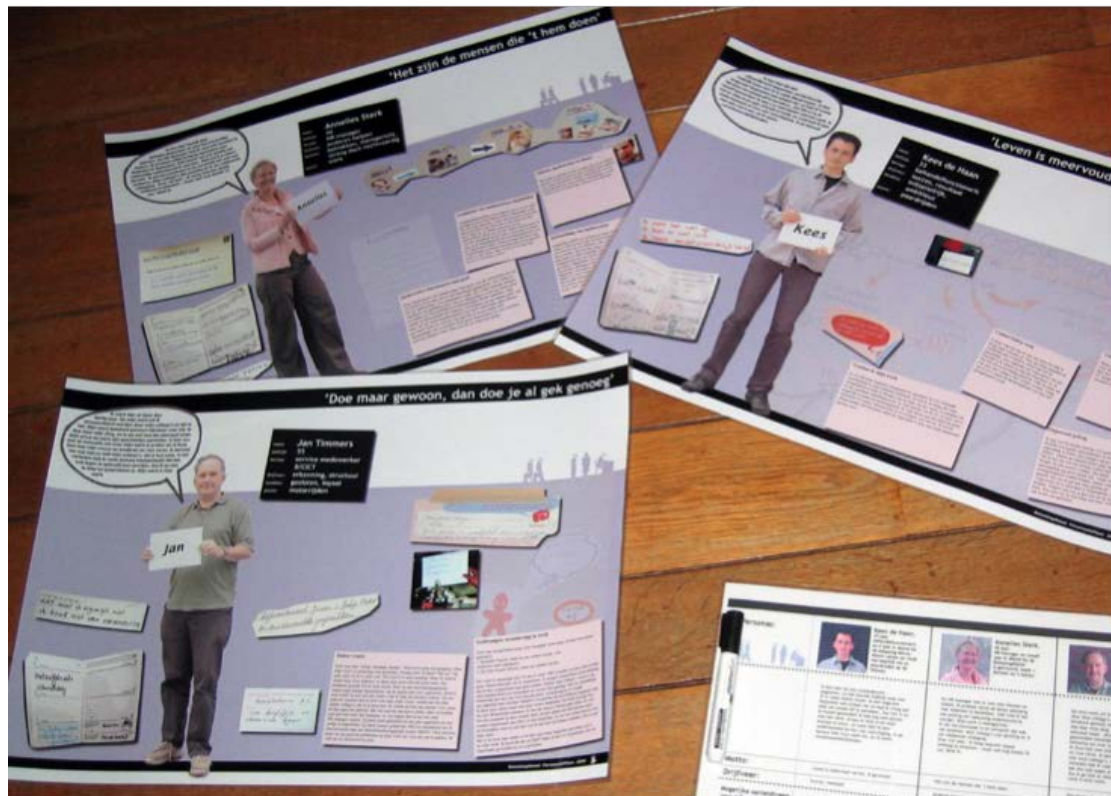


Fig. 1. Personas of workers used for the development of a HR site of a large governmental organisation. The persona's contain general user characteristics, needs, agenda, HR issues, and raw research materials.

Customer journeys

A customer journey is a visual description of the pathway that a user follows through a service or experience. The Customer Journey describes the series of interactions people have with a company via all available channels such as telephone, web, branch, marketing communications and service interactions. *“The Customer Journey concerns itself with what people do and how they feel about those interactions. It can focus on a specific task (say buying a product) or the entire customer lifecycle. (Wright, 2012)”*

Starting well before the user decides to act upon a need, and lasting until well after the service has ended. Typically, customer journeys describe events, considerations,

emotions. Sometimes, on the vertical axis, a scale of level of positive/negative arousal is plotted (see figure 2).

