



I Knew I Shouldn't, Yet I Did It Again! Emotion-driven Design as a Means to Motivate Subjective Well-being

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The purpose of this paper is to introduce the concept of conflicting concerns to emotion-driven design and to demonstrate their translation into emotionally appealing design concepts. People have an endless number of concerns associated with everyday activities, which are challenging, if not impossible, to satisfy simultaneously. Therefore, people often give up long-term goals for immediate satisfactions or obligations, as it is apparent when someone skips an early workout to sleep in, or eats ice cream while being on a diet. The conflicting concern approach demonstrated in this paper is based on the proposition that product emotions can play a key role in resolving concern conflicts by motivating users to pursue long-term goals instead of immediate concerns. This paper first discusses the psychological principles of emotion and motivation, to explain (1) how conflicting concerns arise, (2) why they are important, and (3) how they can be addressed through emotion-driven design. Following this understanding, a research through design approach was adopted to explore and design with conflicting concerns in the domain of sustainable eating habits. The main insights from this study are summarized to identify the initial principles for developing tools that can support using conflicting concerns in emotion-driven design, and an example of such a tool is demonstrated.

Keywords – Design for Emotion, Concern Conflict, Well-being.

Relevance to Design Practice – This paper introduces the idea of conflicting concerns to emotion-driven design, and illustrates how designers can use this understanding to support emotional well-being. Identifying and designing with conflicting concerns allows for the creation of novel ideas that can motivate users to pursue long-term goals instead of short-term benefits.

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Introduction

I knew I shouldn't, yet I did it again! Our emotions sometimes seem to play tricks on us: the person who was fined for speeding knew she was behaving irresponsibly but simply could not resist when testing the new sports car. And the person who has to face an upset spouse knew that he should not have purchased these expensive shoes, but some inner voice made him buy them anyway. These and similar situations typically evoke mixed emotions: combinations of both pleasant and unpleasant emotions, such as pleasure and shame, or pride and regret. Emotions sometimes seem to 'make us' behave irresponsibly, jeopardizing our health, safety, and security. We know we should not eat the bag of candy because it will make us feel bad. But we do it anyway (while enjoying the taste), even when realizing that we will pay for it later. In this paper we explore how products can be designed with the intention to resolve these emotional conflicts, contributing to long-term subjective well-being, rather than to short-term pleasures or thrills.

There are several models in the design literature that attempt to explain the role of emotion in product design (Desmet, 2002; Jordan, 1999; Norman, 2004). The model adopted in this paper has been proposed by Desmet and uses appraisal theory as the basis for explaining how products elicit emotions through addressing one's concerns. As it applies to design and emotion, an appraisal is "an automatic assessment of the effect of a product on one's well-being" (Demir, Desmet, & Hekkert, 2009, p. 1).

For example, if one wants to be successful at work, failing to get a promotion may generate anger or disappointment. Appraisal theory identifies concerns (wanting to be promoted) as reference points in the process of emotion elicitation. Experience of positive or negative emotions towards a given situation depends on whether that situation fulfills or harms one's concern(s) (Frijda, 1986). Different people may experience different emotions in a given situation; however, the process of emotion elicitation, as explained by appraisal theory, is universal.

Design for emotion also provides the means to design for subjective well-being, since the latter benefits from the influence of emotions on one's being. Frijda (2007) argues that emotions can generate long-term goals, when a specific concern obtains a high priority in the hierarchical concern structure of a person. Such concerns are goals with high emotional value: The process

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of achieving the goal may not be emotional, but the person is still emotionally engaged with the goal. In the above example, working hard for a promotion may not evoke emotions during the process itself, but one continues to do so because receiving or not receiving recognition for hard work will certainly evoke positive or negative emotions. In other words, an appraisal of emotion motivates action for goal achievement fueled by “intention, anticipation, and reflective control” to reach a desired end-state (Frijda, 2007, p. 194). As a result, both design for emotion and design for subjective well-being require translating concerns of target users into novel and emotionally evocative products.

Given the everyday prevalence and significance of conflicting concerns on subjective well-being, the goal of this paper is to introduce the concept of conflicting concerns to the process of emotion-driven design and to demonstrate their translation to design concepts in an example design domain: sustainable eating habits. The first two sections discuss the psychological principles of emotion and motivation, to explain how conflicting concerns arise, why they are important, and how they can be addressed through emotion-driven design. Next, a case study is reported. The study adopted a research through design approach, to (1) identify the relevant concerns in the domain of eating meat versus meat alternatives, and to (2) design with the identified conflicting concerns. As the concept of conflicting concerns is a new approach to designing for emotion and subjective well-being, traditional user research methods, such as interviews and focus groups, were adjusted to identify these concerns in the domain of meat eating. In addition, translating conflicting concerns to design concepts has been explored by developing supporting tools and testing them with other designers in idea-generation workshops. The following sections introduce the user research phase and the design phase respectively. Insights from these phases are further discussed together with limitations of the study and recommendations for future research.

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An Understanding of Conflicting Concerns

In studying the relationship between products and emotions, Desmet (2004, 2008), referring to the work of Ortony, Clore, and Collins (1988), differentiated among three distinct types of appraisals: usefulness, pleasantness, and rightfulness appraisals, which correspond to three concern types: goals, attitudes, and standards respectively. These were then linked to three levels of product-person relationships, resulting in a framework with nine sources of product emotions (Desmet, 2008). Desmet (2010) suggested that this framework can be used to design for three levels of emotional appeal that involve self appeal, activity appeal, and product appeal. Both of these frameworks emphasize the central role of concerns in designing for emotion and subjective well-being. However, having such a prominent role in design and emotion, concerns can (and often do) contradict each other. Consider two basic examples from everyday experiences: “I enjoy finishing dinner with a nice dessert, but I also want to lose some weight” or “I understand the importance of saving energy, but I enjoy being careless in my own house.” Both of these examples demonstrate the trade-off between our meaningful, long-term goals (being physically fit, being socially responsible) and immediate satisfactions or obligations (enjoying a tasty dessert, avoiding mental/physical effort).

