

How users experience great products

Juan Carlos Ortíz Nicolás *, Marco Aurisicchio*, Pieter M.A. Desmet**

** Imperial College London, Department of Mechanical Engineering,
jco209@imperial.ac.uk; m.aurisicchio@imperial.ac.uk*

*** TU Delft, Faculty of Design Engineering, P.M.A.Desmet@tudelft.nl*

Abstract: This study reports qualitative research about how users experience great products. Eighteen interviews were conducted in which participants were asked to bring along a ‘great’ product that they own. During the interviews participants explained why they consider a product great and how they experience it. The experiences were categorised in two groups: ‘pragmatic experience’, and ‘significant experience’. The term pragmatic refers to a utilitarian view of the human-product interaction, while the term significant stresses the suitability of the product for users including, their personal benefit and growth. In the paper the two experiences are explained in detail, including the needs fulfilled and the emotions elicited by the products.

Key words: *User Experience, Pleasant experiences, Positive emotions, Well-being*

1. Introduction

Products have a significant role in human daily life. Users buy, collect, and surround themselves with many different objects. Sometimes, they use them to achieve concrete goals and others to express aspects of the self [1]. The field that attempts to understand how users make sense of products is called user experience. Hassenzahl [2] argues that the experiential approach can be useful to understand what makes an experience positive, pleasurable, and good, as well as, to try to deliver pleasant experiences through product design [3]. For example, it has been suggested that pleasant experiences are related to objects and activities that are absorbing and personally meaningful. They contribute to self-definition of users. More so, they are long-lived, i.e., users tend to stick to objects and activities that enhance them [4]. The focus on pleasant experiences has also theoretical support from other fields of research such as psychology. For example, Hektner and colleagues [5] explain that the various theories that have flourished throughout the history of psychology suggest that individuals look for pleasure and avoid pain. It can be expected then, that users look for pleasant experiences with products. In addition, the focus on pleasant experiences implies a tendency towards users’ well-being. In this line, other scholars have also suggested that a strong reason for understanding users’ experiences with products is to improve their lives [6,7,8]. Interestingly, there are two main perspectives on well-being, namely hedonism and eudaimonic. The first is connected to pleasure. The second consists of more than happiness or pleasure, and it lies in the actualization of human potentials [9]. It is possible that pleasant experiences are linked to these two well-being perspectives.

Scholars have also suggested that users are more interested in the overall experience that products provide than in the specific functions that they perform [10]. For example, during product interaction users may feel intense sensations of freedom, relatedness, popularity, and status. Users then ‘evaluate’ products as a whole, including their feel, look, utility, and usefulness. Another factor to consider is that once users have acquired a product they often spend significant time with it. Users’ daily interactions with products can make them to appreciate product

qualities, which designers are not even aware of [11]. Based on daily interactions, users sometimes end up developing bonds with products [12], and in some situations they modify products to meet their personal taste or needs [13]. Recently, the non-designers input has been captured in the term design-as-practice, which acknowledges the work done by professional designers but also opens up design to others, such as managers, or end-users who through their practices, also take part in design [14]. Similarly, a set of perspectives, such as user centre design, co-design, inclusive design, and user experience have emerged trying to impact on the professional practice of design by acknowledging the central role of the user in human-product interactions. Despite this central role, to date little is known about how users experience products in general and ‘great’ in particular in a daily-life context. An interesting aspect to study great products is that they are expected to enhance pleasant experiences. Focusing on great products can help us: understand the aspects that users consider when evaluating a product as great; identify if great products enhance pleasant experiences; and develop new knowledge about great products that may help designers expand their views on design. At present, discussions about the qualities of great products are dominated by the views of experts like professional designers and scholars. Therefore, the aims of this research are to investigate the experiences which users have with great products; and to identify the needs and emotions that great products respectively fulfil and evoke.

2. User Experience

User experience attempts to understand how users make sense of products in a particular context and time. A detailed comparison and synthesis of different views on and perspectives of this subject can be found in [15]. According to this work, the majority of researchers agree on user experience being subjective, conscious, emotional, interconnected, and dynamic. The review also indicated that user experience is determined by at least four elements: the user, the interaction, the artefact, and the context. User experience is not a property of the product but the outcome of human-product interaction and therefore it is dependent on the user [16]. Users bring their knowledge, senses, values, emotions, and needs to the experience. The interaction is the basic relationship that binds the user and the artefact. At a deeper level various types of activities are involved in human-product interaction. The artefact is made by a human being to perform technical and non-technical functions, e.g. symbolic and aesthetical. And the context is understood as a complex, dynamic set of factors [17]. It includes at least the following sub-elements: physical, social, situational, cultural, and temporal.

