

MEANINGFUL MIX OR TRICKY CONFLICT? A CATEGORIZATION OF MIXED EMOTIONAL EXPERIENCES AND THEIR USEFULNESS FOR DESIGN

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ABSTRACT

Mixed emotions are at the basis of some of life's richest experiences. However, in other instances they are inferior to experiences that elicit just positive emotions. A phenomenological study was carried out to find out which kinds of situations evoke mixed emotions, how these emotions influence and transform people's subjective experience, and what the underlying differences are between mixed emotions that contribute to richness of experience and those that detract from it. The categorization of 124 captured experiences from ten participants produced four main clusters: 1) Unrelated emotions; 2) Ambiguous appraisals; 3) Positive effect of negative emotion; and 4) Negative effect of positive emotion; each with a number of sub-clusters. It was concluded that the mixed emotions belonging to clusters 1 and 4 do not add to richness of experience, whereas the experiences in clusters 2 and 3 do, both in a different way. The mixed emotions in cluster 2 enrich experiences because they represent phenomena that are fundamentally positive and negative at the same time, thus creating a tension field that can feel invigorating. The mixed emotions in cluster 3 are enriching because their underlying negative emotions have a beneficial effect on people's thoughts or actions, which produces a positive experience overall. Suggestions are made on how these mixed emotions can be applied in design to create richer product experiences.

Keywords: Mixed emotions, Richness of experience, Phenomenology, Emotion theory

INTRODUCTION

Many of life's most unique and interesting events are defined by mixed emotions. For instance, the experience of seeing one's child grow up and move out of the house (happiness and sadness), getting a promotion in favor of other co-workers (pride and guilt), or starting a new career (anticipation and anxiety) all involve both positive and negative emotions. In these examples, the emotional complexity is an important part of the richness of the experience. For parents seeing their child move out, the sadness signals the significance of the event and the loss of something valued, while the happiness is evoked by the realization that their kid has become an adult and is progressing in life. Analogously, the experience of starting a new job is vibrant and engaging because not knowing what lies ahead elicits both hopeful anticipation and jittery nervousness.

Life events evoke mixed emotions; so do designed objects. For example, someone can admire a car for its innovative design, yet be disappointed by its lack of luggage space; one can feel contempt towards the cruelty of a fur coat, yet be delighted by its soft touch. In fact, it is probably difficult to conceive examples of products that do not evoke some level of mixed emotions. We have seen this observation confirmed in studies that measured emotional responses evoked by a variety of product categories, such as car design (Desmet et al., 2000), wheelchair design (Desmet & Dijkhuis, 2003) and mobile phones (Desmet et al., 2007). In some cases, objects are designed to deliberately evoke mixed emotions. An example is modern art, which deliberately evokes mixed emotions to temporarily shift people's perspective on the world and give food for thought. For instance, Damien

Hirst's *'Mother and Child Divided'*, an installation of a dissected cow and calf exhibited in a series of separate vitrines, evokes negative emotions of disgust and eeriness, and at the same time positive emotions of fascination and amazement.

In mainstream design, however, mixed emotions are scarcely used as an intentional design strategy. There is a good reason for that: mixed emotions do not always contribute to richer experiences. The negative part of the mixed emotion can be just plain unpleasant, and harm rather than contribute to the overall experience. For instance, the experience with the car from the previous example is not particularly rich - the user would probably wish for a car that has both an innovative design *and* ample luggage space. Furthermore, mixed emotions can even cause unpleasant confusion and insecurity (e.g., see Cacioppo et al., 1999), when people feel torn between two options in an important decision, or when they have a love-hate relationship with a person that has made them both happy and unhappy in the past.

These cases show that mixed emotions are a delicate matter - sometimes contributing to the richness of an experience, sometimes doing nothing, and sometimes even detracting from it. This might be one of the reasons why emotional designers often prefer to target a single (positive) emotion in their product experiences, like pride, trust or happiness. This is a pity in our view, because when used appropriately, mixed emotions can be employed to provide users with very unique and engaging product experiences.

In this paper, we want to address the questions of what mixed emotions are, what the differences are between mixed emotions that contribute to richness of experience and those that are superfluous or even harmful, and what the implications are for emotional product design. First, we discuss the definitions and models we have used to frame the phenomenon of mixed emotions, which guided the setup of the study and the data analysis. The chief part of the paper discusses the phenomenological study that was carried out to collect a number of life events that evoked mixed emotions. These events were analyzed and categorized to find out what the commonalities and differences are between the mixed emotions that

are beneficial and those that are harmful to subjective experience. The conclusions of these data were then used to draw some implications for the application of mixed emotions to product design.

A PHENOMENOLOGICAL APPROACH TO MIXED EMOTIONS

In this study, we defined a mixed emotion as an affective episode in which a person feels one or more emotions of both valences (positive and negative) at the same time, which are phenomenally still distinguishable, and in reaction to the same situation or object. The idea that the emotions are felt simultaneously but separately distinguishable means that, although a person has a mixed emotion as 'one' feeling, he can still discern and identify the emotions of which it is made up, like when one eats a single dish but is still able to identify the individual ingredients from which it was composed.

