



MORGAN & CLAYPOOL PUBLISHERS

Experience Design

Technology for All the Right Reasons

Marc Hassenzahl

*SYNTHESIS LECTURES ON
HUMAN-CENTERED INFORMATICS*

John M. Carroll, *Series Editor*

Experience Design

Technology for All the Right Reasons

Copyright © 2010 by Morgan & Claypool

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopy, recording, or any other except for brief quotations in printed reviews, without the prior permission of the publisher.

Experience Design: Technology for All the Right Reasons

Marc Hassenzahl

www.morganclaypool.com

ISBN: 9781608450473 paperback

ISBN: 9781608450480 ebook

DOI 10.2200/S00261ED1V01Y201003HCI008

A Publication in the Morgan & Claypool Publishers series

SYNTHESIS LECTURES ON HUMAN-CENTERED INFORMATICS

Lecture #8

Series Editor: John M. Carroll, *Penn State University*

Series ISSN

Synthesis Lectures on Human-Centered Informatics

Print 1946-7680 Electronic 1946-7699

Synthesis Lectures on Human-Centered Informatics

Editor

John M. Carroll, *Penn State University*

Human-Centered Informatics (HCI) is the intersection of the cultural, the social, the cognitive, and the aesthetic with computing and information technology. It encompasses a huge range of issues, theories, technologies, designs, tools, environments and human experiences in knowledge work, recreation and leisure activity, teaching and learning, and the potpourri of everyday life. The series will publish state-of-the-art syntheses, case studies, and tutorials in key areas. It will share the focus of leading international conferences in HCI.

Experience Design: Technology for All the Right Reasons

Marc Hassenzahl

2010

Designing and Evaluating Usable Technology in Industrial Research: Three Case Studies

Clare-Marie Karat and John Karat

2010

Interacting with Information

Ann Blandford and Simon Attfield

2010

Designing for User Engagement: Aesthetic and Attractive User Interfaces

Alistair Sutcliffe

2009

Context-Aware Mobile Computing: Affordances of Space, Social Awareness, and Social Influence

Geri Gay

2009

Studies of Work and the Workplace in HCI: Concepts and Techniques

Graham Button and Wes Sharrock

2009

Semiotic Engineering Methods for Scientific Research in HCI

Clarisse Sieckenius de Souza and Carla Faria Leitão

2009

Common Ground in Electronically Mediated Conversation

Andrew Monk

2008

Experience Design

Technology for All the Right Reasons

Marc Hassenzahl
Folkwang University, Essen, Germany

SYNTHESIS LECTURES ON HUMAN-CENTERED INFORMATICS #8



MORGAN & CLAYPOOL PUBLISHERS

ABSTRACT

In his *In the blink of an eye*, Walter Murch, the Oscar-awarded editor of the *English Patient*, *Apocalypse Now*, and many other outstanding movies, devises the *Rule of Six*—six criteria for what makes a good cut. On top of his list is "*to be true to the emotion of the moment*," a quality more important than advancing the story or being rhythmically interesting. The cut has to deliver a meaningful, compelling, and emotion-rich "experience" to the audience. Because, "what they finally remember is not the editing, not the camerawork, not the performances, not even the story—it's how they felt."

Technology for all the right reasons applies this insight to the design of interactive products and technologies—the domain of Human-Computer Interaction, Usability Engineering, and Interaction Design. It takes an experiential approach, putting experience before functionality and leaving behind oversimplified calls for ease, efficiency, and automation or shallow beautification. Instead, it explores what really matters to humans and what it needs to make technology more meaningful.

The book clarifies what experience is, and highlights five crucial aspects and their implications for the design of interactive products. It provides reasons why we should bother with an experiential approach, and presents a detailed working model of experience useful for practitioners and academics alike. It closes with the particular challenges of an experiential approach for design. The book presents its view as a comprehensive, yet entertaining blend of scientific findings, design examples, and personal anecdotes.

KEYWORDS

interaction design, user experience, experience design, user-centered design, human-computer interaction, emotion, affect

Contents

	Preface	ix
1	Follow me!	1
1.1	A First Glance on Experience	3
1.2	A Note on the Uniqueness and Irreducibility of Experience	4
1.3	Experience from a Design Perspective	5
1.4	Experience as Emergent, yet Shapeable	6
1.5	Essence of the Chapter	8
2	Crucial Properties of Experience	9
2.1	Subjective (Versus Objective)	9
2.2	Holistic (Versus Instrumental)	11
2.3	Situated (Versus Abstract)	16
2.4	Dynamic (Versus Static)	19
2.5	And Finally, Positive (aka Worthwhile)	27
2.6	Essence of the Chapter	29
3	Three Good Reasons to Consider Experience	33
3.1	Experiences are Self-Defining	33
3.2	Experiences Make us Happier	35
3.3	Experiences Motivate	38
3.4	The Essence of the Chapter	40
4	A Model of Experience	41
4.1	Motives and Action	43
4.2	Categories of Needs Equals Categories of Experiences	45
4.3	From Needs to Products	49

4.4	Pragmatic Versus Hedonic: What is More Important?	52
4.5	Do Needs Have Different Priorities?	55
4.6	A Brief Note on Evaluation	56
4.7	The Essence of the Chapter	57
5	Reflections on Experience Design	59
5.1	Our <i>Menschenbild</i>	59
5.2	Normative Powers of Design	62
5.3	Experience Before Product	63
5.4	Bridging the Gap Between Experiences, Needs, and Products	69
5.5	Theory-Inspired Design	73
5.6	The Essence of the Chapter	75
	Bibliography	77
	Author's Biography	85

Preface

“Für die Große und die zwei Kleinen”

Writing this book was a pleasure. My regular papers are wedged into the conventions of academic writing, often riddled with too many numbers. This small book allowed for a more generous mixture of facts, thoughts, opinions and anecdotes—and I am grateful to Jack Carroll and Diane Cerra from Morgan Claypool for providing this opportunity. In the process of writing, a (not at all anonymous) reviewer voiced “a slight worry [...] that [my] easy style may undermine the traditional hard-talk way of serious academic work.” I sincerely hope so. Academic work needs to follow rules of good practice, but we should not confuse rigor with tediousness or objectivity with lack of personality. Academics are still “human after all”—to quote Daft Punk. And beyond the barren scientific facts that academics produce, they have a life, an upbringing, a cultural context they inhabit, with opinions and passions. This book provides a glimpse on mine.

I am indebted to all friends, colleagues, students and my family (Do not expect name-dropping here). They all provided the input necessary to write this book. Thank you!

Marc Hassenzahl
February 2010

CHAPTER 1

Follow me!

The Kolonel Begaultlaan in Leuven, Belgium, is a straight, dull road, running parallel to a canal. Just across is *Stella Artois*—a huge industrial complex, where one of the most internationally successful lagers is brewed. Number 15, Kolonel Begaultlaan, is a building as non-descript as the road. After entering and climbing some stairs, you will find yourself in a low-ceilinged hallway leading to a room that resembles a multi-story car park. In one corner, a wall opens to a passage. The passage is painted black. Large candles show the way. Behind a wooden door at the end of the passage is *Luzine*, the restaurant of Joeren Meus, a Belgian cook with his own TV show—some call him the Jamie Oliver of Flanders. *Luzine* presents itself in the *Boudoir* style: luscious, decadent, grey, black, gold, and subdued lights. On the occasion I went there, the food was marvelous, my company was splendid, and the whole evening was a true success. However, what especially struck me and what I kept in mind, was the stark contrast between the actual interior of the restaurant and its environment.

Luzine was an experience. It was an episode, a chunk of time that I went through and I am going to remember. It was sights and sounds, feelings and thoughts, motives and actions, all closely knitted together and stored in memory, labeled, relived and communicated to others. Experiencing is the stream of feelings and thoughts we have while being conscious—a continuous commentary on the current state of affairs. Forlizzi and Battarbee (2004, p. 263) describe it as a “constant stream of self-talk” and are careful to distinguish *experiencing* from *an experience*. The latter is something with a beginning and end; it is something that can be named, whereas the former describes an ever-present stream.

While I am writing this passage, I feel excited and expectant. I am about to write a book! At the same time, frustration mounts, given the difficulty to find the appropriate words and expressions; it is made even more difficult by a nagging and distracting thought about a birthday present I have to find—“something with a princess, Daddy”—to bring to kindergarten before(!) my six year old daughter is darting-off empty-handed to her friend’s birthday party. I am *experiencing*, and I can willingly make at least a part of it conscious and verbal (Kahneman, D., 1999, p. 7). In retrospect, writing the book will become *an experience*, that is, particular actions, feelings, thoughts tied to a particular place and time. Eating at *Luzine* was an experience, but the moment I entered the restaurant, I was struck by the surprising contrast between exterior and interior, or the moment I tasted the little fleck of cucumber sorbet, I was amazed by the incongruent feeling of salty ice cream I was experiencing.

Things—technology in its widest sense—made the *Luzine* experience possible: furniture, wallpaper, lights, all carefully designed and combined to create a particular atmosphere; a fully equipped professional kitchen set to prepare the delicious food; telephones to make the reservations

and to order the chicken, vegetables, chocolates, and wines; in addition, credit cards to make sure that the restaurant will not cease to exist. Interestingly, we rarely think of the technology behind all of this.

It is the same with interactive products. In a recent study, we asked people to share a positive personal experience with technology (Hassenzahl et al., 2009). A young woman wrote, “I was on a short trip to Dublin. In the early hours, my mobile phone woke me up. My boyfriend, who stayed at home, had just texted a sweet ‘I love you’.” This episode is not about a mobile phone. It is all about feeling related to others, feeling loved and cared about. It is about her annoyance and disorientation, being woken so early, and how these feelings turn into something warm. The mobile phone itself is only important insofar that it allows for this episode; it mediates and shapes the experience.

One may argue that without the mobile phone, this young woman would never have had this experience. This is at the same time true and not true. She would not have had this *particular* experience, but the couple would have found other ways to feel related over the distance. He would have given her a piece of jewelry, maybe a ring, before the journey, and she would have made a vow to touch the ring every morning at 8 o’clock sharp and think of him. In return, he would have promised to do the same. The product itself, mobile phone or ring, is only interesting because it mediates a personally meaningful experience. Without their love, and the couple’s seemingly necessary but painful separation, touching rings or writing sweet texts is senseless. In other words, the actual product has no value beyond the experiences it allowed for became inevitably attached. Yet, through shaping what we feel, think and do, it has the power to create particular experiences. With the ring, embedded in the agreed upon ritual, the lovers have no chance to surprise each other. Their bond is rather the consequence of a moment in time, dedicated to each other, and the very idea of being “in sync.” In contrast, the mobile phone allows for surprising the partner, it allows for instantaneous emotional expression. Here the bond is created through the receiver’s knowledge, that—most likely—the sender just experienced what he wrote: “I love you and I can’t hold it back.” Both experiences get their meaning through a need to feel close to other people. The products in themselves are only instrumental to this. Nevertheless, they create qualitatively different experiences, which can be more or less appropriate and enjoyable.

This book is about *User Experience* (UX), Human-Computer Interaction’s (HCI) version of experience (see Hassenzahl and Tractinsky, 2006 for an overview)—experience that comes about through the use of (interactive) products. Note, however, that I do not believe the phenomenon of User Experience and its underlying principles to be very different from experience in general. Experience becomes *User Experience* by focusing on a particular mediator of experiences—namely interactive products—and the according emerging experiences. Be it services, products, events or other people—to distinguish the emerging experiences is only important insofar as each source offers different ways to create and shape experiences. From a designer’s perspective, the distinction is worthwhile, from a recipient’s, consumer’s, or user’s perspective, experience remains experience, no matter whether mediated by an object, a service, or other people. The experience approach to designing interactive products, thus, starts from the assumption that if we want to design for

experience, we have to put them first, that is, before the products. Without a clear understanding of experience, the interactive products we design will never be able to properly shape experiences, let alone, to create novel experiences.

I close this chapter with further clarifying experience. In Chapter 2, I discuss the key aspects of experience and its implications for the design and evaluation of products. Chapter 3 will expand on reasons why we should bother with an experiential approach to interactive products. Chapter 4 presents a high-level model of experience and Chapter 5 takes a specific design perspective.

1.1 A FIRST GLANCE ON EXPERIENCE

In a seminal paper on emotions, James Russell (2003) advances the idea that emotional experience is the consequence of self-perception and categorization, a *construction*. In other words, if you find yourself being negatively aroused and running away from a bear, you may—unconsciously—integrate all this into a coherent experience of fear. Russell actually calls it emotional *meta*-experience because all its components produce low-level experiences in themselves—the felt arousal, the felt valence, the sensation of running, the smell of the bear and so forth—but a process on top, a *meta process*, creates a coherent whole. As Russell (2003, p. 165) puts it: "Emotional meta-experience is the construction of a coherent narrative, interpreting, packaging, and labeling the episode—thereby integrating this episode with general knowledge."

In the context of interactive products, we may use the same basic notion of experience as an emergent story, packaged, labeled, and integrated into our general knowledge of the world. But from what does experience emerge? What are the elements and underlying processes?

John McCarthy and Peter Wright (2004) offer the "emotional" as one of their four "threads of experience." Referring to John Dewey, an American Philosopher of the last century, McCarthy and Wright note that "emotions are qualities of particular experiences" (p. 83). To me, it is beyond question that emotion is at the centre of experience. The most compelling argument for this is the observation that emotion, cognition, motivation, and action are inextricably intertwined. Antonio Damasio (1994) made a persuasive case by exposing the consequences of physical severances, through accidents and so forth, of the affective and the cognitive system in the brain. Learning, decision-making and many other higher order intellectual functions crucially depend on emotion. Damasio (1994), for example, wrote about Elliot, one of his patients. Elliot suffered from a brain tumor. Upon removal of the tumor, damage was done to the physiological structures, which connect the cognitive with the affective. Elliot's intelligence and memory remained intact after the operation; however, he was suddenly unable to even make the simplest decisions. With the heritage of the Cartesian separation of body and mind and the longstanding dismissal of emotions as lowly, savage, and uncivilized, the central role of emotion *in* cognition was surprising, leading to a resurgence of the interest in emotions in itself and their function.

Emotion is further closely linked to action and motivation (e.g., Carver & Scheier, 1989), two aspects not explicitly addressed by McCarthy and Wright's thread account. However, it permeates their discussion of the emotional thread when they point out that emotions are best viewed from

the perspective of our goals (p. 84). This implies motivated action. Note that this is neither novel nor controversial (see Ortony et al., 1988, for an example), but nevertheless important.

All in all, the underlying elements and processes boil down to what Kees Overbeeke and colleagues (2002, p. 9) dubbed the "wholly trinity": perceptual-motor, cognitive and emotional skills. In other words, experience emerges from the intertwined works of perception, action, motivation, emotion, and cognition in dialogue with the world (place, time, people, and objects). It is crucial to view experience as the consequence of the interplay of many different systems. Russell's (2003) suggested meta-process, for example, does this. It easily integrates physiological processes (e.g., arousal), affective evaluation (e.g., valence), cognitive processes (e.g., attribution), and behavior (e.g., flight). While many processes together produce experience, emotion is at its heart and has an accentuated position. One may go as far as saying that emotion is the very language of experience.

1.2 A NOTE ON THE UNIQUENESS AND IRREDUCIBILITY OF EXPERIENCE

In their book *Technology as Experience*, McCarthy and Wright (2004) stress the *uniqueness* and *irreducibility* of experience. They argue that while we can certainly focus our analysis on certain aspects, such as the spatio-temporal structure of an experience, we must be careful to not *reduce* the experience to this aspect. By doing so, it will inevitably lose its very essence. Based on this, they argue for an approach, which describes single instances of experiences instead of modeling classes of experiences—the latter certainly a reduction of experiences to their common core. And they eschew attempts to understand experience as reducible to, predictable or explainable by their underlying processes and elements.

Interestingly, Russell's (2003) notion of experience as a meta-process allows for both, the focused analysis of single elements or processes and the notion of experience emerging as a unique, irreducible whole from the configuration of these elements. The difference is important, given the—from my perspective—odd debates in Human-Computer Interaction, repeatedly fuelled by papers, such as Kirsten Boehner and colleagues' (2007) piece on emotions. Emotions, they argue, are cultural constructions, different from and irreducible to physiological processes. True, however, it is not a question of either culture *or* physiology. Emotional experiences are both. They emerge fully-fledged as a narrative, how Russell puts it, heavily colored by our knowledge of the world. Nevertheless, they do not emerge from thin air. They are attempts to make sense of ourselves, our bodily reactions, our behavior, other people's behavior and so forth. It is just a matter of complexity, the sheer amount of single aspects which are integrated into an experience, which let it appear so unique and irreducible. Without culture, emotions would not have the quality they have, but without our bodies, we would not have emotions at all. Again, it is not a question of either physiology *or* culture, it is to understand that emotions emerge by drawing upon, and actually "meta-processing" many different elements and sub processes. As emergent entities, emotions, such as experiences in general, may not be fully explainable and predictable from single underlying elements, but they are not detached from them.

1.3 EXPERIENCE FROM A DESIGN PERSPECTIVE

From a design perspective—and I understand Human-Computer Interaction as a discipline primarily concerned with the making of things—understanding experience as emerging, but emerging from something, is important. Because although we aim at designing an experience, we still have to manipulate single elements to craft the experience. Consider Johannes Vermeer's famous *Girl with a Pearl Earring* (see Figure 1.1).



Figure 1.1: Johannes Vermeer, 1632-1675, *Girl with a pearl earring*, c. 1665, Canvas, 44,5 x 39 cm, The Hague, Mauritshuis.

As a whole, this picture creates a strong impression. Especially, the sense of intimacy seemed to have inspired writers and filmmakers to embellish further on the relationship between the painter and his model. The intimacy is an emergent story, an experience; however, a good part of technique creates it. Johann Vermeer is often dubbed the “Master of Light,” and his use of light and shadow adds immensely to the experience of intimacy. The website of the *Mauritshuis* (www.mauritshuis.nl).

n1), the Royal Picture Gallery in Den Haag housing the picture, explains: “[...] important [...] are Vermeer’s fresh colors, virtuoso technique and subtle rendering of light effects. The turban is enlivened, for example, with the small highlights that are Vermeer’s trademark. The pearl, too, is very special, consisting of little more than two brushstrokes: a bright accent at its upper left and the soft reflection of the white collar on its underside.” The careful crafting of light, shadow, colors, pose, and so forth, is an important ingredient to the experience. Or remember my *Luzine* experience: The contrast between exterior and interior, which seems to have played a crucial role, did not happen by accident. The chef and his interior designer created it deliberately through selecting the place and deciding on a particular way to decorate the restaurant.

Although one might try hard as a designer, an experience cannot be guaranteed. There are definitely people out there who do not relate in any way to Vermeer and his paintings. Similarly, others may not have been as surprised by *Luzine* as me. Experience emerges from a variety of aspects, many of them beyond the control of the designer. However, to design an experience should not be rendered as futile. Although a particular experience cannot be guaranteed, it can be made more likely by applying some of the already available knowledge (in part, presented within this book) to design and by further, design-oriented research.

Naturally, a design perspective on experience focuses on what can be deliberately created. Let me note, however, that some outstanding experiences may even come about without careful crafting. The beauty and fascination of an abandoned industrial complex, such as the *Zollverein Coalmine* in the north of Essen (see Figure 1.2), declared UNESCO world heritage site since 2001, was not created deliberately.

The site was a coalmine, its abandonment a necessity and not an intentional attempt to create a particular experience. As the website of *Zollverein* notes (www.zollverein.de): “Zollverein [...] fell victim to the crisis in the coal and steel industries. Despite all the rationalization measures introduced to reduce costs, the largest colliery in the Ruhr Area was unable to compete with coal mines abroad. On the 23rd December 1986 the last shift was hauled to the surface after 135 years of mining operations. The last remaining colliery in Essen had closed forever. [...] An era had come to an end.” As colliery *Zollverein* died, but it made room for the fascinating and extraordinary experience of an abandoned industrial complex, often hailed as “the most beautiful colliery in the world.”

1.4 EXPERIENCE AS EMERGENT, YET SHAPEABLE

It is useful to understand experience as both unique but at the same time emerging from distinct elements and processes which are open to study and deliberate manipulation in an act of design. One may dismiss this discussion as academic; however, for the present book, the notion of experience as an emergent quality, which is neither entirely reducible to its underlying elements and processes nor fully explainable by them, but which can be nevertheless shaped through careful crafting of elements is key. The latter is the essence of designing. Not living up to resulting challenges will render the concept of experience for Human-Computer Interaction. An account of experience,



Figure 1.2: *Zeche Zollverein*, Essen, Germany.

which rejects the possibility to create and alter experiences through the manipulation of underlying elements in favor of emphasizing its uniqueness and unity, may turn out a dead end for design (see Mathiasen and Bødker, 2008 for an application of McCarthy and Wright's framework, which asks the right questions but fails to inform design).

1.5 ESSENCE OF THE CHAPTER

An experience is an episode, a chunk of time that one went through—with sights and sounds, feelings and thoughts, motives and actions; they are closely knitted together, stored in memory, labeled, relived and communicated to others. An experience is a story, emerging from the dialogue of a person with her or his world through action. *User Experience* is not much different from experience *per se*. It simply focuses our interest on *interactive products* (as opposed to, for example, other people) as creators, facilitators and mediators of experience. Although interactive products are not considered as experience in themselves, through their power to shape what we feel, think, and do, they will inevitably influence our experience.

The experiential approach to designing interactive products explores ways to create and shape experiences through products. This implies that although the emergence of a particular experience can never be guaranteed, it can be made more likely by applying some of the already available knowledge about experience (in part, presented within this book) to the design of interactive products.

CHAPTER 2

Crucial Properties of Experience

Having laid out my notion of experience, in general, I will now turn to a discussion of the key properties of experience, its *subjective*, *holistic*, *situated*, and *dynamic* nature.

2.1 SUBJECTIVE (VERSUS OBJECTIVE)

With its conceptual origins in cognitive psychology, work psychology, human factors, and engineering, Human-Computer Interaction (HCI) long took pride in being an “objective” approach. HCI feels more comfortable to base recommendations on observation rather than mere user opinions. The hallmark of practical HCI methods, *Usability Testing* (e.g., [Rubin, J., 1994](#)), for example, rests primarily on observation (or even time measurement) while participants interact with a product. Other popular methods, such as eye-tracking in the context of the web, aim at the same—to replace opinion with behavior.

In contrast, experience is subjective. It emerges through situations, objects, people, their interrelationships, and their relationship to the experientor, but it is created and remains in her or his head. Given that, it may not matter how good a product is objectively, its quality must also be experienced to have impact.

By that, the question of how objective quality translates into experienced (subjective) quality becomes of interest. In their extensive meta-analysis of usability measures, Kaspar Hornbæk and Effie Law (2007) came across a proportion of published papers, which took an objective performance measure and at the same time explicitly asked about its subjective experience. For example, those studies measured task completion times and let participants answer questionnaire items such as “rate your satisfaction with task completion time” and “how quickly did the system let you finish your tasks.” [Hornbæk and Law \(2007\)](#) concluded “for studies that collect both [objective and subjective] measures of the same phenomenon, we find negligible correlations [between them]” (p. 625). Whether participants were more or less efficient did not register as experience. Similarly, in a widely recognized study of the relationship between beauty and usability in automated teller machines (ATM), Noam Tractinsky and colleagues (2000) noted “[h]owever, most surprising is the fact that post-experimental perceptions of system usability were affected by the interface’s aesthetics and not by the actual [objective] usability of the system” (p. 140).

This is neither astonishing nor should it trouble us much. Human judgment follows particular rules. Tractinsky and colleagues, for example, manipulated usability by increasing system response time, removing shortcuts, and including buttons that did not operate when first pressed. This resulted in task completion times extended by 14 seconds on average. However, the study used a so-called

between-subjects design, that is, participants used *either* the normal or the decreased usability version of the ATM. In this study design, participants lack a concrete standard of comparison, a reference point to become aware of the potential 14 seconds delay. Imagine a study, where each participant would have used both versions of the ATM (a so-called within-subjects design). The likelihood of becoming aware of the difference increases sharply, and by that, the likelihood that the experience reflects the given objective difference.

