Emotion-driven product design

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Emotion-Driven Product Design

16

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1 Introduction

From everyday commodities to exclusive luxuries, emotions are elementary for *all* design that is acquired and consumed by people. Emotions embody the essence of relevance (Gilbert, 2006): We are emotional only about things and events that matter to us, which includes seeing, buying, using and owning consumer goods (Desmet, 2002). Designers are both inspired and challenged by the diverse, holistic, and elusive qualities of consumer emotions (for an overview, see Desmet & Hekkert, 2009). There are no one-to-one relationships between certain types of stimuli and certain types of emotions: Different people have different emotions towards the same event, and one person may be delighted by a consumer good that offends another. A product that rouses a person today, may leave her cold tomorrow, and the same person may have different emotions towards different features of one single product design. Moreover, the emotions of consumers are influenced by the context in which they are experienced, which changes over time. Consequently, the increasing interest in consumer emotions in design practice, commonly referred to as "design for emotion" or "emotion-driven design," has stimulated a need for theory and methodology that support a structured design process.

This chapter focuses on this practice of emotion-driven design: The activity of designing products and services with the deliberate intention to evoke predefined target emotions. Although consumer emotions are taken into consideration in any given design project, in emotion-driven design these emotions take a central role: The design goal typically includes a statement about the intended emotional user effect or "target emotion." Since the late 1990s, the challenges of emotion-driven design have been addressed with a steady growth in design research that focuses on understanding consumer emotions, and on the development of tools and techniques that facilitate emotion-driven design processes. This chapter focuses on a key achievement of this body of research, which is the progress of design-relevant *emotion knowledge*. Emotion knowledge is an explicit understanding of the phenomenon emotion, including the conditions that elicit emotions and their behavioral and experiential manifestations. It embodies universal principles of emotions that are widely applicable because they are not restricted to particular types of stimuli, consumers, or emotions. This

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means that this kind of knowledge is applicable to all kinds of design that is created for consumers, including food and nonfood design, durable and nondurable product design, graphic and package design, and service design.

In this chapter, design is addressed as an activity, which represents the overall innovation cycle until implementation, including gathering relevant insights, formulating propositions, developing concepts, materializing shape and color, and testing the results. Emotion knowledge can serve various functions depending on the place in the design process, such as helping in formulating the design goal, facilitating creativity, and supporting communication within design teams, with clients, and with consumers. In addition, explicit emotion knowledge can feed and enhance implicit design knowledge and skills. Six key insights from emotion knowledge will be introduced that have proven useful in emotion-driven design practice and are supported by published empirical data. Each insight has been developed and matured over several years of design research and application in industry projects. We will explore how and where these insights (and some of the tools and methods that have been developed on the basis of these insights) can contribute to design activities. The first three focus on the emotion itself and explain what emotions are, and which emotions can be evoked by consumer goods. The last three insights focus on the causes of emotions and explain how consumer goods evoke emotions. The insights are introduced in the following six sections, each of which discusses the theoretical basis, the contribution to emotion-driven design, related design tools, and examples of design cases.

2 Shades of pleasure

The first insight is that positive emotions are *highly diverse*. Most consumer products[1] can evoke a wide palette of different pleasant emotions. For example, when first using a new device to measure our blood pressure, we can be inspired by the innovative technology, fascinated by the design, proud of our usage skills, relieved for the security it will provide us with, and so forth. The range of positive emotions that people can experience in response to consumer goods is a lot more diverse than is typically recognized in emotion-driven design projects. Consumers can experience at least 25 different positive emotions when using products (Desmet, 2012), such as pride, hope, joy, and love, see Fig. 16.1.

Although all positive emotions are pleasurable by nature, each represents a different kind of pleasure, and an understanding of these differences has at least two advantages for product innovation. The first is that different emotions have different influences on people's perceptions, thoughts, and behavior (Frijda, 2007). For instance, hope stimulates an urge to commit to the activity at hand (Lazarus, 1991), amusement stimulates an urge to share the joviality (Gervais & Wilson, 2005), and contentment stimulates an urge to savor life circumstances and recent successes

[1] In this chapter, "consumer products" is used to represent all types of design, including food and nonfood, durable and nondurable design, graphic, package, and service design.

Figure 16.1 Typology of 25 positive emotions.
Source: Adapted from Desmet (2012).

(Fredrickson, 1998). Understanding these differences can be put to use by influencing the consumer's behavior in a favorable way. Yoon, Desmet, and Van der Helm (2012), for example, showed that fascination stimulates product users to invest more time in exploring the product's features and discover more functions. A product that evokes surprise draws a person's attention and makes it more likely that he later recalls and recognizes it (Ludden, Schifferstein, & Hekkert, 2008). Lastly, a product that evokes inspiration infuses a user with new and creative thoughts, facilitating a shift in perspective (Desmet, 2008). The second advantage is that selecting distinct target emotions offers possibilities for product differentiation. Several design cases have been published that illustrate that targeting a positive emotion that is unconventional for the product category can stimulate design innovation. Desmet and Schifferstein (2012), for example, described how a unique experience in the category of fabric care was created by selecting *inspiration* as the target emotion for fragrance and package development. Likewise, Owusu (2012) designed a social game that evokes pride in

dementia patients, an emotion that these patients rarely experience in their daily life, which resulted in a game that stands out in the category of social games.