Two specific issues that will be addressed in this research to gain a deeper understanding of experiences with great products are the needs and emotions that they fulfil and evoke. Previous research has shown a strong relationship between needs, emotions, and pleasant experiences. For example, Hassenzahl et al [18] show that the fulfilment of universal needs is a source of pleasant experiences with interactive products and technologies. Emotions are important because they regulate the tone of the experience [19] and colour it [7].

3. Understanding the experience of great products

3.1 Research approach

An aspect that distinguishes this research from previous work is the focus on ‘great’ products. After careful analysis we decided that great products are more suitable than ‘good’ or ‘satisfactory’ products because they are expected to trigger richer experiences. To develop new understanding of users’ experiences with great products

this study used semi-structured interviews as a research method, which has been used in previous user experience research [17, 20]. Given that this investigation deals with the subjective interpretation of a ‘great’ product, the emotions elicited and the needs fulfilled, phenomenology is a suitable mode of inquiry [21]. Phenomenology relies on the subjective interpretation of the world by a person, the way in which that person sees the world and himself or herself in it, including perceptions, thoughts, feelings, and emotions [22].

3.2 Respondents

Eighteen respondents participated to this study, of which ten were males and eight females. They were from ten different nationalities, including French, Belgian, Austrian, Indian, Swedish, Italian, Lebanese, Mexican, Singaporean and British. Participants had no relation to the activity of product design, and had a background either in engineering (mechanical, biomechanical, computing, electric, tribology, and control) or in mathematics. All participants were students enrolled at Imperial College London, and ten were undergraduate and eight postgraduate students. Participants were between 19 and 37 years old ($M=23.44$; $SD=4.8$). They all had a good command of English, and two were native speakers.

3.3 Material

3.3.1 Needs

Ten universal needs, as identified by Sheldon and colleagues [23] and previously used in research on user experience [18], were printed on cards with their descriptions and used in the interviews (white paper sheets of 18 by 4 cm). The descriptions can be found in [23]. The names of the needs are:

- | | |
|--------------------------------|--------------------------------|
| 1. Autonomy - Independence | 6. Physical thriving – bodily |
| 2. Money - Luxury | 7. Security - Control |
| 3. Relatedness – belongingness | 8. Influence – Popularity |
| 4. Self-esteem - self-respect | 9. Pleasure – stimulation |
| 5. Competence - effectance | 10. Self-actualizing - meaning |

3.3.2 Emotions

Twenty-two emotions were also printed on cards and used in the interviews (white paper sheets of 9.5 by 5 cm), see Table 1. These were selected from four studies related to human-product interaction [24, 25, 26, 27]. Detailed information on the source from which each emotion was taken is reported in [28]. The selection was based on the suggestions of Laurens and Desmet [26], i.e. define a set of emotions considering the different domains of user experience, e.g. social interaction, expectations, and well-being.

Table 1. Twenty-two emotions

Positive emotions				Negative emotions			
Admiration	Fascination	Relaxed	Joy	Boredom	Disappointment	Hostility	Fear
Amusement	Inspiration	Satisfaction	Pride	Contempt	Dissatisfaction	Sadness	Shame
Anticipation	Confidence	Surprise		Disgust	Frustration	Displeasure	

3.3 Interview procedure

The procedure was carried out individually in a quiet room. Prior to the interview, participants were asked to select in advance a ‘great’ product. They were encouraged to think of ‘great’ in whatever way made sense to them,

and explained that the researchers wanted to discover their own meaning of it. The session was divided into four phases. First, the participants were asked to describe their experience based on the characteristics of the user, the interaction, the product, and the context. The questions asked during the interview can be found in [28]. Second, with the support of the ten cards showing the needs in section 3.3.1 and their descriptions, the participants were asked to choose those that they fulfilled with the selected product. They were also asked to explain how the chosen needs were fulfilled. Third, with the support of the twenty-two cards displaying the emotions in Table 1, the participants were asked to choose and explain the emotions that the product triggered in them. Participants could choose as many needs and emotions as they wanted. Finally, the session ended by asking participants who or what influenced their evaluation of a great product. The interviews were completed in about 30 minutes and were audio recorded.

4. Results

Following the data collection, the interviews were transcribed, and the data was organised. Preliminary data analysis focused on the reasons that participants reported to explain why their products were considered great. This led to the identification of two groups of experience named: ‘pragmatic’ and ‘significant’. Based on these, the data was split per experience and further analysis was carried out.