Standards of comparison or reference points lie at the heart of understanding human judgment. A well-known judgmental heuristics, *anchoring and adjustment*, is a good example of this. Amos Tversky and Nobel laureate Daniel Kahneman (1974) argued that people make their judgments by—often insufficiently—adjusting an initial value, an anchor. In one study, participants were asked to judge percentages, such as the percentage of African countries in the United Nations. Before doing so, the experimenter spun a wheel of fortune, resulting in a number between 0 and 100. The participants were instructed to first decide whether the wanted percentage is greater or smaller than this random number and, second, to estimate the actual percentage. The arbitrary number had a profound effect on the estimate. Participants, who saw a 10 as initial value estimated 25% on average, whereas people, who saw a 65, estimated 45%. The arbitrary number was used as anchor, and the actual estimate was only insufficiently adjusted.

Anchoring and adjustment is a heuristic, a judgmental shortcut, able to explain an apparent gap between an objective value and its subjective estimation. The crucial point is that the mismatch follows a rule. It is not a random error but a systematic bias based on an underlying judgmental strategy, which, in turn, grounds on the way humans process and integrate information. In other words, whether 23.5 or 37.5 seconds for operating an ATM are experienced as efficient or not, depends on the reference point. If no reference point is provided, people may use whatever they can come up with, because without comparison, they simply cannot judge. If a reference point is provided explicitly, for example, by confronting participants with different versions of a product, the difference becomes much more likely to be experienced, that is, to have an impact on subsequent judgments.

The example of numerical estimates as given above invites the critique of being “unexperiential,” because it describes a process considered to be cool and cognitive in nature. However, further developments and according theories, such as *Norm Theory* (Kahneman and Miller, 2002), are able to shed light on some very common, pervasive and emotional experiences—better: “experience patterns.” Have you ever wondered why a near miss is worse than missing by a mile? Imagine yourself, a business traveler, after a week of hard work, being booked on the last flight home. You are running 30 minutes late, and upon arrival at the airport, you learn that the plane left on schedule. You missed it; another night at an anonymous hotel and a lost Saturday lies ahead. Compare your feelings in that situation to its following slight variation. You are still running 30 minutes late, but upon arrival at the airport, you learn that the plane was delayed as well—28 minutes to be exact. In fact, the gate just closed shortly before your arrival, and no begging and bribing can change this. The consequences in both scenarios are the same: another night at the hotel and a lost Saturday. However, the

near miss feels substantially worse. *Norm Theory* explains this by counterfactual thinking, which is essentially a comparison process. To determine how to feel about something, people compare reality to a salient possible alternative (a fantasy). The near miss makes the alternative of having caught the plane salient. We then start to contemplate about the “what if” rather than accepting the fact.

This mechanism explains a number of puzzling findings. In an analysis of the emotional reactions of bronze and silver medalists at the 1992 Summer Olympics, Victoria Medvec and colleagues (1995), for example, found bronze medalists to be happier than silver medalists. This is explained by the fact that the most compelling alternative for the bronze medalist is finishing without a medal (a *downward* counterfactual; the fantasized alternative is worse than reality), whereas the most compelling alternative for the silver medalist is winning gold (an *upward* counterfactual; the fantasized alternative is better than reality). The former boosts satisfaction with the outcome, the latter subdues it; hence, the difference in experience.

HCI tends to dismiss the subjective. A lack of correspondence between an objective condition and its experience is often understood as an error—on the behalf of the experience. The examples of the wheel of fortune, the missed plane, and the Olympic medals, demonstrate traceable processes, which transform the objective into the subjective. As long as experience is our design goal, the task at hand is clear: to better understand and to consider these transformation rules while designing and in evaluation. The same objective condition may lead to different experiences. A performance measure, such as task completion time, may not predict directly, that is, without transformation, the experience of efficiency. At the same time, by knowing the rules, we may shape experiences. From studies of waiting time in service queues, for example, it is known that occupied time is perceived as shorter than unoccupied time. Peter Jones and Emma Peppiat (1996), for example, found experienced waiting time to generally overshoot actual waiting time by 36%. However, the effect was smaller, that is, the wait felt shorter and was closer to “reality,” given a running television set was present as a distractor. Thus, by applying known transformation rules, we can shape experiences. Unearthing those rules will be an important future objective for any research-oriented, experiential approach to HCI. Note, however, that experience remains an emergent, that is, it might be shaped but never fully explained and predicted by objective conditions and transformation rules.

2.2 HOLISTIC (VERSUS INSTRUMENTAL)

I understand HCI as goal-directed action mediated by an interactive product. Many action theories agree upon the notion of a hierarchical organization of goals (see Carver and Scheier, 1989, p. 67). Figure 2.1 presents a simplified three level goal hierarchy, similar to what, for example, *Activity Theory* suggests (e.g., Kaptelinin and Nardi, 2006). The model relates the actor’s self to the world through activity.

On the middle level are *do-goals*. A do-goal is a concrete outcome, an actor wants to attain, such as “making a telephone call” or “watching a movie.” Do-goals exist to a good part outside of technology, but are not fully independent. “Making a telephone call” can be achieved through many different phones, *Skype*, and so forth; “watching a movie” can be achieved through a TV set, a cinema, a

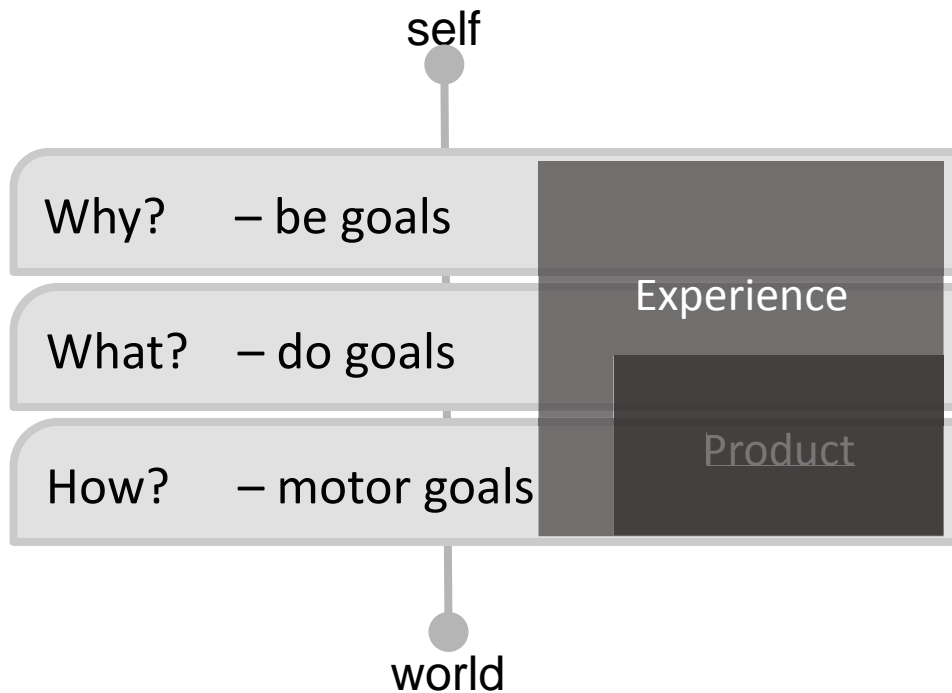


Figure 2.1: A three level hierarchy of goals.

PlayStation Portable, or a laptop. However, without the invention of technology-mediated communication in itself—and I would already understand two tins connected by a string as technology—the very goal would not exist at all, hence the do-goal in itself is at least *born* out of a general technology.

On the lowest level of the hierarchy are *motor-goals*. “Making a telephone call” can be decomposed into sub-goals down to pressing buttons and reading single letters from a display. Traditionally, designing interaction is understood as designing the structure below the do-goal, that is, arranging and covering all the sub-goals, down to the motor-goals. For example, to “make a telephone call” with my Samsung F480, I touch the word “Dial.” This takes me to a screen where I can thump in the numbers via a touch screen. Finally, I have to press a hard key with the pictogram of a telephone receiver. The sub-goals and motor-goals below the do-goal are deliberately designed. They may be similar for different interactive products, but they are never the same. Just take your Nokia or iPhone and check what those require “to make a telephone call.” Sometimes interaction design extends to the do-goal level itself, if, for example, a designer decided to put a “calendar” into the phone. By that, s/he actually adds the potential achievement of “managing an appointment”—a further do-goal. In

other words, the interactive product embeds do-goals (by providing according functionality) and provides ways to achieve them through interaction.

It is not astonishing that HCI primarily focuses on models, methods, and theories of do-goal achievement. *Usability testing* (e.g., [Rubin, J., 1994](#)), for example, helps assessing, whether a designed interaction is comprehensible, in line with the skills and the knowledge users have, and properly communicated by the product. *Hierarchical Task Analysis* (see [Rosson and Carroll, 2001](#), for a discussion, p. 38, and an example, p. 59) is a tool to better understand action in the world to address it adequately through an interactive product. Although HCI has an impressive repertoire of methods and tools, it more or less addresses solely the question of decomposing, representing, and deliberately designing the course of action to achieve a given do-goal. HCI in this sense is primarily concerned with the “what” and the “how” of interaction.

There is another level of goals on top of do- and motor-goals, the so-called *be-goals* (see [Figure 2.1](#)). “Being competent,” “being admired,” “being close to others,” “being autonomous,” and “being stimulated” are examples of be-goals. Their nature is self-referential, that is, close to people’s selves, whereas motor-goals are close to the world, triggered by the actual interactive product and context. Be-goals motivate action and provide it with meaning. “Making a telephone call” in itself is not a meaningful action. However, when feeling lonely, estranged and irritated, maybe because you just missed the last flight home, another night in an anonymous hotel and a lost Saturday ahead, calling your spouse to feel related, for “being close to others,” may be a sensible thing to do. Given a salient be-goal, “making a phone call” becomes meaningful.

In their book *On the Self-Regulation of Behavior*, Charles Carver and Michael Scheier ([1989](#)) note the close link between affect (and emotions) and behavior. “Much of human behavior is accompanied by feelings, good and bad. [...] Our feelings color our experiences in ways that make those experiences three-dimensional. In doing so, feelings tell us critical things about those experiences” ([Carver and Scheier, 1989](#), p. 120). Feelings are integral to experiences (maybe even its core), inextricably intertwined with our action. It is the unpleasant feeling of lostness, being alone in the anonymous hotel room, in the wrong city or even country, which finally makes me pick up the phone to call my wife. And it is the warm feeling of being loved, and the feeling of confidence that I will make the best of my situation, which signals that my actual be-goal of “being related to others” was attained by the phone call. The experiential approach to HCI must consider be-goals. Being *holistic*, thus, means to extend our view beyond the mere do-goals—“beyond the instrumental,” as Noam Tractinsky and I wrote elsewhere [Hassenzahl and Tractinsky \(2006, p. 92\)](#)—to the underlying reasons for action, the “why” of interaction. Given the suggested three level model, it becomes clear that experience comprises of perception, action, motivation, and cognition—it emerges from the simultaneous activation of those sub-processes represented by the three levels and integrates them into a meaningful, inseparable whole. Designing and evaluating experiences implies to take all three levels seriously.

Although Chapter 5 of this book will be devoted to the challenges of Experience Design, let me provide a personal example where a holistic, experiential perspective on interactive products

14 2. CRUCIAL PROPERTIES OF EXPERIENCE

guided design. Some years ago, I was working at the Darmstadt University of Technology, Germany, in the Department of Psychology. The municipality of Darmstadt was interested in concepts of bringing science into the community, thinking along the lines of public science fairs, information booths and the like. I suggested a “bag of knowledge” (see Figure 2.2 for a conceptual drawing and Figure 2.3 for pictures of materials and the prototype).



Figure 2.2: The bag of knowledge, concept.

The “bag” contained an MP3 player connected to a tiny speaker, built into the “neck” of the bag (see Figure 2.3, upper right picture). It played back pre-recorded snippets of psychological knowledge, such as “Did you now ... your arguments are less persuasive, given the target person is forewarned. Forewarning initiates a search for counterarguments. The more counterarguments, the less efficient persuasion becomes. Thus: always surprise people with your attempt to persuade.” From a traditional perspective, that is, concentrating on do- and motor-goals, I would have wondered about how to provide the snippets efficiently, how to navigate among them, how to pause, skip, and replay, in short: how to control their consumption. However, I decided to focus rather on particular



Figure 2.3: The bag of knowledge, prototype.

experiences, around the themes of surprise, curiosity, and competence. In other words, I attempted to design for the “why” (including the “what” and the “how”) rather than for the “what” and “how” only.

To do so, I made some crucial conceptual decisions:

- The bags were to be placed in surprising locations, such as supermarket shelves, side by side with regular products.
- The bag continuously played back the snippets of knowledge, the users had no control about pace, sequence and so forth.
- The volume was so low that a user had to bring her ear close to the neck of the bag. Because of this, users could only consume individually, not as a group.

Imagine being in a supermarket. Suddenly, you hear a faint whisper, trickling from somewhere between the marmalade and the cereals. Curious, you look out for its source, and here it is, a bag spilling “talk.” You shoot a questioning glance at your spouse, who smiles encouragingly. You bring your ear closer to the bag until the whisper becomes intelligible. You listen with a smile, turn to your spouse, and proclaim “Did you know ...?”

For the bag, I used a good part of psychological knowledge to create a particular experience. For the experience of surprise and curiosity, I relied on the irresistible power of voices in low key and an apparent opportunity “to listen in.” For the experience of competence, I created the impression of being told secrets, to be shared immediately or stored away for later use. The goal of the bag was to make psychology a part of the community. I tried to achieve this by choosing specific experiences as design objectives rather than concentrating on the do-goals related to the consumption of the knowledge snippets. I took a *holistic* perspective, which sought to understand *all* levels of goals—be-goals, such as “being stimulated” and “being competent,” included.

I built a working prototype of the bag. It was never placed in a supermarket, but it was used for some time in the course of university road shows at the psychology booth. I also never did any formal evaluation study—the question of whether the bag actually created the experience intended remains open. However, I saw potential future students to be attracted by the whisper, and I witnessed the occasional conversation started by the one having listened to the bag’s content. I am aware that this will not convince any seasoned HCI professional and even less the eager HCI student. However, the primary point to be made is not whether the bag works or not, but what it takes to design holistically, that is, for an experience.

2.3 SITUATED (VERSUS ABSTRACT)

Single experiences are highly situated, idiosyncratic, emerging entities. Experiences are never alike, neither between nor within experientors. My next visit to *Luzine*—if ever—will be different. *Luzine*’s potential to surprise may already be exhausted; it might have other experiences in stock. The friend of the young woman, who created the wonderful experience of closeness while being apart through a simple SMS, will surely send many other SMS in his life, but never one that will create the exact same experience for his lover. And there will be many future occasions to miss my wife, but the experience will never match the one of being in Minneapolis, realizing that the return flight I booked is bound for the day after tomorrow instead of tomorrow. I wanted to go home, desperately. I rebooked the flight, patiently accepting the extra charges, but nearly missed the connecting flight in Chicago O’Hare—a nightmare of an airport. I can still re-feel the strange mixture of exhaustion and enthusiasm, after being seated and finally bound for home.

In his book on *Experiential Marketing*, Bernd Schmitt (1999, p. 61) uses the term “perpetual novelty,” borrowed from work on chaos and complex systems, to describe that “no two experiences are exactly alike.” This is due to experience’s strong dependence on context, its “situatedness.” Experience emerges from the integration of action, perception, motivation, and emotion, however, all being in a *dialog* with the world at a particular place and time. In every moment, we take the world in through

our senses, and we change it according to our goals through our actions. *An Experience* goes even farther. It is a story, experience interpreted, packaged, labeled, integrated with our knowledge of the world, and stored away. Both, experiencing and a particular experience, thus, exhibit an immense complexity, resulting in perpetual novelty.

The idea of “perpetual novelty” is discouraging. It implies that we may well describe and savor an experience after the fact, but the moment we described it, it is already gone and will never occur again. End of story for approaches that only rely on the descriptive. It would also be the end of the story for experience in HCI, because if experiences cannot be repeated, designing on the basis of bygone experiences seems futile.

I argue that although two experiences may not be exactly alike, we may nevertheless be able to categorize them. Schmitt, B. (1999, p. 61) suggests categorizing experiences “in terms of their generic emerging properties.” He then puts forward processes as the important underlying distinction, that is, he categorizes experiences as sense, feel, think, and relate experiences. In Chapter 4, I will present a categorization based on underlying universal psychological needs, hence, autonomy experiences, competence experiences, or relatedness experiences. Russell, J. (2003) understands emotional experiences explicitly as the result of a self-categorization process. The actual, that is, all readings of all elements and processes together, is compared to earlier experiences and general knowledge of the world. Standing in front of this beautiful woman, observing myself, sweating, excited, and staring intensely, I have the experience of just having fallen in love. Now, substitute the beautiful woman for a large, wild grizzly bear, and it becomes fear. Love, fear, hate, surprise, and so forth are just this: categories. By comparing reality to prototypes of experiences, which may define a category, we create consistency and comparability of our emotional experiences. The same may hold true for experiences with technology. Note that the actual categories may be subject to debate, the very idea of categorization, however, should not. It is crucial to predicting and designing for experiences.

Have you ever marveled about some people’s ability to “read your mind?” Poring over incomprehensible, administrative papers, a seductive thought crosses your mind: a huge piece of chocolate cake. Should you go down to cafeteria to get one? Unexpectedly, a distant colleague leans into your office, and he offers some of the remains of his birthday bash—guess—chocolate cake, lush and delicious. The cake is a treat, but the experience of getting a mere thought fulfilled adds immensely to it. You feel understood and somehow more related, closer to the person, who just read your mind. There are many examples, where “mind reading” is the essence of a positive experience: getting your favorite drink served in a bar, without even ordering; a DJ that plays the song, you just thought about asking for; getting something as a birthday present, you secretly wished for. Although played out differently in different situations, the essence of the experience remains the same—one may call it an “experience pattern.”

Experience patterns can be exploited for designing technology. An example is Martin Gibbs and colleagues’ concept of *SynchroMate* (Gibbs et al., 2005, see Figure 2.4), a device to maintain close relationships over a distance.



Figure 2.4: *SynchroMate*, concept (taken from Gibbs et al. (2005), first published by AIGA, the professional association for design, www.aiga.org).

They describe the interaction with *SynchroMate* by a scenario: “Tom is working with a colleague when he feels his *SynchroMate* vibrate gently against his wrist. Flipping it into the palm of his hand, Tom sees lush green rings pulsing around the edge of the device. ‘Ah,’ Tom thinks, ‘Sue must be composing a message for me.’ Taking a brief moment, he scrawls a series of short, iconic doodles with his fingernails across *SynchroMate*’s screen. As the pulsing of the rings around the edge [...] reaches a crescendo, he sends his doodling to Sue. The very next instant, he receives a short, brief but sweet, missive from Sue” (Gibbs et al., 2005, p. 5).

The concept hinges on the particular observation that partners sometimes send messages simultaneously, which appears as if those messages “cross each other in the air.” Gibbs and colleagues’ user study showed that these coincidences had a lasting impact on the couples. They were “attributed with almost metaphysical significance, such as ‘a stroke of faith’ or ‘indicating a special personal connection’” (Gibbs et al., 2005, p. 5). This is essentially an instance of “mind reading,” the essence

of a particular category of experiences, fuelled by the general need to feel related to others. Awareness of those patterns, their abstraction, and application to new cases lies at the heart of Experience Design.

The notion of categories of experiences and experience patterns representing their essence is a reduction. It assumes that, below their surface, experiences with technology (as many other experiences) are not as unique and variable as implied by proponents of a “phenomenological” approach, such as McCarthy and Wright: We all like to be challenged; we all care about what others think about us. Accounts of particular experiences might differ; the essence of the experience itself does not. Compare it to weddings, each a unique experience and all similar at the same time.

Note, that this does not mean to ignore context. We are still designing an experience, highly situated in itself. Even with an experience pattern, such as “mind reading,” at hand, the designer’s task is still to apply it to a particular product, used by particular people in a particular place. The designer contextualizes the pattern. If well done, she creates a fully-fledged, positive experience, based on the “blue print,” that is, the very essence of a class of experiences. It is the explicit reduction of experiences to their essence and not the meticulous description of ever-new experiences, which enables design.

2.4 DYNAMIC (VERSUS STATIC)

Experiencing is a continuous stream, emerging from perceiving, acting, thinking, and feeling. An experience is a chunk of this time, packaged, interpreted, and labeled—a story. Both concepts highlight the temporal, dynamic nature of experience. “Every interaction with the computer—from performing a search for information in a database that may last a few seconds to installing an operating system that can last for hours—requires users to expend time” writes Steven Seow (2008, p. 1)) in his book on *Designing and Engineering Time*. Computers are about interaction, interaction is about space and time, and experience as a concept reflects upon this.

Daniel Kahneman (2000) distinguishes clearly between experienced and remembered “utility.” Experienced utility is the pleasure and pain we feel in every given moment, for example, now! This is what I called “experiencing.” Remembered utility is the pleasure and pain attributed to a whole episode in retrospect; what I refer to as “an experience.” He argues that remembered utility rests on experienced utility. However, an episode is not an unbiased summary of all moments included. It is—as all human judgments are—constructed on the fly, influenced by the weaknesses and strengths of the underlying processes (see Section 2.1). To illustrate this, let’s consider a well-known study by Redelmeier and Kahneman (1996). Every 60 seconds, patients undergoing a colonoscopy reported the intensity of their current pain; on a scale where 10 was “intolerable pain” and 0 was “no pain at all” (experienced utility). From those moment-by-moment accounts, Redelmeier and Kahneman created individual profiles, describing the dynamics of pain, a central aspect of the colonoscopy experience. After the colonoscopy, they asked the patients to rate the overall pain experienced during the event in retrospect (remembered utility). Interestingly, the experience was best predicted by an average of the worst moment and the end, dubbed the *Peak-End-Rule*. In an attempt to construct an experience retrospectively from the experienced, participants relied on their memory. The peak

is likely to be remembered because of its outstanding nature and the following increased likelihood of being encoded. The memory of the end benefits from its relative proximity to the moment of remembering, the so-called *Recency Effect* (e.g., Neath, I., 1993). In that sense, the experience is different from what was experienced, yet predictable based on the particularities of the involved processes (here: memory).

Redelmeier and Kahneman (1996) further demonstrated that—against all intuitions, even those of the patients themselves—the correlation between duration and subsequent evaluation was non-existent (.03). Using both, peak-end and what they called *duration neglect*, they showed that the experience of the colonoscopy become less painful, by actually *prolonging* it by three minutes, however, with keeping the endoscope in place but stationary. This is still unpleasant but not painful. The end becomes better, and by that the whole episode.

Redelmeier and Kahneman (1996) study is an example of Experience Design. They used their intimate knowledge of how the (quasi-)objective, the moments of pain, are transformed into an experience, to improve the actual experience. At the same time, they demonstrate that an experience is not necessarily a mirror-image of the experienced. It nevertheless matters, because eventually our memories rather than the objective guide our attitudes and future behavior.

Interacting with a piece of software is definitely different from undergoing a colonoscopy. Pain may lie ahead as well, but a sort of pain substantially different from the one inflicted by an endoscope. In a study, however, Nina Sandweg and I (Hassenzahl and Sandweg, 2004) were able to demonstrate the difference between the experienced and the resulting experience. In the context of a usability test, we measured the experienced mental effort after each task and a summary assessment of the product's perceived usability. Actually, the experienced effort during the last task was the best predictor for the perceived overall usability of the product ($r = -.49$; a *Recency Effect*); better even than the average of all the experienced effort ($r = -.36$, last task excluded). In an unpublished follow-up study, Ingo Pfeiffer and I showed that this *Recency Effect* can be counteracted by introducing a pause of ten minutes between experiencing and the summary assessment of a product. In this study, we also asked people to re-evaluate the interactive product (a game) after a week. In general, the assessment remained stable, no matter whether participants were in the pause or direct group. In other words, circumstance impacts the way people construe and value an experience (Ariely and Carmon, 2003); however, once derived, the actual construction is remembered as the experienced. These memories will be communicated to others and will guide future behavior.