It is also necessary to clarify what is meant by the term 'rich experience'. It implies an experience that is somehow atypical and therefore notable or memorable, which people are more likely to share with others than a non-rich experience. Secondly, it implies to contain an intellectual or emotional complexity that makes it intriguing, like a dish with dissonant, but ultimately matching flavors. Thirdly, one could make a normative statement about rich experiences, by defining them as experiences that are somehow valuable or worthwhile in life. In this study, we have focused on this last definition, by asking respondents for every experience if and how it had yielded them something on a meta-level. For instance, whether they had learned something from it, whether they felt closer to someone or something after it, whether it had led to a (more) desirable situation, and so forth.

To obtain a detailed overview of the different episodes of mixed emotions that people experience in daily life, we adopted a phenomenological approach. The phenomenological inquiry (e.g., Moustakas, 1994) is a qualitative approach to explicate people's subjective experience of a certain situation or around a certain theme. It is based on the philosophical writings of Edmund Husserl (early 20th century), who argued that experimental psychology was successful in finding out

facts about people's mental life, but, as an empirical science, it was unable to discover the 'essence' of human experience. For instance, experimental psychology might find out different facts about angry people - that they are likely to display certain behavior, to have certain thoughts, memories, preferences, and so forth - but these facts do not tell us what it 'feels like' to be angry. It is this essence of subjective experience that phenomenological methods hope to uncover. Because our investigation deals with the subjective experience of 'richness' in different emotional episodes, phenomenology is a suitable mode of inquiry.

A phenomenological exposition of mixed emotions is facilitated by first introducing some key distinctions in human emotions. Firstly, it is important to make a distinction between the object or event eliciting an emotion, and the actual stimulus of the emotion. For products, the stimulus that causes an emotion is rarely the entire product (Desmet, 2012). It is rather a certain aspect of the product that evokes an emotion, be it the product appearance (e.g., the looks of a mobile phone evoke admiration), the interaction with a product feature (e.g., an incomprehensible television menu evokes frustration), or the inferred meaning of a product (e.g., driving in a hybrid car evokes pride). Thus, a single product can easily evoke mixed emotions because it 'contains' multiple stimuli.

Secondly, the conception of emotion that underlies this study is grounded in the tradition of appraisal theory. This theory understands emotions as cognitive, but non-deliberative evaluations of stimuli and events that help people cope with the situations that elicit them (e.g., see Scherer et al., 2001, p.3-5). Simply said, emotions are automatic bodily processes that help an individual distinguish between the beneficial and harmful events in the world, and act appropriately upon them.

Thirdly, we should distinguish between two manifestations of emotions: emotions are experienced (i.e., someone feels angry) and have behavioral manifestations (i.e., someone who is angry will have the tendency to confront, or even hit someone). The behavioral manifestation of the emotion is often referred to as the 'action tendency': an urge to act in a

particular way in reaction to the situation that evokes the emotion (Frijda, 1986). An example is 'the urge to explore' in the case of fascination, or 'the urge to flee' in the case of fear. Fredrickson (1998) argued that these tendencies are not necessarily only present in physical action, but can also arise in cognitive activity (e.g., the urge to be open to new ideas or the urge to concentrate). To express the combined behavioral and cognitive effects of emotion, Fredrickson (1998) introduced the term "thought-action tendencies". Each distinct emotion has a unique thought action tendency and, in general, negative emotions serve to narrow an individual's momentary thought-action repertoire, whereas positive emotions serve to broaden this repertoire.

Fourthly, time is an important factor in analysis – is there a difference between mixed emotions in which the emotions are truly simultaneous, and mixed emotions that start with one emotion and are joined later by the other? Obviously, experiences are never static, and small changes in the stimuli or the way they are appraised can significantly change emotions over time. The object of the emotion can also reside in different times: when someone moves to another city, she can be simultaneously sad for ending a nice time with friends and neighbors (the past), while excited about the good times she will have in her new environment (the future).

METHOD

PHENOMENOLOGICAL METHOD

Phenomenological methods often use semi-structured, in-depth interviews to acquire data. There are a number of key aspects in a phenomenological interview that a researcher has to take into account (Moustakas, 1994). First of all, the interviewer should try to rid himself of the prejudgments and preconceptions he might have about the topic of inquiry - for instance acquired in previous research or from everyday experience - so he can approach the respondent with an unbiased, receptive presence. This is particularly important for phenomenological topics, as subjective experiences are quite ephemeral and impressionable to outside comments, in contrast to, for instance, facts and opinions. Secondly, the experience should be 'bracketed', which means that

the interview should only be about the subjective experience 'in the moment', and not about the interviewer's or respondent's social, cultural or psychological explanation of the phenomenon. Thirdly, the interviewer should apply a process called horizontalization, meaning that a respondent can go from one 'horizon' (topic) to the other, while the interviewer treats each statement of the respondent as equally valuable. Anything that came into consciousness during the experience of the event is worthwhile to talk about: including but not limited to perceptions, feelings, thoughts, felt bodily changes, memories, judgments, imaginations, own behavior, perceived reactions or behavior of others, real or imagined consequences, expectations and preferences.