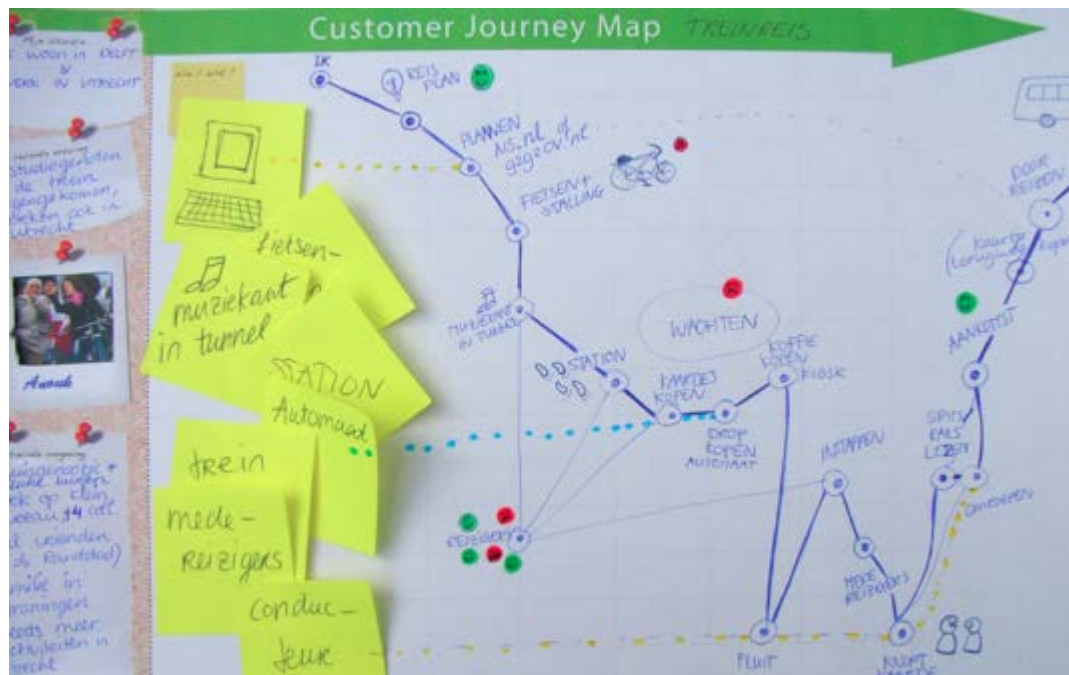


Fig. 2. Customer journey map of a trip by train, filled out by a traveller.

Touchpoints are any moments along the customer journey by which an organization can affect a person's experience, by means of any possible channel, be it a product, a communication leaflet, an app, website, direct contact, etcetera.

The customer journey can be used to describe the experience as it is at present, or the experience how it may be orchestrated through the design of various touchpoints.

Prototyping

Designers make extensive use of prototypes; physical concretizations of design ideas. A prototype is more than a simulation of the design concept. Building a prototype allows for a rapid iteration process. The famous American design agency IDEO carries the slogan 'Fail often to succeed sooner'. By trying out ideas, making them concrete early on in the process, designers power start the learning process. Besides, prototypes function as a scaffold for shared understanding, by being able to relate to a model, different disciplines can connect to a shared vision about the task at hand (van Dijk & van der Lugt, 2013). So, prototypes help to get early user feedback, but also to get a grip on a complex situation. In a recent project, we applied prototyping in a

workshop with engineers, design professionals and elderly users, as a means to collaboratively get a grip on problem and solution space. Boer et al use provocative prototype's to 'fire up' the debate on moral dilemmas and social patterns. They describe provotypes as “*‘types’ that embody tensions surrounding an area of interest, in order to support collaborative analysis of that area and to collaboratively explore design possibilities (2012)*”. They applied working prototype's kn offices as a means to learn about how people deal with shared issues on indoor climate control . Through the presence of the working model, underlying patterns, tensions and convictions of the co-workers became much more explicit.

Participatory design and persuasion

The user-driven approach aims to take the world of the customer as ‘center of the universe’, rather than the world of the organization. User-driven research methods attempt to systematically study the complexity of the consumer context without entering the interaction with pre-formulated hypotheses.

The basic stance of participatory design is that if we change the world of people through design interventions, we better take them along in the process of developing these interventions. For, on the one hand, it is impossible for designers to comprehend the richness of the user world without the user being involved in the process.