Imagine being an administrator confronted with the following choice. There is a million Euro to be invested in a program to improve public health. Two different programs are available. Program A saves 100 additional lives in the first decade of its employment, 200 in the second, and 300 in the third. Program B saves 300 additional lives in the first decade, 200 in the second, and 100 in the third. Which program would you prefer? Shane Frederick (2003) found that a significant 71% of people confronted with that choice preferred program A to B. Although the overall outcome of A and B is identical (i.e., a total of 600 saved lives), people prefer improvement to deterioration (see Loewenstein and Prelec, 1993). In the chapter on “Techniques” for design-in-time, Steve Seow (2008, p. 152) draws upon

this general preference by proposing that a lengthy process, which is dividable into meaningful independent entities, is experienced as shorter, if the entities are arranged in descending durations. His explanation for the effect is questionable—as questionable, as the explanations provided for the general preference for improvement (Read and Powell, 2002). However, the phenomenon is pervasive and the technique is likely to work. For the time being, it is an example, of what is means to understand experience as extended over time. The order, the timing, and the saliency of single moments impact an experience. Thus, they become subject to design—a way to make an experience better or worse.

Although so immensely important, concepts of an *aesthetic of interaction*, focusing on design-in-time, are just emerging. Jonas Löwgren (2009), for example, suggested “rhythm” and “dramaturgical structure” as important principles. To exemplify the drama of using technology, he provided an amusing introspection into withdrawing cash: “The welcome screen [of the automated teller machine] appears, you type in your PIN code and select an amount to withdraw. The machine takes its time to process your request and communicate with its central computers, and dramatic tension builds to a climax as seconds pass. Is there enough money in the account? It is close to the end of the month, after all. How embarrassing to be declined in front of a long line of people waiting to use the machine! You wonder if your wife made a purchase from the same account yesterday; perhaps you even have time to consider how many times you have typed your credit card number into e-commerce web pages of questionable validity. Then the machine returns your card without complaints. Tension drops somewhat but the dramatic resolution is not completed until you get the bank notes and the receipt. Exhale. The End.” What Löwgren describes is an experience in terms of the build up and release of tension. The drama revolves around the question of whether there is enough money in the account (and the humiliation if not). Löwgren understands the slope of the tension as a consequence of the ATM’s design. Providing, for example, the account balance immediately after entering the PIN code would reduce tension and thereby changing the drama of ATM use. Which is better, high or low tension, sharp or gentle slopes, is a matter of appropriateness and empirical exploration. The crucial point, however, is to understand that the way we design (better: script) an interaction inevitably impacts experience. In that sense, Youn-kyung Lim and colleagues (2007) offer the concept of *interaction gestalt* as a bridge between the interactive product and experience. They provide eleven attributes to describe those gestalts, such as pace, speed, proximity and so forth. The authors emphasize that these properties “are not experience qualities—they are simply descriptions of the shape of the interaction” (Lim et al., 2007, p. 249).

Studies of HCI involving time are rare. It is telling, that only one of the 18 papers referenced at the end of Steven Seow’s (2008, p. 169) chapter on “Techniques” is from the domain of HCI. As Timothy Bickmore and Rosalind Picard (2005) noted “We feel that [a] focus on maintaining engagement, enjoyment, trust and productivity [...] over a long period of time is something that has been missing from the field of HCI and represents some of the most important lessons from the social psychology of personal relationship for the HCI community” (2005, p. 249). Settling this claim requires a *longitudinal approach*. In the context of HCI, it is helpful to distinguish between. a *micro*

perspective (e.g., an hour), a *meso* perspective (e.g., 5 weeks) and a *macro* perspective, with a scope on years of use and the idea to map the whole product lifecycle (Wilamowitz-Moellendorff et al., 2006). A typical study in HCI with a micro perspective is a usability test. Participants work on a series of tasks, often for an hour or two, while being observed constantly and questioned repeatedly. Studies with a meso perspective are already becoming rare. An exception is a study by Valerie Mendoza and David Novick (2005), who observed participants' level of frustration using software for creating websites over a period of eight weeks. Overall, the level of frustration decreased over time. In addition, users' reactions to frustrating episodes altered markedly. Whereas in the beginning, participants tended to ask other colleagues, they later found ways of fixing the underlying problem by themselves. These results demonstrate the dynamics in an experiential quality (i.e., felt frustration) and associated patterns of action. Studies with a macro perspective are virtually non-existent in HCI. (A notable exception is Richard Thomas' (1998) study of editor usage, covering a period of seven years.) This is certainly due to the effort, which has to be put into these studies. In addition, HCI is often targeted at exploring prototypes or products under development. This severely hampers opportunities to study experience over time.

I believe much can be learned from studies of experience taking time and change into account. Consider an unpublished study I did in collaboration with Christiane Hartmann and Sanna Cavar in 2005. We gave eight participants a version of the *The Sims - livin' large* (2000), Will Wright's classic social simulation, one of the best-selling computer games ever (see Figure 2.5).

None of the participants ever played a computer-game. We asked them to play for a minimum of 15 minutes per day (in fact, they played an average of 53 minutes per day) over a period of 28 days and to record feelings and behavior with the help of a diary. For example, we asked them to rate the valence (positive—negative) of their momentary affective state immediately before (pre) and after playing (post) with the help of the *Self-Assessment Manikin* (Bradley and Lang, 1994). If subtracting the post-from the pre-measure yields a positive figure, the overall affective outcome of playing was positive—people felt better after having played. If the figure is negative, people felt worse. Figure 2.6 shows the average affective outcome for the eight participants tracked over the 28 days.

Two details strike the eye. First, it apparently took about a week before the players began to benefit from the game emotionally. Imagine what would have happened, given people were not enlisted as participants in the study—they would have quitted before the game could work its magic. One may retort that feeling worse after having played, does not necessarily mean that the time in between was not enjoyed. However, participants were also given the opportunity to report positive and negative events while playing. Events reported in the course of the first week were predominantly negative (mainly concerned with problems of setting-up and handling the game). In general, affect reported while playing was a good predictor of affect after the game ($r = .51$). In addition, affect after playing was attributed to the game ($r = .61$ between post affect and game evaluation), which in turn predicted the time planned to invest in the game measured the next day ($r = .42$). Second, the “spiked” form of the affective outcome curve highlights the fragile and vagrant nature of enjoyment. It is not always there; it is not a constant outcome of playing. Only five of 28 days were especially positive,



Figure 2.5: A screenshot from *The Sims - livin' large*.

the rest was experienced as neutral or even slightly negative. However, the positive experiences were outstanding, such as one's *Sim* finding a job (and being promoted quickly) or making first friends. They will be kept in memory.

Margeritta von Wilamowitz-Moellendorff, Axel Platz, and I (2007; 2006) were interested in covering a longer period than 28 days. To counteract the time restrictions apparent in many projects—and the prime reason for the overwhelming majority of cross-sectional studies—we devised a retrospective interviewing technique called “Change Oriented analysis of the Relationship between Product and User”—in short: CORPUS (see Karapanos et al., 2009a, for an alternative approach). It addresses “expert” users/owners (having used the product for at least one to two years) and combines the characteristics of partly standardized and episodic interviews. The standardized part of the interview is directed at identifying change in the perception of different quality dimensions. It starts from the now and goes back to the beginning of the relationship with the product.

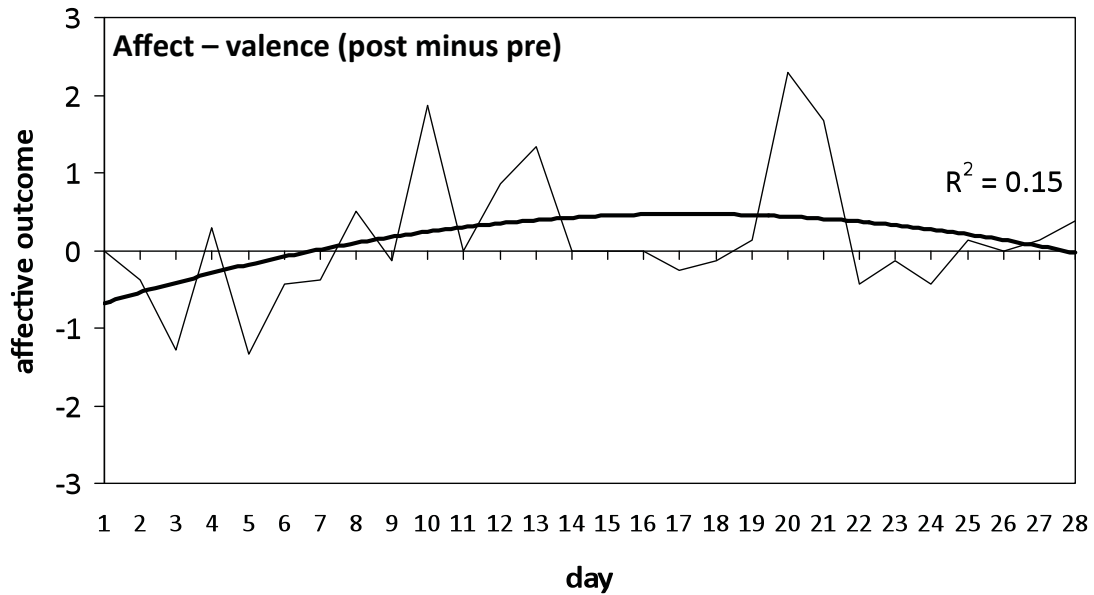


Figure 2.6: Affective outcome of playing *The Sims*.

If change occurred, its direction and shape is assessed roughly (e.g., as accelerated, steady or sudden improvement or deterioration, respectively). Given change is reported, the interview switches into a more open, episodic “mode” to further explore underlying conditions and causes of change. Specifically, participants are asked to tell short stories related to the change. These narratives, so-called “change incidents,” give additional insights into underlying causes and conditions for change.

Margeritta interviewed 57 people with CORPUS, roughly 20 about their mobile phone, 18 radiographers about the Computed Tomography scanner (CT) they use, and another 19 about productivity software, such as Microsoft’s *Excel* or *Word*. The average usage period was 22 months. In CORPUS, participants describe change for different “dimensions” separately. Using my *Pragmatic/Hedonic Model of User Experience* (Hassenzahl, M., 2003), we defined:

- *Utility* (UT): “the ability of a product to provide the necessary functions for given tasks” (pragmatic).
- *Usability* (US): “the ability of a product to provide the functions in an easy and efficient way” (pragmatic).
- *Stimulation* (S): “the ability of a product to surprise, to foster curiosity and to provide opportunities for the perfection of knowledge and skills” (hedonic).
- *Beauty* (B): “the ability of a product to evoke a feeling of ‘beauty’” (hedonic).

- *Communicate identity* (I): “the ability of a product to communicate self-serving symbols to relevant others” (hedonic).

Each participant described the change experienced on each dimension as either stable (i.e., actually no change), improving, or deteriorating. In addition, if change was reported, it was categorized as accelerated, steady or jumping. For example, a participant was asked to assess her mobile phone’s current perceived usability. She was then asked to go back in time and to give an impression of whether perceived usability was more, less, or similar at the beginning of usage. The shape was further probed, by asking whether change occurred over the whole time, or around particular times or events. In the case of usability, most participants agreed that it improved over time, in the first two or three months, quickly reaching a ceiling—hence usability shows *accelerated improvement*. In addition, participants provided short stories or explanations. In the case of usability, habituation was seen as the major driving force of change.

Table 2.1 summarizes the most frequent shape of change for each “dimension” and each product.

Table 2.1: Shape of change (based on Wilamowitz-Moellendorff et al., 2007).

	Dimension				
Product	UT	US	S	B	I
Mobile	Stable	Accelerated improvement	Accelerated deterioration	Jumping deterioration	Steady deterioration
CT	Stable	Accelerated improvement	Accelerated improvement	Stable	Stable
Productivity	Steady improvement	Steady improvement	Steady improvement	Stable	Steady improvement

Apparently, the change is different for the three product “genres.” For mobile phones, hedonic aspects (stimulation, beauty, identity) deteriorate, whereas for the CT scanner, stimulation improves, but beauty and identity remain stable. Taking a look at the explanations people provided, this difference is easy to understand. Stimulation summarizes the ability to explore and the functional opportunities provided by the interactive product. For a CT scanner, these are plenty; the average mobile phone, however, loses its power to stimulate very quickly. This highlights the importance of functionality which provides new “powers,” new ways of doing things, compared to the either overly pragmatic or plainly senseless functionality offered by many mobile phones. Beauty, other than stimulation, has a certain social value to it (Hassenzahl, M., 2008a). And indeed, many participants’ comments pointed at social comparison, such as “a friend just got a new, beautiful phone; since then, mine looks only half as good” as an important cause for a deteriorating beauty. Beauty in

a mobile phone is very much driven by fashion, and, thus, social comparison. This does not hold for CT scanners and productivity software. Take utility as a last example; here the productivity software stands out. Other than the mobile phone and the CT scanner, the utility of productivity software appears less obvious. Through usage, people better understood how to put the functional opportunities provided to an appropriate use.

Let me refrain from going further into the details (and the critique) of the study just presented. It highlights two important points: First, different genres of interactive products provided experiences, which differed immensely in their dynamics. However, users of the same product more or less reported similar experiences. There is a fair chance that *designable* features of the product, such as complexity in the case of the CT scanner, take a sizable effect on the resulting dynamics of the experience. Second, interactive products change over time—not in their material, but in the experiences they provide. In the beginning, a mobile phone is stimulating, beautiful, something to be proud of, maybe riddled with small usability drawbacks. Over time, it becomes easier to master, but loses its fascination. It turns into something utterly pragmatic. Conversely, a CT scanner poses much more usability problems, and needs substantially more time to be mastered. However, it also becomes a stimulating source for new opportunities—smaller dosage, better pictures, changed or even newly invented diagnostic procedures.

The studies presented here and others, more recent, such as Evan Karapanos and colleagues' (2009b) study of iPhone adoption, highlight the dynamic nature of experiences. They help understanding the timing, shape and qualities of experiences as they unfold over time. Given this, an interactive product—as a mediator of these experiences—will also be perceived as dynamic. Product quality, thus, must be understood as emerging from the actual shape and rate of change over time. It is neither stable over time nor can it be sufficiently described by focusing only a single moment in time.

We need more longitudinal studies of experience, be it on a micro, meso, or macro level. However, one should not underestimate the methodological problems associated with this endeavor—especially, when working with quantitative data. Take Mendoza and Novick's (2005) study or my *28 days of Sims* as examples. Both studies report longitudinal data averaged across participants. Actually, this is problematic. Imagine two people: Alma likes her new MP3 player very much, say, 8 on a scale ranging from 0 to 10. Tim, however, is pretty unimpressed—a 2 on the scale. Over time, Alma is repeatedly disappointed by the player and ends up with being as unimpressed as Tim was in the beginning (a 2). Conversely, Tim became more enthusiastic about the player's features and rates it as an 8 after a while. By averaging across Alma and Tim, it would look as if nothing much had happened. The average rating at the beginning of usage is 5 (i.e., $8 + 2/2$)—the same as in the end (i.e., $2 + 8/2$). Individual change was nevertheless dramatic. Alma's judgment (and thus her experience) deteriorated noticeably, Tim's improved. Averaging obscures individual change. Other problems are more technical in nature. For example, Mendoza and Novick (2005) used repeated measurements analysis of variance to test for statistically significant changes in averages. This test assumes independence of associated error variance, an assumption likely to be violated given longi-

tudinal data. (This is because the same people provide data for different points in time. Given that error variance of a single point in time is all the variance that remains unexplained by the tested factors, it will inevitably contain person variance. As long as the person remains the same for the different points in time, error variance will end up correlated.) Substantial advances in statistical techniques, especially hierarchical modeling, promise remedy (e.g., [Singer and Willet, 2003](#)). It will definitely take its time before these techniques will become fully adopted by the HCI community.

2.5 AND FINALLY, POSITIVE (AKA WORTHWHILE)

Subjective, holistic, situated, and dynamic are defining attributes of experience and experiences. An experience will never be objective; it will never focus on a small proportion of processes and aspects only, and it will never be context-free or static. *Positive* as an attribute differs from this.

Imagine being mugged on your way home from a bar: the moment of realization, the feelings of fear, sweating with a racing heart, an attempt to escape, hits and bruises, and the decision of whether to fight back or to solemnly hand over the wallet, mobile phone, and keys. Afterwards, one might experience relief of having made it in one piece, followed by burning anger, an urge for revenge, and maybe even shame of having been victimized. Obviously, being mugged has all the attributes of an experience discussed above. It is subjective—which becomes apparent the moment one painstakingly tries to reconstruct particular events or to describe the attackers. It is holistic—an inseparable blend of emotion (e.g., fear), action (e.g., fighting, running) and cognition (e.g., Can I cope with the loss of my wallet?). In fact, the experience gets most of its meaning through the deprivation of the need for autonomy and security, which emerges as feelings of helplessness, fear, shame, and anger. The bruises heal quickly; however, calling the fulfillment of needs into question will have shaking, long-lasting effects. Being mugged is also situated—imagine the difference between being alone and being accompanied by a friend. A friend may add feelings of guilt (if you ran out on him) or recklessness (if he is a martial arts master) to the equation. The whole experience will differ. Last but not least, being mugged is dynamic—literally “an unfolding drama.” It is not, however, in any sense positive. In fact, we all might be more aware of outstanding negative experiences, our *traumata*, rather than the positive.

Although experience can obviously be bad or good, painful or pleasurable, I believe *positive* to be an attribute worth stressing. Usability Engineering (as a sub-discipline of Human-Computer Interaction), traditionally focuses on problems, frustration, stress and their removal. By restricting itself to the “what” and “how”-levels of action (revisit Figure 2.1) the field quite understandably became concerned with ensuring the potential instrumentality of interactive products. However, avoiding the bad experience due to a lack of instrumentality does not necessarily equate with providing a positive experience. Already in the 1950s, Frederick Herzberg (1959) established a two-factor model of work satisfaction, which distinguished between hygiene factors (dissatisfiers) and motivators (satisfiers). Salary is an example of a dissatisfier. Perceived underpayment reduces work satisfaction, but appropriate or even overpayment does not likewise guarantee high levels of satisfaction. Salary makes the difference between dissatisfied and neutral. High levels of satisfaction, however, rather result from

motivators, such as achievement, personal growth or recognition by superiors and the organization. In this vein, HCI, and especially Usability Engineering, stresses the removal of potential dissatisfaction. But even the best usability may never be able to “put a smile on users’ faces,” because it only makes the difference between bad and acceptable. Experience on the other hand addresses both, satisfiers (e.g., fulfilled needs, emerging emotions) and dissatisfiers (e.g., usability problem, technical problems) on an equal footing through its holistic nature (see Section 2.2).

Confusing instrumentality (the “what” and “how” of interaction) with need fulfillment (the “why” of interaction) will have a profound effect on the range and nature of experiences, people will derive from a product. The *Deutsche Bahn* (German Rail), for example, has a tradition of stressing speed and timeliness—in short: efficiency. However, efficiency is not a human need *per se*. It is an attribute that qualifies primarily the instrumentality of transportation, it describes the “what” and “how.” Now imagine your train running late by an hour. This has a high potential to be a frustrating, negative experience, with all its harmful consequences for the image of the *Bahn* as an organization. But, now imagine the train being exactly on time. Would you marvel about the *Bahn*’s timeliness, call all your friends immediately to praise the *Bahn* and the exceptional experience, you’ve just had? More likely, one would feel rather neutral. This is due to the very nature of efficiency—it is merely a dissatisfier. If something takes too long or is untimely, it becomes unnerving and bad. Disappointingly, *providing* timeliness will not produce the positive mirror-image (only, maybe, if it is a particular outstanding event). To give another example: however interesting the conference talk of your highly esteemed colleague might be, if she overruns time, your impression of her and the talk’s impact will suffer. Keeping one’s time is a hygiene factor, similarly to the *Bahn* being expected to be in time. The difference is that your colleague’s talk has the potential to become a positive experience. Not by her staying in time—this is merely conference hygiene—but by providing stimulating, genuine insights. By emphasizing efficiency only, the *Bahn* finally passes up the chance to provide a truly positive experience. Consequently, the real advancement of an experiential approach is in understanding and focusing on what makes an experience positive, pleasurable, good. HCI already has a profound knowledge about avoiding the bad. What is needed is a science and practice of the positive.

When Martin Seligman, a renowned professor of psychology, became president of the *American Psychological Association* in 2000, he announced the millennium of *Positive Psychology*. For too long, he argued, psychology restricted itself exclusively to the research and treatment of mental problems. It was time for a focus on what makes life worth living. In an introduction to *Positive Psychology*, Seligman and Csikszentmihalyi (2000, p. 5) wrote: “[P]sychologists have scant knowledge of what makes life worth living. They have come to understand quite a bit about how people survive and endure under conditions of adversity. [...] Psychology has, since World War II, become a science largely about healing. It concentrates on repairing damage within a disease model of human functioning. This almost exclusive attention to pathology neglects the fulfilled individual and the thriving community.” Just replace Psychology with Human-Computer Interaction or Usability Engineering to make this passage a proper description of our field. We work under a “disease model

of human technology use,” but the experiential approach is putting fulfillment through technology into focus to overcome this.

In an exercise of *Critical Design*, Alice Wang (2009) suggested the *Tyrant* (Figure 2.7). *Tyrant* is essentially an alarm clock. Instead of waking one up with some sort of acoustic signal—as alarm clocks usually do—it starts to randomly call people from the address book of your mobile phone every three minutes after the desired wake up time. “[It] is the guilt generated by this alarm clock that gets people out of bed” Wang explains (Wang, A., 2009, p. 34).

Although, guilt is clearly a negative experience, I believe *Tyrant* to nevertheless be a good example of Experience Design. It explores the experiential aspects around the theme of getting up and being on time. It is not just a technology that performs a task. It reflects upon central aspects of oversleeping and invokes social means to control it. Although it shifts the responsibility for waking up back to the user, it may nevertheless work—at least I, given something important, often wake up shortly before the alarm clock rings.

The very prospect of an alarm clock, which randomly calls people to tell them that I have overslept, is unpleasant. But there is in an important difference between this and, for example, being mugged. The alarm clock evokes a potential bad experience to a “higher,” personal valuable end. Being mugged is just entirely unpleasant. Thus, the call for a positive experience is not meant as a call to entirely abandon negative experiences. It is not meant as a call for a world of “infinite jest” and shallow amusement—quite to the contrary. A better term for positive may be worthwhile or valuable. Positive experiences are *per se* worthwhile because they fulfill universal psychological needs. Negative experiences can be worthwhile too, if they allow for a higher, valuable end.

2.6 ESSENCE OF THE CHAPTER

Experience is *subjective* and its deduction from the objective is rarely straightforward. However, a lack of correspondence between objective conditions and their experience should not be viewed as an error. Mostly, this is the consequence of a traceable, psychological process, which transforms the objective into the subjective. The task at hand is to reveal and to better understand these underlying processes. This will enable us to shape subjective experiences through the objective.

Experience is *holistic*. It comprises of perception, action, motivation, and cognition. It emerges from the simultaneous activation of those processes and integrates them into a meaningful, inseparable whole. The distinction between abstract *be-goals*, which provide meaning, motivation, and emotion to an activity, *do-goals*, which capture concrete, desired outcomes of activities and plans to achieve those outcomes, and *motor-goals*, which regulate activities on an operational level—grabbing, dragging, pressing buttons and so forth—is a valuable conceptual tool to address the different levels of interacting with technology. Experience Design implies to take all levels of goals seriously and to address them through design.

Experiences are *situated*. They emerge from the integration of action, perception, motivation, and emotion, however, all being in a *dialog* with the world at a particular place and time. In every moment, the world is taken in and immediately changed through our activities. The result is perpetual



Figure 2.7: *The Tyrant*, from Wang, A. *Asimov's First Law / Alarm Clocks*. Proceedings of TEI'09, Copyright ©2009, ACM Press, <http://doi.acm.org/10.1145/1517664.1517677>. Reprinted with permission.

novelty—no two experiences are exactly alike. Experiences can nevertheless be categorized. In other words, although played out differently in different situations, the essence of an experience may remain similar. One may call these prototypical experiences “experience patterns.” Awareness of those patterns, their abstraction, and application to new cases lies at the heart of Experience Design.

Experience is *dynamic*, extended over time. The order, the timing, and the saliency of single moments impact the overall experience. By that, order and timing become subject to design—a way to make an experience better or worse. Thus, Experience Design implies the careful scripting of interaction. Beyond that, the study of change over longer periods of time should become more common in Human-Computer Interaction. Any judgment about a product’s quality will be heavily influenced by the actual shape and rate of change embedded in a given succession of single experiences.