Conflicting concerns arise due to the complex interaction among our goals, standards, and attitudes. Goals are what we want to achieve in our interactions with our surroundings. They give direction and meaning to our striving towards a desired outcome and lead us to appraise events or objects as being useful (Frijda 1986; Ortony et al., 1988). For example, one may find buying a specific cooking book useful for reaching the goal of losing weight but in conflict with the goal of saving money. While goals can align or contradict with each other, they can also be in harmony or in conflict with our standards and attitudes. Standards are how we believe people (including ourselves) and objects should behave. Events that comply with our standards are appraised as legitimate, while those which fail to meet our standards are appraised as illegitimate (Desmet, 2004; Ortony et al., 1988). For example, one may be proud of the perfect fit of a new dress because it helps fulfill the standard of “I should look good in my new dress,” while a couple of extra kilos would create a much different fit and make the person resent trying on the dress. Finally, attitudes are our inherent dispositions towards pleasurable and painful stimuli which lead us to appraise situations as delightful or offensive (enjoying cooking, having a certain fashion taste, or inherent liking for sweet foods; Desmet, 2004; Ortony et al., 1988). Standards and attitudes can be considered as feedback or feed-forward mechanisms that monitor and energize our progress when trying to reach a specific goal (Frijda, 1986). For example, “I should look good in my new dress” (a standard) or “I enjoy cooking my own

meals” (an attitude) both align with the goal of losing weight, and thus they energize goal engagement. As a result, when standards and attitudes align with the goal being pursued, they encourage goal progress; and in case of misalignment, they complicate goal progress leading to conflicting concerns and mixed emotions (when, for example, a person on a strict weight-loss diet cannot resist the temptation of eating chocolate).

Design Significance of Conflicting Concerns

As it is apparent in the examples given so far, people have an endless number of concerns associated with their daily activities, which makes it challenging to understand the significance of conflicting concerns for our well-being in general. To clarify, all concerns can be linked to a finite number of higher-order, abstract human goals, or motives, such as belonging, physical well-being, safety and so on (Frijda, 2007; Ortony et al., 1988). However, concern conflicts experienced repetitively over a long period of time can hinder the achievement of these motives and seriously threaten personal well-being, as supported by Emmons and King (1988) who found that conflict and ambivalence among personal strivings are associated with high levels of negative affect, depression, neuroticism, and psychosomatic complaints.

A number of well-known classifications for motives exist in social and motivational psychology (Chulef, Read, & Walsh, 2001; Ford, 1992; Maslow, 1970; Murray, 1938). For example, “I want to have dinner with my parents tonight” is a context-specific goal that corresponds to the universal goals of belonging and physical nurturance. Similarly, “I enjoy receiving compliments on my cooking skills” is an attitude statement that expresses the motive for resource acquisition at a concrete, dispositional level. It has been argued that the achievement of those concerns that bring us closer to realizing these abstract motives (self-actualization) lead to the most fulfilling product experiences (Demir et al., 2009). On the other hand, concern conflicts jeopardize self-actualization because of our inherent disposition to seek pleasure and diminish pain, often causing our important motives to be sacrificed for our immediate satisfactions or obligations (the law of hedonic asymmetry; Frijda, 2007). We want to enjoy our everyday transactions while avoiding pain and mental stress, yet we struggle to fulfill many responsibilities towards both ourselves and others. According to Frijda, “resulting concern conflicts cannot be resolved neither by compromise nor by weighing satisfactions” (p. 149). How can they be resolved then? The answer can be found in theories of motivation that have consistently attempted to explain how people can engage in successful goal pursuit, i.e. how to go from the current state to a future state that is considered ‘better for well-being’ by keeping up with our long-term goals. For this, it is necessary to understand human motivation and one of its most important constituents that

designers can have control over: the emotional arousal processes (Ford, 1992).

From a functional perspective, our emotions signal a possible concern match or mismatch and serve to amplify the effect of motivation by preparing us to take action by inducing mental and/or bodily changes in action readiness (Frijda, 2007). For example, anger prepares us to confront, and fear prepares us to flee. Frijda argues that a special domain of emotions, called inner emotions, can modulate attention and drive cognition to notice an event or certain aspects of it (being jealous of someone for taking interest in another person can signal much denied attachment). In this way, emotions act as prioritizing mechanisms in determining which concerns to follow. Similarly, some inner emotions can modify appraisal by changing the way a person or event is perceived. For example, one may view a new colleague with respect or jealousy, which may lead to modest or hostile actions in a real situation. Frijda (2007, p. 44) calls these “small emotions” adding that they are small with regard to motor engagement, but can nevertheless be powerful in their effects, forming the basis of many important decisions in life, such as who to vote for as the next president. Finally, inner emotions can also exist as virtual emotions in the form of images or emotion anticipations, which have considerable power in provoking action and can especially be helpful in contemplative behavior when weighing the attractiveness of two or more options. “Much of our life is dictated by virtual emotions: we act in prudent and conscientious ways not because we feel guilty but to forestall future feelings of guilt” (Frijda, 2007, p. 45). Based on the argument that products can be designed to evoke different variants of inner emotions, interaction with such products can resolve concern conflicts by motivating the users to modify their goal priorities and pursue long-term goals despite current satisfactions or obligations. Here lies an important opportunity for designers to create design interventions that can help resolve concern conflicts through designing emotionally appealing products and/or services.

The potential contribution of conflicting concerns to design and emotion has been mentioned in a limited number of past studies (Desmet & Dijkhuis 2003; Desmet, 2010); however, it has not yet been studied. For example, Desmet and Dijkhuis adopted an emotion-driven design approach to present a children’s wheelchair design case in which the parents (being users of the same product) had mixed emotions towards the proposed design due to conflicting concerns. While the parents were fascinated by the design, they were also worried that it was too unusual to let the child naturally blend into a crowd. Moreover, Desmet emphasized that conflicting concerns underlie powerful emotions such as self-anger, guilt, and regret; however, did not provide an explanation on how to incorporate them in the proposed steps for designing for emotion, i.e. (1) selecting a design theme, (2) forming a concern profile, (3) creating a product profile, and finally (4) product design.