Modeling, breaking down complex situations to understandable sub-problems, are elusive. They may help the design process forward, but with each simplification of reality, the design intervention deviates from what fits the real lives of people.

Involving people along the design process will keep the design efforts closely connected to the user perspective and user context.

On the other hand, if we are going to interfere with the world of the user, according to the participatory design mindset, the user has the right to be involved in the design process. Especially with delicate matters like behavior change for health and sustainability, the user has the right to be partner in the development process.

Petterson & Boks (2008) give a comprehensive overview of the ethical aspects of designing for behavior change towards sustainability. Even though there is growing consensus -even among engineers- that solely technological innovation is not going to

lead to sustainable society, the way that engineers approach behavior change is still strongly rooted in technocratic beliefs. Petterson & Boks argue: *“With persuasive and behaviour-steering technologies, the aim is to make individuals behave in accordance with the values and desires of someone else, and, in the case of feedback and persuasion, to convince users into adopting the same goals and values. (p290)”*. Participatory design counters this top-down approach by sharing the responsibility of the intervention with the user. However, just inviting the user in does not suffice. Just like experts are trained in their domains, participatory tools enable users to become ‘experts of their own experiences’. Such generative, or convivial tools (see Sanders & Stappers, 2013) involve among other things, reflective workbooks to enable reflection on experiences and visual materials to help users express themselves fully.

Finally, user participation itself could be an intervention strategy, by being part of the process, people may become more aware of their current and desired behavior, and they may change their behavior accordingly.

Embodiment

The ‘embodied turn’ in HCI and industrial design

With the rise of new fields such as augmented reality, ubiquitous computing, tangible interaction, context-aware- and wearable computing, interaction designers are currently seeking new concepts and theories to give directions for how to elegantly mix physical form and digital process (Hornecker, 2013, Klemmer et al, 2006). The classical division between on the one hand ‘digital forms and processes’ (digital ‘media’) and on the other ‘physical forms and processes’ (industrial products) could no longer explain and give direction to the way present-day interactive products, interactive spaces and interactive body-enhancements integrate with our experience and influence our behavior. Even the mobile phones and tablets, mounted with context-aware information, detecting our bodily movements, can be seen as the first, though modest step, towards the far-reaching futuristic possibilities of ‘embodied interaction’ (Dourish, 2001) currently explored in conceptual design projects and academic research (Hornecker & Buur, 2006; Ishii et al, 2012).

In light of these developments, one of the theories that has recently gained interest by designers is the theory of Embodied Cognition (Dourish, 2001; Klemmer et al; 2006). Embodied Cognition (EC) is a theory of how people think, act and in general make sense of the world (Clark, 1997). EC has therefore been presented as a relevant collection of principles that may inspire interaction design (Dourish, 2001, Klemmer et al, 2006; Hornecker & Buur, 2006)

EC rejects the Cartesian picture of the mind as essentially separated from the body, where the mind is essentially an internal model of the outside world, and thinking is a detached, abstract reasoning on the basis of that internal model, stored in the brain (Clark, 1997). EC also rejects the *modularity* and *sequentiality* of classical models, in which the cognitive process is seen as a stepwise procedure, which starts first with ‘sensory input’, which is then processed internally in distinct mental modules, and which finally leads to an appropriate ‘motor output’: the response (Clark, 1997). EC instead takes the *body-in-action* as a starting point for explaining how people interact with the environment and make sense of it. This body is neither ‘inner’ nor ‘outer’, it is neither ‘input’ nor ‘output’, but somewhere in between. Phenomenologist Merleau-Ponty describes this peculiar status of the body as follows:

“I move external objects with the aid of my body, which takes hold of them in one place and shifts them to another. But my body itself I move directly, I do not find it at one point of objective space and transfer it to another, I have no need to look for it, it is already with me ... The relationships between my decision and my body are, in movement, magic ones.” (Merleau-Ponty, 1962, pp. 107-108)

With the body as a grounding structure, EC portrays cognition and behavior as essentially as a form of *coordination*, achieved through a *self-organizing* network of elements (Clark, 1997; Beer, 2008). This network reaches beyond the brain to include the inner body (e.g. homeostasis), its possibilities for sensing and acting (Clark, 1997) as well as dynamic relations between body and the local physical- and social environment (Beer, 2008). In other words, instead of the classical idea that behavior is driven by internal decision making, on the basis of knowledge and beliefs, the

embodied alternative claims that body, brain *and* the environment together, in interaction, determine what people will do when they find themselves in a particular concrete situation. (See figure 3).