Deliberately designed experience should be *positive*. However, this is not meant as a call for a world of “infinite jest” and shallow amusement. A better term for positive, thus, may be “worthwhile” or “valuable.” Positive experiences are *per se* worthwhile, because they fulfill universal psychological needs. Negative experiences, however, can be worthwhile too, if they allow for a higher, valuable end.

CHAPTER 3

Three Good Reasons to Consider Experience

3.1 EXPERIENCES ARE SELF-DEFINING

In 2019, a group of Nexus 6 replicants, the latest model of android slave workers, fled an off-world colony. They are back on earth, willing to confront and kill their maker Tyrell. In his novel *Do Androids Dream of Electric Sheep?* (better known as Ridley Scott's *Blade Runner*), Philip K. Dick provides a remarkable reason for the replicant's frenzy: implanted memories. Fabricated accounts of a non-existent childhood, condensed into a small pack of forged photographs, blur the line between the human and non-human. In one scene, Batty, the replicant group's leader, sneers at his fellow Leon, "Did you get your precious photos?" Leon shakes his head, "Someone was there" (see Figure 3.1).

Psychology suggests the concept of *episodic memory* (Tulving, E., 1972), storing autobiographical information, vivid, visual, emotional accounts of the good and bad that happened to us throughout our lives. Consider the case of AJ reported by Elizabeth Parker and colleagues (2006). AJ is a woman, born in 1965, with an unusual ability to remember autobiographical information. Prompted with a random date, such as April 27, 1994, she remembers: "That was Wednesday. That was easy for me because I knew where I was exactly. I was down in Florida. I was summoned to come down and to say goodbye to my Grandmother who they all thought was dying but she ended up living. [...] This was also the weekend that Nixon died [...]" (Parker et al., 2006, p. 40). AJ remembers incidents from as early an age as of 24 months. Before 1980, her memories are fuzzy, but from 1980 on, she could remember "crystal clear" and correctly each day. Interestingly, this ability is restricted to autobiographical information, that is, experiences she personally had. Her memory for other knowledge is just average or even slightly below. Concerning the public events she often recalls along with her personal experiences, such as Nixon's death in the example above, Parker and colleagues explain: "[AJ] could recall public events only if she was interested in them, or if something important had happened to her on the day they occurred" (Parker et al., 2006, p. 46). The authors attribute AJ's supernatural memory to a failure to suppress so-called retrieval cues. Thus, it is not the memory in itself, but the inability to ignore the ever-present hints that trigger recollection—an ability, a "normal" person has. Admittedly, AJ's case is an extreme example. It nevertheless highlights what is central to all of us, but easily forgotten: the importance of experiences in forming our personalities. In that sense, we are what we've experienced.

AJ describes her memories as vivid, like a running movie and full of emotion. In *Searching For Memory*, psychologist Daniel Schacter (1996) discusses the key ingredients of personal recollections,



Figure 3.1: Leon's precious photos (taken from Ridley Scott's *Blade Runner*).

such as the importance of emotion, especially the felt arousal, their vividness, and visual (perceptual) nature. Besides being the one, who originally provided the *Blade Runner* example above, Schacter reports about GR, a poet, painter and art-reviewer, who lost (but later regained) his autobiographical memory. While suffering from amnesia, GR felt deeply depressed and could not bring himself to paint again, because—as he said—“he had no more self to express” (Schacter, D., 1996, p. 32). In other words, the memory of experiences, and, thus, the experiences themselves, with all their qualities discussed in the preceding chapter, are the gist of ourselves. Without them, identity is lost.

Action theories, such as *Activity theory* (see Kaptelinin and Nardi, 2006, for a very good overview), alert us to the importance of things, mediating our everyday life. Indeed, it is almost impossible to conjure up experiences independent of technology. The thrill of *Lord of the Rings* depends on the ability to print and distribute books, on pens and paper, or—lately—on advances in digital imagery. A good, down-to-earth *Sauce Bolognese* needs knives, pots, an oven, fork and spoon, and a bowl. The replicants in the *Blade Runner* relied on a pack of photos, and, thus, cameras and technology to print, and AJ kept a diary to soothe her urge to memorize. Given that things,

technology, play an ever-present role in our daily lives, they also play a role as facilitators, creators, and mediators of experiences. In retrospect, some of them will even define our selves. Note, that I am not necessarily arguing, that technology itself should become an experience. However, technology plays a role in experiences and, thus, needs to be designed with those experiences in mind. By that, technology gets its meaning through providing experiences, which in turn are crucial ingredients of our identities.

3.2 EXPERIENCES MAKE US HAPPIER

Take a second and think of a recent a purchase you made with the intention of advancing your happiness and enjoyment in life. Think of a purchase for more than 100€ that involved spending the money with the primary intention of acquiring a life experience—an event or series of events that you personally encounter or live through.

Leaf Van Boven and Thomas Gilovich (2003) asked a group of students of the University of British Columbia this question. Participants primarily mentioned fees and admissions to concerts and the like, followed by travel and dining. Van Boven and Gilovich further asked the students to rate how happy thinking about the purchase makes them, how much the purchase contributed to their overall happiness in life, how well the money was spent, and whether—in hindsight—they might have better spent it on something else.

Another group of students got the same general question, but instead of an *experiential* purchase, they were asked about a *material* purchase. It was defined as “spending money with the primary intention of acquiring a material possession—a tangible object that you obtain and keep in your possession” (Boven and Gilovich, 2003, p. 1194). This group mentioned clothing and jewelry, followed by televisions, stereos, and computer equipment. Strikingly, the material group was less happy with their 100€ purchase than the experiential group. They found their money less well spent, and were more certain that it would have been better spend on something else. In addition, Boven and Gilovich (2003) gave the collected purchase descriptions—the admissions, fees, clothes, dine outs, jewelry, stereos—to outsiders and asked them to rate how happy the according purchase would make *them*. Again, experiential purchases made happier than material purchases.

Boven and Gilovich (2003) research obviously takes a critical stance towards materialism. They cite Robert Frank (1999), an economist, who observed that across-the-board “increases in our stocks of material goods produce virtually no measurable gains in our psychological or physical well-being. Bigger houses and faster cars, it seems, don’t make us any happier” (Frank, R., 1999, p. 6). It is consumption, the experiences one goes through, which can increase well-being. Accordingly, interactive products, which focus primarily on creating and shaping experiences, could be considered as post-materialistic (Blythe et al., 2009). It is neither the processor power or hard disk space, nor fancy aluminum casings or ever-higher resolutions that make us happy—the value does not lie in the material, but in the experiences provided.

Money buys consumption, thus, one may assume that determining the value of money should be based on the experiences it enables. In this view, money is just a placeholder for concrete acts

of consumption. It buys holidays, nights at the cinema, or ice cream. However, research shows that people are not always able to align money and consumption properly. Imagine having the choice between two tasks. One is short (6 minutes) and you get rewarded with 60 points, the other is a bit longer (7 minutes) but you get 100 points. The points can be exchanged for a bucket of ice cream. The size is the same, but for 60 points you get vanilla flavor and for 100 points pistachio. What would you do? In the study by Christopher Hsee and colleagues (2003) over 50% took the long task, got their 100 points and pistachio flavored ice cream. However, some did so, although actually preferring vanilla. If simply asked, only 25% chose pistachio. In other words, 25% of the participants worked harder to get something they do not prefer. In a control condition, people chose between the same short and long task, but got ice cream directly without any mentioning of points. Here only 25% chose the long task and, thus, pistachio. Only those worked harder, who better like pistachio.

What happened to the people getting points? Instead of optimizing the experience emerging from the consumption of the ice cream (i.e., eating the preferred flavor), people maximized the number of points they received. They maximize the “medium” instead of taking the medium as a placeholder for experiences. Points are easy to count and 100 is definitely more than 60—let’s go for the 100. We all know a celebrity, who fell into the same trap (see Figure 3.2).

Recently, Hsee et al. (2009) did a further interesting study of the difference between money (material) and consumption in terms of resulting happiness. It featured two independent groups of students, let’s call them A and B. Each group was further separated into a “poor” and “rich” subgroup resulting in four groups (A-poor, A-rich, B-poor, B-rich). Group A got handed out coupons worth either one point (A-poor) or two points (A-rich). This was done in a group situation, that is, each participant knew what all others got. The points were then exchanged with the experimenter against a 100 ml glass of milk made of milk powder. Depending on the number of points, people got either one or two spoonful of milk powder. Above that, the points had no additional value. Imagine being a member of this group. You get your coupon. You are lucky, you got two points! There are others with only one point. You are then asked to rate your happiness with the coupon. Subsequently, you get your glass of milk, made of two spoonful of milk powder, and marked ostensibly with a two. You have your drink and again are asked to rate your happiness—this time with the drink after you consumed it. Group B did not differ from A, except that the B-poor subgroup got five points and accordingly five spoonfuls of milk powder, whereas the B-rich group got ten points and ten spoonfuls. Thus, overall, A was poorer than B.

The results were striking. Concerning the points, *within* each group (A or B) the “poor” participants were less happy than the “rich” participants. However, there was no difference in averages between A and B. In other words, if your direct neighbor earns more than you, you feel miserable. But if you happen to be a millionaire, living in a society of other, even richer millionaires, you are likely to feel as miserable. The happiness derived from material wealth is relative. Hsee argues that money is *inherently inevaluable*. We basically have no clue whether 100€ is much or not worth the effort. Only by social comparison does money get its value.



Figure 3.2: A well-known *medium maximizer*.

The happiness derived from consumption of the drinks showed a different pattern. Again, the “poor” participants enjoyed their drink less compared to “rich” participants. In addition, however, group B overall felt better than group A. While a participant with a two points coupon (A-rich) was happier about that coupon than a participant with a five points coupon (B-poor), happiness derived from consuming the milk was the better, the more milk powder. Happiness from consumption was absolute. People can refer to an internal standard, their feelings while consuming, to derive a judgment. Other than material wealth, consumption, experiencing, is *inherently evaluable*.

Hsee and colleagues conclude that by focusing on improving consumption experiences through increased wealth, happiness can be improved. By focusing on material wealth, more money and the acquisition of things only, the efforts will simply blow-out. As they put it: “Our grandchildren won’t feel happier than us when they count their wealth and possessions. Nor will they feel happier than us if they have more sparkling diamonds to wear during dinner parties. Yet they may well feel happier than us if they have more comfortable condoms to wear during sex following their dinner parties.” Admittedly, interactive products are not condoms, and using a computer is only faintly as exciting

as sex, but the message still holds: by focusing on creating positive, personally meaningful, and, thus, inherently evaluable experience, we have the opportunity to make people happier.

3.3 EXPERIENCES MOTIVATE

Imagine yourself being treated to a wonderful dinner by some beloved friends. You eat, drink, and talk—there is not a single discord in the conversation. A successful evening all round. It is likely that you experienced relatedness, a feeling of being connected to other people, to be loved and cared for. As I argued above, this relatedness experience emerges from the interaction with your friends. It combines thinking and acting with positive feelings, and is thus a building block of psychological well-being.

The experience just emerges. It provides meaning to actions and situations. However, it is not necessarily planned for. It is a—certainly welcomed—outcome of spending an evening with friends. But this evening was not spent with the explicit *goal* of having this experience. We did it—to use Edward Deci and Richard Ryan’s (2000, p. 230) words—because we find meeting our friends “interesting” or “important,” but not with the explicit intention to satisfy a need for relatedness. Deci and Ryan (2000) provide the example of “a man who, in the evening, sits at the keyboard and begins to play a piece of music, may become lost in its beauty and experience great pleasure. He would not experience the pleasure if coerced to play, or if he felt unable to master the music. Thus, need satisfaction, which in this case means experiences of autonomy and competence, is necessary for the enjoyment of the activity, but his explicit purpose in playing the music is not likely to be need satisfaction. He would be doing what interests him, and he would experience spontaneous pleasure as long as the activity was self-organizing and the task appropriately challenging.” In other words, need satisfaction is often an outcome but rarely an explicit goal. You are not meeting your friends to feel related. You just do it, and a feeling of relatedness emerges. The man does not play keyboard to feel competent. The competence experience just emerges.

Don’t get me wrong. Need fulfillment and according experiences, energize our behavior. They are the reason, why we do things. However, while acknowledging this power, it is important to be aware of the fact that we do things primarily because we find them “interesting” or “important,” and they are likely to create a positive feeling. Most of the time, we are not, however, deliberately calling our friends, to fill up our “relatedness reservoir.”

Having said this, there are nevertheless situations in which the need becomes more explicit. I am sure each of us once in a while feels trapped, bored, lonely, clumsy, excluded, or insecure. All those attributes of human experience describe situations of need *deprivation*. And, in fact, an intense feeling of loneliness, for example, will exert a motivational force. When lonely, behavior and situations will be more explicitly chosen to provide need fulfillment. I may call a close friend or my spouse. I may feel the urge to go out, to immerse myself into a crowd on the streets or in a noisy bar. Or I just switch on the television, not because of the interesting program, but to hear human voices. These are all behaviors motivated by a deprived need for relatedness and all have the potential to

provide some relief through need fulfillment. By this, the motivational character of needs becomes apparent.

At first glance, the difference between explicitly doing something to fulfill a need and the more implicit way, where we do something because it appears “interesting” or “important,” but it gets its meaning through need fulfillment seems hair-splitting. However, it touches upon the important distinction between “extrinsic” and “intrinsic” motivation (Deci and Ryan, 2000). The distinction is not dichotomous but rather continuous, with “external regulation” at the extrinsic endpoint and completely “self-determined behavior” at the intrinsic endpoint. In between are different shades of internalization. To give an example: If you jog because somebody pays you for it by the hour, your behavior, jogging, is externally regulated. However, if you just jog because you find it interesting, and while (and after) doing so, you feel exceptionally healthy and competent; the behavior is “self-determined.” To jog is a pleasure in itself, fueled by the fulfillment of underlying basic needs for physical striving and competence. In between is, for example, a configuration, where you already identify with jogging as a means to stay healthy. However, jogging still remains instrumental. It is not a pleasure in itself. We do it to an end.

Intrinsic motivation is in many ways superior to extrinsic motivation. The most obvious drawback of extrinsically motivated action is its strong tendency to disappear, given external control is withdrawn. No money, no jogging. From an experience point of view, extrinsically motivated action is pallid. It lacks meaning, positive emotion, and integration with the actor—in short: it is unlikely to be construed as a positive experience. Most of the time, it sucks.

From an Experience Design perspective, the distinction between intrinsic and extrinsic is crucial. The moment, one is coerced into action, ostensibly *forced* into an experience, the probability is high that the experience does not feel genuine. The same may hold true, given an action is too obviously tied to deprivation. Technologies for the lonely, dependent, or excluded are unlikely to become successful, if marketed and communicated as forms of self-help. The more obvious the attempt of fulfilling a deprived need, the less potentially successful becomes the interactive product aimed at that need.

In Craig Gillespie’s *Lars and the Real Girl*, Lars is a shy guy with some problems in building a relationship with a woman. Pestered by his sister-in-law, he finally orders a lifelike sex doll and introduces it as Bianca, his new, disabled girlfriend from Rumania. His brother thinks Lars is nuts, but eventually the entire town goes along with his delusion in support of this sweet natured boy. By that, Lars gets the chance to experience an—admittedly unusual—relationship. He is invited to parties and brings Bianca along. Bianca even gets offered a job as window dummy in a boutique, and Lars has to learn to control his jealousy and share her with others. In the end, Lars lets her die. Although the illusion was near to perfect for him, deep down he always knew that Bianca was just a technology, a mere trick to overcome his loneliness and detachment. She was useful, but eventually it was time for Lars to get the real thing. The gist of the story is obvious. We can explicitly employ technology to create particular experiences; we can—for a while—deceive ourselves or let ourselves

be deceived by others. Eventually, we will get aware of it, and it will lose all its magic. To postpone this moment requires a skilled experience designer.

The challenge of Experience Design is, thus, to shape experiences without giving the impression of doing so. This especially holds for motivational interactive products (e.g., Fogg, B., 2003). Be it more walking and less driving, more vegetables and less chocolate, or more social contact and less video games, in any of those cases, obvious strategies of reward and punishment, or “put-on” play are unlikely to be successful. Motivational—I prefer the term *transformational*—products must provide situations, which allow for meaningful experiences and self-determined action. The challenge for design is to *inject*, to make certain types of experiences more likely, but in an unobtrusive, natural way.

In sum, motivation is an ever-present and important aspect of experiences. By that, experiences are not only retrospective summaries of the past. They have the power to influence future activities.

3.4 THE ESSENCE OF THE CHAPTER

There are at least three reasons to consider experiences as a design objective: their self-defining nature, their power to make us happy and to energize our behavior.

Episodic, autobiographical memory is crucial to our identities. Other than semantic or procedural memory, it consists of personal first hand encounters with the world—what we did, thought, and felt in particular situations. Thus, experiences and our memories of them are the gist of ourselves. Given that things play an ever-present role in our daily lives, they also play a role as facilitators, creators, mediators of personally meaningful experiences. Technology needs to be designed with those experiences in mind.

Positive experiences we went through hold more power to increase well-being than any material possession. Technology with a focus on creating and shaping experiences inherits this power. It is neither the processor power nor fancy aluminum casings that count—the value does not lie in the material but in the experiences provided.

Experiences get their value through the psychological needs they fulfill. By that, they also become a source for motivation. We may engage in activities to simply relive personally meaningful experiences or to soothe moments of need deprivation—moments we feel lonely, insecure, or worthless. Technology that creates particular experiences, thus, becomes motivational in itself.

CHAPTER 4

A Model of Experience

“We continue to see [...] the prospect of a decade of research analysis of usability possibly failing to provide the leverage it could on designing systems people will really want to use by ignoring what could be a very potent determinant of subjective judgments of usability—fun” (Carroll and Thomas, 1988, p. 23).

When I first read this sentence in 1998 it irritated me immensely. Trained in psychology and computer science, I stumbled across usability within the scope of applied cognitive psychology. And admittedly, “fun” was not a crucial part of either theorizing or practice. Quite the contrary, we took pride in making things easy and efficient. We simply assumed that ease and efficiency *is* fun. Isn’t it so? At first, the very idea of a contradiction between usability and fun appeared ridiculous to me.

But it nevertheless made me think. In their brief paper on *Fun*, John Carroll and John Thomas (1988) argued that fun requires a sufficient complexity, which has to be warranted because “tacking on ad hoc complications will not evoke fun” (Carroll and Thomas, 1988, p. 21). The usability approach, however, is about reducing complexity rather than preserving and turning it from “bad” to “good.” For example, when working on the user interface of the *SOMATOM*© *Smile*, a computed tomography (CT) scanner, I quite mulishly found myself insisting that CT scanning should not be different from taking a simple photograph. Just press the release—*et voilà*—a picture! Whenever colleagues mentioned that there might be more to CT scanning than just pressing the release, I immediately filed this under either “not willing to take usability seriously” or “being stuck in the rut.” I wanted to simplify CT scanning by *reducing* complexity. Only in hindsight, it occurred to me that this also implies disempowering users, to deprive them of possibilities to improve and extend what they do. Handling complexity through reduction is as if arguing that a video tape recorder becomes more usable without time-shifted recording. Hey, there is no need to program anymore; there is no need to fiddle around with timers or *Video Programming System* (VPS) code—just plain video watching!

What sounds absurd for a moment appears to have been the predominant mindset and common practice in the field of Human-Computer Interaction and Usability Engineering of the late 1990s up to mid 2000s (read through Jacob Nielsen’s *Alertboxes* to get the idea, www.useit.com). We, for example, marveled at the simplicity of the early *iPods*. However, the 3rd generation’s (see Figure 4.1) simplicity and elegance was reached at the expense of functionality. For example, I could add a song to a so-called on-the-go playlist while listening, but I could never remove it. This had to be done with the help of a computer and jukebox software instead. Today, *iPods* offer many more functions, ranging from “cover flow” to “genius” playlists—all successful approaches to cope with complexity rather than trying to avoid it by cutting functionality.



Figure 4.1: *Apple's 3rd generation iPod (2003, Wikipedia).*

Obviously, reduction is not the “silver bullet” to better products, but Human-Computer Interaction nevertheless went on mocking “creeping featuritis” or “bloatware.” In a revealing study, Joanna McGrenere (2000), looked at how people use Microsoft’s *Word 97*, a software often dubbed as “bloated.” On the top-level, the default *Word 97* interface offers 265 functions. On average, participants only used 40 of those 265 regularly (15%). They are familiar with only 135 out of 265 functions (51%). Thus, objectively *Word 97* easily qualifies as “bloatware.” It provides a lot more functions—and, thus, complexity—than warranted. However, when asked whether unused functionality should be removed, only 25% of the participants readily agreed. Another 45% called for ways to keep complexity, but making it more manageable by being able to tuck away unused functions. Based on this, McGrenere, J. (2000, p. 338) concluded: “press reports that suggest that users are dissatisfied with applications such as word processors and would be better served by simple or light versions oversimplify the problem and are not grounded in actual user experience.” Nevertheless, companies go on to belief in reduction. The latest example is the *Bare Necessity Car* by General Motors. In their *The Lab* blog (<http://thelab.gmblogs.com/bare-necessity-car/>), Therese Tant describes: “We knew from our research that people wanted an extremely efficient vehicle that was also low-cost and green. [...] The idea of a back-to-basics, bare-necessity approach to designing a vehicle made sense.” This was written by the same designer, who reveals on her personal page (<http://thelab.gmblogs.com/contributors/theresetant>) that a 1967 Cadillac Fleetwood Eldorado is just the car, she “would be so happy in.” A roaring V8 engine—this is what I call a bare necessity.

Since I first read Carroll and Thomas’ (1988) paper, I had many conversations with colleagues about Human-Computer Interaction’s perspective on ease versus fun. I remember one example particularly well. In a workshop on *Funology* (Monk et al., 2002), Randy Pagulayan from Microsoft Games Studio said: “If a usability engineer designs a game, it would be most likely a single button announcing ‘To win, press here.’” Reduction is neither what people want nor need. If we equate usability with reduction, ease, and simplicity, we are—as Carroll and Thomas put it—at risk of failing “to provide the leverage we could” (Carroll and Thomas, 1988, p. 23). Consequently, back in 1988, they called for developing “a research program in fun and motivation” (Carroll and Thomas, 1988, p. 23). User Experience is this program.

The present chapter’s purpose is to develop the thoughts presented in Chapter 2 into a more coherent model of User Experience. As long as Human-Computer Interaction is about technology-mediated action, I ground this model on a proper understanding of action itself.

4.1 MOTIVES AND ACTION

Almost any theory of action defines distinct levels of action regulation (see Figure 4.2). *Self-Regulation Theory* (Carver and Scheier, 1989), for example, distinguishes *be-goals* from *do-* and *motor-goals* (see Section 2.2). *Activity Theory* (see Kaptelinin and Nardi, 2006 for a good overview) defines the highest levels as consisting of *activities* appropriate to fulfill particular *motives*. Activities then consist of *goals* and according *actions* to fulfill those goals. The actual action in turn comprises of *operations*, which are highly dependent on the given *conditions*.