User Research

Food preparation and consumption is a domain that serves the purposes of this study well, due to many contradictions that already exist in it. For example, food can be considered both as a basic life necessity and a luxury product, and its consumption is influenced by a number of factors such as personal, cultural, or social considerations. Additionally, trends in food consumption are constantly changing as a result of population growth, globalization, and varying lifestyles, giving rise to health-related, environmental, and ethical concerns (Grunert, 2006). Being one of the most prominent food categories, meat is a main ingredient of many traditional dishes from all around the world, and the centerpiece of most main plates served in restaurants. However, new trends in the food domain also influence the way we perceive and consume meat, giving rise to conflicting concerns. For example, many people are dependent on mass-produced meat (often without even realizing it due to lack of time, knowledge, creativity, or resources to move away from it), while at the same time they want to lead a healthy and sustainable lifestyle.

Consequently, one needs to take into account the underlying concerns that lead to such inconsistent behavior patterns when designing new products in the domain of meat eating. In line with this argument, the user research was focused on the controversial aspects of the experience of eating meat versus its alternatives such as man-made meat replacers or edible insects to develop a relevant and inspiring concern profile. The main research questions were formulated as follows: (1) What are the emotional concerns (goals, standards, attitudes) relevant for the experience of eating meat in comparison to eating meat alternatives? (2) What are the concerns that are in conflict with each other in this design domain? (3) How can these conflicts be resolved to motivate novel food and food practices?

Methods

Twenty-three people (13 female, 10 male) between 20 and 37 years of age volunteered for the user research study. The participants came from eleven different cultural backgrounds, and they all had the experience of living in a western country. Asian people were excluded from the study due to previous findings that they experience lower level of perceived discomfort in dealing with mixed emotional appeals (Williams & Aaker, 2002). Fourteen out of the twenty-three participants were in the target group of the study (meat eaters), while the remaining nine were lead users who mainly followed a vegetarian diet. Inclusion of lead users was crucial in emphasizing the differences between actual and desired user profiles (Herstatt & von Hippel, 1992; Grunert, 2006).

Focus groups, interviews and a generative session were used to explore users' emotions, underlying concerns, and concern

contradictions. Since this information is mainly latent knowledge, each method was designed to suit the creative needs of this study (Sleeswijk-Visser, Stappers, van der Lugt, & Sanders, 2005). Prior to each session, participants were given a sensitizing activity to start them thinking about certain aspects of the design domain. During the sessions, the researcher provided the participants with visual exercises and food items relevant for the design domain to stimulate discussions. During the discussions, the researcher used a laddering technique by sequentially asking 'why' to trigger the participants to reason with their responses and express higher level concerns (Reynolds & Gutman, 1988).

Three focus groups were conducted with four participants in each group. The groups of people were housemates, which allowed the sessions to be conducted in a natural environment. Participants were sensitized for the session through two sensitizing activities: (1) to e-mail the researcher their favorite meat dish with a note on why they like it (at least four days before the session), and (2) to think about their own definition of sustainable living (one day before the session). Each session took approximately three hours to complete, and participants were provided with food that consisted of both meat and its alternatives, including man-made meat replacers, edible insects, and plant-based proteins. The researcher prepared supporting visual information and exercises to facilitate expressing feelings and opinions about each food product brought to the session. A set of questions was also prepared that built on the major topics discussed in the food domain, such as different sources of food emotions (Desmet & Schifferstein, 2008), factors affecting food choices (Steptoe, Pollard, & Wardle, 1995), the role of meat in everyday food culture (Holm & Møhl, 2000), and future trends and consumer lifestyles with regard to meat consumption (Grunert, 2006). Additional questions were asked during the session in order to encourage explanations or to probe disagreements.

Besides focus groups, interviews were conducted with one or two participants in each session using the same procedure as the focus groups. Participants who volunteered for the interviews were either target users who could not make it to the focus groups (working parents) or lead users who mainly followed a vegetarian diet. Furthermore, a generative session was conducted with four participants (two targets, two lead users), who were asked to create a collage of 'what makes food appealing to them in an imaginary emotionally loaded experience.' The purpose of the generative session was to gather insights on the values and ideals that surround eating experiences and makes food appealing to the participants. Materials provided for the collage making session included magazines, a list of inspirational words, and stationery material (scissors, glue, colored markers, blank paper). Neither the magazines nor the word list contained material related to food or cooking in order to avoid tendency toward depicting concrete and

stereotypical eating experiences (Costa, Schoolmeester, Dekker, & Jongen, 2003). Following the completion of the collages and a short break, the facilitator asked the participants to explain their collages to the group, after which she encouraged questions from other participants and posed additional probing questions such as “what are the interactions involved in the event depicted on your collage?” or “how would you translate this event to your real life context?” (Costa et al., 2003). The discussion lasted about 45 minutes and ended with the facilitator summarizing the main points and thanking each participant for their research contribution.

Analysis

All sessions were video-taped and fully transcribed. Table 1 shows a snapshot of how the raw data were categorized and analyzed. Initially, insightful user quotes (1-5 sentences) were extracted from the transcripts using thematic analysis. Next, the concrete information given in these quotes were interpreted and abstracted to form representative concern statements (a goal, standard, or an attitude). Finally, selected concern statements were categorized using priori-coding (Miles & Huberman, 1994). For this categorization, the goal taxonomy developed by Ford (1992) was utilized. It is important to note that abstract goal categories provided by Ford were not used in a way to imply a specific concern type (goal, standard, or attitude); rather, these abstract goals were operationalized in three different levels to represent different concern types. For example, the goal category of social responsibility may intuitively sound like a self-standard; however, Table 1 illustrates that participant DN appraised this concern as being useful, and expressed it as a goal statement (I want to be socially responsible to keep my conscience at ease) instead of a standard (I should be socially responsible).