Because positive emotions are highly diverse, designers can benefit from having a broad repertoire of positive emotions and an understanding of the nuances between them. In a recent study, we found that having a nuanced understanding of positive emotions can contribute to design activities in at least four ways (Yoon, Pohlmeyer, & Desmet, 2014a). The ability to recognize emotions with precision and specificity positively influences empathy (Mayer & Salovey, 1993), and an increased level of empathy facilitates a deep understanding of consumers' emotions, which can help to uncover relevant consumer insights. Secondly, being aware of nuances of emotions supports a precise determination of the intended emotional impact, which increases the effectiveness of emotion-driven design activities. Thirdly, considering a wider diversity of positive emotions stimulates creativity and innovative thinking. Fourthly, articulating emotional states with fine-grained emotion terms provides innovation teams with a shared language of emotions that facilitates collaboration and communication about the subjective qualities of the design.

These advantages have stimulated the introduction of tools and techniques that support design teams in developing a nuanced understanding of positive emotions. An example is the "Positive Emotional Granularity" card set (PEG cards) developed by Yoon, Desmet, and Pohlmeyer (2013) (Fig. 16.2). The set consists of 25 cards that depict definitions of emotions, underlying causes, and visuals of expressive manifestations. The set can be used for communication (eg, to enable design teams to determine and communicate target emotions to design for, and to enable consumers to report their emotions in the context of product testing) and as a source of inspiration (eg, to facilitate lateral thinking in design conceptualization).

Yoon, Pohlmeyer, and Desmet (2014b) describe a design project for an international airline company in which various positive emotions served as target emotions.

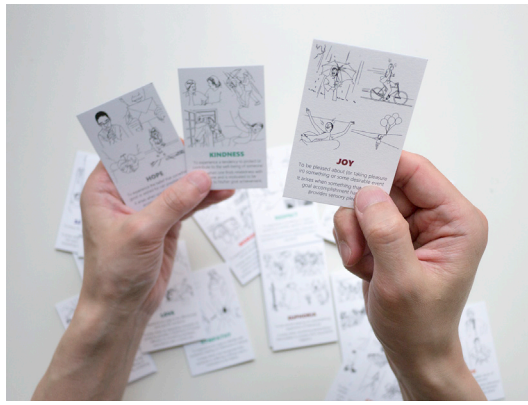

Figure 16.2 Positive emotional granularity cards.

The company wanted to introduce products and services in the crew center that evoke positive emotions to improve the mood of flight attendants just before boarding the airplane. At the beginning of the project, the PEG cards were used in the communication with the client to select which emotions should be experienced by the cabin crew. This resulted in a selection of 10 positive emotions that guided the design process: anticipation, confidence, energized, inspiration, joy, kindness, pride, relaxation, respect, and sympathy. For each emotion, separate ideas were generated. Because the emotions differ in terms of causes and behavioral effects, with interviews, observations, and creative workshops, the designers explored when and why flight attendants experienced each of the 10 emotions, and how these emotions contributed to their professional activities. The gained insights were translated to a collection of 30 designed interventions, 3 for each emotion. Two examples are "Good Night" and "The Curtain" (Fig. 16.3), which were designed to evoke kindness and anticipation, respectively.

Good Night is a smartphone application that enables team members to help each other to be on time when they have early flights. The application is aware of the schedule of a flight attendant and automatically sets the desired wake-up time for each team member. At wake-up time, the application gently reminds the team members to check who might still be asleep by showing each member's state, and, if necessary, signaling to give them a friendly wake-up call. In this way, the flight attendants kindly look after each other, and feel connected even before they meet. The Curtain intends to stimulate positive anticipation for the upcoming flight. As the flight attendants walk from the crew center towards the airport gate, the closed curtain slowly opens and lights around the curtain frame glow, one by one. When all the lights are on, the curtain is completely open. This moment builds up a feeling of expectancy and signals that they are ready and prepared to go "on-stage."

Summarizing, in this section we discussed that positive consumer emotions are highly diverse, and that having an awareness of this variety can facilitate creative innovation and design differentiation. In addition, design that targets specific positive emotions can be used do incite different types of consumer behavior. Tools that broaden the repertoire of positive emotions can be used to facilitate communication with clients and between members of the design team.

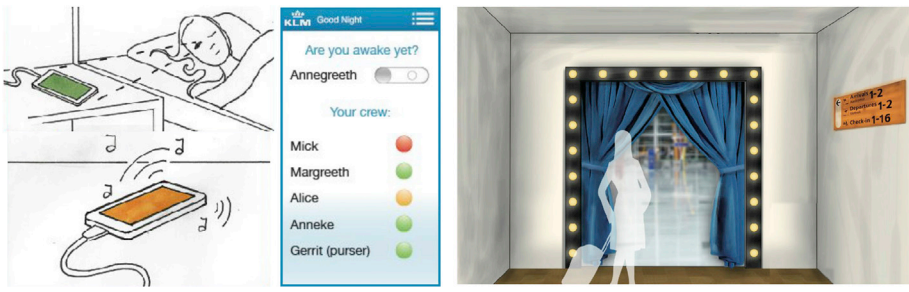

Figure 16.3 Emotion intervention designs.

3 Delights of distress

The second insight of design-relevant emotion knowledge is that people often *enjoy experiencing negative emotions*. This idea contrasts with common sense, which dictates that negative emotions are caused by bad or unfavorable events. Different negative emotions like fear, anger, sadness, frustration, and shame signal that a situation or event is a threat to a person's well-being and typically leads him to avoid, oppose, or reject the object of emotion (Frijda, 1986). It therefore makes sense that companies spend a lot of effort to ensure that their products do not evoke negative emotions: A food package should not be frustratingly difficult to open, the lifespan of a washing machine should not be disappointingly short, and plane travel should arouse as little anxiety as possible. Consequently, most research in the domain of product development and testing has focused on interventions that increase positive emotions and decrease negative emotions (Schifferstein & Desmet, 2010; see chapters: Emotions Elicited by Foods and Emotion in Beverages).