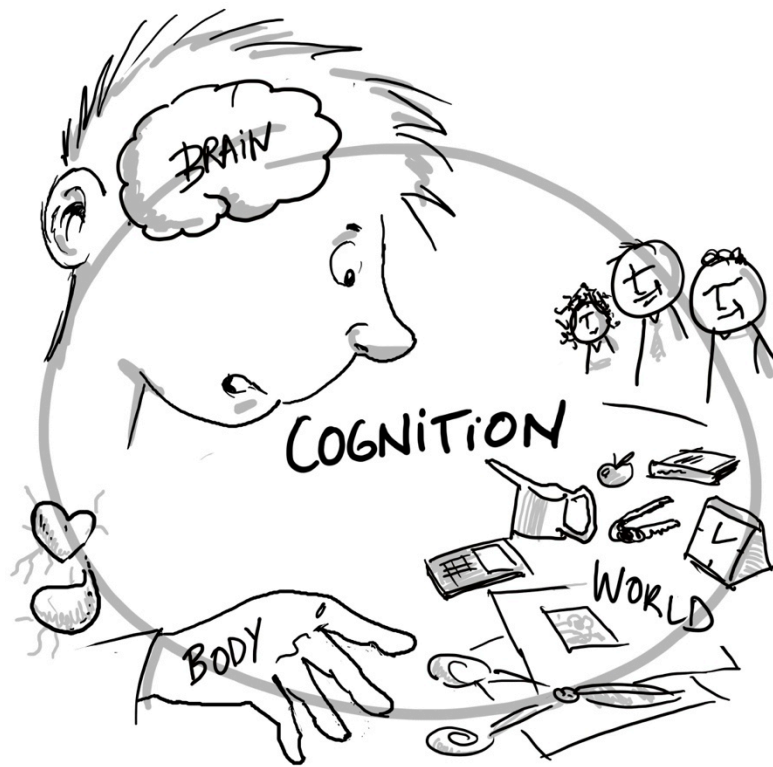


Figure 3. Sketch of the embodied cognition perspective. Cognition is an emergent property of interactions between brain, body and the physical- and social environment.

If cognition is strongly tied to the way the body interacts with the immediate environment, this means that cognition is no longer a detached ‘virtual’ activity, that could in principle be influenced apart from the actual, concrete circumstances in which it is embedded. Rather, cognition is seen as an inherent *aspect* of those practical circumstances. EC is therefore also a theory that turns away from abstraction and revalues concreteness. It argues, therefore, that cognition is part of a “publicly available, collaboratively organised world of artefacts and actions, and secondly, that the significance of artefacts and actions, and the methods by which their significance is conveyed, have an essential relationship to their particular, concrete circumstances. (Suchman, 2007, p. 50).” It is in these concrete circumstances that people’s behavior is determined, which means that it is these

concrete circumstances that we must seek ways to connect our to-be-designed persuasive systems.

Embodied cognition and persuasion

Over and above internal planning and reasoning, also the local environment, our body, its capacity for sensing the environment, and its possibilities for acting in the environment, all directly influence our behavior ‘in situ’, asks us to rethink our design objective. From an embodied cognition perspective, the goal is not so much to provide people with ‘information’, that they can then integrate into their ‘mental model’ and subsequently use to ‘decide’ to act this way or that way in a particular situation. Instead, the goal becomes to find out how an interactive product or service can be ‘taken up’ into the self-organizing network of interacting elements and become part of it, such as to enhance or transform the unfolding coordination process in certain desired ways. Based on this shift in focus, several things can be noted in relation to the idea of persuasion.