In addition to identifying the concern categories for selected concern statements, the appraisal type and product-person relationship level were defined for each concern statement based on nine sources of product emotions defined by Desmet (2010). Finally, most frequently voiced statements were selected, and similar ones were grouped together to form a concern profile that is relevant and inspiring for the design case.

Finally, it is worth to note that goal taxonomy of Ford (1992) was selected for data clustering because it provides both sufficient detail and a clear overview. Although the taxonomy of basic human values developed by Schwartz et al. (2001) has been extensively applied in food research, it consists of categories that are too broad for the current application, such as tradition and security. The taxonomy developed by Chulef et al. (2001), despite providing a comprehensive list of universal human goals, was considered too detailed to investigate the interaction among different concerns and to define possible concern conflicts.

Results

The concern profile that resulted from the analysis is shown in Table 2. The number of people who voiced the selected concern statements and the corresponding goal categories are added in parenthesis after each statement. Based on this concern profile, conflicting pairs were identified to guide further stages of the design process. The following factors were taken into account while selecting the conflicting concern statements:

1. Each conflicting concern pair needed to include a goal of which the achievement is obstructed by another concern that could be another goal, a standard, or an attitude.
2. Self-focused or activity-focused goals were preferred over product-focused goals because fulfillment of higher-level goals is more likely to contribute to self-actualization (and thus elicit intense emotional experiences) compared to the fulfillment of concrete goals.
3. Concern statements that were neither too abstract nor too concrete were selected in order for the statement to give clear design direction while still being inspiring.

Besides conflicting concern statements, three standards were selected as relevant and inspiring for the design case. Standards and attitudes are considered as being equally meaningful and important reference points for appraisals underlying product emotions; however, attitudes were not preferred because they refer to what users like or dislike; which, on its own, says little about the reasoning behind those preferences (Demir, 2010).

Table 1. Three example rows showing the data analysis procedure.

User	Volume	Abstracted concern statement	Concern category	Appraisal type	Relationship level
DN	I only pay attention when I am buying eggs; I buy biological or free-range eggs. It is a small thing that keeps my conscience at ease.	I want to cook and eat food in a socially responsible way.	Goal-Social sponibility	Useful	Activity
CE	I have a strong reaction to the body of the grasshopper, may be if it was smaller, I could put it in my mouth.	Food should look appealing.	Standard-Bodily sensation	Rightful	Product
LO	The real meat eating started when I left home, I am free to cook it however I like, and eat as much as I want.	I enjoy cooking and eating whatever pleasures me.	Attitude-Self determination	Pleasurable	Activity

Table 2. Concern profile [modified from the nine sources of product emotions in Desmet (2008)].

	Usefulness appraisal (goals)	Pleasantness appraisal (attitudes)	Rightfulness appraisal (standards)
Self-focus	I want to lead a long, healthy life. (Physical well-being, 11)		People should be aware of the limited resources of the world. (ST*-Social responsibility, 2)
	I want to connect/spend time with my loved ones through cooking and eating together. (Belongingness, 11)	I enjoy cooking and eating whatever pleases me. (AT*-Self determination, 3)	Media/supermarkets should help raise awareness about sustainable and healthy ways of cooking and eating food. (ST-Social responsibility, 6)
Activity-focus	I want to improve my cooking skills. (Mastery, 3)	← 1 →	I should cook in a fast, easy, and manageable way. (ST-Management, 5)
	I want to cook and eat food in a socially responsible way. (Social responsibility, 4)		← 2 →
	I want to explore new ways of cooking and eating food. (Exploration, 7)	← 3 →	
	I want to cook and eat food the way I am used to. (Tranquility, 7)		
	I want to avoid being stressed when I am cooking and eating food. (Tranquility, 3)		
	I want to have control over my body and what enters there as food. (Physical well-being, 4)	I enjoy exploring new ways of cooking and eating food. (AT-Exploration, 9 lead)	I should cook and eat food in a socially responsible way. (ST-Social responsibility, 7 lead)
Product-focus	I want to eat healthy and nutritious food. (Physical well-being, 6)	I enjoy different textures in my food like meat has bones, skin, and flesh and vegetables are crunchy. (AT-Bodily sensation, 4)	Meat replacers should not imitate meat: food should be authentic. (ST-Bodily sensation, 3) 4
		I enjoy having variety in my plate. (AT-Bodily sensation, 4)	Food should look appealing. (ST-Bodily sensation, 7)
			Food should be fulfilling with body like meat, taste, juiciness, texture and so on. (ST-Bodily sensation, 2) 5
			Meat should be of good quality. (ST-Bodily sensation, 3)
			Food should be fresh (natural). (ST-Safety, 2) 6
			Food should be hygienic. (ST-Safety, 4)
		Food should not be processed. (ST-Physical well-being, 5 lead)	

Note: * Total number of participants is 23 (14 target and 9 lead users); * AT-attitude; * ST-standard.

The next step was to summarize this information in an appropriate format to be communicated to other designers for the idea-generation workshops. For that purpose, six concern cards were prepared (see Figure 1 and Figure 2). The card format was found appropriate since many design tools use that format (method cards by IDEO, living cards by Enzo Mari, and Paolo Gallerani, or creative whack pack by Roger Van Oech). The front side of the cards was used for a title, conflicting concern statements or a standard statement, and a related conceptual visual. The back was used for user quotes that correspond to the concern statements on the front.

In this way, the concern cards attempted to communicate the selected concerns and standards to the designers by making use of various levels of information abstraction (an abstract title, a brief concern statement, and concrete user quotes). It must be noted that other conflicting concern pairs could have been identified. For example, “I want to have control over my body and what enters there as food” is a goal that could also be in conflict with the standard “I should cook in a fast, easy, and manageable way.” However, it was preferred to select between 4-6 concerns to keep the concern profile at a manageable level for the idea-generation workshops.