However, when digging deeper in the nuances of emotional experiences, we can identify many enjoyable activities that are characterized by negative emotions. For example, people enjoy spending effort on frustratingly difficult puzzles, they watch tearjerker movies to wallow in sadness, and they ride rollercoasters that literally sway them between anxiety and terror. Not only do people enjoy these activities, they actively seek them out and spend money on them. Yet, consumer products are rarely designed to evoke such experiences, and therefore enjoyable negative emotions are typically restricted to the domain of art and entertainment.

The reluctance to target negative emotions with consumer goods can be partly attributed to a lack of understanding about the differences between negative emotions that are plainly unpleasant and those that are enjoyable. Why do we enjoy solving a frustrating puzzle, but find a frustratingly difficult-to-open package plainly unpleasant? The answer is that people can enjoy negative emotions when they are able to experience the negative stimulus while knowing that they are *protected* from its adverse consequences (Andrade & Cohen, 2007; Apter, 2007, pp. 50–53; Fokkinga & Desmet, 2012). This "protective frame" makes the difference between a negative emotion and an enjoyable "rich" experience. For example, people in a rollercoaster experience all the physical sensations of being part of a spectacular accident, but simultaneously know that they are actually safe from harm. People can deeply pity the misfortunes of a movie character, but can also enjoy these feelings because they know that they are not feeling sorry for a real person. Lastly, the difficult puzzle is "enjoyably frustrating" because the user knows that it can be put aside without any repercussions. Compare this experience to the frustration that is evoked by a food tin that is impossible to open: This frustration is genuinely unpleasant because not having access to its contents has actual unwanted consequences.

There are several reasons why it is beneficial to include negative emotions in the designer's repertoire (Fokkinga & Desmet, 2013). The first is that negative emotions can provide an edginess and engagement to product experiences that can surpass that of positive emotions. Secondly, negative emotions are typically easier to evoke

in high intensity than purely positive emotions: The intensity of a rollercoaster ride can only be matched with events that are highly favorable and uncommon, such as winning the lottery or getting married. Lastly, like positive emotions, each negative emotion has a unique effect on people's perception, thought, and behavior. These effects can be put to functional use by influencing the product user in a favorable way. For example, Fokkinga and Desmet (2013) reported the "Direct Dietitian" (Fig. 16.4), a smartphone application that informs people about nutrition, keeps track of the food items that supermarket customers put in their shopping carts and represents the consequences of their choices in the body shape of a cartoon character. When the customer only picks up foods that are high in saturated fat, the character will start looking obese, and when the customer mostly picks up food that is high in protein and fiber, the character will become very muscular. By exaggerating the consequences of the food choice, the cartoon character takes on grotesque body shapes that can evoke mild embarrassment and disgust. Because people are wired to pay attention to stimuli that evoke these emotions, they will consult nutritional information more frequently than in its traditional numerical format.

While disgusting stimuli draw people's attention, other negative emotions have completely different effects. For example, sadness slows people down and makes them reflect on things (Rucker & Petty, 2004). Conversely, anger can make people more assertive and confident (Tamir, Mitchell, & Gross, 2008). Thus, it is crucial to consider which emotions should be part of the product experience. Fokkinga and Desmet (2013) introduced a three-step approach that design teams can use to arrive at a specific emotionally rich product experience (Fig. 16.5). The first step is selecting the most suitable negative emotion, the second step is finding a way to evoke this emotion through the product or service, and the third step is making the experience enjoyable by ensuring the consumer is protected from possible negative consequences.

For each step, it is paramount to have a thorough understanding of the characteristics of specific negative emotions. Evoking the wrong negative emotion, or evoking the right negative emotion in the wrong way could lead to adverse product experiences. For this purpose, an online database was set up that explains in great detail

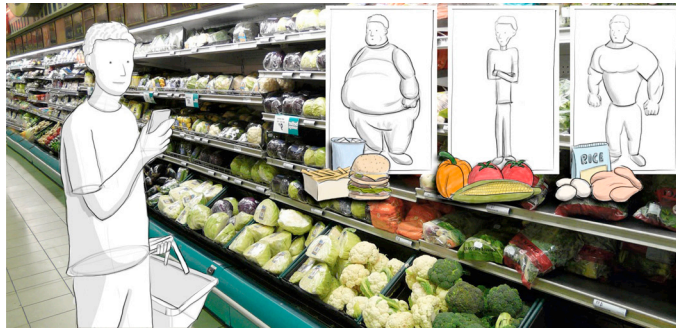

Figure 16.4 Design for rich experiences: The "Direct Dietitian."

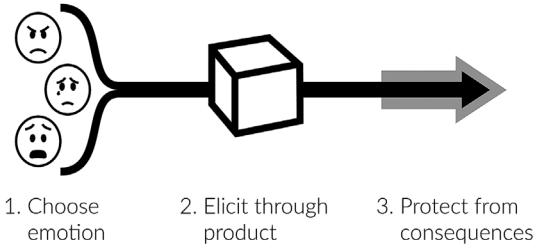

Figure 16.5 An approach to create emotionally rich experiences.

Figure 16.6 Artist's rendering of "Run for your life," a wristband that evokes enjoyable fear in recreational runners.

the characteristics of 36 negative emotions (Fokkinga & Desmet, n.d.), which serves as the counterpart to the typology of 25 positive emotions discussed in the previous section. This database was designed as an informative yet engaging tool that provides both analytical understanding and intuitive familiarity with a large number of emotions through detailed texts, movie clips, comic strips, and a quiz to test current emotion knowledge.