4.1 Experiences with great products

4.1.1 Pragmatic Experience

The pragmatic experience is described in Table 2 by means of the products brought by users and the justifications of why they are great. Eight experiences were included in this group, and the products involved were: a sport watch, a mobile phone, an external hard drive, a backpack, an Mp3 player, a fountain pen, a Bic biro, and a bicycle. The term pragmatic refers to a utilitarian view of human-product interaction.

Table 2. Pragmatic experience

Product	Why is this a great product?
Sport watch	<i>It is the classic watch, the Casio, it is really basic. There is nothing fancy about it. You just know when you buy it that it will do what you want it to do.</i>
External hard drive	<i>The characteristics of this product to make it great are: it is small, it has high storage, it looks pretty, and it came with everything I needed to use it, so I do not need additional things.</i>
Bic biro	<i>It is 'something which fulfils the expectations of the user and serves a purpose and it does that in a way which does not cause the user to feel impedance when they select the product. This one is phenomenally cheap, does exactly what you would expect it to do, it works every time, and it just does what it is supposed to do and it serves its purpose well.'</i>

Participants whose experiences were classed as pragmatic explained that the greatness of their products was linked to how well they performed the instrumental function, i.e. what the product is meant to do. Participants also reported that the products were easy to use and that they did not need special skills to use them. Other product attributes such as appearance or novelty were seen as extras but not the core. Six participants from this group reported that the evaluation of a great product is strongly influenced by the characteristics of the user and the product. The rest of the participants reported that it depends either on the user, or on the product. Participants described their experiences using the following words: comfortable, positive, reliable, fine, professional, satisfying, good, and recreational.

The large majority of the participants indicated that they were not attached to the product that they chose; some explained that this is positive because it meant that they could replace them at their will. In addition, five participants reported that they did not intend to reflect aspects of their identity through the products. The remaining three mentioned that the products portrayed aspects of their identity such as pragmatism, preference for function over form or for good quality.

Regarding interaction the following results were identified: participants found difficult to express product-interaction qualities. Nevertheless, they used descriptors for the interaction such as: comfortable, smooth, well-built, and with familiar or standardised interactions. Regarding the activities that they typically do with their products all participants reported that these were important in their daily life, e.g. doing exercise.

With respect to the context all participants reported that their products adapt well to different environments, i.e. physical context. Social context was not relevant. Two participants mentioned it but as a negative aspect of their products because they did not fit well in social interactions, e.g. the Bic biro will not be used in a business meeting or the sport watch in a party. About situational context six participants reported that they used their products for both work and leisure, e.g. a mobile phone for playing but also for arranging meetings. The other two participants reported that they used their products only for work.

4.1.2 Significant Experience

The significant experience is described in Table 3 by means of the products brought by users and the justifications of why they are great. Ten experiences were included in this group, and the products involved were: two hair straighteners, a mixing turntable, an amplifier, an instant camera, an electric piano, a watch, a guitar, an electronic tablet, and a pair of trousers. The term significant was taken from constructive psychology, because it conveys a constructive view of human experience involving five key aspects (active agency, order, self, social-symbolic relatedness, and lifespan). This view emphasizes the importance of meaningful actions by a developing self in complex and unfolding relationships [29]. The significant experience stresses the valuable role of the activities involved in human-product interaction. These offer benefits for users including possibilities for growth. It also acknowledges the active role that users have in human-product interaction. These experiences are significant because users reaffirm themselves through the activities or products involved.

Table 3. Significant experience

Product	Why is this a great product?
Instant camera	<i>Something that is suitable for you and that you use very often and do not get bored of. It also needs to be something you are comfortable with.</i>
Electric piano	<i>In this case, what characterises a great product is the fact that you enjoy using it and you do not spend your time worrying about it: is it going to break? Am I doing something wrong?</i>
Hair straightener	<i>It is not what is cool at the moment, what everyone has, but it is something great for someone in particular. Like the first thought that crosses your mind is like would I be able to live without that? I think that is a definition of a great product. This product is like a part of me, I take it everywhere I go.</i>

Participants whose experiences were classed as significant explained that the greatness of the products is related to how suitable they are for them, i.e. how well the products adapt to the users. They explained that with the help of their products they can express themselves by creating new music or pictures for instance, and do enjoyable activities. They also reported that in order to use the products they refined or developed some skills, e.g. playing the piano, or mixing music. This indicates that the users have an active role in human-product interaction,

and that participants to this research seem to be aware of it. More so, participants reported that once they learnt how to use these products, they found them easy to use. All participants reported also that their products worked well, and that this was a basic attribute of them. Nevertheless, they acknowledged that this attribute was not enough to assess them as great. Eight participants from this group indicated that the evaluation of a great product is strongly influenced by the characteristics of the user and the product. The remaining two participants reported that it depends either on the user, or on the product. When participants were asked to describe their experiences they used the following descriptors: fun, comfortable, very positive, enjoyable, and intimate.