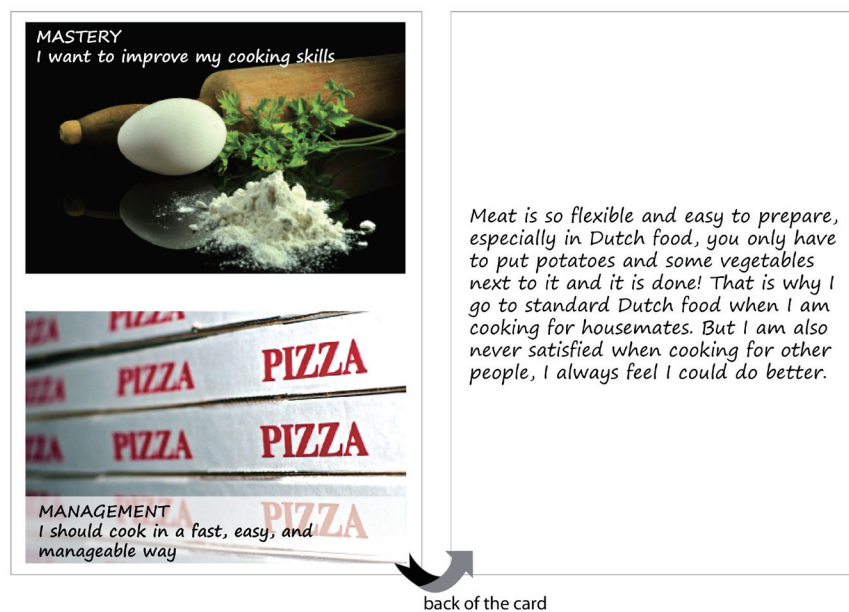


Figure 1. Concern card illustrating the conflicting concern pair of mastery versus management.

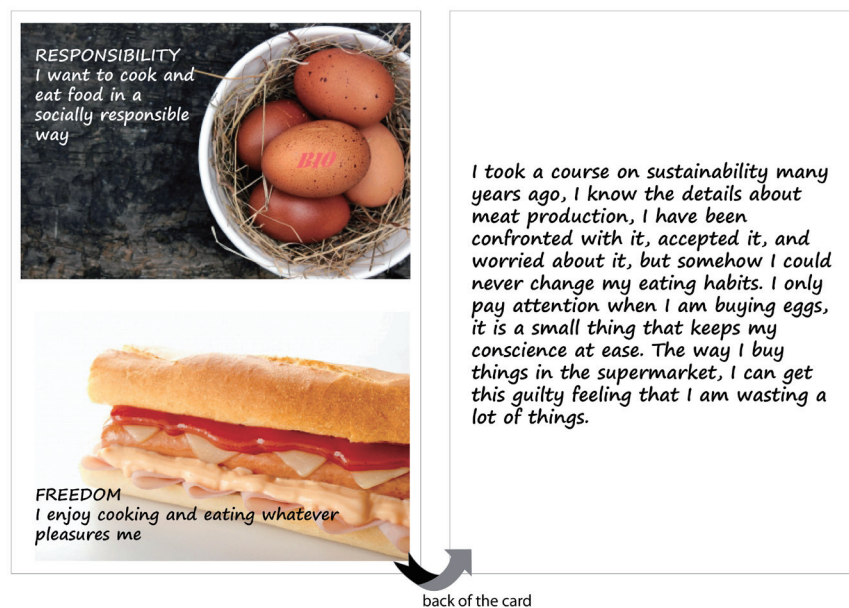


Figure 2. Concern card illustrating the conflicting concern pair of responsibility versus freedom.

Idea-generation Workshop

The purpose of the idea-generation workshops was to get insights into whether designers would find conflicting concerns useful and inspiring to work with, and if so, to explore directions for developing tools and methods to support the conflicting concern approach. For that purpose, participating designers were introduced to the concern cards. The design goal of the study was worded as follows: "To create emotionally appealing design concepts that can motivate meat eaters to reconsider their food choices regarding meat and its alternatives." In this way, the participating designers were guided to create design concepts with an emotional intention that could motivate their target users to reflect on (and possibly change) their concern priorities regarding their long-term goals related to the experience of eating meat and short-term benefits obtained from these experiences.

Method

Twenty-six designers were recruited for the idea-generation workshops, which took place on two different occasions. The participants were current master level students or recently graduated alumni of the Faculty of Industrial Design Engineering at Delft University of Technology. Prior to the workshop, the designers were given the following sensitizing activity (Desmet, van Erp, Hu, & van der Veen, 2008):

Please prepare written examples of emotional experiences involving food for as many of the emotions listed below as you can. Your descriptions can be 1-2 sentences; but it is important that they represent real personal experiences. "Hope - enjoyment - pride - admiration - fascination - attraction - satisfaction - fear - disgust - anger - boredom - shame - contempt - sadness - desire.

The first author acted as the facilitator during the workshop. Following a brief introduction to the study and the design goal, the designers were introduced to the concern cards and were asked to generate ideas using one or more of the cards. No emotional intention was specified; however, the designers were told they could design for either positive or negative emotions. The participants were also asked to document their process using mindmaps, sketches, stories or any other method they were accustomed to using. Workshops ended with a discussion of the ideas and participants' comments on using conflicting concerns as a starting point to generate ideas.

Analysis

The workshops were video-recorded, and the discussions were fully transcribed to support evaluation of the ideas generated. Sixty-one ideas were generated and were structured to form idea cards. These cards were later evaluated by an expert who is a designer with eleven years of professional experience in the field of experience driven design of food and food products. During the idea-evaluation discussion, she used her implicit criteria to assess the overall quality of the ideas and worded this criteria in terms of:

novelty of the idea (Has it been done already?); relevance (Does it apply to the target users?); and evocativeness (Will the target users understand it/will they care?). Finally, she categorized the idea cards in three groups: (1) satisfactory, (2) partially satisfactory, and (3) unsatisfactory.