The design approach and database were used to develop a wristband that aims to engage and motivate recreational runners, called "Run for your life" (Fig. 16.6). Through visual, auditory, and tactile feedback, the product evokes fear emotions by giving the runner the impression of being chased by something. For example, in one scenario the runner wears headphones through which she periodically hears dogs coming after her, inciting her to go faster and outrun them. If successful, the dogs will fall back, if not, she will feel a (harmless) sting. This product was prototyped and tested in several versions that varied the type of feedback, the behavior of the pursuer, and the targeted fear emotion. For the latter, the negative emotion database was

instrumental, as it differentiates between eight fear emotions, such as anxiety, startle, worry, and nervousness. The prototype was tested with 11 participants in a total of 26 runs (Fokkinga & Desmet, 2014). Four runners did not find the wristband enjoyable or motivating, either because they did not enjoy the presence of audiovisual stimuli while running or because they did not like the idea of something manipulating their emotions. For seven runners the wristband did have the intended effect. Four of those mainly commented that the product made the experience of running more enjoyable, while the three others found that it was an effective way to increase their performance. Interestingly, during the development of this product, a smartphone app with a similar idea was released by studio Six, entitled "Zombies, run!" With this app, runners listen to a scenario that includes running away from zombies. This app was one of the best-selling nonfree apps in the iOS and Android app stores, generating over 2 million downloads in 4 years (Six to start, n.d.).

Summarizing, in this section we proposed that it is profitable to include negative emotions in the designer's repertoire because they can create unique and powerful consumer experiences that stimulate engagement and desirable consumer behavior. A three-step approach to design for "rich experiences" enables design teams to make use of negative emotions while creating positive consumer experiences.

4 Landscape of emotions

The third insight is that most consumer emotions are *nuanced and mixed*. On the one hand, product emotions are not a particular type or subset of emotions. Any positive or negative emotion that a person experiences in social interactions or other situations can also be experienced when seeing or using a product. Products may evoke some emotions (eg, fascination or irritation) more often than others (eg, euphoria or fear), but essentially all emotions can be evoked by consumer products. There is nothing unique or special about these emotions, and they can only be distinguished from "regular" emotions in terms of the stimuli that elicit them. On the other hand, product emotions are *atypical* in two ways (Desmet, 2002). Firstly, the emotions evoked by consumer goods are typically subtle and low in intensity. Even though products can evoke strong emotions, for example, when you buy your first car or when your computer gives a "fatal error," these moments are best considered rare and isolated peaks in a wide landscape of mild experiences. While we remember these peaks as emotions, we often do not remember the subtle hills that surround them. Consequently, many people believe that they are "not so emotional" about products. In reality, we are very emotional about products, but most these emotions are too subtle to be remembered after the episode (Laurans, 2011). The second atypicality is that product emotions are often mixed or diverse. Products are complex stimuli (see also Section 7) and therefore evoke multiple responses at the same time. Moreover, the human–product interaction that unfolds over time generates a constant stream of emotional stimuli. For example, a consumer can first be delighted by the design of her new smart phone, then anxious that she will damage the fragile cover, disappointed about the sound quality, and finally inspired by its ease of use.

Emotion research that is intended to support design processes should be sensitive to this subtle and mixed nature of product emotions and to the designer "frame of thought." Designers focus on integrated possibilities of various future worlds, "in which values like originality and creativity overshadow the typical scientific values like validity and reliability." Hence, creativity is supported when data are represented in a descriptive and holistic fashion and communicated with visual data representations (Desmet & Schifferstein, 2012, p. 172). When using emotion questionnaires, an important question is how many emotions to include. The ambition to obtain rich insights into nuanced variations in emotional experiences encourages the inclusion of a high number of emotions. On the other hand, the disadvantage is that longer questionnaires take more time to fill out and are more demanding for the respondent, which can reduce the validity of measurement and increase study costs. Moreover, the optimal number of emotions to be measured depends on additional considerations, like the number of products to be measured, the difference between products, context of measurement, and the respondents (for discussions, see chapters: Emotion in Beverages and Methodological Issues in Consumer Product Emotion Research Using Questionnaires). For each study, an optimum balance has to be determined, and various lists are available, ranging between 3 up to 72 emotion adjectives (for an overview, see Desmet, Vastenburg, & Romero, in press), including the often-used lists of 39 emotions by King and Meiselman (2010) and 47 emotions by Richins (1997).

Although there is no single "best" instrument to obtain design-relevant emotion insights, self-report methods are particularly useful because they can measure low-intensity emotions and enable an efficient integration of qualitative and quantitative research (for an overview, see chapter: Methodological Issues in Consumer Product Emotion Research Using Questionnaires). In addition, they can be administered in real-life situations and are easy to administer, they can be customized to match research needs, and analyzing resulting data does not require specialist knowledge or equipment. A limitation is that self-report cannot be used for continuous measurement, because respondents have to interrupt their activities to record their responses (for a discussion, see chapter: Short-term Time Structure of Food-Related Emotions: Measuring Dynamics of Responses). Moreover, compared to physiological and behavioral measures, they are more demanding for the respondent, which can affect validity.

Pictorial self-report measures have the advantage of requiring relatively little effort from the respondent and, when carefully developed, they enable the measurement of low-intensity emotions, and can be used with a variety of respondent populations, including children and respondents with different languages (Laurans & Desmet, 2008). An example is PrEmo2 (Laurans & Desmet, 2012), which features an animated character that expresses 14 emotions.[2] The questionnaire is administered through a web interface. When a participant clicks on a character, it plays a 1-second animation of the emotion expression with body movement and sound (Fig. 16.7).

[2] PrEmo2 is an updated version of PrEmo1, which measures 14 emotions that are often evoked by product design, see Desmet, Hekkert, and Jacobs (2000).