Participants

Ten participants from different backgrounds were recruited to participate in the study. In the selection of participants, an effort was made to recruit participants that a) were likely to encounter mixed-emotion situations, because of their occupation or their lifestyle; b) easily reflected and talked about their emotions; and c) were reasonably different from each other in terms of age, gender and background. The participants were recruited through our social networks, but none of the participants knew the interviewer prior to the study. The participants had the following occupations: emergency-room doctor, theatre actor, art critic, user insights researcher, dancer, entrepreneur and employer at a medium-sized design agency, psychology student, industrial design student, psychotherapist, and student

councilor for children with learning and behavioral disorders. All participants spoke Dutch. Five of the participants were women, five were men.

Procedure

For each participant, the study consisted of two parts: a diary study and an in-depth interview. In the diary study, participants were asked to fill in thirteen experiences of mixed emotions over the course of seven days into a booklet (see figure 1). These thirteen experiences formed the basis of the interview, which was conducted immediately after the seven-day period of the diary-study. The diary gave participants a slightly different assignment every day, but always with same structure of questions: "What was the event?", "Where and when did it take place?", "Which negative feeling(s) was/were evoked by the event?", and "Which positive feeling(s)?" The assignments asked about different objects of emotions (e.g., oneself, another person, an object) and were meant to stimulate participants to explore the breadth of different mixed emotion experiences, without presenting any specific combination of emotions as more or less appropriate. In fact, care was given that no examples of mixed emotions were provided anywhere in the diary or in communications to participants, to prevent a bias in the type of experiences participants would come up with. Participants were supposed to only use the given definition of a mixed emotion and their own judgment to determine which personal experience would be suitable. The given definition was: an event that is positive, nice, beautiful or pleasant on the one hand, while also negative, uncomfortable, bitter or



opdracht Beschrijf vandaag twee momenten uit de afgelopen week waar je een gemengd gevoel had over een ding. Het maakt niet uit wat voor ding, dat kan iets kleins zijn (bv. een pen) of iets groots (bv. een auto of een gebouw), iets eetbaars (bv. een appel), iets ontastbaars (bv. een website), enzovoort.

Over wat? Wat & wanneer?	Wat gebeurde er?
Zo voelde ik me:

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Figure 1. Two pages of the mixed-emotion diary (in Dutch).

unpleasant on the other hand - in which both feelings have to be about the same situation, object or event.

Even though the study was conducted as part of a design research project, the diary did not exclusively ask about product experiences. This was done to capture a broader spectrum mixed emotions than current products elicit, so that mixed emotions that are currently unused in design might also be considered for application in product experiences.

The purpose of conducting a diary-study before the interview was to give participants more time to come up with good examples of mixed emotions than just an interview setup would allow. Furthermore, the diary was meant to 'sensitize' participants over the course of a week to think about the subjective experience of different emotional situations, so that they would be more prepared for the interview (e.g., see Sleeswijk Visser et al., 2005). Lastly, it allowed more time during the interview to directly go in-depth about the nature of the different experiences, without spending time to first come up with experiences.

The interviews, which were audio-recorded and lasted for about two hours, started with a run-through of the diary to shortly discuss all experiences. Each experience was discussed until the interviewer had a good understanding of what had happened in the event, and which emotions were involved. After all experiences were discussed, the researcher took some time to evaluate which of them would be worthwhile to discuss in more detail (ranging from two to five experiences). In the in-depth treatment, participants were asked to relive the event in the first person as if it took place here and now, and recall several sensorial details of the situation (i.e. what the respondent saw, heard, smelled, and touched during the event). This process of recalling details was supposed to a) put the respondent in the moment of the event again, so he or she would more easily recall the emotions; and to b) have the respondent focus on their body and bodily reactions, to get descriptions of emotions that were more about direct feelings and less about psychologized explanations. Next, respondents were asked to give a detailed account of their emotions at the time, and how different feelings interacted with each other. Lastly, the effect of the

emotions was discussed. Central was the question if and how the experience had yielded something. This last question was meant to get a sense of whether a mixed emotion had somehow enriched the experience, or had been beneficial in any other way.

Data analysis

All the experiences were summarized and formatted on the basis of the diaries, the audio data and the notes of the interviewer, as much in the words of the respondent, and with as little interpretation from the researcher as possible. Next, for each experience the researchers considered which kind of mechanism had brought about this particular mixed emotion, paying careful attention to the described effects of the different emotion, the relation between the emotions and the sequence and timing of the emotions. When a mechanism was found that did not apply to any of the previous experiences, a new cluster was made. At the end, these clusters were again categorized in main clusters, when they appeared to share some obvious commonalities.

RESULTS

The study yielded 124 mixed emotion experiences from ten participants (not every participant completed all thirteen assignments). The experiences were categorized into four main clusters, each consisting of several sub-clusters. All clusters were created on the basis of the inferred interactions between the positive and negative emotions in the experiences. The first main cluster consists of experiences in which there is no interaction between the positive and the negative emotions. The experiences in the second main cluster were characterized by positive and negative emotions having a mutually intensifying effect on each other. In the experiences of the third main cluster, the negative emotion brought about a transformation of attitude or behavior in the participant, which in turn produced or helped to produce the positive emotion. The different sub-clusters all fit the descriptions of the main cluster to which they belong, but also have differences that set them apart. Table 1 shows an overview of all clusters. In this section, each cluster is discussed briefly with examples and respondent quotes (translated from Dutch). The diagrams give a visual representation of the emotion mechanism of the experience in the intended cluster.