Results

The results of the idea-generation workshop can be summarized along three lines: (1) quality of the ideas generated, based on the expert opinion, (2) strategies followed by participants when designing with conflicting concerns, based on their comments and examination of the ideas, and (3) the effectiveness of concern cards as a design tool, based on the designers' comments.

Quality of the Ideas Generated

Out of 61 ideas that were generated, one was discarded for being identical to another participant's idea, and a second idea was discarded for lacking design value. Out of the remaining 59 ideas, 24 were rated as satisfactory, 15 were rated as partially satisfactory, and 20 were rated as unsatisfactory. Three of the ideas generated are shown in Figures 3 to 5. For the first idea, the designer selected the concerns "I enjoy cooking and eating whatever pleasures me" versus "I want to eat in a socially responsible way." The designer used these concerns to create a smart phone application that can enable the user to keep track of shopping habits and reminds the user how much meat has been consumed using charts and illustrations. The second idea demonstrated using the concerns "I want to cook and eat food the way I am used to" versus "I want to explore new ways of cooking and eating food." The designer thought of a new recipe book for cooking insects that is accompanied by a mini-pan, a box of ants, and a magnifying glass, as a funny birthday present for friends. Finally, for the third idea, the designer selected the conflicting concern pair "I want to avoid getting stressed when cooking and eating food" versus "I want to explore new ways of cooking and eating food," and intended to seduce the users in a playful way to buy vegetables that people seldom buy, which can encourage them to also explore foods other than meat.

The expert commented on the applicability of the ideas in the selected design domain, emphasizing that the design interventions need to be subtle and acceptable by the majority of users in the target group. For example, for the second idea (the insect kit), the expert mentioned that the idea triggered the user to explore novel food in a sarcastic way; however, unlike the smart phone application, it would not apply to many users. One general observation was that many ideas were mainly about communicating the negative aspects of eating meat or positive aspects of eating meat alternatives through visual means (text, images) and thus, they lacked valuable interaction qualities. In summary, the expert found the ideas promising, yet not sufficiently thought through.

Strategies Used by Designers in Ideation

Most participants found the idea of working with two seemingly opposite statements very stimulating. Many participants mentioned that they picked one or the other statement in the conflicting concern pair, because satisfying both statements was not possible: “How can users enjoy eating whatever they want and still be healthy and responsible?” The first idea illustrated



Figure 3. Idea 1: Smart phone application.

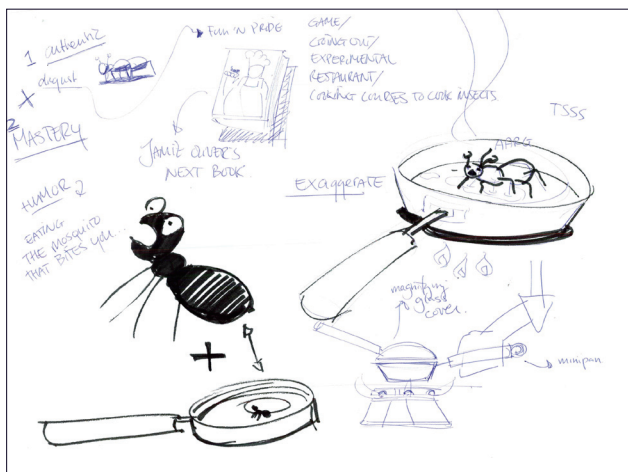


Figure 4. Idea 2: Insect kit.

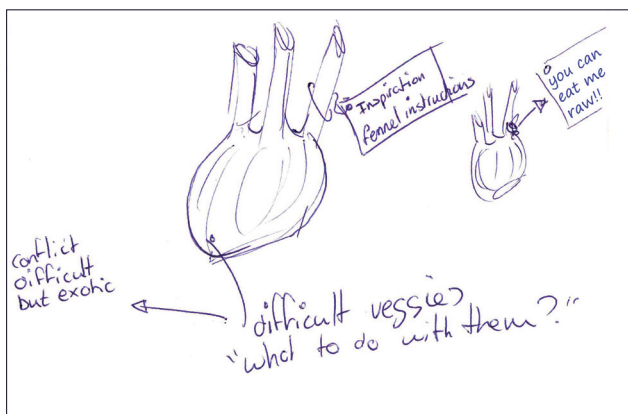


Figure 5. Idea 3: Fennel with instructions.

above (Figure 3: smart phone application) exemplifies how the designer intended to limit the freedom of users in an attempt to force them to follow a responsible and healthy diet.

Additionally, some participants mentioned that they kept both concerns in mind when trying to come up with ideas, although they were not always conscious about it: “I used one concern as the solution to the other, thus trying to satisfy both concerns to some extent.” For example, one participant thought of a ‘ready to cook meal box’ that contains both traditional meat and novel alternatives. That way the user can explore unfamiliar food in a comfortable way, i.e. without having to buy and cook them separately. Also, the third idea illustrated above (Figure 5: fennel with instructions) tries to enable the users to explore unfamiliar food products without having to worry about how to prepare them.

Finally, almost all participants intended to evoke negative emotions in one or more of their ideas to motivate the user to eat less meat by emphasizing the unhealthy or unsustainable aspects of eating meat. For example, one participant suggested packing vegetables in meat packages to ‘create a moment of reflection while shopping,’ while another participant thought of an ‘evil fridge’ that changes shape or color to warn the user about the increasing meat products inside.

Comments on the Concern Cards

During the discussions, the designers also commented on the content and effectiveness of the concern cards as a design tool. They mentioned that the provided concern statements were easy to understand and user stories were helpful in stimulating role-playing and empathy: “I also get this guilty feeling in a supermarket, but I do not know how to be more responsible, but I think there should be more information in a supermarket. You only get to know things if you investigate.” However, some participants mentioned that they needed more detailed information about the context of the concerns provided: “I could use the user quotes to envision scenarios, but there was rarely a mention of where and with whom those concerns were experienced.”