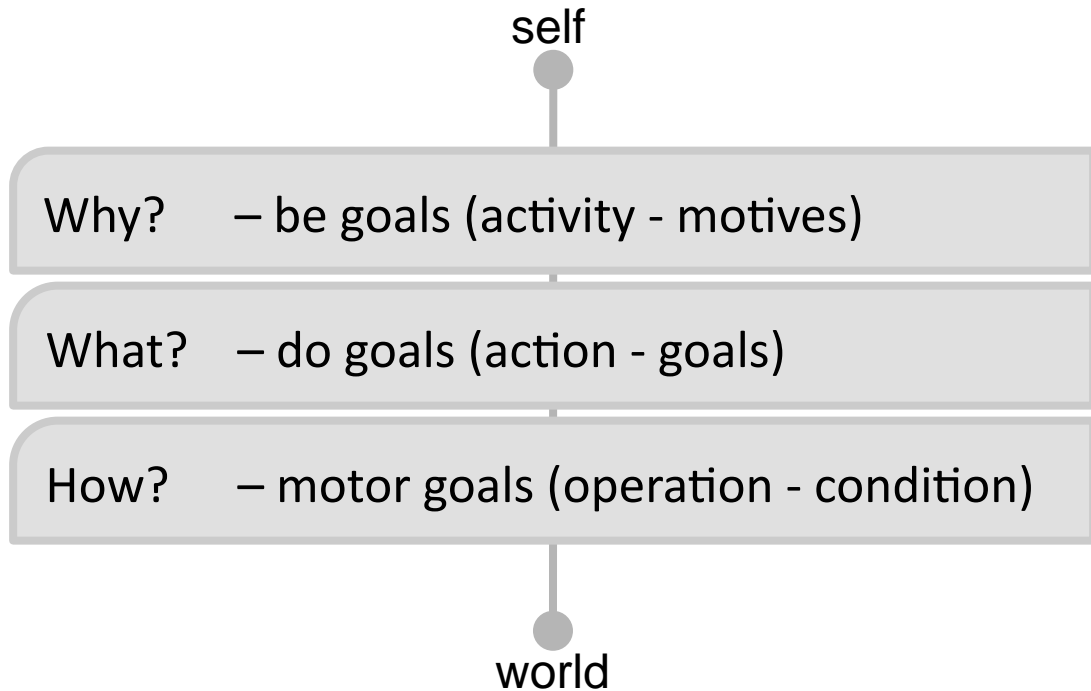


Figure 4.2: A three level hierarchy of goals. The terms used in the context of *Activity Theory* are in brackets.

For me, the pleasing feeling of routine and ritual, for example, accompanies the daily preparation of a morning coffee. This activity comprises of different actions, such as boiling the water, filling the coffee filter, heating the milk and so forth. The way of heating the milk, the single operations needed, is further shaped by specific conditions. The amount of milk to heat depends on whether my wife is at home or travelling. If the milk container in the fridge is empty, I will check the closet for supply on hand. Sometimes a full container sits on the upper shelf (if I was shopping) or on the floor (if my wife was shopping). (If there is no milk at all, we have to relinquish, however, I will make the coffee less strong.) All these operations are generated on the fly and heavily contingent on context (see [Suchman, L., 1987](#)). No two sequences of operations to fulfill a do-goal will ever be exactly similar. The do-goal in itself is more stable. Brewing a coffee is something I do most mornings of a year. However, sometimes, if coffee is not available at all, a tea may be a viable alternative to fulfill my strong and ever-present need for a routine, which covers the first 15 minutes of a day. Motives, that is, be-goals in [Carver and Scheier \(1989\)](#) terms, are the most persistent. Without a routine in the morning, I'm likely to feel odd for the rest of the day.

I argued in Section 2.2 that be-goals motivate action and provide meaning. Action theories provide the framework for this assumption and nicely integrate experiential aspects and observable behavior. Although those action theories are in principle already well-accepted within Human-Computer Interaction, motives, needs, be-goals never received much attention. In fact, two chapters of Kaptelinin and Nardi's (2006) book on *Activity Theory* address theoretical questions of the relationship between motives and actions (for example, whether there is a one-to-one relation between motive and activities or a many-to-one), thereby demonstrating how neglected the level of motives had been in the past. Donald Norman's *Seven Stages of Action* (1988) is a typical example of how action in Human-Computer Interaction was reduced to do-goals, without taking higher order motives, needs, or be-goals into account.

In explaining their “emotional thread” of experience, McCarthy and Wright (2004) point out that all our activities are “shot through with values, needs, desires, and goals” (McCarthy and Wright, 2004, p. 85). In line with the present discussion, the relation between action (i.e., do-goals) and motives (i.e., be-goals, needs) is believed to color experience; to set its emotional tone. However, McCarthy and Wright's (2004) approach falls short of providing what these motives are. One may argue that motives are so manifold and different that their description and classification is futile. However, although actual experiences may occur in an infinite number of variations, they nevertheless share a common, defining core—in the same way as chairs come in an infinite number of variations, but they are nevertheless recognized as chairs (most of the time). A need for a daily routine, which could be thought as a part of a broader need for feeling secure, can be satisfied in a myriad of different ways. Some people need their morning coffee, others their afternoon tea. Some enjoy their round of the garden, others the assuring familiarity of a telenovela. However, the experiential core is the same and, thus, will follow similar rules.

Understanding action in terms of motives fulfilled is crucial to an experiential approach to design. Brewing the morning coffee because of a need for routine is different from brewing it because of expressing your affection for your loved one through caring. Although the action appears the same, the newly designed, especially efficient coffee maker will certainly fail to support a need for routine (it actually may take it away), whereas the same coffeemaker may give me some extra minutes to spend with my spouse in the morning (but may actually ruin the symbol of caring because the less invested the less it might be valued). Thus, the meaning of experiences with interactive products is created through motivated action (i.e., activities).

4.2 CATEGORIES OF NEEDS EQUALS CATEGORIES OF EXPERIENCES

In psychology, a number of theories about the content of motives, often interchangeably called needs or values, exist. Among the best known outside psychology is surely Abraham Maslow's (1954) *Theory of Personality* which suggests a pyramid of five needs, starting from physical health and security, going up to self-esteem, belongingness, and self-actualization. Fulfillment of a need on a particular level is viewed as a necessary precondition for fulfilling the need on a higher level. Other authors compiled

their own lists, such as Milton Rokeach (1973) or Steven Reiss (1998), without assumptions about hierarchy. A prominent theory today is Richard Ryan and Edward Deci’s (2000) *Self-Determination Theory*, featuring three universal needs: autonomy, relatedness and competence.

In an attempt to identify the psychological needs most important for satisfying events, Kennon Sheldon and his colleagues (2001) recently provided a concise list of the top ten psychological needs based on a review of many of the available theories. Table 4.1 shows their final list.

Table 4.1: Top-ten psychological needs (based on Sheldon et al. (2001)).	
Need	Description
Autonomy—Independence	Feeling like you are the cause of your own actions rather than feeling that external forces or pressure are the cause of your action
Competence—effectance	Feeling that you are very capable and effective in your actions rather than feeling incompetent or ineffective
Relatedness—belongingness	Feeling that you have regular intimate contact with people who care about you rather than feeling lonely and uncared of
Self-actualizing—meaning	Feeling that you are developing your best potentials and making life meaningful rather than feeling stagnant and that life does not have much meaning
Security—control	Feeling safe and in control of your life rather than feeling uncertain and threatened by your circumstances
Money—luxury	Feeling that you have plenty of money to buy most of what you want rather than feeling like a poor person who has no nice possessions
Influence—popularity	Feeling that you are liked, respected, and have influence over others rather than feeling like a person whose advice or opinion nobody is interested in
Physical thriving—bodily	Feeling that your body is healthy and well-taken care of rather than feeling out of shape and unhealthy
Self-esteem—self-respect	Feeling that you are a worthy person who is as good as anyone else rather than feeling like a “loser”
Pleasure - stimulation	Feeling that you get plenty of enjoyment and pleasure rather than feeling bored and understimulated by life

In a series of studies, they addressed a number of questions revolving around the importance of those needs for well-being. Their general approach was to ask people to report on a relative recent, most satisfying (peak) life event, as well as on feelings of need fulfillment and the affect (positive, negative) experienced during the event. Specifically, after having provided a description of an event, participants were instructed to make ratings concerning “a variety of complex thoughts and feelings” (Sheldon et al., 2001, p. 328) during the event. Statements such as, “During this event,

I felt that I was successfully completing difficult tasks and projects,” (competence) or “During this event, I felt close and connected with other people who are important to me,” (relatedness) were used to assess need fulfillment. Participants responded on a five-point scale ranging from *not at all* to *extremely*. All in all 30 items measured the 10 needs (three items for each need). Affect was measured with the *Positive Affect Negative Affect Schedule* (PANAS, Watson et al., 1988), a well accepted and validated questionnaire to assess the valence and quality of affect. It consists of 20 affect adjectives, such as *proud*, *excited*, *scared* or *hostile*; ten for positive affect and ten for negative affect. The average of the responses to each set of ten was used as an index of experienced affect.

The results proved interesting. First of all, the degree of need fulfillment was positively related to the intensity of positive affect. Except for luxury, all needs were related to positive affect (correlations in the range from .20 to .50). The more intense the feeling of need fulfillment, the more intense had been the positive feelings. Second, a factor analysis (principle components analysis) showed needs to be relatively independent from each other. In other words, positive experiences are often marked by a particular need and, thus, were classified accordingly. Third, needs differed in their general intensities: autonomy, competence, and relatedness were especially noticeable in the reported positive life events. Fourth, although participants were able to rank needs according to personal importance (Study 1), the needs which were rated as personally more important did not produce more positive affect. This supports the notion of universality rather than the idea of a matching process between individual preferences and events. Fifth, a comparison of participants from the United States and South Korea revealed only a minor difference: In line with the notion of a collectivist culture, relatedness was significantly more salient in the South Korean sample. The remaining results were similar.

In analogy to Sheldon and colleagues’ (2001) work on satisfying events, Sarah Diefenbach, Anja Göritz and I (Hassenzahl et al., 2009) explored the idea of needs as a source of positive experience with interactive products and technologies. All in all, we collected over five-hundred positive experiences with technology, ranging from mobile phones to arc welding equipment. The results suggested that experiences with technology can indeed be categorized by the primary need they fulfill. In addition, it revealed a clear relationship between need fulfillment and positive affect, with stimulation, relatedness, competence and popularity being the most salient and contributing needs.

Timo Partala (2009) used Sheldon and colleagues’ (2001) list of needs to analyze the experience of *Second Life*, one of the best known virtual worlds created by *Linden Lab* in 1999. He compared need fulfillment through *Second Life* with real life. The results showed a clear picture of what people enjoy about *Second Life*: greater autonomy, more luxury, less security and, interestingly, more physical striving. *Second Life* allows for a free, luxurious, dangerous life, in the skin of a—at least slightly—idealized version of myself. People were also aware of the advantages of their real life: more relatedness and more opportunities to experience competence and meaning. All in all, the needs provided a handy tool to quantify experience plausibly and to guide a deeper qualitative analysis. The resulting picture of the *Second Life* experience is beyond cliché. Tracing back action to underlying motives created a rich understanding of people’s positive experiences.

Needs, I argue, provide categories of positive experiences. These categories can be used to describe and classify many experiences with interactive products. An advantage of needs as categories is its grounding in sound and extensive psychological research. Other than many “homebrew”-approaches, needs and according models already evolved—to a good part empirically—over the last 100 years. They are validated and still lend themselves to further empirical validation in the context of interactive products. Admittedly, needs as categories of experiences are very broad. They are able to capture the essence of a class of experiences, rather than the myriad of slight variations that let experiences appear so unique and so ever-new. Still, this helps understanding classes of experiences and related feelings, typical behavior, conditions, rules and typical failures and problems.

Categories of experiences should not be understood as a reduction; they are not intended to strip experiences of all their wonder, charm and mystery; rather I understand them as vessels yet to be filled. Take Mihaly Csikszentmihalyi’s (1975) well-known concept of “flow.” Csikszentmihalyi describes “flow” as being one with the activity, in control, the experience of flying time (or acting in slow motion) and a strong sense of intrinsic motivation that is, doing something because you want it not because somebody tells you to. Through interviews with dancers, mountaineers, or athletes, he found some important pre-conditions for flow: The activity needs to be challenging but still attainable with the available skills. Climbing the same mountain over and over again is not likely to produce flow. Rather, you will pick new mountains, slightly bigger, slightly more demanding. Luckily, your skills are improving, too. And, eventually, you might find yourself on top of the *Eiger*. Another precondition of flow is a clear goal and a good sense of progress towards that goal. I cannot think of anything meeting those requirements better than a pinnacle and the activity of climbing.

Flow can be understood as competence experience (maybe spiced up with a little autonomy). It makes us happy, and more importantly, it follows some basic rules: challenges meeting skills, a clear goal and a good sense of progress. This is almost a recipe, detailing some of the crucial ingredients of a competence experience. And we can use this recipe to design for experience.

Csikszentmihalyi was a humanist. Humanists believe in the good in people and the idea that, given the necessary freedom and proper support, people will develop that good. For Csikszentmihalyi, flow was, thus, a road to happiness. But 25 years after his book, he still marvels at “Why do people choose to watch television over reading a challenging book, even when they know that their usual hedonic state during television is mild dysphoria, whereas the book can produce flow?” (Seligman and Csikszentmihalyi, 2000, p. 12). An answer is that competence experiences are just one of at least seven roads to happiness. Stimulation, relatedness, autonomy, popularity, meaning, security and physical striving are alternatives, following their own set of rules and producing distinct, but still positive experiences. From this point of view, watching a telenovela might not lead to competence experiences but to the soothing and warm experience of security, the joys of routine and familiarity. To me, devaluing this experience as “mild dysphoria” as Csikszentmihalyi does, misses the point.

The notion of categories of experiences as *vessels* is an important one. Such as challenge, skill, goal, and progress are the essence of competence; other categories will attain to completely different

rules. For example, the idea of “randomness” as a design resource or the notion of “serendipity” (e.g., [Leong et al., 2008](#)) might be central elements of stimulation experiences, whereas emotional expressiveness might be strongly associated with relatedness experiences (e.g., [Vetere et al., 2005](#)). The proposed category system bears the opportunity to integrate scattered knowledge about experiences and ways to create them into a coherent model.

4.3 FROM NEEDS TO PRODUCTS

Human-Computer Interaction quite naturally focuses on the interactive product, the “thing” rather than the experiences resulting from interacting with the thing. This is quite natural, because Human-Computer Interaction is eventually about designing products. Despite arguing for a refocus from designing products to designing action and ultimately to designing experiences (see Section 5.3), it would be shortsighted not to consider the product in itself. It is through the product’s functionality, content, presentation and interaction with people that designers create particular experiences. An easy, simplified product, reduced to core functionality, is unlikely to create sustained competence or even stimulation experiences. People seem to know that. Joanna McGrenere’s (2000) results on “bloat,” the fact that people want to retain functions even if unused, supports this. Unused functionality is perceived as a resource, as opportunities to improve daily work, as challenges, or as a way to experience something new. The particular design, understood as a bundle of functionality, content, presentation, and interaction, shapes experience.

The majority of content-oriented models of User Experience simply define a number of quality dimensions considered to be important. With an exploratory approach, Talia Lavie and Noam Tractinsky (2004) found five distinct dimensions (example attributes are in brackets): Classical aesthetics (“Clean design”), expressive aesthetics (“Original design”), usability (“Easy to use”), pleasurable interaction (“Feel pleasure”), and service quality (“Can count on site”). At least the first three dimensions are clearly product-oriented, whereas pleasurable interaction is rather experiential. Jan Hartmann, Alistair Sutcliffe, and Antonella De Angeli (2007) argued for usability, content, aesthetics, reputation/identity, and customizability based on their former work and what is considered important in the literature. Other models could be added here. Each suggests a slightly differing list of attributes. The important point here, however, is that those attributes are more or less product-oriented and, in sum, important for the “attractiveness,” “satisfaction,” or “appeal” of an interactive product.

Since 2000, I and colleagues ([Hassenzahl et al., 2000](#); [Hassenzahl, M., 2001, 2003, 2004](#); [Hassenzahl and Roto, 2007](#)) work on our own product-oriented model of user experience, the hedonic/pragmatic model. It assumes people to perceive interactive products along two different quality dimensions. *Pragmatic quality* summarizes the product’s perceived ability to support the achievement of do-goals, such as “making a telephone call,” “finding a book in an online-bookstore,” or “setting-up a webpage.” In contrast, *hedonic quality* summarizes the product’s perceived ability to support the achievement of be-goals, such as “being competent,” “being related to others,” and “being special.” An individual’s assessment of pragmatic quality calls for a focus on the product—its utility

and usability in relation to potential tasks. Assessing hedonic quality, however, calls for a focus on the Self, i.e., the question of why does someone own and use a particular product. Here, the general human needs discussed above come into play. In other words, pragmatic quality maps primarily onto the “what” and “how” levels of interacting with a product, whereas hedonic quality maps primarily onto the “why” level (see Figure 4.2).

The model further assumes that people have implicit notions of the relation between particular attributes (e.g., simple–complex, ordinary–novel) and pragmatic or hedonic quality, respectively, (in the sense of means-end-chains, see Reynolds and Olson, 2001). Simplicity, for example, may signal high pragmatic quality, whereas novelty may suggest high hedonic quality.

The hedonic/pragmatic model supposes that people view both aspects as more or less unrelated (Hassenzähl, M., 2001). For instance, a mobile phone’s particular features will trigger the formation (perception) of a number of attributes (e.g., simple, novel, admirable), which in turn are viewed as being either related to be- or do-goals. Some attributes of the phone suggest that making a telephone call will be easy, others imply jealous friends because of the phone’s coolness and beauty. A relation between both is only rarely made—pragmatic and hedonic quality are perceived as distinct aspects. In fact, all studies published so far support this notion. Andrew Monk and I (Hassenzähl and Monk, 2009), for example, studied three different data sets, with a total of over 607 participants and 110 different products and with an abridged version of the AttrakDiff2 questionnaire. It consists of ten seven-point semantic differential items—product attributes so to say—four to measure pragmatic quality (*confusing—structured, impractical—practical, unpredictable—predictable, complicated—simple*), four to measure hedonic quality (*dull—captivating, tacky—stylish, cheap—premium, unimaginative—creative*) and *good—bad* and *beautiful—ugly* as measures of general product evaluation. The correlation between hedonic and pragmatic quality ranged from .00 to .52, with an average of .24, which all in all suggests independence.

Throughout the book, I argued for a hierarchical model of goals, following well known action theories where subordinate do-goals are derived from and are instrumental to superordinate be-goals. People are not interested in “making a telephone call” *per se*, but they may rather think of whom to call for what reason. Nevertheless, I believe that the pragmatic quality of a product is typically assessed without a strong link to be-goals. Simplicity, for example, suggests the ability to make telephone calls whenever needed but not a particular suitability of the phone to make romantic phone calls to feel related to others. Thus, although do-goals (making a telephone call) are the product of superordinate be-goals (being related to others), people may make a clear distinction between both aspects. It is as if people use different “glasses” while judging an interactive product. This is also in line with Carver and Scheier (1989) observation that people are either tuned to the do-goal level, that is talk about their actions, or step back and talk about the be-goal level. Rarely, both are in focus at the same time. Note that this neither implies that the hierarchical organization is non-existent, nor that pragmatic aspects are not intertwined with hedonic aspects nor shouldn’t even reflect upon them as I will argue in the next chapter. However, if asked, people seem to separate both aspects.

The notion that be-goals are higher up in the hierarchy and by that closer to an individual's Self has an interesting implication: People may become more attached to a particular product the more intense its hedonic attributes. Take the souvenir in Figure 4.3 as an example.



Figure 4.3: An illuminated gondola from Venice (picture by Uwe Dettmar, Frankfurt Main, Germany).

The gondola triggers pleasant memories of one's honeymoon, which is linked to relatedness and provides personal meaning. The object is personally relevant, and its owner certainly feels emotionally attached to it (Belk, R., 1988). In case the gondola would break, its owner most likely wouldn't replace it—even if an exact copy of the gondola would be available. He or she would rather keep the pieces or try to fix it than replacing it. Now imagine a standard dishwasher. It addresses clearly defined do-goal and may be primarily assessed in terms of effectiveness and efficiency. The product is perceived as pragmatic even if superordinate be-goals may ultimately trigger the need for clean dishes. (A well-known German advertising for detergent announced that if you use it, "then it will work out with the neighbor." Clean dishes are announced to work as a "mating call," which reflects on a potential underlying social motive.) Clearly, there is also a strong attachment to a dishwasher (I personally wouldn't survive without one); nevertheless, this attachment is rather functional than emotional (Belk, R., 1988). A particular dishwasher can easily be replaced by any other model performing the same basic task.

Of course, even pragmatic objects can be loaded with meaning. A grandfather's old wrench, for example, can have significant meaning to a grandchild beyond its utility as a tool. Looking at it this way, any object can be hedonic. However, I believe that products can be more or less experien-

tial, depending on how clearly they communicate a relationship to needs through their attributes. Novelty may promise stimulation experiences, modernity may promise popularity experiences, and professionalism may promise competence experiences—all hedonic attributes, which signal positive experiential outcomes of product use. Simplicity, manageability, and predictability, however, may be rather about the potential instrumentality of a product. They signal that the product is in principle usable, if needed. Thus, hedonic quality could be understood as a “motivator,” capturing a product’s perceived ability to create positive experiences through need fulfillment and pragmatic quality as a “hygiene factor,” enabling the fulfillment of needs through removing barriers but not being a source of positive experience in itself. To give an example: At the end of a hard working day, the lonely business traveler might want to call her spouse to feel related. Her mobile phone would be, thus, instrumental for creating a relatedness experience. Given the phone is entirely “unpragmatic” (i.e., unusable), it will create an insurmountable barrier to the relatedness experience. The business traveler will be frustrated due to her blocked need fulfillment. Thus, pragmatic quality is an important aspect of any product. However, it has no meaning in itself. It rather gets its meaning through enabling or blocking particular experiences. The experiences themselves, however, are the true benefit of product use. This defies any model that assigns value to pragmatic quality or usability in itself.

In our study of positive experiences with technology (Hassenzahl et al., 2009), we not only let participants report and rate a recent positive experience with technology, we also let them rate the technology’s hedonic and pragmatic quality. The results were revealing. As suggested by the present model, need fulfillment was related to hedonic and not to pragmatic quality perceptions. Interestingly, whether experienced need fulfillment was reflected in subsequent hedonic quality perceptions depended on the belief that the product was responsible for the experience. In other words, the young woman receiving a sweet “love you” message while staying in Dublin will only find her mobile phone more hedonic if she realizes that the experience was made possible by the phone. In this case, the mobile phone gets meaning through the relatedness experiences it provides. Pragmatic quality was not related to need fulfillment. Again, this does not imply that pragmatic quality is superfluous. It still enables or blocks experiences. But in itself, without an active need, it is without any value.

4.4 PRAGMATIC VERSUS HEDONIC: WHAT IS MORE IMPORTANT?

In his well-known book *Designing Pleasurable Products*, Patrick Jordan (2000), by the way, a true pioneer of experience, suggested a simple yet plausible model. Following the principles of Maslow’s hierarchy of needs, he argued functionality to be the necessary precondition for usability, and usability to be the necessary precondition for pleasure—thus, without usability, there wasn’t any fun.

Such a strict model can be easily challenged. A souvenir, such as the gondola from Venice, provides a relatedness experience through keeping a memory alive. It does so without providing practical functionality and usability. It is primarily hedonic. On the other hand, without the ability to keep a memory alive, it would not provide pleasure. A model of the Eiffel Tower can never be

a symbol for a honeymoon trip to Venice. This ability to symbolize could be considered a form of functionality or usability, a then necessary precondition for a pleasurable relatedness experience. The Eiffel Tower is simply not as appropriate (usable?) as the gondola.

Trying to resolve this seeming contradiction is revealing. Take the high heels in Figure 4.4. as example.



Figure 4.4: High heels (picture by Keith Coleman, [flickr.com](https://www.flickr.com/photos/keithcoleman/)).

Wikipedia (http://en.wikipedia.org/wiki/High-heeled_footwear) laboriously lists the numerous consequences of wearing or not wearing high heels. On the positive side, they “change the wearer’s posture, requiring a more upright carriage and altering the gait in what is considered a seductive fashion,” “they make the wearer appear taller,” “legs appear longer,” “the foot appears smaller,” “the toes appear shorter,” and “the arches of the feet appear higher and better defined.” On the negative side, “they can cause foot pain,” “create foot deformities, including hammertoes and bunions,” “they can cause an unsteady gait,” “render the wearer unable to run,” and cause various medical problems. In short: supposing you are female, you will definitely look better, more

seductive, more desirable, but it will hurt a lot. And for male readers: she will definitely look better, more seductive, more desirable, but it hurts her a lot. (Just try them on for a first-hand experience.) Typically, usability professionals are at loss with high heels (at least, within their professional lives). Shoes are made for walking. Shoes should be comfortable, safe and healthy. Shoes should support activity not deliberately cripple people. High heels are simply unusable and, thus, a proper example for pleasure *without* usability as precondition.

This analysis is only true given the starting point is the do-goal “walking.” Let’s consider “being admired” (a popularity experience) or “being physically improved” (a physical striving experience, similar to what people strive for by slightly idealizing their avatars in *Second Life*) as the ultimate essence of a positive experience with high-heels. Through changing gait and posture, high heels are indeed able to produce according popularity or physical striving experiences. From this point of view, they are *instrumental*—no heel, no fun. Other, more practical shoes are unlikely to produce similar effects.