Cluster	Sub-cluster	Example
1. Unrelated emotions	1a. Different stimuli	I am happy for my friend because she is moving to another country, but jealous that I am not going on such an adventure.
	1b. Inability to fully experience something positive	I am happy that the sun is finally out again, but sad that I have to work indoors all day.
	1c. A negative event turned out better	I am envious of the beautiful teacups my partner received, but I am relieved that they turned out to be quite impractical.
	1d. Putting something negative into perspective	I am angry that my friend is being so difficult, but I feel affection because I know it will be all right in the end.
	1e. Ambivalence	I feel frustrated but happy over my decision to not finish my paper and going to my family instead.
2. Ambiguous emotions	2a. Ambiguous appraisals	I feel both anxiety and anticipation over the prospect of starting a new job.
	2b. Negative and positive emotions resonate and intensify the experience	I feel an intense mix of disgust and fascination over a program depicting open-body surgery.
3. Positive effect of negative emotion	3a. Using the action tendency of the negative emotion	I am angry because I received an unfair evaluation, but it also makes me pugnacious and determined, which I enjoy.
	3b. A negative emotion helps to realize the importance of something	I feel sad over leaving my grandparents after a nice weekend, but it makes me realize how important they are to me.
	3c. Feeling good about overcoming a negative emotion	I feel guilty over telling a co-worker that she is not suitable for a job, but I feel proud that I told her despite my reluctance.
4. Negative effect of positive emotion	4a. Feeling bad about an inappropriate positive emotion	I feel desire over a beautiful but very expensive cup, but that emotion also makes me feel greedy and guilty.

Table 1 – An overview of all clusters of mixed emotional experiences

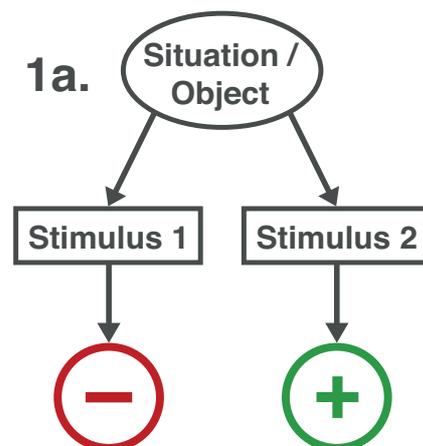
1. Unrelated emotions

The experiences in this cluster involved positive and negative emotions that had no mutual relationship or interdependence, other than the fact that they were evoked by the same situation or object.

1a. Different stimuli

Although the emotions that made up the experiences in this sub-cluster were elicited by the same situation or object, upon closer inspection they were evoked by different stimuli. An example was the experience of one participant with his son’s baby stroller: he felt happy that the stroller was so sturdy and convenient in everyday use, yet he felt frustrated and annoyed that the process of folding it up for transport was tedious and complicated. Although both emotions are elicited by the same product, it is clear that they are aimed at different aspects of the product. Another example was when a woman heard her friend announce over drinks that she was going to move to Australia. This made the respondent feel simultaneously happy for her friend for setting off on adventure (stimulus 1), jealous that her friend was

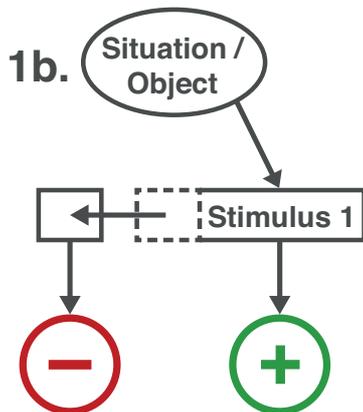
doing this while she was staying home (stimulus 2), and pity that her friend was not going to be around any longer (stimulus 3). In this case, the emotions were all evoked at the same time and by the same announcement, but the actual stimuli were the different implications of the announcement.



1b. Inability to fully experience something positive

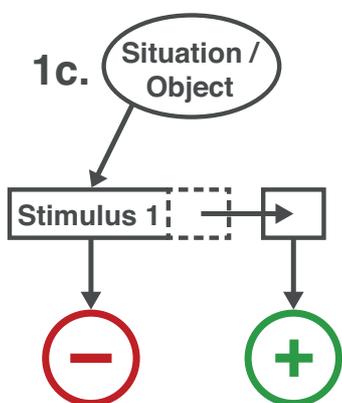
The main stimulus in these experiences was positive, but because the respondent was in some way unable to fully benefit from or enjoy the positive stimulus, they

experienced an additional negative emotion. For instance, one respondent was very excited that it was finally sunny outside after weeks of bad weather, but disappointed that she had to stay inside to work. The mixed emotion arose because she was happy with the sunshine coming in through the window, but she would have been even happier if she had been able to go outside.



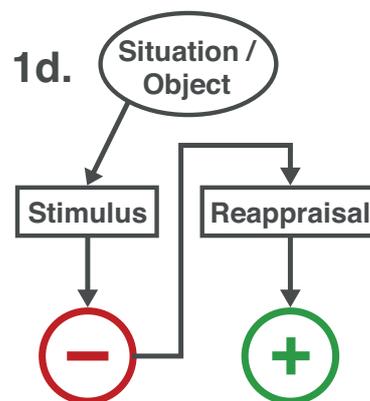
1c. A negative event turned out better

This sub-cluster is a mirrored version of the previous one: the primary stimulus was negative, but mitigating circumstances subsequently introduced a relieving, positive emotion. For instance, the partner of one respondent received teacups as a present, which the respondent found very beautiful, evoking jealousy. However, later he discovered that they were not very well designed: they had no handle and became very hot with tea inside, making it difficult to drink from them comfortably. This imperfection in the product evoked relief in the respondent, which dispelled some (but not all) of his initial jealousy.