Six participants from this group reported that they were attached to the products because they were either mementos of happy times, e.g. a gift, or of enjoying activities, e.g. playing music with an instrument. In addition, the large majority of the participants reported that the products reflected something about themselves, e.g. their personal interests, and creativity.

Participants from this group also found difficult to verbalise qualities of the interaction. Nevertheless, they used descriptors for the interaction such as: old fashion (e.g. a turn table), nice, and comfortable. Regarding the activities that participants typically do with the products, they all reported that these were important in their daily life.

With respect to context, all participants from this group reported that the products adapt well to different environments. Eight participants mentioned social context as a positive aspect of the experience. For example, playing music, or looking nice is relevant in a social context. About situational context six participants reported that they used the products only for leisure. The remaining four used it for both leisure and work.

4.2 Needs involved in experiencing great products

The needs fulfilled by the products are shown and compared in Figure 1 per experience type (pragmatic=8, significant=10). The most salient needs fulfilled by products linked to the pragmatic experience were autonomy, competence, physical thriving, and self-actualizing. Pleasure was the most salient need fulfilled by products linked to the significant experience. Other two relevant needs for this group were competence, and self-actualizing. The most salient needs are those that were reported by at least 50% of the participants in each group. It is interesting to note that influence, relatedness, and self-esteem were fulfilled only by products, which triggered significant experiences. Money and security seem to be little relevant for great products. On average participants from the significant group reported more fulfilled needs ($M= 3.40$ $SD= 1.85$) than participants from the pragmatic group ($M= 2.75$, $SD = 1.49$).

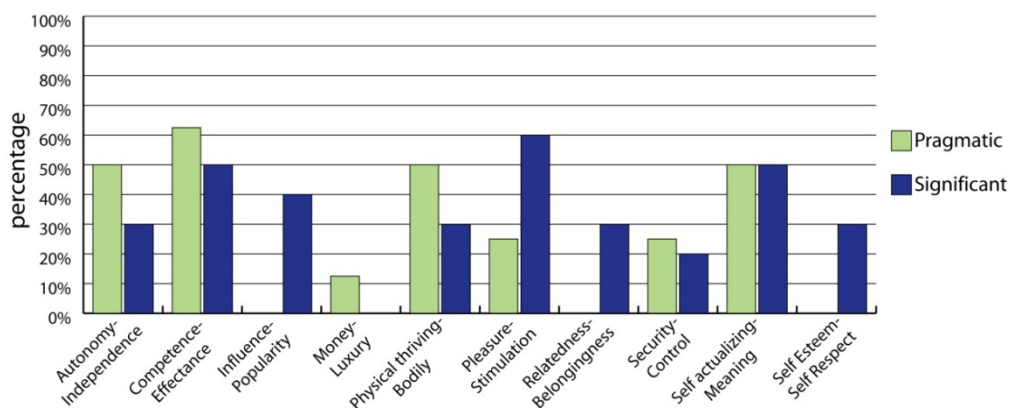


Figure 1. Needs fulfilled by great products

4.2.1 How the products fulfil the needs

The participants to this study fulfilled their needs through: the product itself, e.g. a mobile phone; the activity carried out with the product, e.g. cycling; and the outputs of the activity, e.g. playing good music. These three sources of fulfilment are used in Table 4 to explain the most salient needs. To identify the sources of fulfilment of the needs we relied on the work of Desmet [27]. The number in brackets in Table 4 is the percentage of the group that chose that need.