From message-passing device to coupling-mediator

First, EC strongly rejects the idea that persuasion operates on the level of ‘message passing’ between the persuasive agent (be it a person, a product or a service, etc) and the to-be-persuaded person. Instead, behavior is guided by the emergence of *couplings* between a person and her environment, and so whatever may ‘persuade’ a person to move into a certain course of action should come from such couplings. Couplings emerge in time, and are therefore subject to temporal dynamics, and in context, and are therefore subject to contextual circumstances. As Don Norman famously showed, no matter how big the print is that says “PULL”, some doors will always remain ‘push-doors’ (Norman, 2002). This fact originates in the way the appearance of the door is linked to the actions of the perceiver *in the act of approaching* the door: While moving ones’ body towards the door, the flow of visual input becomes coupled to the ones own evolving pattern of movements, and in that coupling the perception arises that the door is a push-door, even if mechanically

speaking, it isn't (Gibson, 1979). Norman's doors are one simple example of how perception-action couplings are not the same mechanism as the communication mechanisms that drive on message passing. In this case, they even show that the perception-action coupling, or 'affordance' as Gibson (1979) called it, overrides the message: the word 'PULL' written on the door.

Interact with the body-in-action

Secondly, EC gives the *body-in-action* a central role. This goes beyond the popular position in psychology that behavior can be influenced 'subconsciously', and that large parts of our behavior are indeed determined by the brain, at the subconscious level (Dijksterhuis & Nordgren, 2006). Even though we agree that much of our behavior is shaped and changed at the unconscious level, The popular view still assumes that what is being influenced subconsciously is in the end some internal 'mental' model (sub-conscious beliefs, goals, perceptions, etc), as implemented in the brain. Instead, it is important to stress the fact that EC speaks about ways in which behavior is influenced 'in the situation', which means that behavior can be formed and transformed at the interface between the body and the environment, in the course of action itself. And this 'external' source of behavior is under the influence of locally available structure in the environment. People crucially depend on this locally available structure and they make active use of it, readily detecting and using unexpected opportunities when they arise in context (Kirsh, 2010). Hence, our behavior, to a large extent, is not pre-planned internally, but evolves as a 'situated' improvisation dependent on local contingencies in the current body-environment interaction. To be able to coordinate one's behavior in the continuous interaction with the environment is in that sense essentially a *skill* (Dreyfus, 2002).

Representations as social mediators

Thirdly, EC reinterprets the role of explicit representations such as text-messages, images, procedures, recipes, instructions, orders, advice and suggestions. Instead of viewing these as directly impacting behavior, such external representations are first and foremost seen as designed artifacts themselves that have their particular, mediating role in the self-organizing network that determines a person's behavior.

One important aspect of this mediating role is that it is inherently social: external representations are made by other people, and so incorporating a message, or instruction into ones' embodied cognitive scheme means to engage into (or change, or reaffirm) a certain social relationship with that other. Action, on this view, is strongly 'socially situated': one does not respond so much to an instruction being given, rather than to 'being given an instruction by a particular someone'.

Appropriation in a practice

Finally, Embodied Cognition has stressed that human action is always part of a 'practice' (Lave, 1988). A practice can be seen as a kind of context, that is created by people's activities but in turn helps to shape those activities. It connects both to the social situatedness discussed earlier (people are members of a community of practice, Lave, 1988), as well as the idea of an (embodied) skill: in order to be able to be part of the practice, one has to be trained in the skills that co-define it (Lave, 1988). Of crucial importance to a practice are its tools (including dedicated spaces and organizations of spaces, Agre & Horswill, 1997) that members of the practice share and know-how to use. In a way, knowing how to deal with the tools that belong to the practice partly determines what the practice is. When designing for persuasion, a too strong focus on creating a 'information-communication system' that should 'deliver the right message', so as to change people's behavior, might ignore the way their behavior is already embedded in existing practices. Instead, EC would suggest to view the to-be-designed persuasive system not as a communication system that will tell people what to do (even if subconsciously). Instead, it suggests we see the designed system first and foremost as a *tool*. This tool should come to function in a person's practice, people should be able to become *skilled* at using it, and through acquiring the skill, people should be able to (re)affirm their membership of the community of practice. This change of perspective however means we first must know what kind of existing practice the new system could possible connect to (Wakkary & Maestri, 2007), how the new tool could become *appropriated* into that practice (Dourish, 2001), and in what way the new tool itself will come to transform the existing practice (Hummels, 2012). The philosopher of technology Verbeek argues that the transformational aspect of tools in existing practice implies an