1d. Putting something negative into perspective

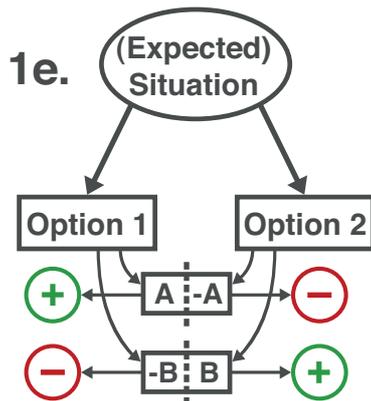
Emotions can also become mixed when someone actively tries to find a silver lining to a negative event, or attempts to put the implications of an event into perspective. This is also an experience of initial negative emotions and a relief afterwards, but instead of a change in the situation or the stimuli, the relief is brought forth by a reappraisal of the situation. For example, a respondent told that she had treated a friend unfairly at one occasion, which resulted in her friend not responding to her text messages anymore. The respondent inferred that her friend was angry with her, which she found exaggerated and unreasonable of her, given the mild indiscretion that she had committed. This idea made her become angry herself. However, she calmed down after a little while, because she realized that they had been friends for a long time and this incident would not jeopardize their friendship. She forgave her friend for being a bit unreasonable. Finally, she ended up feeling still a bit angry, but also feeling acceptance and affection for her friend.



1e. Ambivalence

When people make a decision about something, they consciously or unconsciously weigh the pros and cons of each option. In the simplest situation, there are two choices (1 and 2) and two factors (A and B) that set these choices apart. If A and B are both things that a person wants, but cannot have simultaneously, the choice is between a situation 1 that consists of A and not-B, and a situation 2 that consists of B and not-A. From an emotional viewpoint, people either have a mixed emotion that consists of a reaction to A (positive) and not-B (negative), or a reaction to B (positive) and not-A (negative). One example came

from a respondent that was working on an article that should have been finished that day. However, he had agreed to pick up his girlfriend and spend Christmas with her family in two hours, which was not enough time to finish the paper. He decided to keep his agreement (A) and not finish his paper (not-B), which left him with the positive emotion of anticipation of a nice and peaceful time with his in-laws, but also with frustration and anxiety of not meeting his professional deadline.



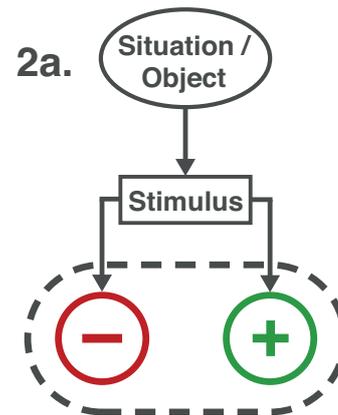
In all of the above categories of mixed emotion experiences, the emotions are evoked by different stimuli. This has an important implication: the negative emotion and the aspect causing it are simply unwanted elements of the experience, and if they could somehow be extracted from the experience, the remaining positive emotion would be enjoyed more fully. Thus, in these cases the mixed nature of the emotions does not enrich the situation.

2. AMBIGUOUS EMOTIONS

2a. Ambiguous appraisals

The emotions in the experiences of cluster 1 were elicited by different stimuli. However, it is also possible that different emotions are elicited by the same stimulus. For instance, one participant described how he was looking for a new job, after he was notified that the contract of his former job would soon expire. This situation created a void, which he experienced as simultaneously scary and exciting. It was scary, because he was not sure if he was able to find something interesting in time. However, it was also exciting, because as long as his future job was still undetermined, he could fantasize with anticipation

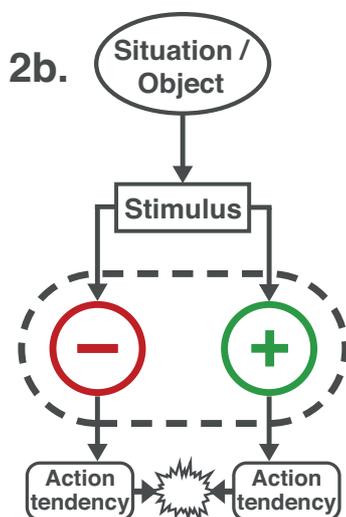
about all the different things he could be doing. The stimulus in this case could be described as ‘unknown future’ – which can be appraised as an opportunity or as a threat. An important implication is that it is not possible to just remove the negative aspect from such stimuli, as the positive and negative aspects are intertwined. In these cases, it is more important how a person mentally approaches such a stimuli – as a threat or an opportunity, which determines the experiential outcome. However, apart from the most fervent optimists and pessimists in the world, the majority of people will always experience both sides to a certain extent. Some other examples of ambiguous appraisals were: remembering a lost relative (sad over the loss, but simultaneously happy with the good memories); starting a big project (eager to work on it, but simultaneously daunted by all the effort it would be going to take); and taking strong measures against a problem (proud that you dealt with the problem sturdily, but simultaneously feeling troubled that you may have been too severe).