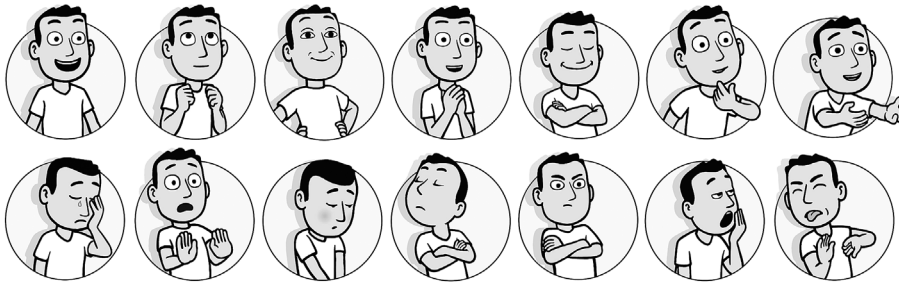

Figure 16.7 PrEmo2 character stills. (Top row: joy, hope, pride, admiration, satisfaction, fascination, and attraction. Bottom row: sadness, fear, shame, contempt, dissatisfaction, boredom, and aversion.)

PrEmo2 measures seven positive and seven negative emotions that were based on the work of Ortony, Clore, and Collins (1990) and represents four relevant emotional domains: general well-being emotions (joy, hope, sadness, fear); expectation-based emotions (satisfaction, dissatisfaction); social context emotions (pride, admiration, shame, contempt); material context emotions (fascination, attraction, boredom, disgust). Respondents are asked to consider the emotions represented by the animated cartoon and, for each emotion, to indicate the extent to which it corresponds to their current experience, using a 5-point scale. PrEmo2 can be used to measure emotions evoked by separate aspects of products, like appearance or fragrance, but also by product usage.

Several additional methods are available that depict distinct emotions using cartoon-like illustrations. Examples are the "Gaston Lagaffe" scale, which measures 8 basic emotions (GLS; Johnstone, Van Reekum, Hird, Kirsner, & Scherer, 2005), LEM, which measures 8 interaction-relevant emotions (Huisman & Van Hout, 2010), Russkam, a set of emoticons that express 29 emotions (Sánchez, Hernández, Penagos, & Ostróvskaya, 2006), and MAAC, developed for young children, which measures 16 emotions with animated characters (Manassis et al., 2009). Unique among visually oriented self-report methods is the "Sensorial Evaluation Approach" (Isbister, Höök, Sharp, & Laaksolahti, 2006), which uses eight abstract three-dimensional objects as a projective technique for qualitative affect measurement. A disadvantage of pictorial scales is that emotion sets are not easily customized because the development and validation of pictorial representations requires a substantial investment of time and effort. A main advantage however, is the sensitivity: Several studies have shown that methods that use pictorial or multisensorial representations of emotions can be more sensitive to nuanced variations in emotions between products than those that use verbal representations (Desmet, 2002; Isbister et al., 2006; Manassis et al., 2009). This sensitivity is promising for design research that aims to pick up on the subtle variations in experiences evoked by consumer products.

Summarizing, in this section we proposed that emotion research in a design context should be sensitive to the subtle and mixed nature of product emotions. Rather than focusing on emotional peaks, design intentions can focus on the landscape of

mild consumer experiences. Emotion measurement tools that address this landscape can be used to formulate emotion profiles that guide emotionally innovative product development.

5 Gateways to value

The fourth key insight is that emotions are *gateways to what people really care for*. Whereas the first three insights addressed the emotional experience evoked by products, this fourth insight focuses on the causes that underlie these emotions. It echoes the "law of concern" that was formulated by Frijda (1986, p. 351), stating that "every emotion hides a concern, that is, a more or less enduring disposition to prefer particular states of the world." In other words, the occurrence of an emotion *always* points to the presence of a personal concern.[3] This explains why different people can have a different emotion in reaction to the same stimulus: Because their concerns are different. For example, the informal demeanor of a waiter may delight one restaurant guest and irritate another: The first guest has a concern for "friendly service," while the second values "polite service."

When designers want to obtain an overview of the relevant concerns of a target group, they typically use methods like interviewing, focus groups, or questionnaires to ask people what they want, need, and expect. A drawback is that people often find it difficult to retrieve and formulate concerns that are not immediately relevant to the current situation (Sanders & Stappers, 2008). Moreover, they are not always aware of all their concerns that can be relevant for the design brief at hand. In those cases, emotions, when probed, can be a valuable gateway to these concerns. Desmet and Roeser (2015) argued that because emotions are a prime source of knowledge and understanding of values, it follows that emotions can play an important role in understanding concerns involved in design. This means that, because emotions and concerns are so intrinsically linked to each other, emotional experiences are reliable entry points to uncover underlying concerns.

All the positive and negative emotions that are experienced in the context of using a product are viable entry points to understand what people really want, need, and expect in that situation. Because these real-life consumer concerns can serve as input in emotion-driven design processes, emotion measurement can generate insights that are useful for emotion-driven design when used to probe for consumer concerns (for a discussion on emotions studied in context, see chapter: Emotions Studied in Context: The Role of the Eating Environment). Ozkaramanli, Fokkinga, Desmet, Balkan, and George (2013) developed a guided self-report procedure that uses this insight to find relevant consumer concerns: the Emotion Capture Card (ECC) procedure, see Fig. 16.8. In the two-staged procedure, the participant is first asked about a specific experienced emotion, which is then taken as the starting point to probe for the underlying concern

[3]We follow the convention in emotion psychology to use the word "concern" as the umbrella term for everything an individual wants or cares about, comprising goals, needs, standards, and values.