expansion of the the moral responsibility of the designer. Verbeek indicates that designers must use their creativity to explore unforeseen effects of intended use and even foreseen effects of unintended use. “What ought to be” embodied in a tool (or more broadly an artefact) should then be taken one step further to “what might be but we do not want it to be” in the interaction between users and tools or artefact (Verbeek, 2006). The embodied cognition approach again calls for, if not in principle, then at least for many pragmatic reasons, the participatory approach to design we have introduced earlier (Ehn, 2008).

Towards a framework

In her research on how designers could communicate about rich experience information during the design processes. Sleeswijk Visser (2005) derived a three level framework allowing her to connect ‘how to’ type of tools with more abstract and theoretical levels of knowledge addressing ‘for what purpose in the design communication process’. She describes how abstract aims (e.g. ‘enhancing empathy with users’) are operationalised in practice by operational means (e.g. ‘depictions of users’) while incorporating mechanisms (e.g. ‘personification’ as a way to empathize). Additionally Sleeswijk Visser provides guidelines e.g. how users could be best represented to enhance empathy (Sleeswijk Visser, 2009). We see a comparison with our ambition to investigate how designers could work with designing for behavior change in practice.

In a similar fashion we envision to address multiple levels of abstraction in a persuasion design framework. A first attempt can be seen in below (see figure 4). When merging participatory design and embedded cognition, we position three different design aims in order to change behavior.

The intermediary level involves designerly approaches that work towards these aims. On the lowest level we collect the operational means that could be seen as the actual ‘design tools’, tools can work with to actually ‘help shape the world’.

As an example one could think of developing a variation of a provotype that works both for designers and users in a participatory design process (see Boer, 2013). One of the cases we will explore in the TouchPoint project is changing hand hygiene of

health care workers in hospitals. It is hard to change the routine of those professionals and it is hard to measure compliance (Vicky Erasmus, 2010). Vicky Erasmus et al. report ‘One study made a new step in this direction, however, by monitoring the entrance and exit of people from a patient's room and linking this to electronic monitoring of the alcohol-based hand rub dispenser’. After investigating for instance the existing practice and related norms, values and beliefs with people involved in this context and involving patients or their families in the monitoring this may lead to an entire new situation for hygiene in hospitals by restoring the patient as the primary responsible for his or her own health, adding a social dimension to the situation, provoking debate among patients and professionals on multi-resistant bacteria, etc.

in order to change behavior
 participatory design & embedded cognition help to...