Table 4. Salient needs fulfilled per group (P=Pragmatic, S=Significant)

Need	Explanation
Competence-effectance	P (62.5%) It was fulfilled through the <i>activity</i> , e.g. doing exercise. By performing it the person felt very capable and effective due their progress, i.e. running faster.
	S (50%) It was fulfilled through the output of the <i>activity</i> . A person felt competent when they had taken a good picture or had played good music.
Autonomy-independence	P (50%) It was fulfilled through the <i>product</i> . By using it, the person was independent, he/she relied on their performance to do something, e.g. travelling with a bike.
	S Not relevant for this group
Physical thriving-bodily	P (50%) It was fulfilled through the <i>activity</i> , e.g. doing exercise had a positive impact on people's health. Products were people's companions when doing these activities.
	S Not relevant for this group
Self-actualization-meaning	P (50%) It was fulfilled through the <i>activity</i> , e.g. studying. These activities were meaningful for the person because through them, they developed their best potentials.
	S (50%) It was fulfilled through the <i>product</i> , e.g. mixing good music with a turntable represents an everyday challenge and through daily use people develop their best potentials. It was also fulfilled through the <i>activity's output</i> , e.g. creating good music.
Pleasure-stimulation	P Not relevant for this group
	S (60%) It was fulfilled through the <i>activity</i> , e.g. listening to music, taking pictures, playing music, or watching films are pleasant in themselves. <i>Products</i> also fulfilled this need because of the way people interact with them, e.g. a turntable.

4.3 Emotions involved in experiencing great products

The emotions elicited by the products are shown and compared in Figure 2 per experience type. The most elicited emotions from the pragmatic experience were: satisfaction, relaxed, and amusement. For the significant experience the emotions were instead: joy, satisfaction, relaxed, confidence, amusement, inspiration, and pride. On average participants from the significant experience reported more emotions elicited by the products ($M=6.6$ $SD=3.6$) than the pragmatic experience ($M= 4.25$ $SD=2.49$).

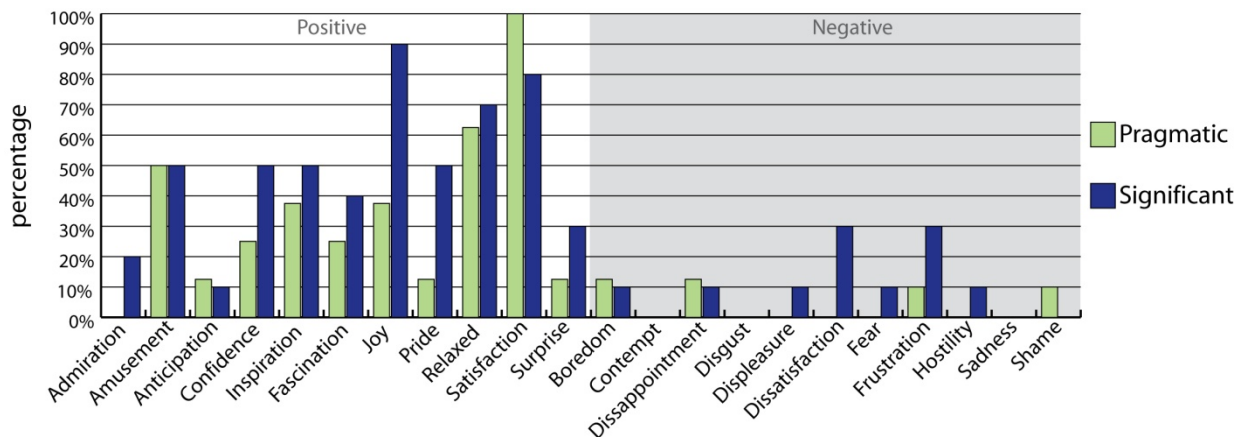


Figure 2. Emotions evoked by great products

4.3.1 How the products evoke the emotions

The participants to this study had their emotions evoked by: the product itself, the meaning of the product, the interaction with the product, the activity that is facilitated, themselves, and others [27]. These six sources are used in Table 5 to explain the most salient emotions.

Table 5. Most frequent emotions evoked per group (P=Pragmatic, S=Significant)

Emotion	Description
Satisfaction	P (100%) It was triggered mostly by the good performance of the <i>product</i> . In few cases by the <i>person's</i> performance e.g. it is satisfying doing exercise
	S (80%) It was triggered by the <i>activity's output</i> . Thus, it is related to people's achievements. They were satisfied by the music they created, or the picture they took.
Relaxed	P (62.5%) It was triggered by the <i>product's</i> good performance; when it works well people do not have to worry about it. It was also triggered by the involved <i>activities</i> , e.g. cycling
	S (70%) It was triggered by the involved <i>activities</i> e.g. playing music is relaxing, and comfortable. Participants were absorbed into it and experienced relaxation.
Amusement	P (50%) It was triggered by the <i>activities</i> that participants typically perform with their products, e.g. playing video games or watching films.
	S (50%) It was triggered by the <i>activity</i> , e.g. playing the guitar or the piano were reported as amusing. <i>Products</i> were also means to be amused, e.g. watching films on a tablet.
Joy	P Not relevant for this group
	S (90%) It was triggered by the attributes of the <i>product</i> , e.g. a turntable. It was also elicited by the <i>activity</i> , e.g. playing music is joyful in itself; and by the <i>activity's output</i> , e.g. tacking good pictures triggers joy in the person.
Confidence	P Not relevant for this group
	S (60%) It was elicited by the <i>self</i> , e.g. the person was confident because they were capable to deal with a challenging situation. It was also related to self-expression, e.g. looking good. In less degree people were confident because of the <i>product's</i> good performance.
Inspiration	P Not relevant for this group
	S (50%) It was triggered by the <i>activity</i> , playing music allows the person to create and explore new sounds; by the <i>product</i> , when the person could do new things with it; and by <i>other people's</i> ideas which can be accessed with the help of some products, e.g. a tablet
Pride	P Not relevant
	S (50%) Pride was elicited by the <i>self</i> . Participants reported to be proud to own these products or to take pride in what they do.