Although the supporting visuals on the concern cards were found stimulating, three participants mentioned that they would have liked to see a wider selection of both abstract and concrete images related to target users and their context: “For me, the images were important but I would have liked to have more images of people. You make up ideas while watching the pictures of real people or places. I say, OK, I can do something with this.” Additionally, several participants complained that there were too many cards, which made it hard to handle and/or maintain an overview of the information provided. The format of the cards was also criticized because it did not stimulate trying new combinations and/or making new associations among different standard and concern statements: “Changing to another card without producing an idea with this pair of concerns is like defeat!”

Discussion

The purpose of this study was to introduce the concept of conflicting concerns to emotion-driven design, and to demonstrate their translation into emotionally appealing design concepts. For this purpose, a research through design approach was adopted in the domain of meat eating to identify and design with conflicting concerns relevant to this design domain. The following paragraphs discuss the main insights from these two steps (identification and design) and provide the initial principles for developing tools and methods that can further support using conflicting concerns in emotion-driven design.

Identifying Conflicting Concerns

The presence of conflicting concerns in the domain of meat eating was expected due to several well-known contrasts that have been identified in previous discussions about diet, such as the contrast between indulgence and health, or novelty and familiarity (de Boer, Hoogland, & Boersema, 2007). Therefore, the questions asked during focus groups and interviews focused on exploring these controversies to ensure that the participants would express not only their emotions and underlying concerns, but also those concerns that conflict each other. This is a difficult task because users are rarely fully aware of their concerns (Frijda, 2007), which makes it challenging for the researcher to access this information. The task becomes even more challenging in the case of conflicting concerns for two reasons. Primarily, people tend to justify their contradictions when they become aware of them, a theory known as cognitive dissonance in social psychology (Festinger, 1957). For example, one participant mentioned that it would be unreasonable not to buy meat at the supermarket because those animals are already dead, and they would go to waste if she did not buy them. Having two opposing thoughts (killing animals for food versus enjoying meat) creates an unwanted state which motivates the person to remove or alter one of the opposing cognitions. Upon being probed further to explain the opposing thoughts, the participant claimed that there is nothing to do but to eat meat since the animals were already dead. Moreover, people tend to adapt to certain behavior by observing themselves act and inferring their emotions and attitudes from their actions very much like an outside observer (see the self-perception theory of Bem, 1967). For instance, one participant mentioned that she ate more meat when she fell ill because she believed that meat helped her to heal faster. In summary, the tendency to settle opposing cognitions or basing beliefs or attitudes on self-observed behavior pose critical challenges for identifying conflicting concerns through self-reports.

Focus groups proved to be especially useful in this study due to the nature of discussions that took place during those sessions. One important observation was that participants with opposing concerns related to the topic engaged in deep and heated discussions among themselves, talking, arguing, and even

trying to change each other's minds. This gave the researcher the opportunity to probe disagreements and further explore the enjoyments, frustrations, and motivations of each participant in the group. Therefore, it could have been interesting to have both target and lead users in one focus group to create a natural opposition for target users, instead of the researcher having to purposefully drive the discussion to controversial topics. Focus groups combined with a generative session with using the collage technique have been previously shown to complement each other effectively (Costa et al., 2003). In this study, preparing a collage of an 'imaginary, emotionally loaded experience related to food' was a fruitful approach to explore users' real and imaginary experiences, since conflicting concerns are often associated with the gap between how people would like to be (ideal/imaginary situation) and how they actually are (current/real situation).

Since using conflicting concerns as a starting point for emotion-driven design is a relatively new concept, there are no specific tools and methods targeted at the identification of these concerns before forming a concern profile. Although the user research in this study was designed with an a priori understanding of conflicting concerns, the contradictions in the resulting concern profile were rather implicit, and were mainly observed among activity-focused or product-focused concerns. However, the realization of self-focused goals can contribute to self-actualization and well-being better than the realization of concrete goals at the activity or product level (Demir et al., 2009). For example, the realization of "I want to cook and eat in a socially responsible way" is more likely to contribute to well-being than "I want to have variety in my plate." Therefore, it is the conflicts among these higher-order motives that one should emphasize in a profile of conflicting concerns. As a result, it is important that the design researcher sets up the user research with an understanding of conflicting concerns and uses tools and techniques that create room for target users to express this information. In this way, a balanced concern profile can be formed more efficiently compared to figuring out those concerns that contradict each other later at the analysis phase.

Designing with Conflicting Concerns

Most designers commented that working with two conflicting concern statements was stimulating. Contradictions stimulate creativity because they trigger the designer to act on whatever is contradicting to restore balance (Glover, Ronning, & Reynolds, 1989). This idea is supported by some other creativity techniques such as Theory of Inventive Problem Solving (TRIZ) by Genrich Altshuller and his colleagues, or lateral thinking methods by Edward de Bono. For instance, TRIZ focuses on identifying and eliminating conflicts among scientific, engineering, and creative approaches to design (Mann, 2001); while lateral thinking is used to enable *serious creativity* by making use of contradictory opinions to improve an idea (de Bono, 1995). Such action requires the designer to move away from traditional ways of thinking and

generate novel solutions, which makes conflicting concerns, one might say, inspiring. The quality of the ideas generated during the idea-generation workshops was important in assessing whether it is a useful and inspiring approach to use conflicting concerns as a starting point to design for emotion and subjective well-being. The designers tried to satisfy both statements in the conflicting concern pair whenever they could (such as the idea of fennel with instructions). This approach is in line with the motivational principle of goal alignment, which states that one is most likely to engage in behaviors that can satisfy multiple concerns leading to higher emotional arousal (Ford, 1992). A general observation was that trying to align two statements in the conflicting concern pair led to functional or practical solutions that were relevant to the design domain, but mostly lacked novelty.