The problem is one of defining usability. The present model argues that needs (be-goals, motives) are the source of experience and the drivers of product use. It is need fulfillment, which creates meaning in interacting with a product. However, to be able to fulfill a need, a product has to be *instrumental*, that is, able to create or shape the experience as desired. In this model, every level has to be aligned and is shaped by and feeding back to the superordinate level. Needs imply instrumental actions, which in turn imply appropriate operations; and only if the action is indeed instrumental, that is, fulfills a particular need, an experience emerges. In Jordan’s terms: Pleasure, usability, and functionality are an entity. Functionality and usability are necessary preconditions for pleasure, but functionality and usability without pleasure are meaningless.

This is not necessarily the way usability is defined within Human-Computer Interaction. An official definition is “The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO, 1998). Although the term *goal* is sufficiently vague, most academics and practitioners would understand it as a synonym for do-goals. In other words, we focus on do-goals, such as “making a telephone call,” and usability becomes the sole question of whether this goal can be reached or not. Whether “making a telephone call” actually fits the targeted need, whether “making a telephone call” creates a positive relatedness experience, is excluded. Likewise, one may argue that shoes are made for walking, and if they do not allow for walking, they are “crap.”

Imagine sitting on your terrace. It is a warm morning, springtime, and as usual you are having a coffee, peacefully enjoying the garden. There is a robin sitting on the roof of a bird house nearby. Suddenly, the stillness gives way to the robin’s tiny but clear voice. It trills a song. With a smile, you recognize it: David Bowie’s *Ashes to Ashes*, one of your favorites. “This could be made possible by an artificially intelligent birdfeeder. Joining a microphone, speaker, pitch-tracker, and software, it would use behaviourist principles to teach the birds new songs, first playing an example of the tune, then progressively rewarding them as they learned to sing in response, to sing small phrases of the song, and finally to match it in tune and tempo” (Gaver and Martin, 2000, p. 210).

In their paper on *Alternatives*, Bill Gaver and Heather Martin (2000) suggest this concept—the *Dawn Chorus*—to cater for peoples’ need to exert influence over their environments. “Just as the burgeoning garden industry has allowed people to extend control from their living rooms to their gardens [...], so the *Dawn Chorus* would extend this control to the very wildlife that shares domestic neighborhoods” (Gaver and Martin, 2000, p. 213).

From the perspective of the present model of experience, the *Dawn Chorus* is as useful as any other product as long as it delivers the promised competence experience through exerting control over nature. If the robin does not learn *Ashes to Ashes* even after months in the birdhouse; if I do not understand how to tell the bird house that *Ashes to Ashes* is my favorite; or if the electronics pack up the first heavy rainfall, I will not have the promised competence experience. Functionality, usability and pleasure are different aspects, but they have to be aligned to create a positive experience. Only if I neglect that do-goals are motivated by be-goals, and rather focus on the typical do-goals already embedded in products (or generally accepted by a society), there is suddenly a need to explain that things can be useless and useful at the same time. The very fact that Bill Gaver feels a need to explain it shows the default perspective—at least in Human-Computer Interaction.

Marketing traditionally distinguishes between primary and secondary utility, an idea going back to the 40s of the last century (e.g., Vershofen, W., 1940). Primary utility is the core function a product performs: cleaning carpets, quenching thirst, making photos. Secondary utility is all the rest: cleaning carpets *in an environmentally compatible way*, quenching thirst *in a fashionable way*, or making photos *in a professional way*. The problem of this view should be apparent now. It suggests that do-goals, such as cleaning a carpet, are self-evident. However, they do not have any meaning without a proper link to a need. Without a need for order (i.e., security) or health (i.e., physical striving), people would not clean carpets at all. In that sense, the security or physical striving experiences are primary and cleaning one’s carpet is only *one* way of achieving them. From an experiential perspective, both are important. Neither products which provide function without meaning, nor those which provide meaning without function are likely to be successful.

4.5 DO NEEDS HAVE DIFFERENT PRIORITIES?

Given a list of needs, such as autonomy, stimulation, relatedness, competence, popularity and security, one may ask: Are some needs more important than others? They are not. Each need covers an important class of experiences, central to being a human. This does not necessarily mean that we do not believe some needs to be more important than others. In Sheldon et al. (2001) study, for example, participants were asked to rank order the needs according to importance, which they did without much protest. However, fulfilling their—personally—important needs did not make them happier than fulfilling rather unimportant needs. Sheldon et al. (2001) concluded that needs are rather universal, important and meaningful to any human.

If we think of priorities in *fulfilling* needs, however, a different picture emerges. Deprivation of needs exerts motivational power. The more deprived people are, the higher the priority of fulfilling a particular need. After a full day of classes, meetings, conversations, my need for relatedness is more

or less saturated. Given a further opportunity to feel related—a chatty person in the next seat at the train—I might pass up on it. This is completely different after a full day of writing. Even after only a few hours of concentrated work in solitude, I would take up literally any opportunity for social contact and—I confess—distraction. Thus, needs are all equally important, but the urge to fulfill them might differ depending on the situation at hand (Sheldon et al., 2001).

Most of the time, deprivation and fulfillment are in a constant flux, like ebb and tide. Human behavior is to a good part directed at finding a balance between the different needs and identifying opportunities to fulfill the most urgent ones. However, external or self-imposed forces can lead to the systematic deprivation of particular needs. For instance, people in long-distance relationships, frequent business travelers with families, singles, and people with disabilities, which restrict their mobility, may experience a more thorough, constant, systematic deprivation of the need for relatedness. People in close relationships typically have problems with maintaining autonomy and *need* to get loose now and then. And others may be so utterly bored by their daily job that they need to fill their evenings, weekends, or holidays with stimulation experiences.

Identifying situations, which imply the systematic deprivation of a need, is an important starting point for Experience Design. It is difficult to “sell” an experience of a certain type to somebody, who is already saturated. However, the true challenge for Experience Design is to fulfill needs without making this too obvious.

4.6 A BRIEF NOTE ON EVALUATION

Sheldon and colleagues’, Partala’s, and our own work showed that people’s experiences can be indeed described and characterized with the help of a questionnaire. I believe this to be a promising strategy for Human-Computer Interaction: away from the usual product-centered towards a more experiential evaluation.

At first glance, the difference seems negligible. Whether I acknowledged to have experienced “new sensations and activities” while using a technology, or whether I rate it as “novel” or “stimulating” shouldn’t matter much. However, I argue that experiential evaluation has at least two potential advantages. First of all, it is easier for people to describe their experiences with an interactive product compared to describing the product itself. The former is a personal, highly subjective task, whereas product-oriented evaluation often raises the question on behalf of the participant, whether she or he has the competence or right to judge the product. Experiences are personally meaningful, whereas product perceptions and evaluations always require a process, which transforms anticipated or experienced need fulfillment into product attributes. In addition, experiential evaluation might enable us to compare the results of empirical evaluations of different products or even product genres, due to the universal nature of experiences.

Drawing a distinction between product-oriented and experiential evaluation is supported by the finding that experience is only reflected by corresponding product attributes, if an attribution process took place, that is, if people believe the product to be responsible for their experience (2009). In other words, although product attributes might directly mirror particular experiences, as in the

case of a stimulation experience and the novelty or originality of a product, the experience must not necessarily show up in the judgment about the product. It only does so if the judge considers the product as an important ingredient of the experience, ignoring the difference between product and experience, and only focusing on the product alone, creates the danger of missing important insights into the effects a product takes on people.

4.7 THE ESSENCE OF THE CHAPTER

Although actual experiences may occur in an infinite number of variations, they share a common, defining core—in the same way as chairs vary, but are nevertheless recognized as chairs. I suggest universal psychological needs, such as competence, stimulation, relatedness, autonomy, popularity, meaning, security and physical striving as important constituents of experience. It is the fulfillment of those needs which creates emotion and meaning in interacting with a product. The fulfillment of psychological needs is important to every healthy human being. However, depending on the situation at hand, the urge felt to fulfill needs may vary. This urge arises from need *deprivation*—repeated or prolonged episodes in which need fulfillment is blocked. To identify those blocks is an important starting point for Experience Design. It is difficult to “sell” an experience of a certain type to somebody who is already highly saturated. However, the true challenge for Experience Design is to fulfill needs without making this too obvious.

To fulfill a need, a product has to be *instrumental*, that is, able to create or shape the experience as desired. Needs imply instrumental actions, which in turn imply appropriate operations; and only if the action is indeed instrumental, that is, it fulfills a particular need, an experience emerges. In other words, functionality and usability are necessary preconditions for need fulfillment (i.e., pleasure), but functionality and usability without needs are meaningless. All expects have to be aligned to create a positive experience.

CHAPTER 5

Reflections on Experience Design

“It is now about creating experiences beyond just products and services, about creating relationships with individuals, creating an environment that connects on an emotional or value level to the customer” (AIGA, 2002).

This summary of Experience Design provided online (but unfortunately no longer available) by the AIGA, the American professional association for design touches upon many of the themes discussed in this book. It is not about products anymore, it is about the experiences they deliver. This requires a broader perspective, extending the designer’s scope to context and its control. The goal is to fulfill needs (values), which in turn creates meaning and emotion. So far so good. The question at hand is the following: “But how, Marc, tell us how?”

Don’t expect this final chapter to provide a definite answer to this question. Traditional design is a challenging business, and Experience Design is not making it any easier. However, there are some—to my mind—crucial themes to be discussed, some of them obvious for designers, but maybe it is less so for readers with a background in psychology or computer science and *vice versa*.

5.1 OUR *MENSCHENBILD*

Our image of humanity, our *Menschenbild*, is ever-present, but it is only rarely made explicit or discussed. It, nevertheless, influences any approach to the design of a product, be it interactive or not. “Things have to be simple, convenient, easy to understand, and learn;” for example, is a claim almost everybody in Human-Computer Interaction (HCI) or Usability Engineering would support without much further thinking! But is it really true? Playing the violin is a challenging and demanding endeavor. Why on earth is anybody bothering with it? The same holds true for planning adventurous holiday trips, solving mind-boggling puzzles or cooking tremendous five course menus. It is complicated, hard to master, and not always convenient—but apparently a lot of fun.

The intellectual roots of HCI are work science, work psychology, and ergonomics. All those disciplines were basically triggered by a more or less economically-driven demand for an improved workplace (Karwowski, W., 2006). One strategy was to select and train people to increase work performance, the other to adapt workplace design, machines and so forth to the skills and capabilities of workers. In this context, efficiency and effectiveness was clearly an institutional and not a personal goal. Better performance equaled more money. The human was viewed as a necessary, but yet

improvable part of the system. Do you remember *Billow's Feeding Machine* (Figure 5.1) in Charlie Chaplin's *Modern Times*?



Figure 5.1: *Billow's Feeding Machine* (from Charlie Chaplin's *Modern Times*, 1936, see <http://www.youtube.com/watch?v=8-UiCnxARJY> for the complete scene).

The feeding machine is “a practical device which automatically feeds your men while at work. Don't stop for lunch: be ahead of your competitor. The Feeding Machine will eliminate the lunch hour, increase your production, and decrease your overhead. Allow us to point out some of the features of this wonderful machine: its beautiful, aerodynamic, streamlined body; its smoothness of action, made silent by our electro-porous metal ball bearings. Let us acquaint you with our automaton soup plate—its compressed-air blower, no breath necessary, no energy required to cool the soup.” Back in 1936, the economic world seemed so obsessed with efficiency and effectiveness that Chaplin could mock it easily.

Since then, the general objective to increase performance remained stable; however, the underlining reasons have been forgotten. For instance, a well-accepted international standard on usability, ISO 9241-11 (ISO, 1998), re-iterated and further popularized the performance objective of usability by calling for efficiency and effectiveness. It also added a third objective, namely *satisfaction*. Although

broadly defined as a general positive attitude towards an interactive product, in the minds of many practitioners and academics, satisfaction became tightly coupled to performance. Satisfaction was framed by the ISO standard as a subjective perception of efficiency and effectiveness, as a by-product of performance, rather than as a self-contained, independent aspect (Lindgaard and Dudek (2003); see Bevan, N. (2010) for attempts to extend the concept of satisfaction). This implicit coupling of performance with satisfaction further helped establishing a notion of users as *Homines Oeconomici*. This breed values technology only insofar as it saves time to do whatever else is concerned pleasurable. Performance became an end in itself.

In his book *The Armchair Economist*, Steven Landsburg (1993) fervently pointed out a common misconception. Economics, so he argued, is not about being productive; it is about being happy. “We live in an age of ‘policy wonks,’ who judge their programs by their effect on productivity, or output, or work effort. [...] Wonks want Americans to die rich; economists want Americans to die happy” (Landsburg, S., 1993, p. 44). I would argue that only the most puritan will regard productivity as a value in itself. Productivity is a means, sometimes important, sometimes not. With its strong focus on effectiveness and efficiency, HCI was about to take the same false turn as economics took. Experience, however, reminds us of all the things beyond performance.

If we challenge the image of humanity as being obsessed with their own performance, we need feasible alternatives. Landsburg suggested the more cheerful image of humans as striving for happiness. In line with this, Bill Gaver (2002) suggested *Designing for Homo Ludens*. By implicitly or explicitly following the notion of the *Homo Oeconomicus*, he argued, we will end up “surrounded by technology devoted to taking care of our everyday chores, giving us the leisure to pursue whatever activities we really value.” The crucial question he further posed was “But what if technologies helped us pursue those activities now, directly, rather than merely helping us get the chores done?” In other words, technology use in itself can be meaningful and a pleasure. Accomplishing externally given tasks alone is a too limited view of what people do with and gain from technology. Gaver’s (2002) alternative to the *Homo Oeconomicus*, the *Homo Ludens*—a term borrowed from Johan Huizinga (1939)—understands humans as playful creatures. We are not characterized by performance alone, but “by our curiosity, our love of diversion, our explorations, inventions and wonder. An aimless walk in the city centre, a moment of awe, a short-lived obsession, a joke—all are defining and valuable facets of our humanity, as worthy of respect as planning, logic or study.” Bill Gaver is one of the few people writing about the design of interactive products who explicates his underlying notion of the humanity he is designing for. *Homo Ludens* as such may be debatable; the importance of stating the *Menschenbild* is not.

What would be a notion of humans compelling for the present perspective on experience? Borrowing from Deci and Ryan (2000, p. 229), I understand humans as active and growth-oriented. They are naturally inclined towards integration of their feelings, thoughts and actions into a unified sense of self (provided through experiences) and the further integration of themselves into larger social structures. This is not just humanistic claptrap. Actually, this notion of humans has concrete implications for the design of interactive products. It defeats high levels of automation and in some

domains, typical approach to mask complexity through overly simplistic technology. It urges us to *not* underestimate peoples' skills and abilities, and their interest in learning and improving themselves. And finally, it calls for meaningful, self-relevant experiences delivered through technology and an ever-present focus on the social processes and practices, in which technologies are embedded.

5.2 NORMATIVE POWERS OF DESIGN

Imagine yourself being in the clutches of a market researcher. Fair enough, she seems genuinely interested in your view. Finally, she comes up with a really tough question: "Image future home electronics, such as portable music devices, computers, and so forth would be white. What do you think?" You think. "White? Entirely? Completely" She smiles: "Even the headphones!" "What a crazy idea," you reply, "White reminds me of hospitals, doctors, washing machines and old science fiction movies, such as Spielberg's ...uhm ...Emmerich's ...wait ...Kubrick's *2001—A Space Odyssey*. And, on top of that, it is utterly impractical. I don't want to clean my MP3 player every other day, not to speak of the headphones." "Well, well," the market researcher says, "I take that for a No!"

I doubt that a conversation like that really took place, but it nevertheless summarizes more or less what you would have got as a market researcher from people in pre iPod-times, when consumer technology was brown or silver, never white. Today, the white coated headphones became Apple's unique brand signature. It seems to be so central that even if you buy a matt black iPod classic, it comes with silly, white coated headphones—something I found quite hideous when I first found out (first-hand); especially for a company that is praised and praises itself for its taste and style.

"Empirical Measurement" was one of the three "golden principles" John Gould and Clayton Lewis (1985) devised to design for usability. Since then, HCI never lost its empirical stance (e.g., ISO, 1999). And in fact, meddling with real people, observing, asking, and confronting them with new ideas and products is an important step towards a better understanding of how people feel, think and act. However, one should keep in mind that the relation between designer and user (consumer, recipient) is bi-directional. It is not as if users have well-defined requirements, which only wait to be discovered. Indeed, requirements are *co-constructed* in the ongoing dialog between user and designer. Each interactive product is a proposition, a new opening in the design space. It will inevitably alter expectations and ultimately the requirements users formulate concerning future technologies. John Carroll and colleagues Carroll et al. (1991) already described a similar effect, but focusing on tasks: Their *task-artifact cycle* acknowledges the fact, that through the use of new technologies, existing tasks will be altered and new tasks will emerge. To broaden this notion: An interactive product can be understood as a theory about its users, purpose, and context of use (Carroll et al., 1992). The better the theory, the better the fit to the world as it is. Or it can be seen as an alternative to the existing way of doing things; a proposition, which will—if being accepted by people—change the world.

To be aware of the normative powers of design is crucial. I have no patience for designers, which create overly expensive, wasteful, fast and aggressive looking cars, used to terrorize people on German *Autobahns* and escape their responsibility by announcing that this is what consumers want. (Not even if the designers try to further justify it by acknowledging the seemingly "dark sides of

humanity.”) On a product level, consumers only desire what they know about. To believe that people have an inborn “need” for fast cars is either ignorant of one’s own powers or a cheap trick to escape responsibility. Either way, it is unacceptable. In line with this, [Sheldon et al. \(2001, p. 336\)](#) argued that needs (as discussed extensively in the previous chapter) “carry little information about exactly what behaviors to engage in, a fact that allows for considerable behavioral plasticity.” In Experience Design, we actually suggest particular activities through an interactive product. As long as this leads to need fulfillment and, thus, to a positive experience, we may consider it as appropriate and good. However, this does not free the designer from taking on the responsibility for the particular way of fulfilling a need she or he just devised. Each product is a proposition, and we cannot escape the fact that it has the power to change how people feel, think, and act. To do this consciously is important. The more, the better we fulfill our goal to design deep, meaningful experiences.

5.3 EXPERIENCE BEFORE PRODUCT

Remember: experiences are emergent, and in Experience Design, we use functionality, content, presentation and interaction as materials to create and shape experiences. Experience is prime, and the product only a means. Accordingly, one of the basic claims of Experience Design is to consider the experience *before* products. The notion of experience as an emergent story, a narrative summarizing feelings, thoughts and actions, developed in Chapter 1 helps here. Experience Design urges us to set the story straight before we start thinking about how we can create this story through a technology.

Although a simple idea—to put experience before products—to live it is difficult, especially for designers and engineers. The reasons for this difficulty are manifold, but they all revolve around the designer’s quite natural focus on the only tangible aspect of the experience to be created: the product. In addition, design and engineering is often taught as a concrete problem solving exercise and especially engineers and industrial designers are sometimes more interested in solving technical or formal problems than in the overall experience they create. You need an interest for humans, not technology if you want to be an experience designer. In addition, many products do not seem to have much potential for novel, experiential narratives. A chair is a chair, is a chair, and it is used—well—for sitting. It is only obvious to focus on form, material or constructive aspects of a chair. To speak of a sitting experience seems utterly forced. This is surely one of the reasons why Experience Design is so tightly related to interactive products. Interaction, its temporal dimension and its heavy focus on action, makes the idea of a story much more applicable. Don’t get me wrong. I am not arguing for restricting Experience Design to interactive products. It is always worthwhile to think experiences through, and most of the time, an experiential perspective yields insights even for products, which are not highly interactive.

I like to bake cakes; nothing illustrious, though, just plain cake with apples or chocolate. To my utter disapproval, my three year old daughter Greta loves to join in. I am not complaining. This could all be a very sweet daughter-father (relatedness) experience, except for the explosive mixture of willpower, stubbornness and lack of motor skills so typical for three year olds. Greta insists on cracking the eggs, and I have to pick small pieces of egg shell out of the mixing bowl. She enjoys

beating the batter vigorously, which is crucial to a good cake. A standard hand-operated mixer, however, is just too heavy for her. Consequently, I have to do a lot of cleaning and wiping afterwards. What we need, Greta and I, is a proper—what Katja Batterbee (2003) might call—*co-experience*. I really enjoy doing things with Greta, at least in principle, but I also take pride in my cakes. Greta seems to enjoy only specific aspects of the baking procedure, such as cracking the eggs, beating the batter, putting in the ingredients, resetting the kitchen scales. For her, the whole activity even seems to have a different structure. I consider baking to be finished the moment I remove the cake from the oven. Greta loses any further interest the moment we finish working on the batter. Because this means, she can lick the beaters clean. For her, the cake is just a welcomed but secondary outcome.

An Experience Design perspective would focus on baking as an activity—in the present example, as a *shared* activity (hence the reference to *co-experience*). It would identify the important experiential aspects of the whole procedure and the barriers that may prevent the experience to be entirely positive. It would create a new script, a slightly revised, better “baking story” for the two of us and a set of physical products, which allow the story to be acted out. Thus, an experience-minded designer would provide us with a way to crack eggs safely with verve and fun and underdeveloped motor skills. He or she would create a mixer, which can be operated by a three year old. However, the tools are only a means to an end, and the criterion for a good tool is neither practicality nor efficiency but the emergence of a better baking co-experience for Greta and me.

In 2009, students, Anke Bernotat and I participated in the *Philips Creative Challenge*. The general objective was to explore “hospitality from a well-being perspective.” Among the emerging themes, one particularly interesting touched upon the duties linked to the roles of host and guest. Typically, hosts set and control the setting for acts of hospitality, whereas guests submit themselves to the benevolence (or tyranny) of the host (Douglas, 1991, in Lynch, P., 2005). Hosts are expected to take responsibility, action, and control—an asymmetric situation, which is not always experienced as entirely pleasurable by both, host and guest. A way to reduce this asymmetry may be “guest participation.” This is similar to recent work on “customer participation” in commercial hospitality settings (e.g., Lugosi, P., 2007), which emphasizes the guest’s role in creating a pleasurable hospitality experience.

One of the student groups we supervised, Nora Helms, Anna Kuperski, and Simon Pfarr, further explored this idea and found music to be a promising subject. Indeed, in many cases the music, which accompanies gatherings, is considered important by hosts and guests alike. However, hosts find it difficult to cater for the potential different tastes of her guests, especially when they are not much interested in music themselves. In addition, controlling the music is considered a burden on top of all the other duties of a host. In contrast, guests often have no clue how the stereo works, don’t dare to touch it, or don’t know the music available (which prevents selecting something appropriate for the moment). Even if guests brought their own music, for example, on an MP3 player, they are still afraid of virtually “usurping” the party with their music.

As a response to this analysis, Nora Helms, Anna Kuperski, and Simon Pfarr created the concept of a “sociable” MP3 music player. Nora is invited over to her friend Anna’s house (see

Figure 5.2, for a concept story board). Before leaving her own home, Nora selects her favorite music and copies it to her player. The moment she meets Anna, the player senses the proximity of another, Anna's player. They automatically connect, combine their playlists, and start playing songs in random order, but synchronously through their inbuilt loud speakers. In fact, the player only works, given a second player is in proximity. This reflects on the necessity to meet face to face to create a social experience.

The concept in itself is simple and surely debatable, but for the time being, it is a good example of what the claim *experience before product* suggests. Take the controls as a first example. Any generic MP3 player has similar controls, such as play, pause, stop, or skip song. It seems only natural to exploit this and copy this quasi standard to the music player at hand. But wait for a second? Imagine you filled your player to the brim with music, carefully chosen for this upcoming occasion. On arrival, the player connects to the network of all the other players people brought to the party. As a courtesy function, the player is programmed to insert a song from a subsequently added player into the running playlist. Thus, the next song will be one of yours—what a wonderful start for a party. You immediately recognize *Crystallised* by *the XX* from the first couple of seconds it is playing. It is one of your favorites, a song inclined to be a classic. It is just perfect, until this guy in the other corner, you barely know, stopped the song from playing because he pressed the skip button. You are annoyed and, to be honest, a bit hurt. This is the type of social experience one can surely go without.