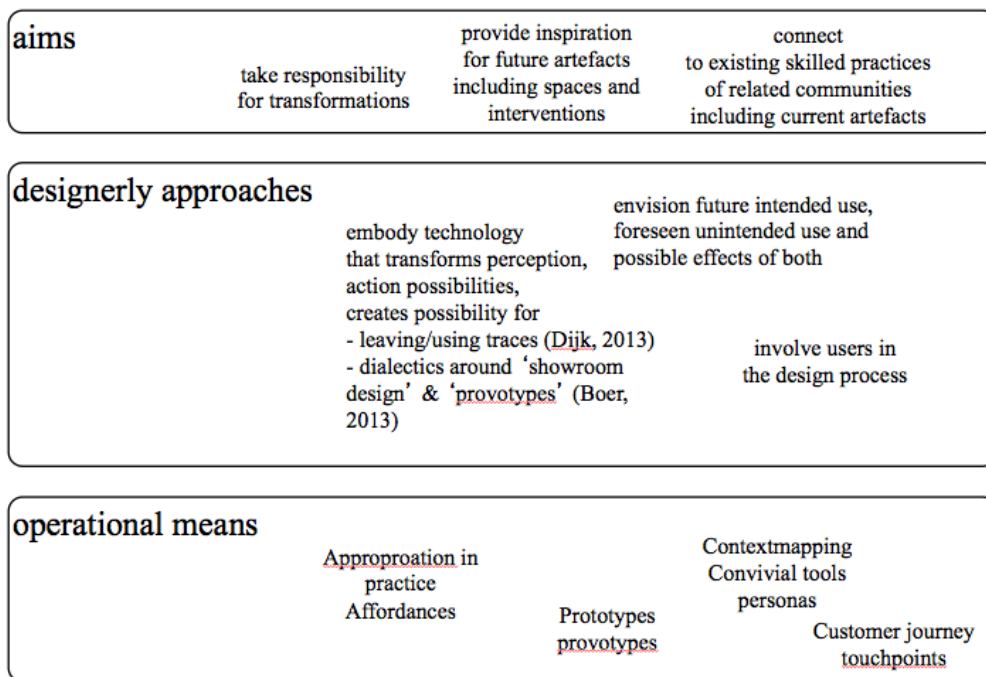


Figure 4 Framework addressing design for behavior change from participatory design and embodied embedded cognition perspective

Current gaps in the framework

Especially in the given example an ethical dimension is at stake that unveils a vast area: to what extent is the set-up satisfying in a moral sense? Is the patient ultimately responsible for his own well being? What does the set-up do from the perspective of

the patient and his family? What about the legality of the set-up? What are foreseen and unforeseen effects of this set-up? The framework needs to be amended driven by design practice. Furthermore the level of ‘design tools’ needs to be added and explored in full detail.

DISCUSSION

How design and communication differ

Traditionally, the idea of persuasion has been investigated and applied within the field of communication, which draws from both social psychology and communication sciences. In this field, the persuasion operates through a process of communication. We have presented our position implicitly as a reaction to a more classical ‘communication-based’ perspective, such as is the tradition in social psychology and communication science. On the danger of over polarization, we listed some typical aspects that contrast the perspectives of the designer and the communication professional in table 1 to contrast what we think is typical of design-based approaches versus communication-based approaches:

designers regard...	communication professionals regard...
what is real and relevant	what is true and valid
wicked problems, future behavior	visible behavior, measurable attitudes
artifacts as representations of theory	models as representations of theory
affordance, scripting, mediation	communication, cues and meaning
interaction	message, content, explanations, knowledge
generative research	qualitative/quantitative empirical research

long term interventions and appropriation of artifacts to one's own life and context	short term interventions like triggers, campaigns
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Table 1: Contrasting design-based views with those of communication professionals

We offer the designer's perspective as a complementary view, that might lead to new sorts of solutions. rather than as a replacement. It is therefore helpful to explore where the two perspectives can be integrated.

Let us start with the idea, already hinted at above, that much of our cognitive processing and decision making proceeds largely unconscious (Dijksterhuis & Nordgren, 2006). Both embodied cognition theory as well as social psychology/communication science take notice of this effect. Theoretically both may differ on how to interpret this phenomenon (are we talking about unconscious communication of information, or does it mean action-selection operates outside of information communication altogether?). In practice, the designer may derive from these theories the same shift in design orientation. That is, instead of focusing on how to translate the *persuasive goal* to a *persuasive message*, that the receiver then consciously perceives and interprets (e.g. the classical billboard by the side of the road), the goal becomes to design a much more subtle intervention that functions to influence a person's behavior at the right moment at the right time in the right contextual setting, even without the person being (completely) aware of this effect. For example, instead of creating a media-campaign with posters at bus-stops to prevent children being injured by fireworks, one may start to think about where children are, physically, when they are prone to using fire-works, how their behavior is embedded in the social context (peers, parents, and so on), and what subtle situated effects leads them to be careless in using fire-works (quick access to dad's cigarette lighter), and so on.