2b. Negative and positive emotions resonate together and intensify the experience

An interesting variant within this cluster are the experiences in which emotions with opposing action tendencies, evoked by the different sides of the stimulus, start to ‘resonate’ with each other. If the action tendencies of the two emotions ‘push’ a person in opposite directions (sometimes even literally), the emotions can start to build up against each other in an upward spiral, thus intensifying the overall experience. A straightforward example is the description of a respondent seeing a surgical procedure on television. He described how the graphic images repulsed and captivated him at the same time. He stated: “It is a bit

that feeling of pleasant shivers, you know, so enjoying something that looks nasty. (...) I am seeing that image, and then I see how it is cut open and parts, and I find it very dismal to see, so from that emotion you would want to look away, but at the same time I was very curious, you know, how it would work. So yes, I did not want to look away.” The underlying emotions of this experience, disgust and fascination, pushed him in opposite directions – the disgust demanded him to look away, while the fascination compelled him to keep looking. On a behavioral level, he ended up somewhere halfway – intermittently looking and not looking, or looking through his fingers. This could be conceptualized with the metaphor of two equally large forces pushing against each other. As a net result, they appear to stand still, but between them is a great deal of pressure. This pressure is what makes the experience unique, and what sets it apart from an experience of interest that is evoked by a less controversial program. Another example of this phenomenon was when a respondent was celebrating ‘Sinterklaas’ (a Dutch tradition resembling Christmas), in which family members anonymously give presents to each other. When the respondent’s sister was unwrapping the present he bought for her, he felt a great suspense toward her possible reaction. This suspense consisted of anxiety that she might be disappointed by the present, and anticipation of seeing a positive reaction. This gave him a jittery, nervous energy in which he looked at her unwrapping the present with “pricked-up eyes” and experienced “an alertness kick”, which made the whole event more lively and interesting.



3. POSITIVE EFFECT OF NEGATIVE EMOTION

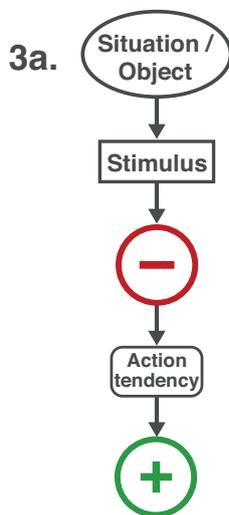
In the third cluster, the negative emotion has a certain positive effect on either the person’s experience of the situation, their attitude towards the situation, or their behavior, which in turn leads to a positive emotion.

3a. Using the action tendency of a negative emotion

Negative emotions have a clear function; they signal us that there is something wrong or harmful in the situation, which we should somehow fix or get away from (e.g., Frijda, 1986). It seems that if a person can effectively use the resulting action tendency of a negative emotion successfully, this can directly or indirectly lead to a positive emotion. Although different negative emotions (e.g., frustration, sadness, anxiety) have very different action tendencies, this mechanism seems to work in some way for most or all negative emotions. For example, a respondent had to hand in a full paper for his university course within a few hours, but he had almost nothing on paper yet. Even a few hours before his deadline he found it hard to concentrate, and spend most of the time procrastinating. Suddenly, he felt extremely frustrated and fed up with his inability to work properly, which led him to a surge of rapid and dedicated writing. According to the respondent: “*That frustration led to a sort of hyperconcentration like ‘and now it is going to happen’, and then I was really typing like a madman. (...) The focus that sprang from that, it is just, everything falls away from it, like, ‘if I want to finish this paper it has to be now’, that feeling of that aggressive undercurrent in frustration helps me, a sort of straightforwardly looking only at that [issue].*” After this, he managed to finish the paper just in time. Another respondent experienced the beneficial effect of a different emotion. He was having dinner with an old friend, who had obtained her masters degree three years earlier. However, because of the difficult job market, she had not yet found suitable employment and was still working her student job. The sadness and compassion that he felt for her situation caused him to see her as ‘helpless’ and ‘child-like’, which made him consequently feel more mature and responsible. This put him in a position where he could comfort her and give her advice, even though he himself was still a student. This resulted in positive

feelings of affection towards her, which had been ‘dormant until then’.

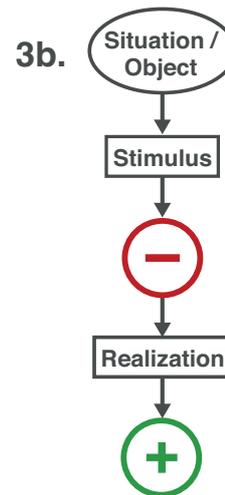
A third respondent experienced constructive effects of anger. The school where she worked, which was generally considered a very good school by its employees, was being visited by an inspector. On the first day this inspector gave her initial impressions of the school, which were quite negative. This did not go down well with the respondent, who was expecting a positive review. She felt the evaluation was extremely unjust, and felt unapproved in her work. In her reply to the inspector, she could suddenly express very clearly why her school deserved a better judgment: *“At that moment I could very well formulate it, what I thought we are doing well. That went really automatically, I didn’t have to think about that. Right now, for instance, I would have a much harder time to do that, yes, because you are in a certain flow then, or something, because it really affects you. At that time, I could really express well why I found it so unfair.”* During her speech to the inspector she was very focused, she felt a surge of adrenaline going through her body, and felt very pugnacious and righteous about her cause. All these effects contributed to a thrilling, positive emotion.