Whenever the designers thought that aligning two conflicting statements was not possible, they tried to take the ‘long-term goal’ of the target users as ‘what to design for’ and the immediate concern as ‘what to design against’ (idea of the smart phone application). This approach mainly relies on the motivational principle of incremental versus transformational change, which states that some extreme situations may require a disorganization-reorganization process to achieve goal progress because goal progress cannot occur unless the person fully disengages from one of the concerns in the conflicting pair (Ford, 1992). In some cases, this led the designers to also make use of users’ standards (food should be fulfilling, natural, or authentic) in designing engagement with the desired long-term goal. For example, the designer who thought of the idea of the insect recipe kit intended to evoke pride as a result of facilitating exploration of novel food by emphasizing its authenticity. In other words, attractiveness of a goal can be enhanced with the help of another significant concern (a facilitator concern) that is outside of the conflicting pair. Fulfillment of a facilitator concern can give direct feedback to goal progress, which is in line with the principle of focusing on sub-goals while trying to fulfill a long-term goal (Ford, 1992).

More often than not, designers made use of negative emotions in motivating desired behavior. Although many of

these ideas received a negative evaluation from the expert for attempting to criticize the users instead of helping them, recent research in designing for emotion emphasizes the contribution of negative emotions to emotion-driven design of enriched product experiences (Fokkinga, Desmet, & Hoonhout, 2010).

As a result, three strategies that the designers used when creating ideas with conflicting concerns were identified: (1) enabling the user to fulfill both concerns in the conflicting concern pair, (2) seducing the user to seek long-term goals instead of immediate concerns, and (3) triggering the user to give up immediate concerns by evoking negative emotions. The strategies followed by the designers have important implications for improving the conflicting concern approach and developing tools and methods to support its practical application in emotion-driven design.

Development of the concern cards used in this study was the first attempt to develop a tool that could introduce conflicting concerns to the creative process of designers. However, a particular limitation of using the concern cards was that it did not allow for making different combinations of conflicting concern pairs. Also, the designers commented that neither the images nor the direct user quotes helped them to situate the concern statements in a specific context. Additionally, previous research showed that designers may face difficulties linking concrete goals to abstract motives (Demir, Ozkaramanli, & Desmet, 2010). Therefore, the formulated concern statements (whether done by the researcher who identified the conflicting concerns or by the designer who would use them) needed to be neither too abstract nor too concrete in order to give clear design direction while still being inspiring. For example, “I explore new ways of cooking and eating food” is more concrete than “I want to be an explorative person”; but not as directive as “I want to try different dishes every time I eat in a restaurant.” Based on these findings, the concern cards were improved to a second tool, ‘Sweet & Sour’ (Figure 6), that allowed for making different combinations using concern statements, and enabled the designers to interpret and formulate their own concern statements based on direct user quotes.

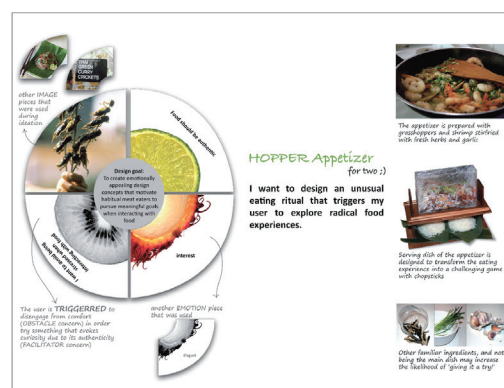


Figure 6. Sweet & Sour tool kit (left) and an idea illustrating how the tool works (right).

Sweet & Sour is targeted at the early stages of the design process to inspire designers in using conflicting concerns as a starting point to generate ideas. The tool consists of four puzzle pieces (an image, an emotion word, and two conflicting concern statements) and allows the designer to make different combinations and associations among these four pieces until an interesting idea strikes. Sweet & Sour is a work-in-progress design tool, currently being tested and improved for its effectiveness in various design domains.

This study comes with some limitations. Ideas generated during the design workshops show potential for motivating desired behavior based on expert opinions. However, in order to further clarify the contribution of conflicting concerns to emotion-driven design, these ideas should also be evaluated with real users, preferably using longitudinal studies to fully understand the motivational influences of owning and using these products. Additionally, this study adopted an opportunistic approach in which no product domain or emotional intention was specified from the beginning. However, application of the conflicting concern approach may be limited in other, more focused design cases such as the redesign of a product with a specific situation in mind. Many products have both appealing and unappealing aspects; however, this does not necessarily mean that all design cases will equally benefit from the use of conflicting concerns as starting point to generate ideas.

Conclusion

Conflicting concerns are inherent in human nature, and therefore, they are an inevitable part of any user-centered design case. Our disposition to seek pleasure and diminish pain, as well as the priorities we need to assign to the goals that govern our daily activities lead to conflicting concerns, which over time, can pose serious threats to subjective well-being. Emotions play an important role in directing attention to stimuli that are significant for our goals, and thus, they can induce behavior through motivating for action readiness. In line with this argument, emotions evoked by products can also motivate the user to prioritize meaningful, long-term goals over others, or avoid giving into current attitudes or standards. Therefore, emotion-driven design can be a means to resolve conflicting concerns of target users in a given design domain. As a result, future products designed with the use of conflicting concerns can contribute to the well-being of users in various design domains. Besides in a user-centered perspective, designing with conflicting concerns can also be used in designer-driven projects. Many societal issues ranging from promoting safe sex to sustainable consumer behavior can be approached from the perspective of conflicting concerns to explain the resulting human behavior. Therefore, designers who want to address these societal issues can benefit from an understanding of conflicting concerns. This study attempted to demonstrate the inspiring and useful nature of conflicting concerns using a research through design approach in the domain of meat eating. Main insights on the process of

identifying and designing with conflicting concerns have been discussed and initial principles for the development of future tools and methods have been demonstrated. Future studies should focus on further supporting designers in identifying conflicting concerns in various design domains and their successful translation to emotionally appealing design concepts.

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