5. Discussion

The results of this research explain how users experience great products, including the needs fulfilled and the emotions evoked. Two experiences, namely pragmatic and significant, were identified based on the descriptions provided by users and confirmed by the investigation of needs and emotions. These experiences differ in the way in which users deal with products and in the level of pleasure that they gain from them. In addition, four constituent elements of user experience identified in previous research, namely the user, the product, the interaction and the context, were investigated to better understand user experience with great products.

In this research there are three results showing that great products enhance pleasant experiences. First, the descriptions provided by users indicate that experiences with great products are reliable, positive, and fun. Second, some of the needs fulfilled by great products, e.g. pleasure, relatedness, competence, and popularity, are linked to pleasant experienced as it was also found in previous research [18]. However, for the pragmatic experience, only

competence emerged as a fulfilled need associated with pleasant experiences. Third, the emotions evoked by great products are mostly positive. The pleasantness of great products varies depending on the experience type. Users whose experiences were classified as significant seem to derive richer pleasure from their products in comparison to users whose experiences were classified as pragmatic. Four aspects explain this issue. First, users in the significant experience group reported more often that their products fulfilled the need of pleasure-stimulation. Second, products from the significant experience evoked a richer quantity and variety of emotions (e.g. joy, satisfaction, confidence, relaxed, amusement, inspiration, and pride), in comparison to products enhancing pragmatic experiences (e.g. satisfaction, relaxed, and amusement). Third, when taking into consideration the activities that users typically perform with products that enhance significant experiences, it seems that their nature is more pleasant than those linked to pragmatic experiences, e.g. cycling versus backing up data. Fourth, the characteristics of the interaction and the product are reflected in the richness of the experience, e.g. the turntable versus the external hard disk. The activities performed with the product, the attributes of the product, the needs fulfilled, and the emotions elicited by the product indicate that significant experiences are more pleasant than pragmatic experiences.

Users assigned to the pragmatic experience seem to have a utilitarian relationship with their products. They were not attached to the products or did not use them to communicate something about their identity. Nevertheless, they valued the overall product and gave a central role to performance. The pleasant side of pragmatic experiences partially covers aspects of hedonic well-being. Particularly in the fluency that users have with their products to perform activities that are important for them. Regarding the significant experience users seem to have a personal relationship with their products, i.e. these are suitable for them, and as a result they can create with them, be attached to them, and reflect something about their identity. Significant experiences fit better with eudaimonic well-being because products from this group seem to help users pursue their potential. For example, great products from the significant experience group provide users a stimulating challenge and help them pursue something of value within a community (e.g. playing music for friends) or something more meaningful for them (e.g. enjoying life). In addition, research carried out in the field of psychology on the topics of emotions and well-being has shown that positive emotions like joy, contentment, love, interest, amusement, and pride improve psychological well-being, and physical health functioning [30,31]. Some of these emotions were mostly triggered by products from the significant experience group, i.e. joy, amusement, and pride. There is a need to undertake further research to clarify if pragmatic experiences fit with hedonic well-being and significant experiences with eudaimonic well-being.

Designers who aim to design for well-being need to understand the differences between these two perspectives for at least two reasons. First, to select the perspective that aligns better with the characteristics of the project that the designer is undertaking. Second, to reflect on the role that users have in human-product interactions, e.g. passive or active agents. These issues are addressed in the following paragraphs.

Many designers aspire to promote well-being in users. At present it is not clear if this is possible. However, designers who attempt to fulfil this aspiration can start by identifying if the design project that they are working on can promote either hedonic or eudaimonic well-being. The selection of the most appropriate conception will guide designers during the design process. For example, eudaimonic well-being considers the active role of the person when developing their human potentials. To promote an active role by users designers may stimulate self-expression with or through products. Users can be part of the design solution by adding their personal touch [32].