3b. A negative emotion helps to realize the gravity or importance of something

In addition to the action tendency, negative emotions also have an impact on conscious thought. Through the intensity of a negative emotion, a person can gauge how difficult, grave or important a situation is. For instance, one respondent was coming back from a

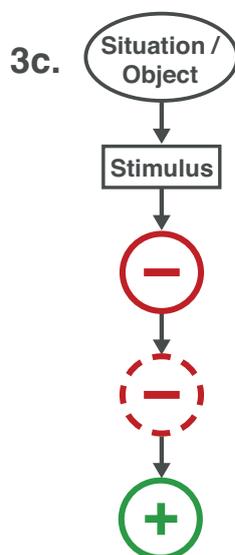
nice weekend with her grandparents, who she does not see often as they live abroad. She felt sad about saying goodbye to them again, but this emotion made her realize how much her grandparents meant to her. On her way back in the car, she talked for a long time to her friend, who had accompanied her on the visit, about the importance of keeping contact with your grandparents, and she resolved to visit them more frequently than she had before.



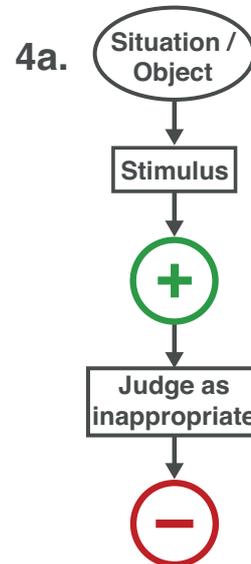
3c. Feeling good about overcoming a negative emotion

Mixed emotions can also arise when overcoming a negative emotion. This experience is related to the one in the previous sub-cluster, because the initial negativity of the situation signals how grave or difficult the situation is, thus adding to the feeling of achievement for overcoming it. For example, a respondent was asked by the school to sit in on a meeting to give advice about the employment of a co-worker. This co-worker had been working for the school part-time, but now that another employee was leaving, she wanted to apply to the full-time position. The co-worker sat in the meeting cheerfully, thinking that the meeting was a formality and the job was practically hers. However, the respondent did not think that her co-worker would be suitable to fill the position by herself. When the director asked her for her opinion during the meeting, she felt resistance and guilt to speak truthfully and shatter her co-worker’s expectations. Nevertheless, she felt it was her obligation, so she honestly expressed her opinion. After the meeting, her feeling of guilt was mixed with feelings of pride about herself, for being able to be

honest and putting the school's interests first. If she had not felt so much reluctance to speak her mind, it would not have felt as an achievement to her. Another respondent made a statement about the satisfaction of physical workout: *"Good, hard exercising and going through that fear or pain threshold, that is really Prozac to me. (...) That cannot fail, mentally, when I go exercising and encounter that threshold, and I persevere, then that will make me happy."* The difference between the experiences in this cluster and those of 1c and 1d, is that here the negative stimulus is faced and dealt with, rather than changing by itself (1c) or being put in perspective as something not important or serious (1d).



example was from a respondent who saw a beautiful, but very expensive cup in a kitchenware store. He felt an enormous desire to buy the cup, but at the same time felt guilty and greedy, for desiring something that he did not really need.



4. NEGATIVE EFFECT OF POSITIVE EMOTION

Negative emotions sometimes have positive outcomes, the opposite is also true: sometimes positive emotions are misplaced and have a negative consequence.

4a. Feeling bad about an inappropriate positive emotion

People can have a positive emotion, but then regard that emotion as inappropriate and feel bad. For instance, one participant was doing a wall-climbing competition with her friend, and had performed quite well on the particular route. Then, while observing her friend's climb, she felt anticipation and hope that her friend would make a mistake and fall, so that she would win the competition. But soon after, she felt guilty about having these unfriendly thoughts. Another

DISCUSSION AND IMPLICATIONS FOR DESIGN

The apparently clear-cut distinction between positive and negative emotions is deceptive. Negative is not always unwanted or superfluous. In the analysis we saw cases in which negative emotions actually even *feel good*. Moreover, there may be aspects of positive emotions that are unpleasant. For instance, after the termination of a relationship, people often express that they do not want to be cheered up right away - they sometimes want to feel the significance of their loss as part of the grieving process. We should also be careful when analyzing emotions outside of the context of the situated experience. Emotions are most of the time experienced in an episode involving multiple and interrelated emotions that evolve and interact with each other, with the events at hand, and with our responses to these events. The positive-negative distinction may be useful as a rudimentary distinction in everyday conversation, but relying on it in the design discourse obscures opportunities for designing products that evoke rich and, in a way, realistic experiences.