Looking at it this way, immediately invites a design-based –rather than communication-based- approach to persuasion: For example, how could we change the actual design of items of fireworks itself, such that children will treat them more safely? Could we design a new 'fireworks-holder' that helps children to behave with

more caution and attention to what they are doing? Or, perhaps, how could we redesign the physical setting where fireworks are used (create special spots in the street where fireworks can be lit?). Would it help to create workshops at school, where children learn to make fireworks themselves, learning about the risks along the way? Or, how, even, could we start to redesign the culture, and its current habits, within fireworks have their present role, by introducing new rituals or festive artifacts (how to celebrate New Year's eve?). Naturally, finding out about all these questions would mean to get the children in question involved in the process, precisely because it is the subtle details of their lives and activities that is at stake. Note, also, that the goal in all these cases would not be to design a more safe situation per se – that would be the classical perspective of *engineering*. Instead, the goal would be to design a situation in which *children will quite naturally start to behave more safely by themselves*, while the locus of control and responsibility could still be traced back to the person: it is not a matter of simply enforcing or physically constraining action, rather one of eliciting desired behavioral couplings in situ.

Creating common ground

The discussion of subconscious influence is one example where the tradition of communication science and our present position meet. There are a number of other possible overlaps, that together create space for a common ground.

There is 'common ground' where the research traditions could meet.

Both research traditions see the limitations of conducting research in a controlled lab environment. Instead, research seems to be moving towards accepting, and dealing with the 'messy reality out there', without trying to reduce it to abstract experimental settings.

Like design, the communication domain has started to acknowledge that behavioral change involves a process, rather than a one-shot affair. Change happens in time, it 'develops', so to speak, in situ/context and in interaction with other people and artifacts. For communication theories, this would mean to think more about how a series of communication 'moments' forms a pattern over time, and how people may couple their behavior to that pattern, rather than to each of the 'messages' individually.

In service design, this is precisely the idea of ‘touch-points’, where customers are seen to undertake a journey past a number of interaction moments with the service. It is the quality and consistency of the journey that counts, not what happens at each individual interaction instance.

As designing for behavior change in the wild is subject to many unforeseen and uncontrollable events and circumstances, both design and communication rely on process validity to substantiate their work. Communication professionals refer to this as ‘accountability, which provides openness regarding the argumentation for design choices made. In design research this is referred to as ‘design rationale’ and in anthropology as in developing a common understanding in context (Schegloff, 1991; Suchman, 2007).

Rounding up

In closing, we may point out that the integration of both perspectives is already taking place, not so much theoretically rather than in the form of concrete product proposals that can no longer be understood purely in terms of one or the other theory. For example, consider the fact that one can now receive messages on a mobile phone that are specifically tailored to one’s current situation. We can speak about such messages as messages, that is, as bits of information sent to the receiver of the mobile phone medium. However, one can also see the mobile phone and the appearing message, and the way it intervenes at that moment in that situation in that context in a person’s activities, as an aspect of the external environment that may come to be integrating within a person’s coupling loop, and thereby have its persuading influence. Given these new technological developments, we thus feel the urgency of augmenting the standard communication model with the embodied and situated notions presented so far, so as to be able to make better sense of the way such new tools and systems could work for us.

Further work, towards a toolbox

To conclude, we will share some first thoughts on new tools for persuasive design to share how a combined embodiment and participatory design perspective could work in practice. We envision two sorts of tools: tools that are used by designers during their design activities and ‘tools’ in the sense of artifacts that transform users’ life in context.

It makes sense to approach our own toolbox from an EC perspective as well. Bongers states ‘... the use of a tool depends on how it can alter the capabilities for action given a user and the user’s surroundings. Tool use is embodied and also embedded in the environment, which again implies that it does not solely depend on the emergence of new cognitive abilities’ (Bongers, 2001). If we want to develop a persuasion toolbox for designers we have to take into account how designers currently use ‘design tools’ in their design processes especially when the purpose is to change behavior.

Finally, we would like to state the ‘golden rule of persuasion that will be engraved in the toolkit: “*the creators of a persuasive technology should never seek to persuade a person or persons of something they themselves would not consent to be persuaded to do (Berdichevsky and Neuenschwander, 1999)*”

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