To place the experience before the product implies understanding every function and every detail of the product as a way to shape the emerging experience. If the objective of the player is to create a pleasant social experience, skipping songs is just not very helpful. Given that all people brought their favorite music, to skip a song is simply rude. A function useful and commonplace in many other seemingly similar devices (technically it is just a networking music player) may cause severe problems in terms of the desired experience.

There are a number of other, less drastic examples. Does the player need a display? From the perspective of the emerging experience, the answer is surely not. Imagine you like the song playing, but you have no clue what it is. What would be the most natural thing to do? You would simply ask the name of the song. And as long as this song is someone's favorite, there should be a person with a little extra information around. Or even better, imagine asking the name of the song and two people answer simultaneously. They shoot a curious glance at each other, well aware now that they may share a similar taste in music. All these occasions have the power to positively impact the overall experience. They are icebreakers and entry points for communication, and a simple, innocent display may have the power to decrease the likelihood of their occurrence.

The player's memory capacity is another example. If it becomes too large, people may tend to copy all their music onto the player and not just their favorites. However, the latter is crucial to the overall concept. Note that limiting memory capacity is only one solution. An alternative is to simultaneously make playlist creation mandatory and to limit the overall running time of the playlist. In either case, we have to consider this detail while we design—not from a practical point of view, but in terms of helping or obstructing the emergence of the desired experience.

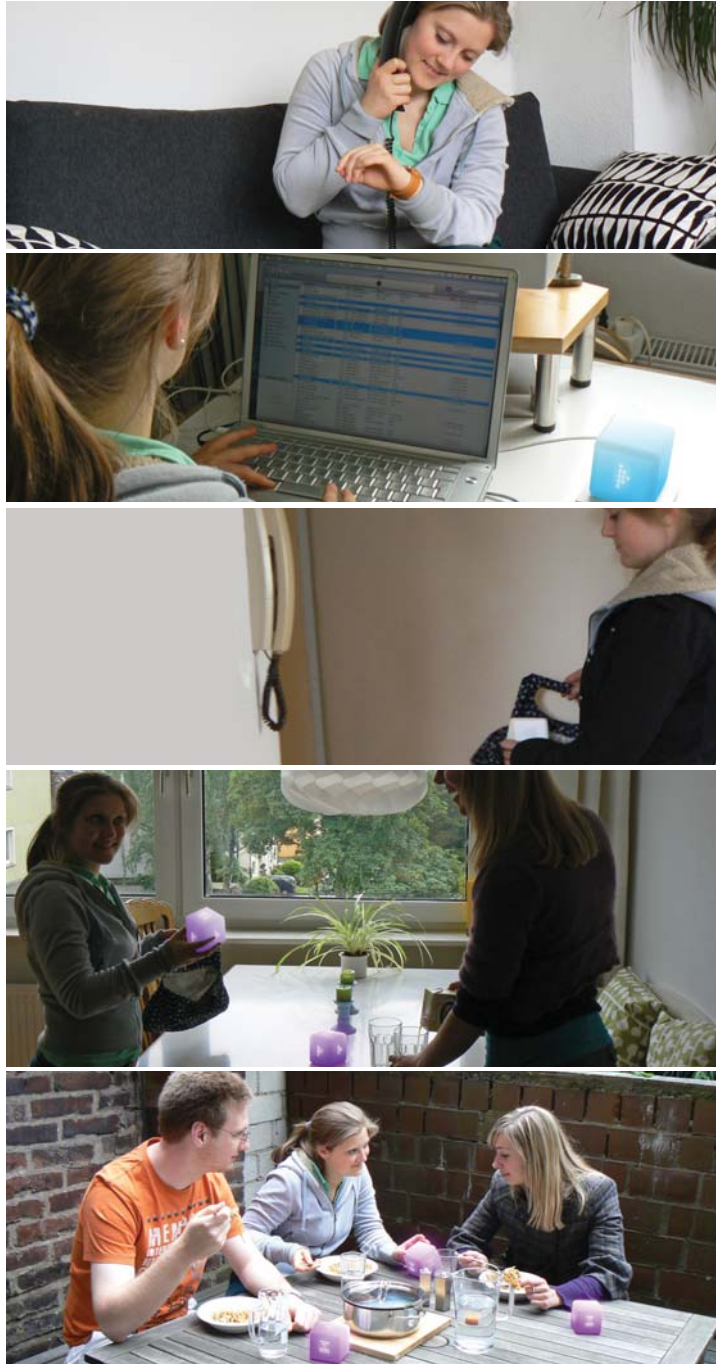


Figure 5.2: An experiential music player (photos courtesy Helms, Kuperski, and Pfarr).

Experience Design is, thus, more than adding something to a product's core function to make it a little more interesting. Experience Design puts experience before products, and acknowledges that all aspects of a product, its functionality, content, presentation and interaction, have to be in line with the experience to be designed. In addition, Experience Design may even take a normative, prescriptive stance. In many cases, its objective is to *improve* experience. To achieve this, it not only provides products that fit a given context particularly well (a usability approach), but also alters, rewrites, and invents new experiences. Take Gaver and colleague's (2004) *Drift Table* as an example. It is designed based on the philosophy of *ludic design*. In brief, *ludic design* uses ambiguity, defamiliarization, and an overall anti-utilitarian stance to create open-ended, exploratory and fulfilling experiences.



Figure 5.3: The *Drift Table* (Copyright © Interaction Research Studio, Goldsmiths, University of London).

The *Drift Table* is a small coffee table (see Figure 5.3). It has a circular porthole to a screen that shows aerial photography that “drifts” according to the distribution of weights on the table with

a maximum of 50 kilometers per hour. The current ‘location’ of the table is shown on a small screen on its side. Almost a terabyte of aerial photography of England and Wales is available for viewing.

Interestingly, Gaver et al. (2004) decided against a number of seemingly useful functions, such as travelling at higher speeds or the direct input of coordinates. The stated rationale was to “evoke the impression of drifting over the countryside, as if an opening had been created in the home’s enclosure. But fundamental to the table’s design is the fact that it isn’t ‘for’ anything in particular but creates an evocative situation for people to explore” (Gaver et al., 2004, p. 893). Functionality such as direct access to locations seemed to get in the way of the desired experience, such as the display on our music player would get in the way of a satisfying social experience.

The ethnography-inspired studies (see also <http://www.youtube.com/watch?v=uRK0ypmDDBM>) Gaver and colleagues carried out supported their general idea. One participant, S., commented (Gaver et al., 2004, p. 898): “Initially, I thought fantastic, another hi-tech toy in town. [...] I thought about having a switch for double speed. Now that’s worn off [...]. You should take a look around on the way like on a train journey. One should accept it and use it as it is. Another thing I thought was that it would be great to have a keypad so as to type in a coordinate. Then I thought no, it’s for drifting around. I like it for what it does. It’s extremely sophisticated but without the arsing about. It has one use. It drifts. [...] After a couple of days I was about to get bored with it because of its weaknesses but now those are strengths. From shiny new object, to where’s the buttons, to this is what it does.” Based on their experience with the table, Gaver et al. (2004, p. 898) recommended: “Don’t seek to meet users’ immediate desires. [...] we consciously restrained ourselves from adding features to support expectable demands (e.g., moving quickly to a particular location). Many people in fact voiced exactly the desires we had decided not to support. Over time, however, our decisions appeared justified as a noticeable subset of users accepted the table for what it was, and relinquished the desire to engage with it to achieve obvious tasks. For these individuals, the table worked to encourage the exploration of new activities and appreciations.”

I am skeptic about the general claim of *ludic design* to deliberately exacerbate utilitarian use to foster exploration. It reminds me of my own distinction between pragmatic and hedonic qualities (see Chapter 4) but extended with a somewhat dogmatic demand to focus on the hedonic alone, instead of finding a balance between both. However, taking away some of the theoretical underpinnings, I believe the *Drift Table* to be a perfect example of Experience Design. Gaver and colleagues created a clear target experience, a compelling story. They wanted to create the experience of travelling but in a slow, conscious, reflective way—hence the drifting. They intended to create a feeling of the distance and the time it takes to reach locations. Creating this particular experience required them to eschew some obvious functionality, such as light-speed travel or the direct input of locations. The opposition to this functionality must not necessarily be justified by a dogmatic wish to be anti-utilitarian. It is simply a necessity to create the desired experience; the same as excluding the skip function on the social music player was a necessity to create a particular experience.

An experience designer is foremost an author of experience. Only after having outlined the desired emotional and cognitive content of an experience, the action involved, its context and temporal

structure, we may start designing the product. And then, each and every detail (content, functionality, presentation, interaction) has to be scrutinized according to its potential to create or destroy the desired experience.

5.4 BRIDGING THE GAP BETWEEN EXPERIENCES, NEEDS, AND PRODUCTS

What a wonderful feeling. You just took a hot shower. The bathroom is misted and so is the bathroom mirror. Suddenly, a point of light emerges on the mirror's surface. You smile and place your fingertip onto the point. It starts to move. You follow it with your finger, drawing on the wet and steamy mirror. Slowly, a heart appears—a sweet message left by your spouse and captured by the mirror hours before you got up and took your shower (see Figure 5.4).



Figure 5.4: A sweet message (photo courtesy of Baffi and Schmeer).

This concept for volatile messaging, *Touch Trace Mirror*, was developed by Tom Baffi and Johanna Schmeer in one of my courses on Experience Design at the Folkwang University. The objective was to create a *relatedness experience*. Beyond all details, the gist of this design is letting the message to be re-constructed by the receiver him or herself. This is supposed to create a feeling

of closeness through a virtual, time-shifted form of co-construction. In fact, Baffi and Schmeer started with the need for relatedness, identified leaving messages as an activity related to that need, developed the idea of message co-construction, placed it in the bathroom, picked the mirror as the communication device, created a story of message leaving and receiving revolving around the bathroom mirror and then started to work on the aesthetics of the actual interaction. Obviously, it is a long way down from abstract universal needs to the concrete design of *Touch Trace*. The challenge for Experience Design is to bridge that gap or, at least, to allow for shorter leaps from need to product.

The notion of “scripting” an experience, of creating a narrative of acting through a product developed in the preceding section is central. Before determining the functionality of a product (the “what”-level) and ways to operate this functionality (the “how”-level), the experience designer creates the story of product use. *Touch Trace* uses an already existing story: leaving love messages on the bathroom mirror. This story already holds a number of connotations, such as memories of a spontaneous night, which—surprisingly—led into the love of one’s life, or a simple “thank you” for a wonderful shared experience. From both, it becomes apparent that messages on bathroom mirrors are already intimately linked to relatedness, as a way of expressing and creating a relationship. In addition, Baffi and Schmeer did that little bit of “rewriting” of the story by using the available technology to craft an experience of message co-construction. Suddenly, I am not only the receiver of a message, but I am also involved in constructing it, as if receiving and answering at the same time.

To develop those enhanced narratives is crucial to Experience Design. But while in retrospect, the link between mirror (product) and relatedness (need, experience) is plausible; it rests completely on the skills of the designers, their ability to find and enhance those stories, and their interest in people. The question at hand is the following: how can we support this type of design work?

In a recent project with Joonhwan Kim and his team from *Samsung*, Kai Eckoldt and I explored what we called *experience patterns* as a way to reduce the gap between needs and a specific product experience. Experience patterns attempt to condense seemingly complex positive experiences into a minimal set of crucial insights. This set is then sufficient to explain why people enjoy experiences of this type. By that, it becomes a blueprint of various positive experiences and serves as a “molding form” for shaping an experience.

In their compelling review of patterns in Human-Computer Interaction, Andy Bearden and Janet Finlay (2006) distinguish between patterns as solutions to problems and patterns as descriptions of behavior. The latter “emphasizes patterns as recurrent phenomena or structures that must be observed and discovered” (Dearden and Finlay, 2006, p. 58). For example, Martin et al. (2002) used patterns as a way to summarize findings from their ethnographic studies.

“[...]Patterns are derived from the lived world (Lebenswelt) of everyday experience and they gain their power, if at all, not by being proven empirically correct, but by showing us a direct connection between the pattern and our experience [...]” (Dovey, 1990, cited in Dearden and Finlay (2006, p. 81)). Our version of patterns owes much to this view. They are foremost congealed experiences, blueprints for stories to be told through the use of a product. Nevertheless, they go beyond the

mere description as long as they also prescribe ways of optimizing an according experience. They are grounded in our *Lebenswelt* but at the same time, idealized, optimized versions of everyday experiences. In contrast to the view of Dovey, we believe that patterns can be empirically proven correct or not. However, the question of empirical validity should not dominate their use. Accordingly, our minimal set of requirements for quality experience patterns consists of a clear scope (i.e., not too broad), plausibility (i.e., face validity), and “resonance.” Resonance is a feeling of “recognition” and affirmation by the pattern’s *user*. Patterns, which appear “outlandish,” are not likely to be useful or inspiring. Beyond this, patterns have to be evaluated through their use. Quality patterns prove applicable (i.e., there are domains/products which benefit from the insights captured by the pattern), generative (i.e., able to inspire designs), and successful (i.e., produce superior products).

Each of our experience patterns is related to a particular need, that is, they are generic ways to fulfill a need. In other words, autonomy patterns are about creating and maintaining individuality, relatedness pattern about deepening interpersonal relationships, and so on. Examples of experience patterns already made in this book were “mind reading” and Gibbs et al. (2005) *SynchroMate* as an example of a product concept, which creates the feeling as if romantic message “cross each other in the air” (see Section 2.3). Baffi and Schmeer’s co-construction of a message is a further example for a potential relatedness pattern.

For a more concrete example of an experience pattern and its application, consider the following story (from the *Samsung*-collection): “Bernhard has this hard to explain weakness for watching gory horror movies. His wife, Anna, detests this. She neither understands nor easily accepts Bernhard’s ‘passion’. To avoid constant conflict, Bernhard agreed to fight his ‘bad habit.’ At least officially, he threw away his complete horror DVD collection. However, once in a while, when Anna is out, he takes his favorite DVD—the one he secretly managed to save—out of a hidden place and watches it. When Anna comes home and asks Bernhard about his evening, he says ‘Just wonderful!’ and grins. He feels at the same time a little guilty and much more alive.”

I guess many of us know this story in the one or the other version. The secret itself may vary. The behavior and the accompanying feelings often follow a similar pattern. We call the essence of the story the “keeping a secret”-pattern and describe it as follows: “Many people have ‘true’ secrets. Revealing them would have severe consequences. It would disappoint people they love, they might lose their job or face other severe threats to existence. In this case, keeping a secret is a necessity. However, there are also situations, where keeping a secret is of its own value. Having secrets supports autonomy. The self, individuality, is not a closed, well-defined entity. It consists of self-knowledge (e.g., things done, experiences made, people one knows), but also of other people, possessions and so on. Especially people in close relationships may experience a blur of the boundary between one’s self and the close partner. To maintain self-knowledge, which is truly one’s own, creates a boundary between the person and others. By this, it reminds people of their individuality and helps them to define themselves. This is supported by the observation that secrets are an important part of children’s development. Although ‘keeping a secret’ is positive, it may create mixed feelings due of the tension between the pleasure of having a secret and the guilt of keeping it from close others.

Self-defining secrets only work if they remain a secret. Even the mere fact that one has a secret is not to be revealed. Any plain signifier of a secret (e.g., locked drawers or boxes, password protected parts of computers) must be avoided. Self-defining secrets are rarely ‘true’ secrets. If they become revealed accidentally, others are often unable to understand, why it was kept as a secret at all. Given the psychological function of the secret, this is easy to understand: it is keeping the secret and not the content of the secret that matters.”

The pattern describes a particular experience linked to the need for autonomy. It further details some crucial elements, with direct implications for design. At this point, you most hopefully agree with the content of the pattern—it may “resonate”—however, how it can possibly support design may still be vague. Take the example of an electronic picture frame, we developed based on the pattern in a workshop with Samsung. Figure 5.5. shows four stills from an a resulting video prototype.



Figure 5.5: Marc’s picture frame is holding a little secret (stills from a video prototype by Eckoldt, Hassenzahl, and Kim).

The upper left corner shows a picture frame with a photo of the *Wedding Tower*, a famous *Jugendstil* building located in Darmstadt, the city I am living in. Upon lifting and tilting the frame to the right, however, the *Wedding Tower* slides away and reveals a more personal picture of my wife and my younger daughter Greta. Leaving the tilting gesture causes the secret picture to be masked

immediately by the original picture, which slides back into place. Through the functionality of the hidden picture, “keeping a secret” can be acted out and, thus, experienced through the picture frame. It is a function, but it is carefully grounded in and modeled after the experience to be provided. It does not sport any signifier of the secret, no latch or switch or keypad. The interaction necessary to reveal the secret was carefully chosen. It ensures a certain privacy as long as picking up other peoples’ picture frames—for example in an office—appears bad-mannered, akin to opening other people’s drawers or peeping through key holes. This does not prevent certain people from doing it nevertheless, but most agree that it is unacceptable behavior. In addition, the whole gesture is one of shielding the hidden picture against unwanted peeks. The sliding of the picture emphasizes the impression of revealing something and maps at the same time the potential physical consequences of tilting. The sliding back upon leaving the tilting position is needed for consistency; however, the secret picture is masked immediately, again reducing the chance of unwanted peeks. If you manage to not look too guilty, if caught in the act of fiddling with your picture frame, your secret is relatively safe.

The picture frame is a—to my mind—very good example of an experiential product. It is able to create a story, an experience, through the provision of a secret picture function. In addition, the whole interaction is carefully designed to be in line with the experience to be delivered. In contrast to much other functionality one can put into an electronic picture frame, the secret is one that provides meaning and is fun—at the same time. The according experience pattern captures this essence and makes it available to the design process as a “molding form.” Just take a second, and use “keeping a secret.” Apply it to your mobile phone, laptop, television, or coffeemaker. I am sure you will instantly stumble across a number of interesting design ideas.

5.5 THEORY-INSPIRED DESIGN

McCarthy and Wright (2004); Boehner et al. (2007) and many other phenomenology or ethnomethodology inspired researchers and designers in HCI eschew the idea of (content) models and theories in Experience Design. A common argument is one of unjustified abstraction and reduction and the envisioned danger of losing the richness of experience (see Section 1.2).

I am critical about this claim for various reasons (see Hassenzahl, M., 2008b). First, it assumes a richness in experience, which might not be that ubiquitous in everyday life. We continuously experience, but rich, deep, meaningful experiences may be less frequent. In addition, rich accounts of experience might require an outstandingly reflective and attentive “experientor.” I suspect experiences with technology (as many other experiences as well) to be far less unique and far less variable as implied by the proponents of the “phenomenological” approach: we all like to be challenged; we all like beautiful things, we all care about what others think about us and we all like romantic sunsets. Accounts of according experiences, however, might differ in their quality, the experience itself does not so. A poet may find beautiful words to describe his or her experience; this does not make it superior to experiences of more mundane people.

Designing an experience (and according products) requires a detailed understanding of the people and the context it is designed for. In addition, designers need inspiration. They are able to build ideas from anecdotal observations and loose associations. Certainly, a bottom-up, ethnographic approach and method is able to provide this. It urges us to leave our laboratories or studios, to meddle with real people, in the real world. On the other hand, many contexts are already substantially explored by other people's research. The obtained knowledge takes the form of models or theories, reductions, and summaries. But still: they condense important knowledge already available.

Take marriage counseling as an example. I'm sure that the problems couples encounter and the actual experiences they make in their relationships are rich and diverse. A thorough understanding of each case is necessary to pick or even develop appropriate approaches to, for example, solve marital problems. However, counseling and intervention also requires a more general understanding of what intimate relationships have in common and how classes of marital problems should or shouldn't be approached. Both is a reduction—the combined result of many people trying to understand this problem domain, the distillate of hours and hours of counseling work. No seasoned practitioner or researcher would dismiss this knowledge, and to always start afresh each time.

However, closing the eyes to already available knowledge—either because of ignorance or dogma—seems to be a common theme to HCI. In a recent, unpublished report, Stephanie Heidecker, Uwe Hillmann, Kai Eckoldt and I reviewed published concepts broadly addressing the mediation of intimate relationships—relatedness experiences in my terms. We collected 144 published concepts. Interestingly, those concepts refer to a small number of papers only as their basis for understanding intimacy and close relationships. One of those is [Vetere et al. \(2005\)](#) study of six couples over a period of seven weeks. They used [Gaver et al. \(1999\)](#) *Cultural Probe* technique and contextual interviews ([Beyer and Holtzblatt, 1998](#)). Both techniques are bottom-up and ethnography-inspired. This work resulted in a published “framework” of intimacy and close relationships widely used.

To base concepts rather on a framework derived from a small, bottom-up study of six couples, than systematically exploiting the vast literature on close relationships available in social psychology, is problematic. I am fully aware of the important role of first-hand experience for the design process, and I firmly believe that Experience Design—any design—becomes impossible without asking, observing and confronting real people. However, this should not be seen as a legitimating knowledge already available in form of theories or models.

I am truly amazed when, for example, [Vetere et al. \(2005\)](#) dismiss a whole, detailed corpus of research into close relationships with the lapidary comment: “Despite numerous social science studies of intimacy and the exchanges that occur within intimate relationships, a universally acknowledged definition of intimacy has yet to surface. Of those definitions that have emerged [references] few provide any significant design traction” ([Vetere et al., 2005](#), p. 475). Definitions may not be helpful, but how can the accumulated knowledge about intimate relationships *not* hold any knowledge significant for design? Or to put it differently: what kind of design is not able to capitalize on the available knowledge?

In fact, [Vetere et al. \(2005\)](#), for example, do not cite a single, high quality reference from social psychology. This somewhat rash dismissal of already available information is dangerous. It implies a “do-it-yourself-culture” under the cloak of a particular approach to research and an according philosophy. An only cursory glance into the literature of close relationships reveals that the insights gained in studies such as [Vetere et al. \(2005\)](#), and many additional insights beyond that are readily available. We only have to grab it. Conceptual research done by Human-Computer Interaction with a do-it-yourself stance is just a waste of resources. Even more annoying is the fact that the major insight we could, and a discipline such as psychology cannot provide, is often neglected: the impact of technological interventions on close relationships. Of the 144 published concepts we reviewed almost 40% were not evaluated at all. For the others, the quality of evaluation was very mixed. I am not talking about usability evaluation here. I am talking about an attempt to gain an insight into how a specific technological intervention (as opposed to a general trend, such as internet’s consequences for relationships) impact relatedness experiences. Instead of using up all the energy in repeating research already done, Human-Computer Interaction and interaction designers should focus on exploring their ideas’ power to impact and change thoughts, feelings, and action—in short: experience.

For Experience Design, I would argue for both: understanding the particularities of a concept idea and context at hand (maybe through a phenomenological approach) and using the already accumulated knowledge available through, admittedly, reduced, but proven models. For me, a theory is not limiting, but inspiring. For example, already in the 60s of the last century, [Reiss, I. \(1960\)](#) suggested a four stages *Wheel* theory of the development of love. It addresses the general notion that relationships are dynamic, changing entities. It focuses attention on the differences between stages of a relationship and according transitions. In our review, we found no single concept which reflected explicitly upon potentially different requirements implied by different stages or potential transitions. As long as Experience Design is not primarily about determining whether the one or the other model of relationships is “true,” we can use according theories more freely as a source for inspiration. To ignore them would be culpable.

5.6 THE ESSENCE OF THE CHAPTER

Experience Design asserts design not to be about products anymore but about the experiences they deliver. This requires a broadened perspective, with the fulfillment of psychological needs (values), which in turn creates meaning and emotion, as the prime design objective.

This requires to drop the efficiency-oriented *Homo Oeconomicus* as the guiding *Menschenbild* and to replace it with a more appropriate view on people. In line with the need-based approach of the present book, I understand humans as active and growth-oriented. They are inclined towards integration of their feelings, thoughts and actions into a unified sense of Self (provided through experiences) and the further integration of themselves into larger social structures. This *Menschenbild* has concrete implication for the design of interactive products. It defeats high level of automation. It urges us to acknowledge peoples’ skills and abilities, and—even more important—their interest

in learning and improving themselves. It calls for technology, which creates—or at least supports—self-relevant experiences embedded in social processes and practices.