There were some limitations to the choice of research method and its execution in this study. Although a substantial number of experiences were collected, the set of clusters that it produced is probably not exhaustive. For instance, the fourth cluster could have featured a second sub-cluster that is the opposite of 3a: a person feels bad about his own inappropriate behavior, following the action tendency of a positive emotion. For example, a person in a social situation could, encouraged by other people's laughter and general cheerfulness, make a joke that crosses the line and subsequently feel ashamed. Similarly, there could be other sub-clusters (or even clusters) that did not emerge in the current study. Secondly, although care was given that participants were relatively different in terms of background and lifestyle, they were all Dutch natives. This was decided to ensure that the in-depth interviews would not be hindered by a lack of vocabulary or understanding from the participant or the interviewer. Additionally, for practical reasons all respondents were interviewed by the same researcher. These decisions may have introduced cultural and personal bias, which could be solved by carrying out a study in several countries and cultures, with different (native) interviewers. Thirdly, although all ten participants were very cooperative and insightful in recalling their experiences, at some point most of them ran into the limits of their introspective and descriptive power. Some even expressed frustration over their inability to exactly describe the dynamics of their feelings, and were puzzled by the fact that their own feelings were, upon scrutiny, so difficult to describe. However, in general the quality of the results mostly depended on the willingness of participants to openly explore the different sides of their inner life, more than on their intellectual capacities. If a researcher would plan a study that involves a long-term analysis of subjective feelings, perhaps they could adopt a panel of 'phenomenological experts', who are selected for their ability and willingness to analyze and describe their inner life.

We can summarize some key findings about qualities of mixed emotions. First of all, a negative emotion can have a beneficial effect on our thoughts and actions, which in turn can create a positive experience (3a). This means that a designer could attempt to design a

product that evokes a negative emotion in the user, while making sure that the beneficial effects of the negative emotion are appropriate and that the overall experience is pleasant. A strategy to achieve this has been proposed in another paper (Fokkinga & Desmet, in press). Secondly, certain negative emotions can help people to realize the importance of something (3b), which can be useful in design for behavioral change. Issues, such as environmental responsibility, which are otherwise 'cold' concerns to many people, might become more poignant through the right emotional cues. Thirdly, there are certain life experiences that are emotionally mixed on a fundamental level, such as unknown futures (2a). These kind of ambiguous stimuli can feel more unique and 'realistic' than those that evoke only (moderately) positive emotions. Ersner-Hershfield et al. (2009) investigated the ambiguous appraisal of a 'meaningful ending', which they call a phenomenon with a 'bi-valenced nature'. They found meaningful endings to evoke a mix of sadness and happiness. Fourthly, a negative emotion and positive emotion can be intertwined in such a way that their opposing thought-action tendencies clash, thus creating invigorating experiences (2b). The same phenomenon has been observed in art: "*Few, if any, pleasurable experiences match the intensity of our reactions to painful art*" (Smuts, 2007, p.72). Apparently, stimuli that are partly 'painful' evoke a reaction of an intensity that neutral or positive stimuli simply cannot attain. This can be useful for products that have to attract a lot of attention, or in situation where it is appropriate that people become energized for action. Fifthly, a negative emotion can be seen as an obstacle to overcome, after which the resulting experience is more positive than it was before (3c). It is clear that in this experience, as well as in some others (1c, 1d and 4a), the dimension of time is crucial. When designing such product experiences, it is important that the designer is conscious of and has control over the progression of events in time, like the storyteller of a narrative. One requisite is probably that the final or concluding feeling in the experience should be positive, as is the case in sub-clusters 1c and 1d, and in clusters 2 and 3 (but not in cluster 4). The emotional design of product narratives might prove to be a very interesting and worthwhile new direction of research. Examples of narratives that were

deliberately designed with mixed emotions are scarce, but some activities have evolved in a way to make use of them. For instance, the many mixed emotional experiences people go through in military initiation rites, like shared hardship and humiliation, can lead to a much greater sense of bonding and togetherness. In movies, a similar mechanism compels audiences to empathize with the main character after 'together' going through hardships with him or her (Tan, 1996).

Another design-relevant issue is that cultural and personal differences influence the tendency of an individual to enjoy mixed emotions. For instance, Williams and Aaker (2002) showed that both older people and people from an Asian background (as opposed to younger people and people with an Anglo-Saxon background) had a preference for an ad that evoked a mixed emotion (of a type that we would put in category 2a) over one that was purely positive. Hong and Lee (2010) found that the abstraction level at which people mentally represent information determines for a large part their liking for mixed emotions. Comparing higher-level abstraction thinking (e.g., thinking of vacation as having a good time and enjoying life) with lower-level abstraction thinking (e.g., thinking of vacation as lying on the beach with a cold drink), people in a higher level responded equally or more favorably to mixed emotion appeals than to positive appeals, whereas the obverse was true for people in a lower level. The rationale behind it is that abstraction introduces a psychological distance, which moderates the conflict of the mixed stimulus. Importantly, a person's abstraction level is partly a personal trait, but can also partly be influenced by certain triggers, for instance asking someone to imagine what life will be like a year from now (rather than tomorrow; Foerster et al., 2004). Apter's (2007) concept of the protective frame proposes a related mechanism – enjoying negative emotions by introducing psychological distance. In (Desmet & Fokkinga, submitted), we discuss how protective frames can be used in design.

Summing up, we think that there are several ways in which mixed emotions are interesting and worthwhile for designers and design researchers to explore, each creating product experiences that are interesting and unique in their own way. Rich emotional experiences

are experiences that feature both a positive and a negative emotion, which are either causally related (cluster 3) or mutually dependent (cluster 2).

The (sub-)clusters should bring some clarification in the forest of emotional experiences, so that designers have a better idea which type of mixed emotion works best for their purpose.

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