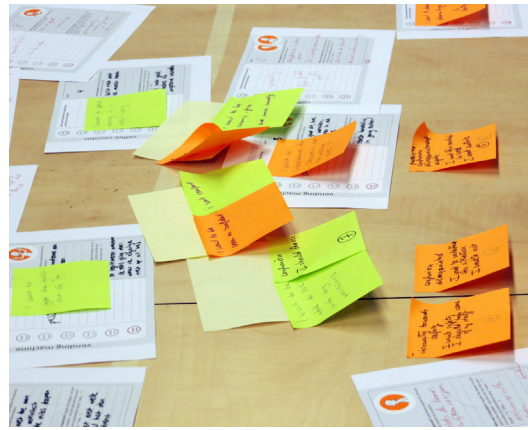

Figure 16.8 Emotion Capture Cards.

using a laddering-type interview technique (see Reynolds & Gutman, 1988). The researcher notes each emotion and corresponding concern on a separate card as input for further interviewing.

In the first stage, the research team immerses in a predetermined real-life consumer situation (eg, having breakfast, watching a movie) in a relatively unobtrusive way. The main goal is to "capture" all emotions experienced in that situation; subtle and intense, positive and negative. Participants report their emotions as they arise, and the researchers can occasionally prompt for emotions when they observe emotional events. All emotions are noted on separate paper cards, the ECCs. In the second stage, the results are the basis for an interview that aims to uncover the concerns that underlie the captured emotional experiences. For each card, three types of questions are asked: *what* questions to determine what happened (eg, "I bought a bag of nuts that was expired"), *how* questions to determine how the participant felt about this event (eg, "I was angry"), and *why* questions to understand why this event was important to the participant (eg, "shops should pay attention to what they are selling"). An ECC procedure can yield anywhere between a few dozen to hundreds of capture cards, depending on the number and length of the research sessions. In the analysis, typically one concern is distilled from each capture card, which are then aggregated to a set of relevant concern clusters.

In a case study, Ozkaramanli et al. (2013) found that using emotions as a means to access consumers' concerns can combine qualities of customer journey mapping (see, eg, Norton & Pine, 2013) with those of experience sampling (Larson & Csikszentmihalyi, 1983): It helps uncovering a precise and rich profile of consumer concerns that is anchored in the dynamic usage episode. The design case was the development of new tea snack concepts. The designs were based on an overview of tea ritual concerns that were uncovered with an ECC study. Sixteen Turkish consumers from a target group were visited for 3–6 hours during their afternoon tea ritual with friends or family. These home visits yielded 210 ECCs, which were clustered in

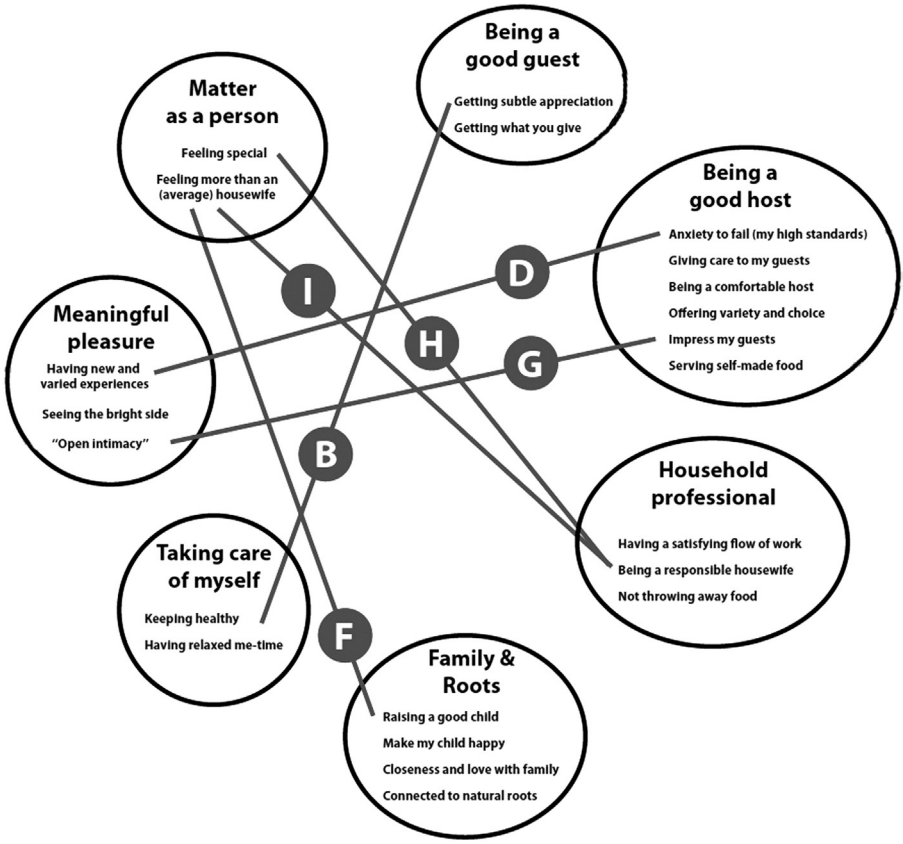

Figure 16.9. Seven clusters of consumer concerns for the tea ritual. *Lines* denote relationships that were used to formulate six design directions.

seven main concern categories including "being a good host," "taking care of myself," and "being a responsible housewife," see Fig. 16.9.

The three concerns statements "I want to enjoy a satisfying flow of work," "I want to be a responsible housewife," and "I don't want to throw away food," were clustered in the theme of "being a household professional." These three represent important nuances and add richness to the overall theme. Having such a comprehensive yet compact overview of concern themes enables identifying important relationships (denoted by lines and letters in Fig. 16.9), which were subsequently used as input for emotion-driven design directions.