A second way to promote an active role by users is to create solutions that make the person feel satisfied about their performance instead of focusing on improving the product's performance. Both aspects are relevant. However, the choice impacts on the type of experience that the user will gain. A third way to promote an active role by users is through autonomy and mastery, which have been previously linked to well-being by Ryff and Keyes [in 9]. To promote mastery designers can develop solutions that represent a challenge to the user. By overcoming the challenge it is expected that users become better at something, e.g. more skilled musicians or drawers.

This study focused on aspects of user experience such as the user, the interaction, the product and the context, to better understand it. User experience is the result of a person interacting with at least one product, which is in line with most of the theoretical views [2,6,8,19] and against McCarthy and Wright [7] who argue that experience does not refer to subjective states. This study showed that it is difficult for users to articulate or verbalise the attributes of the interaction. Nevertheless, a set of interaction descriptors were identified such as familiar, old fashion, or comfortable interactions. These descriptors complement the interaction modes suggested by Forlizzi and Battarbee [6] and can help future research to discuss interaction qualities with users. In addition, this study shows the relevancy of activities that users performed with their products. Activities, however, are context dependent and relational [4]. They depend on the situation itself but also on the product used to perform the activity. The results of this study indicate that more research is needed to better understand the role of interaction and activities in user experience. Regarding the context of use and its sub-elements, significant experiences involve social interactions, which also play a role on the overall experience, as well as, the situation in which the product is used, i.e. leisure versus work. About the cultural context, most of the participants were European; therefore, the findings of this research are expected to be culture-dependant. Hofstede [34], for example, identified that self-actualization is a goal in individualistic countries. On the other hand, collectivist societies seek different goals such as harmony and consensus. This, however, is still unclear, considering that participants of this study were from various countries.

In the field of user experience, Hassenzahl [10] has suggested the terms pragmatic and hedonic to describe product attributes. Pragmatic attributes provide effective and efficient means to manipulate the environment, whereas hedonic attributes provide stimulation, identification or provoke memories. These terms are similar to the two experiences identified in this study. i.e. pragmatic and significant. However, in this research the terms are used to communicate the overall experiences or characters of the products not to their attributes.

This is an exploratory study and therefore, more research is needed to confirm its findings with larger or different populations. In addition, the categorisations pragmatic and significant may be too basic to explain the variety of experiences which result from human-product interactions. These categorisations were the result of studying great products. Undertaking a study based on pragmatic and significant experiences may provide more insights on them. However, they may not necessarily be related to products that users consider great.

5 Conclusions

A conclusion of this research is that to investigate and understand pleasant experiences a broad perspective is needed. This is expected to help generate a more precise picture of how the user, the interaction, the product and the context impact on user experience. In particular, the study of needs and emotions used in conjunction with the

descriptions provided by users was found to be useful to understand in detail pleasant experiences. Regarding the identification of a pleasant experience, emotions were found to be a more reliable indicator than needs because they are more distinctively positive.

Great design as defined by professionals is only one side of the story. Users can also interpret, recognise and assess it. Their view is essential because they bring their creativity, goals, and motivations to human-product interaction. Based on the data gathered in this study, we have identified two types of experiences, which we have termed as pragmatic and significant. These two experiences differ in the level of pleasure that they provide to users. Designers could use the knowledge developed to create products that work well and are beautiful, but also products that embody possibilities for users, can be modified for their own benefit or have the intentional purpose of impacting on users' well-being.