Human-Computer Interaction focuses on the empirical analysis of people and their preferences. By that, evaluation can quickly become a question of whether people “like” or would “buy” a concept, if put on the market. However, one must keep in mind that the relation between designer and user (i.e., consumer, recipient) is bi-directional. It is not as if users always have well-defined requirements, which only wait to be discovered. Indeed, requirements are *co-constructed* in the ongoing dialog between user and designer. Each interactive product is a proposition, which will inevitably alter expectations and ultimately the requirements users formulate. Psychological needs are universal reasons for using interactive products, but they carry little information about exactly what behaviors to engage in. Actually, experience designers suggest a need-fulfilling behavior through an interactive product, thereby hopefully creating a meaningful experience.

Consequently, the basic claim of Experience Design is to consider experience *before* products. It urges us to set the story straight before we start thinking about how we can create this story through a product. By that, Experience Design becomes more than adding something to a product's core function to make it a little more fancy, interesting, or beautiful. It acknowledges that all aspects of a product, its functionality, content, presentation and interaction, have to be in line with the experience to be designed. The experience designer becomes foremost an author of experiences.

A potential tool which supports the designer to author experience may be “experience patterns.” We understand those patterns as congealed experiences, blueprints for stories to be told through the use of a product. Experience patterns are grounded in our *Lebenswelt*, but at the same time, they are idealized and optimized. A quality experience pattern has a clear scope (i.e., not too broad), is plausible (i.e., face validity), “resonates” with its user (the designer), is applicable (i.e., there are domains/products which benefit from the insights captured by the pattern), generative (i.e., able to inspire designs), and successful (i.e., produce superior products).

Besides the importance of first-hand empirical insights into context—real people living in the real world—for design, I believe that we should exploit the already accumulated knowledge available through often reduced but proven models and theories. Those models and theories can be as inspiring as first-hand observation. Instead of re-doing conceptual work, already provided by other disciplines such as psychology, we should focus our resources on the study of the effects of our designs on the people we design for.

Bibliography

- Ariely, D. & Carmon, Z. (2003). Summary assessment of experiences: the whole is different from the sum of its parts. In G.Loewenstein, D. Read, & R. F. Baumeister (Eds.), *Time and decision. Economic and psychological perspectives on intertemporal choice* (pp. 323–349). New York: Russel Sage. 20
- Battarbee, K. (2003). Defining Co-Experience. In *Proceedings of the 2003 international conference on Designing pleasurable products and interfaces* (pp. 109–113). New York: ACM. DOI: [10.1145/782896.782923](https://doi.org/10.1145/782896.782923) 64
- Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, **15**, 139–168. DOI: [10.1086/209154](https://doi.org/10.1086/209154) 51
- Bevan, N. (2010). Extending the concept of satisfaction in ISO standards. In *Proceedings of the KEER 2010 International Conference on Kansei Engineering and Emotion Research*. In press. 61
- Beyer, H. & Holtzblatt, K. (1998). *Contextual Design. Defining Customer-Centered Systems*. San Francisco: Morgan Kaufmann. 74
- Bickmore, T. W. & Picard, R. W. (2005). Establishing and maintaining long-term human-computer relationships. *ACM Transactions on Computer-Human Interaction*, **12**, 293–327. DOI: [10.1145/1067860.1067867](https://doi.org/10.1145/1067860.1067867) 21
- Blythe, M., Hassenzahl, M., & Law, E. (2009). Now with Added Experience? [Editorial]. *New Review of Hypermedia and Multimedia*. DOI: [10.1080/13614560903251100](https://doi.org/10.1080/13614560903251100) 35
- Boehner, K., DePaula, R., Dourish, P., & Sengers, P. (2007). How emotion is made and measured. *International Journal of Human-Computer Studies*, **65**, 275–291. DOI: [10.1016/j.ijhcs.2006.11.016](https://doi.org/10.1016/j.ijhcs.2006.11.016) 73
- Boven, L. v. & Gilovich, T. D. (2003). To do or to have? That is the question. *Journal of Personality and Social Psychology*, **85**, 1193–1202. 35
- Bradley, M. M. & Lang, P. J. (1994). Measuring emotion: the Self-Assessment Manikin and the Semantic Differential. *Journal of Behavior Therapy and Experimental Psychiatry*, **25**, 49–59. DOI: [10.1016/0005-7916\(94\)90063-9](https://doi.org/10.1016/0005-7916(94)90063-9) 22
- Carroll, J. M., Kellog, W. A., & Rosson, M. B. (1991). The task-artifact cycle. In J.M.Carroll (Ed.), *Designing Interaction: Psychology at the Human-Computer Interface* (Cambridge: Cambridge University Press. 62

- Carroll, J. M., Singley, M. K., & Rosson, M. B. (1992). Integrating theory development with design evaluation. *Behaviour & Information Technology*, **11**, 247–255. DOI: [10.1080/01449299208924345](https://doi.org/10.1080/01449299208924345) 62
- Carroll, J. M. & Thomas, J. C. (1988). Fun. *SIGCHI Bulletin*, **19**, 21–24. DOI: [10.1145/49108.1045604](https://doi.org/10.1145/49108.1045604) 41, 43
- Carver, C. S. & Scheier, M. F. (1989). *On the self-regulation of behavior*. New York: Cambridge University Press. 11, 13, 43, 44, 50
- Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety*. San Francisco: Jossey-Bass. 48
- Damasio, A. R. (1994). *Descartes' Error: Emotion, Reason and the Human Brain*. New York: Grosset/Putnam.
- Dearden, A. & Finlay, J. (2006). Pattern languages in HCI: A critical review. *Human-Computer Interaction*, **21**, 49–102. DOI: [10.1207/s15327051hci2101_3](https://doi.org/10.1207/s15327051hci2101_3) 70
- Deci, E. L. & Ryan, R. M. (2000). The “What” and “Why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, **11**, 227–268. DOI: [10.1207/S15327965PLI1104_01](https://doi.org/10.1207/S15327965PLI1104_01) 38, 39, 61
- Fogg, B. J. (2003). *Persuasive Technology: Using Computers to Change What We Think and Do*. San Francisco, CA: Morgan Kaufmann. 40
- Forlizzi, J. & Battarbee, K. (2004). Understanding experience in interactive systems. In *Proceedings of the 2004 conference on Designing interactive systems (DIS 04): processes, practices, methods, and techniques* (pp. 261–268). New York: ACM. DOI: [10.1145/1013115.1013152](https://doi.org/10.1145/1013115.1013152) 1
- Frank, R. H. (1999). *Luxury fever: Why money fails to satisfy in an era of excess*. New York: Free Press. 35
- Frederick, S. (2003). Measuring intergenerational time preference: Are future lives values less? *The Journal of Risk and Uncertainty*, **26**, 39–53. DOI: [10.1023/A:1022298223127](https://doi.org/10.1023/A:1022298223127) 20
- Gaver, W. W. (2002). Designing for homo ludens. *I3 Magazine*. 61
- Gaver, W. W., Bowers, J., Boucher, A., Gellerson, H., Pennington, S., Schmidt, A. et al. (2004). The drift table: designing for ludic engagement. In *Proceedings of the CHI 04 Conference on Human Factors in Computing Systems. Extended abstracts* (pp. 885–900). DOI: [10.1145/985921.985947](https://doi.org/10.1145/985921.985947) 67, 68
- Gaver, W. W., Dunne, A., & Pacenti, E. (1999). Design: Cultural probes. *Interactions*. DOI: [10.1145/291224.291235](https://doi.org/10.1145/291224.291235) 74

- Gaver, W. W. & Martin, H. (2000). Alternatives. Exploring Information Appliances through Conceptual Design Proposals. In T.Turner & G. Szwillus (Eds.), *Proceedings of the CHI 2000 Conference on Human Factors in Computing* (pp. 209–216). New York: ACM, Addison-Wesley. DOI: [10.1145/332040](https://doi.org/10.1145/332040) 54, 55
- Gibbs, M. A., Vetere, F., Bunyan, M., & Howard, S. (2005). SynchroMate: A phatic technology for mediating intimacy. In *DUX '05: Proceedings of the 2005 conference on Designing for User eXperience* (New York: AIGA: American Institute of Graphic Arts. 17, 18, 71
- Gould, J. D. & Lewis, C. H. (1985). Designing for usability: key principles and what designers think. *Communications of the ACM*, **28**, 300–311. DOI: [10.1145/3166.3170](https://doi.org/10.1145/3166.3170) 62
- Hartmann, J., Sutcliffe, A., & De Angeli, A. (2007). Investigating attractiveness in web user interfaces. In *Proceedings of the CHI 2007 Conference on Human Factors in Computing* (pp. 387–396). New York: ACM, Addison-Wesley. DOI: [10.1145/1240624.1240687](https://doi.org/10.1145/1240624.1240687) 49
- Hassenzahl, M. (2001). The effect of perceived hedonic quality on product appealingness. *International Journal of Human-Computer Interaction*, **13**, 479–497. DOI: [10.1207/S15327590IJHC1304_07](https://doi.org/10.1207/S15327590IJHC1304_07) 49, 50
- Hassenzahl, M. (2003). The thing and I: understanding the relationship between user and product. In M.Blythe, C. Overbeeke, A. F. Monk, & P. C. Wright (Eds.), *Funology: From Usability to Enjoyment* (pp. 31–42). Dordrecht: Kluwer. 24, 49
- Hassenzahl, M. (2004). The interplay of beauty, goodness and usability in interactive products. *Human Computer Interaction*, **19**, 319–349. DOI: [10.1207/s15327051hci1904_2](https://doi.org/10.1207/s15327051hci1904_2) 49
- Hassenzahl, M. (2008a). Aesthetics in interactive products: Correlates and consequences of beauty. In H.N.J.Schifferstein & P. Hekkert (Eds.), *Product experience* (pp. 287–302). San Diego, CA: Elsevier. 25
- Hassenzahl, M. (2008b). User Experience (UX): Towards an experiential perspective on product quality. In *IHM '08: Proceedings of the 20th French-speaking conference on Human-computer interaction (Conférence Francophone sur l'Interaction Homme-Machine)* (pp. 11–15). DOI: [10.1145/1512714.1512717](https://doi.org/10.1145/1512714.1512717) 73
- Hassenzahl, M., Diefenbach, S., & Göritz, A. S. (2010). Needs, affect, interactive products – Facets of user experience. Under review. 2, 47, 52
- Hassenzahl, M. & Monk, A. (2009). The inference of perceived usability from beauty. Under review. 50
- Hassenzahl, M., Platz, A., Burmester, M., & Lehner, K. (2000). Hedonic and Ergonomic Quality Aspects Determine a Software's Appeal. In T.Turner & G. Szwillus (Eds.), *Proceedings of the*

- CHI 2000 Conference on Human Factors in Computing* (pp. 201–208). New York: ACM, Addison-Wesley. DOI: [10.1145/332040](https://doi.org/10.1145/332040) 49
- Hassenzahl, M. & Roto, V. (2007). Being and doing: A perspective on User Experience and its measurement. *Interfaces*, **72**, 10–12. 49
- Hassenzahl, M. & Sandweg, N. (2004). From Mental Effort to Perceived Usability: Transforming Experiences into Summary Assessments. In *Proceedings of the CHI 04 Conference on Human Factors in Computing Systems. Extended abstracts* (pp. 1283–1286). New York: ACM. DOI: [10.1145/985921.986044](https://doi.org/10.1145/985921.986044) 20
- Hassenzahl, M. & Tractinsky, N. (2006). User Experience – a research agenda [Editorial]. *Behavior & Information Technology*, **25**, 91–97. DOI: [10.1080/01449290500330331](https://doi.org/10.1080/01449290500330331) 2, 13
- Herzberg, F., Mausner, B., & Bloch-Snyderman, B. (1959). *The Motivation to Work*. New York: Wiley. 27
- Hornbæk, K. & Law, E. (2007). Meta-analysis of correlations among usability measures. In *Proceedings of the CHI 07 Conference on Human Factors in Computing Systems*. (pp. 617–626). New York: ACM. DOI: [10.1145/1240624.1240722](https://doi.org/10.1145/1240624.1240722) 9
- Hsee, C. K., Yang, Y., Li, N., & Shen, L. (2009). Wealth, warmth, wellbeing: Whether happiness is relative or absolute depends on whether it is about money, acquisition, or consumption. *Journal of Marketing Research*, **46**, 396–409. DOI: [10.1509/jmkr.46.3.396](https://doi.org/10.1509/jmkr.46.3.396) 36
- Hsee, C. K., Yu, F., Zhang, J., & Zhang, Y. (2003). Medium maximisation. *Journal of Consumer Research*, **30**, 1–14. DOI: [10.1086/374702](https://doi.org/10.1086/374702) 36
- Huizinga, J. (1939). *Homo ludens. Vom Ursprung der Kultur im Spiel*. Rowohlt. 61
- ISO (1998). *ISO 9241: Ergonomic requirements for office work with visual display terminals (VDTs) – Part 11: Guidance on usability* International Organization for Standardization. 54, 60
- ISO (1999). *ISO 13407: Human-centred design processes for interactive systems* International Organization for Standardization. 62
- Jones, P. & Peppiatt, E. (1996). Managing perceptions of waiting times in service queues. *International Journal of Service Industry Management*, **7**, 47–61. DOI: [10.1108/09564239610149957](https://doi.org/10.1108/09564239610149957) 11
- Jordan, P. (2000). *Designing pleasurable products. An introduction to the new human factors*. London, New York: Taylor & Francis. 52
- Kahneman, D. (1999). Objective happiness. In D.Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic quality*. (pp. 3–25). New York: Sage. 1

- Kahneman, D. (2000). Experienced utility and objective happiness: A moment-based approach. In *Choices, values and frames* (pp. 673–692). New York: Cambridge University Press and the Russell Sage Foundation. 19
- Kahneman, D. & Miller, D. T. (2002). Norm theory: Comparing reality to its alternatives. In T.D.Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases. The psychology of intuitive judgment* (pp. 348–366). Cambridge: Cambridge University Press. 10
- Kaptelinin, V. & Nardi, B. A. (2006). *Acting with Technology: Activity Theory and Interaction Design*. MIT Press. 11, 34, 43, 45
- Karapanos, E., Martens, J.-B., & Hassenzahl, M. (2009a). Reconstructing experiences through sketching. *Arxiv preprint, arXiv:0912.5343*. 23
- Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J.-B. (2009b). User experience over time: an initial framework. In *Proceedings of the CHI 09 Conference on Human Factors in Computing Systems* (pp. 729–738). New York: ACM. DOI: 10.1145/1518701.1518814 26
- Karwowski, W. (2006). The discipline of ergonomics and human-factors. In G.Salvendy (Ed.), *Handbook of Human Factors and Ergonomics*, 3rd ed. (pp. 3–31). New York: Wiley. DOI: 10.1002/0470048204 59
- Landsburg, S. E. (1993). *The armchair economist*. New York: Free Press. 61
- Lavie, T. & Tractinsky, N. (2004). Assessing dimensions of perceived visual aesthetics of web sites. *International Journal of Human-Computer Studies*, **60**, 269–298. DOI: 10.1016/j.ijhcs.2003.09.002 49
- Leong, T., Howard, S., & Vetere, F. (2008). Choice: abdicating or exercising? In *Proceedings of the CHI 2008 Conference on Human Factors in Computing*. (pp. 715–724). New York: ACM Press. DOI: 10.1016/j.ijhcs.2003.09.002 49
- Lim, Y., Stolterman, E., Jung, H., & Donaldson, J. (2007). Interaction gestalt and the design of aesthetic interactions. In *Designing Pleasurable Products and Interfaces, 22–25 August 2007, Helsinki, Finland* (pp. 239–254). DOI: 10.1145/1314161.1314183 21
- Lindgaard, G. & Dudek, C. (2003). What is this evasive beast we call user satisfaction? *Interacting with Computers*, **15**, 429–452. DOI: 10.1016/S0953-5438(02)00063-2 61
- Loewenstein, G. & Prelec, D. (1993). Preferences for sequences of outcomes. *Psychological Review*, **100**, 91–108. DOI: 10.1037/0033-295X.100.1.91 20
- Löwgren, J. (2009). Towards an articulation of interaction aesthetics. *New Review of Hypermedia and Multimedia*. DOI: 10.1080/13614560903117822 21

- Lugosi, P. (2007). Consumer participation in commercial hospitality. *International Journal of Culture, Tourism and Hospitality Research*, **1**, 227–236. 64
- Lynch, P. A. (2005). Reflections on the home setting in hospitality. *Journal of Hospitality and Tourism Management*, XXX, XXX. 64
- Martin, D., Rouncefield, M., & Sommerville, I. (2002). Applying patterns of cooperative interaction to work (re)design: e-government and planning. In *Proceedings of the CHI 2002 Conference on Human Factors in Computing* (pp. 235–242). New York: ACM. DOI: 10.1145/503376.503419 70
- Maslow, A. H. (1954). *Motivation and personality*. New York: Harper. 45
- McCarthy, J. & Wright, P. C. (2004). *Technology as Experience*. Cambridge, USA: MIT Press. 45, 73
- McGrenere, J. (2000). “Bloat.” The objective and subjective dimensions. In *Proceedings of the CHI 2000 Conference on Human Factors in Computing. Extended abstracts*. (pp. 337–338). New York: ACM Press, Addison-Wesley. DOI: 10.1145/633292.633495 43, 49
- Medvec, V. H., Madey, S. F., & Gilovich, T. D. (1995). When less is more: Counterfactual thinking and satisfaction among olympic medalists. *Journal of Personality and Social Psychology*, **69**, 603–610. DOI: 10.1037/0022-3514.69.4.603 11
- Mendoza, V. & Novick, D. G. (2005). Usability over time. In *Proceedings of the 23rd annual international conference on Design of communication: documenting & designing for pervasive information* (pp. 151–158). New York: ACM. DOI: 10.1145/1085313.1085348 22, 26
- Monk, A. F., Hassenzahl, M., Blythe, M., & Reed, D. (2002). Workshop: Funology: designing enjoyment. In *Proceedings of the CHI Conference on Computer–Human Interaction – Extended Abstracts* (pp. 924–925). New York: ACM Press, Addison-Wesley. DOI: 10.1145/506443.506661 43
- Neath, I. (1993). Contextual and distinctive processes and the serial position function. *Journal of Memory and Language*, **32**, 820–840. DOI: 10.1006/jmla.1993.1041 20
- Norman, D. (1988). *The psychology of everyday things*. New York: Basic Books. 45
- Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions*. Cambridge, MA: Cambridge University Press.
- Overbeeke, C. J., Djajadiningrat, J. P., Hummels, C. C. M., & Wensveen, S. A. G. (2002). Beauty in Usability: Forget about ease of use! In W. Green & P. Jordan (Eds.), *Pleasure with products: Beyond usability* (pp. 9–18). London: Taylor & Francis.
- Parker, E. S., Cahill, L., & McGaugh, J. L. (2006). A case of unusual autobiographical remembering. *Neurocase*, **12**, 35–49. DOI: 10.1080/13554790500473680 33

- Partala, T. (2009). Psychological needs and virtual worlds: case Second Life. Under review. 47
- Raabjerg Mathiasen, N. & Bødker, S. (2008). Threats or threads – From usable security to secure experience? In *NordiCHI'08: Proceedings of the 5th Nordic conference on Human-computer interaction: building bridges* (pp. 283–289). New York: ACM. DOI: 10.1145/1463160.1463191 8
- Read, D. & Powell, M. (2002). Reasons for sequence preferences. *Journal of Behavioral Decision Making*, 15, 433–460. DOI: 10.1002/bdm.429 21
- Redelmeier, D. A. & Kahneman, D. (1996). Patients' memories of painful medical treatments: real-time and retrospective evaluations of two minimally invasive procedures. *Pain*, 116, 3–8. DOI: 10.1016/0304-3959(96)02994-6 19, 20
- Reiss, I. (1960). Toward a sociology of the heterosexual love relationship. *Journal of Marriage and Family Living*, 22, 139–155. DOI: 10.2307/347330 75
- Reiss, S. & Havercamp, S. M. (1998). Toward a comprehensive assessment of fundamental motivation: Factor structure of the Reiss Profiles. *Psychological Assessment*, 10, 97–106. DOI: 10.1037/1040-3590.10.2.97 46
- Reynolds, T. J. & Olson, J. C. (2001). *Understanding Consumer Decision PR: A Means End Approach to Marketing and Advertising Strategy*. Mahwah, NJ: Lawrence Erlbaum. 50
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press. 46
- Rosson, M. B. & Carroll, J. M. (2001). *Usability Engineering*. Morgan Kaufmann. 13
- Rubin, J. (1994). *Handbook of usability testing : how to plan, design, and conduct effective tests*. New York: Wiley. 9, 13
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, 110, 145–172. DOI: 10.1037/0033-295X.110.1.145 17
- Ryan, R. M. & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78. DOI: 10.1037/0003-066X.55.1.68 46
- Schacter, D. L. (1996). *Searching for memory. The brain, the mind, and the past*. New York: Basic Books. 33, 34
- Schmitt, B. H. (1999). *Experiential marketing*. New York: Free Press. 16, 17
- Seligman, M. E. P. & Csikszentmihalyi, M. (2000). Positive Psychology: An Introduction. *American Psychologist*, 55, 5–14. DOI: 10.1037/0003-066X.55.1.5 28, 48

- Seow, S. (2008). *Designing and Engineering Time: The Psychology of Time Perception in Software*. Amsterdam: Addison-Wesley. 19, 20, 21
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology* 80[2], 325–339. DOI: 10.1037/0022-3514.80.2.325 46, 47, 55, 56, 63
- Singer, J. D. & Willet, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press. 27
- Suchman, L. A. (1987). *Plans and situated actions*. Cambridge, NY: Cambridge University Press. 44
- Thomas, R. C. (1998). *Long term Human-Computer Interaction: An exploratory perspective*. Springer. 22
- Tractinsky, N., Katz, A. S., & Ikar, D. (2000). What is beautiful is usable. *Interacting with Computers*, 13, 127–145. DOI: 10.1016/S0953-5438(00)00031-X 9
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), *Organization of memory* (pp. 381–403). New York: Academic Press. 33
- Tversky, A. & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124–1131. DOI: 10.1126/science.185.4157.1124 10
- Vershofen, W. (1940). *Handbuch der Verbrauchsforschung*. Berlin. 55
- Vetere, F., Gibbs, M. A., Kjeldskov, J., Howard, S., Mueller, F., Pedell, S. et al. (2005). Mediating intimacy: designing technologies to support strong-tie relationships. In *Proceedings of the CHI 2005 conference on human factors in computing systems* (pp. 471–480). New York: ACM. DOI: 10.1145/1054972.1055038 49, 74, 75
- von Wilamowitz-Moellendorff, M., Hassenzahl, M., & Platz, A. (2006). Dynamics of user experience: How the perceived quality of mobile phones changes over time. In E. Law, E. Hvannberg, & M. Hassenzahl (Eds.), *Proceedings of the workshop “Towards a Unified View of UX,”* 14 October, 2006, Oslo, Norway (in conjunction with NordiCHI’06) (pp. 74–78). 22, 23
- von Wilamowitz-Moellendorff, M., Hassenzahl, M., & Platz, A. (2007). Veränderung in der Wahrnehmung und Bewertung interaktiver Produkte. In T. Gross (Ed.), *Mensch & Computer 2007. Interaktion im Plural* (pp. 49–58). München, Wien: Oldenbourg. 23, 25
- Wang, A. (2009). Asimov’s First Law / Alarm Clocks. In *Proceedings of the Third International Conference on Tangible and Embedded Interaction (TEI’09), Feb. 16–18 2009, Cambridge, UK* (pp. 31–34). DOI: 10.1145/1517664.1517677 29
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of Positive and Negative Affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. DOI: 10.1037/0022-3514.54.6.1063 47

Author's Biography

MARC HASSENZAHL

Marc Hassenzahl is Professor for “User Experience and Ergonomics” at the Folkwang University in Essen, Germany, and research manager at MediaCity, Åbo Akademi University, Vaasa, Finland. He is interested in the affective and motivational aspects of interactive technologies—in short: User Experience. During the last 12 years, he has published over 40 academic articles and book chapters, and worked on experience-related projects together with Nokia Research, Samsung, German Telekom, Siemens, and several others. He is member of *Interacting with Computers*’ editorial board and is a founding and active board member of the German Usability Professionals’ Association.