Summarizing, in this section we proposed that emotions are reliable entry points to understand what people care about in the context of consuming goods and services. A guided self-report approach was discussed that combines observation, emotion measurement, and interview techniques to obtain a design-relevant set of consumer concerns.

6 Desires and dilemmas

The fifth key insight is that consumer emotions are often driven by *conflicting concerns*. Half the time people are awake they experience a desire and half of these desires conflict with other goals (Hofmann, Baumeister, Förster, & Vohs, 2011). As a result, people experience mixed emotions, in many everyday events, including those in which they consume products and services (eg, Otnes, Lowrey, & Shrum, 1997). For example, a person having dinner in a restaurant can feel delighted by the prospect of having a chocolate dessert, but also anticipate the regret of this choice and feel better off with a fruit salad. While the dessert is more satisfying in the moment (concern for enjoyment), the fruit salad contributes more to a slim waistline in the long run (concern for positive self-image). Such conflicts of concerns create emotional dilemmas: When faced with two mutually exclusive choices of action, people experience positive and negative emotions towards both choices, because either one violates one concern while fulfilling the other.

One approach in dealing with conflicting concerns is to design different consumer goods to target the different concerns represented by the conflict, which require the consumer to make a choice. For example, indulgence-focused desserts can be developed for those who want to give into the concern for enjoyment, and health-conscious desserts for those who want to respect the concern for long-term positive self-image. The fifth insight, however, implies that consumers often have both concerns represented by the concern conflict at the same time. As a consequence, products that fulfill one of these concerns will always be emotionally satisfying in some aspects, while dissatisfying in others. Ozkaramanli, Desmet, and Ozcan (in press) proposed that products that solve the concern conflict instead of "choosing sides" for one of the two concerns, can stimulate positive consumer emotions. Such products can tackle the emotional duality that is created by products that do not address the concern conflict. For instance, a fruit salad that is designed to be experienced as a luxurious treat can simultaneously fulfill the concern for indulgence *and* the concern for positive self-image.

Designing with dilemmas, with its focus on conflicting consumer concerns, can be a source of design creativity. Contradictions stimulate problem solvers to search for solutions that can eliminate the tension to restore consistency (Glover, Ronning, & Reynolds, 2013). Recognizing the value of dilemmas, design approaches such as Theory of Inventive Problem Solving (TRIZ) and lateral thinking encourage design practitioners to seek and utilize conflicting requirements or opinions in a design brief (De Bono, 1995; Mann, 2001). Being related to important psychological processes such as decision-making and self-actualization, dilemmas can have a negative influence on the satisfaction derived from daily choices (a phenomenon called paradox of choice; Schwartz, 2004) and on general subjective wellbeing (Emmons & King, 1988). Therefore, products and services that support people in dealing with their dilemmas can contribute to consumers' overall wellbeing. For instance, recognizing the prevalence of self-control dilemmas in everyday life, a large body of work in consumer research has focused on factors that influence decisions between virtue products (ie, products that promise future benefits but carry immediate usage costs,

such as condoms or dental floss) and vice products (eg, products that promise immediate benefits, but carry future costs, such as cigarettes or fast food) (eg, Ein-Gar, Goldenberg, & Sagiv, 2012).

A dilemma-driven design approach requires an overview of concerns that are relevant for the consumer and inspiring for design innovation. The previous section demonstrated that the ECC procedure is a useful tool to obtain clear concern statements. When making sense of the (typically) hundreds of concern statements that the capture card procedure yields, it can be useful to consult general goal taxonomies that provide compact and comprehensive overviews of universal human goals, like the one developed by Ford (1992). Once concern themes are identified, juxtaposing them can reveal consumer dilemmas that are relevant in the domain of the design brief. In order to best inspire design creativity, the formulated dilemmas should create a "positive solution space." Such a positive space is generated when the formulations of the concerns is open-ended (eg, "I want to eat healthy," instead of "I want to eat a banana") and positive (eg, "I want to eat healthy," instead of "I don't want to eat unhealthy").

The dilemma-driven design approach was used to develop three concepts for a multinational food company, see Fig. 16.10. The brief was to develop energizing breakfast cereal concepts for young professionals. The designers first identified relevant and inspiring dilemmas experienced in the context of having breakfast. These dilemmas, which were formulated to include concerns that are both open-ended and positive, were used as the basis for their design concepts.

The first design concept, "Dare and Share," was based on the dilemma of "I want to nurture relationships," but also "I want to enjoy my personal time." This dilemma was experienced by couples who wake up at different times. The person who has to get up first enjoys the private moment of having breakfast before rushing off to work, but she would also like to use the breakfast moment to express her love for her partner. The design goal was to enable consumers to nurture their relationship *while* they are having a moment of personal time. The concept is a cereal box that includes a large bag and seven separately packed spoon-sized pockets. Users can leave a small pocket on the kitchen table for their partner as a little expression of their intimacy. "Break on the Go" was based on the dilemma between the concerns "I want to have my breakfast in peace" and "I want to be on time for work." The design goal for this concept was to create an on-the-go breakfast that feels more like having a breakfast at home.

Figure 16.10 Design with dilemmas: Breakfast cereal concepts for young professionals.

The design is a breakfast box that allows users to pack their cereal, yoghurt and fruit combinations, to eat on-the-go. When opened, the lid of the box forms a barrier between the user and his environment, which enables a "private and cozy" breakfast experience. The third concept in Fig. 16.10, "One-bite Crunch," was based on the dilemma between "I want to add surprising ingredients to my breakfast," and "I want to manage my time in the morning." The design goal for this concept was to create "convenient surprises." The design is a box with bite-size cereal balls that surprise consumers with different flavors, while also allowing them to enjoy their breakfast in an efficient way.