7. Bibliography

- [1] Belk R W (1988). Possessions and the Extended Self, *The Journal of Consumer Research*, Vol. 15, No. 2 pp. 139-168.
- [2] Hassenzahl, M. (2010) *Experience Design: Technology for All the Right Reasons*, Morgan & Claypool Publishers
- [3] Hassenzahl, M. & Tractinsky, N., User Experience - A research agenda. *Behaviour & Information Technology*, 25(2), pp.91-97, 2006.
- [4] Blythe M. and Hassenzahl M. (2003) The Semantics of Fun: Differentiating Enjoyable Experiences. In Blythe, M. A., Overbeeke, K., Monk, A. F., & Wright, P. C. (Eds.). *Funology from usability to enjoyment*. London: Kluwer Academic Publishers.
- [5] Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M., (2007). *Experience sampling method: Measuring the quality of everyday life*. Thousand Oaks, CA: Sage.
- [6] Forlizzi, J. and Battarbee, K., (2004). Understanding experience in interactive systems. In *on Designing interactive system*. pp. 261-269
- [7] McCarthy, J, and Wright P. (2004) *Technology as Experience*, London: The MIT Press
- [8] Law, E.L.C., Roto, V., Hassenzahl, M., Vermeeren, A.P.O.S., Kort, J. (2009) Understanding, scoping and defining user experience: a survey approach. In *Proceedings of the 27th international conference on Human factors in computing systems*. ACM, p. 719–728
- [9] Ryan R.M. and Deci E. L. (2001) ON HAPPINESS AND HUMAN POTENTIALS: A Review of Research on Hedonic and Eudaimonic Well-Being, *Annual Review of Psychology*, Vol. 52: 141-166
- [10] Chapman, J. (2005). *Emotionally durable design. Objects, experiences, and empathy*. London: Earthscan.
- [11] Heylighen, A., & Bianchin, M. (2013). How does inclusive design relate to good design? Designing as a deliberative enterprise. *Design Studies*, 34(1), 93–110.
- [12] Mugge, R., Schoormans, J. P. L. and Schifferstein, H. N. J. (2009) Emotional bonding with personalised products, *Journal of Engineering Design*, 20:5, 467 — 476
- [13] Slater, D. (2003). *Consumer, Culture and Modernity*. Polity Press: Cambridge
- [14] Kimbell, L. (2012). Rethinking Design Thinking: Part II. *Design and Culture*, 4(2), 129–148.

- [15] Ortíz Nicolás, J.C. & Aurisicchio M. (2011) A scenario of user experience, Proceedings of the 18th International Conference on Engineering Design (ICED11), Vol. 7, pp. 182–193.
- [16] Desmet, P. M. A. and Hekkert P. (2007), Framework of product experience. *International Journal of Design* 1, no. 1: 57–66
- [17] Forlizzi, J. (2007) The product ecology: Understanding social product use and supporting design culture. *International Journal of Design*, 2(1), 11-20
- [18] Hassenzahl, M., Diefenbach, S., & Göritz, A. (2010). Needs, affect, and interactive products – Facets of user experience. *Interacting with Computers*, 22(5), 353–362.
- [19] Varela, F. J., Thompson, E., and Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*, Cambridge: MIT Press.
- [20] Arhippainen, L., & Tähti, M. (2003). Empirical Evaluation of User Experience in Two Adaptive Mobile Application Prototypes. 2nd International Conference on Mobile Idots Proceedings (pp. 27-34).
- [21] Creswell J. W. (2007) *Qualitative Inquiry and Research Design: Choosing among five approaches*. California: Sage Publications
- [22] Apter, M. J. (2006). *Reversal Theory: The Dynamics of Motivation, Emotion, and Personality*. Oxford: Oneworld Publications.
- [23] Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What Is Satisfying About Satisfying Events ? Testing 10 Candidate Psychological Needs. *Journal of Personality and Social Psychology*, 80(2), 325–339.
- [24] Desmet, P. M. A. (2002). *Designing emotions*. Unpublished PhD dissertation, Delft University of Technology.
- [25] Ortíz Nicolás, J. C., & Hernández López, I. (2008). Product relevant emotions in the Spanish language. *Design & Emotion Conference*, 6.
- [26] Laurans, G. and Desmet P.M.A. (2012). Introducing Premo2 New Directions for the Non-verbal Measurement of Emotion in Design. *Design and Emotion conference* (pp. 11–14). London.
- [27] Desmet, P. M. A. (2012). Faces of product pleasure: 25 positive emotions in human-product interactions. *International Journal of Design*, 6(2), 1-29.
- [28] Ortíz Nicolás J.C. (2013) *Understanding and designing pleasant experiences with products*. Unpublished PhD dissertation, Imperial College London
- [29] Mahoney (2004). What is constructivism and why is it growing? *Contemporary Psychology*, 49, 360-363.
- [30] Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating positive
- [31] Fredrickson, B. L. (2003). The value of positive emotions: The emerging science of positive psychology is coming to understand why it's good to feel good. *American Scientist*, 91(4), 330-335.
- [32] Mugge, R. (2007). *Product Attachment*. Unpublished PhD Dissertation, Delft University of Technology
- [34] Hofstede G. (1991). *Cultures and Organizations, Software of the mind*. London: McGraw Hill

Acknowledgments

The research was supported by the Mexican National Council for Science and Technology (CONACYT) and the Department of Mechanical Engineering at Imperial College London.