Summarizing, in this section we proposed that concern conflicts are valuable input for design because they offer opportunities for creating products and services that are both innovative and highly relevant to the consumer. Dilemma-driven design is a potent approach to design for emotion because human emotions are often driven by concern conflicts instead of by single concerns. By targeting these conflicts, emotion-driven design can enable consumers to manage or solve their personal dilemmas.

7 Context for emotion

The sixth and final insight is that consumer emotions are *often not evoked by the product*. Consumer goods can evoke a wide pallet of emotions, as was illustrated with several cases in the previous sections. The majority of research on the emotional impact of design focuses on situations in which the product is the emotional stimulus. For example, one may be fascinated by a novel smartphone, disappointed by its slow interface and delighted by its colorful interface. In real life, however, most emotions that consumers experience when using products are not about these products—implying that the product is not the stimulus that evokes the emotion (Desmet, 2012). Take the smartphone example: one may be upset with her friend for not calling her back, relieved that her online agenda alerts her that the meeting has been canceled before she got into her car, and delighted to see that her weather app predicts that it will stop raining this afternoon. In these cases, the emotions are clearly not directly evoked by the smartphone. The phone, however, does play a role by facilitating the activities and interactions that evoke the emotions. Hence, if this person would not have owned and used the phone, she may not have experienced these emotions. In these cases, the role of the product is indirect: It is not causing emotions but it is a resource that facilitates and influences activities and interactions that, in turn, evoke emotions.

The sixth insight implies that emotion-driven design can benefit from a holistic view on consumer emotions that not only takes into account the emotions that are evoked by the product design but also those that are experienced in the context of usage. The context in which a product is used influences the emotional impact of the product (for a discussion, see chapter: Emotions Studied in Context: The Role of the Eating Environment), and likewise the product can influence the emotions that are experienced in the context of use. These "contextual emotions" are less direct than the "product emotions" and therefore more difficult to conceive or influence with design. At the same time, they offer additional opportunities for emotion-driven design

Figure 16.11 Airplane breakfast: morning tapas.

innovation. For instance, a straightforward approach is to identify and solve negative emotions in the context of use. This approach starts with capturing all emotions that consumers experience in the context of a particular activity (eg, having breakfast) or situation (eg, at the train station). The results can be used to inspire new goods and services that reduce negative emotions that are experienced in this activity or context. Likewise, new goods and services can be conceived that capitalize on positive emotions experienced in the context of an activity.

The airplane breakfast in Fig. 16.11 is an example of an emotion-driven product design that was based on insights into the emotions of people in the context of usage. This design (as presented by Desmet & Schifferstein, 2012) was created for an international airline company. Passenger emotions were measured on board during the context of a flight. The study indicated that passengers experienced two strong negative emotions: *boredom* due to a lack of stimulation, and *frustration* due to a lack of control. Hence, the two key concerns the designers focused on, were those of "being stimulated" and "having control." Although these emotions and related concerns had nothing to do with the meal, they were relevant in the context of consuming the meal. The intention was to reduce the overall passenger boredom and frustration by using the meal to fulfill these two concerns.

The resulting design was named morning tapas because it was a breakfast that consists of several main elements (warm and hot, savory, and sweet), and some condiments in the middle, like nuts and honey. These elements can be combined in many different ways, allowing the passengers to "play with their food," which addresses both the concerns for control and for stimulation. An evaluation study found that boredom and frustration had decreased significantly, and the overall passenger satisfaction had increased after introducing the new breakfast type (Desmet & Schifferstein, 2012).

Summarizing, in this section we proposed that many consumer emotions are not "about" the product but about activities and situations in which the product is consumed. This implies that opportunities for emotion-driven design increase when acknowledging that consumer goods are not only emotional stimuli (direct emotions), but as part of the "context for experience" (indirect emotions). This approach

to emotion-driven design requires researchers and designers to look beyond direct product emotions and also capture and design for emotions in the context of use.

8 Conclusion

This chapter introduced six insights that represent design-relevant emotion knowledge. In our experience, a profound emotion knowledge can serve several purposes in innovation processes. It helps to organize the research in service of the emotion-driven design process, that is, which research questions to pose, which methods to use, and what insights to obtain. In addition, it is useful to structure design thinking, stimulate creativity, and facilitate communication with clients and within design teams. To be relevant to design research and practice, emotion knowledge should be implemented in tools that help design teams to measure, represent, and interpret user emotions.

In the first three sections, we proposed that design can evoke a broad pallet of positive and negative emotions, and that an understanding of the differences between emotions can be beneficial when aiming to design goods and services that evoke unique experiences. Moreover, because different emotions stimulate different behaviors, emotion-driven design can be used to influence consumer behavior in a favorable way. The opportunities to do so increase when also including negative emotions in the design repertoire. When applied with the inclusion of a mental protective frame, negative emotions can contribute to a rich and unique consumer experience. The first three insights illustrate that consumer emotions are nuanced, subtle, and multidimensional, and that emotion-driven design requires research and design methods that accept and adopt this richness. In the second part of the chapter we discussed the implications of the direct relationship between emotions and personal significance. Because emotions always point to the presence of a consumer concern, measuring emotions is an effective approach to understanding what people really care for. Moreover, because emotions are often driven by concern conflicts, dilemma-driven design is a powerful approach to design emotionally relevant products and services. Lastly, the opportunities for emotion-driven design increase substantially when not only considering emotions that are evoked by products and services (ie, direct emotions) but also those that are experienced in the context of consuming products and services (ie, indirect emotions).

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