



# INDIVIDUAL UX PORTFOLIO

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Susan, S.H.M.L, Draaijer  
University of Technology,  
Eindhoven, The Netherlands,  
[s.h.m.l.draaijer@student.tue.nl](mailto:s.h.m.l.draaijer@student.tue.nl)

## KEYWORDS

User experience; UX design; subconscious mind; design process

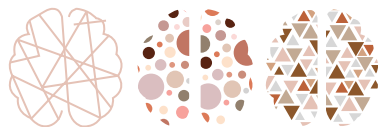
## CSS CONCEPTS

Interaction design; Visualization; User characteristics

## INTRODUCTION

We evolve with time. From a young age, we are propelled to learn from various experiences in our daily lives; through observing our parents, our culture, and our surroundings, we learn new skills and gain awareness of societal norms and values [16]. Starting as a relatively young student in the design industry, these aspects, distinctively rooted in the concept of the subconscious mind, have served as a framework during my personal education of comprehending the viewpoint of the user. This particular aspect of the user experience, namely, can be considered as the primal functioning of the human individual; according to current scientific estimates, around 95% of human brain activity is unconsciously regulated, meaning that the majority of human decision-making, action-taking, as well as e.g. our emotions and behaviors, depend on the 95% of brain activity that lies beyond conscious awareness [17]. Accordingly, it is proven that between the ages of 0-7 years old, the subconscious mind is formed, implying that elements such as upbringing, norms, values and surroundings, play a role in the person that is nurtured [3]. I believe that these unconscious thought processes in the general user experience are of value, and

thus concede with the notion that the designer has a responsibility to comprehend the human psychological foundation; yearning for the why in general life. In my personal understanding, user experience in its definition is explained by the holistic encounter a user undergoes while engaging with a product or service; e.g. considering past experiences and learnings the individual has gone through, the influence of genetically determined components, and the influence of their mental state in relation to the rest of their experienced life (e.g. age). Through personal evaluation of user experience evaluation methods, however, it had been noted that these aspects, regarding subconscious thought processes today, are not specifically addressed, but rather incorporated unnoticeably and without specific acknowledgment. Starting the course ‘User Experience Theory & Practice’, I am ambitious to gain a deeper understanding of the subconscious thought processes’ impact in regards to user experience in design, as well as understanding how this aspect could best be evaluated in an experience user testing method.



Next to the subconscious mind – aspect of UX, the learning goals when applying for this course were to understand the changes the user experience term had gone through in the past, its history trajectory line, and future development, in order to understand the key elements

prospective designers should consider. Will user experience methods vastly change in the world of design in the upcoming years? What key elements should a designer pay attention to regarding UX? and hitting the core of the premise, How could the theory of user experience best be comprehended and applied in practice?

In order to come closer to an understanding of these questions, insights within this report regarding user experience theory & practice have been analyzed and divided into the following headings; UX definitions, Reflection on UX course, Understanding UX, JESI FBP project (discussion and insights of the user experience in earlier project work), and UX proposition. The purpose of this report is to generate a comprehensive understanding of the fundamental principles and practical applications of UX design, and come to an eventual conclusion of a personal future path regarding the RDD master track at the TU/e.

## UX DEFINITIONS

The term user experience can be evaluated from various perspectives and holds not one single universally accepted definition [13]. According to the ‘User experience white paper’, where it is aimed to bring clarity to the concept of user experience, the user experience field deals with studying, designing for, and evaluating the experiences that people have, through the use of (or encounter with) a system [19]. Additionally, according to the paper, UX can be regarded as a phenomenon, a field of study, or as a practice, automatically indicating its

intricate nature [19]. The International Organization for Standardization (ISO) has drafted the international standard for the definition of user experience as the following [14]:

*“A person's perceptions and responses that result from the use or anticipated use of a product, system or service.”*

— ISO 9241-210, Ergonomics of human-system interaction—Part 210: Human-centered design for interactive systems

The ISO definition of user experience comprises two key elements: ‘a person’s perception and responses’, and ‘the use of a product, system or service’. For a designer, the initial key element is challenging to predict, regulate, or impact, as it is subjective and relies on the user's personal factors. The second key element, however, provides designers a distinct opportunity to exert influence by designing with e.g. specific characteristics, appearance, or notable cues. Marc Hassenzahl, professor in user experience and experience design, has a different view on user experience in its definition. He claims that the term ‘user experience’ merely focuses on the first key factor of the ISO definition: “User Experience is not about good industrial design, multi-touch, or fancy interfaces. It is about transcending the material. It is about creating an experience through a device” [12]. According to Hassenzahl, the user experience, therefore, is just a sub-category of experience, focusing on the particular mediator of interactive products [12]. Designers, like Hassenzahl, have developed an interpretation of the user experience definition through the years, either through their

own interpretation or based upon established research [11]. Researchers Aurora Berni & Yuri Borgiaanni provide a contribution to the understanding of this phenomenon. According to them, user experience has become an integral part into design practice, and thus restricting the definition could hinder advancements in the design field [1]. Accordingly, in their investigation to the definition of user experience, they conclude that the term UX should have the possibility to build upon previous literature and develop the field autonomously [1].

## REFLECTION UX COURSE

In the first 3 weeks of the ‘User Experience Theory & Practice’ course, master students were provided with literature self-study, corresponding lectures and elaborating workshops. It was encouraged that during these weeks, resources regarding motivated goals could be studied in detail in order to gain a deeper understanding. In relation with my vision as a designer, which centers on the intersection of human psychology and technological advancement, the following topics have been investigated in detail; the interaction-attention continuum, attention from a designer’s perspective, and the implication of incremental & radical innovation within design.

During the first week of the course, user experience as a phenomenon, as well as the user experience time spans within the context of human-centered design (HCD) had been encountered. This brought clarity to how the term user experience is used in the design field.

However, learning that the user experience consists out of a restricted time frame, namely the anticipated, momentary, episodic, and cumulative time spans, sparked my contemplation [19]. I initially contended that there is another valuable time period that should be considered in user experience research; the accumulation of experiences prior to encountering the tested design. The paper ‘The Interaction-Attention Continuum’ provides a contribution to this presumed notion. Researchers Saskia Bakker and Karin Niemantsverdriet describe that there are different levels of attention when interacting with a design, or during experiences in general [2]. Accordingly, they describe this phenomenon as the interaction-attention continuum and divide it into 3 core levels; focused interaction, peripheral interaction and implicit interaction (Figure 1).

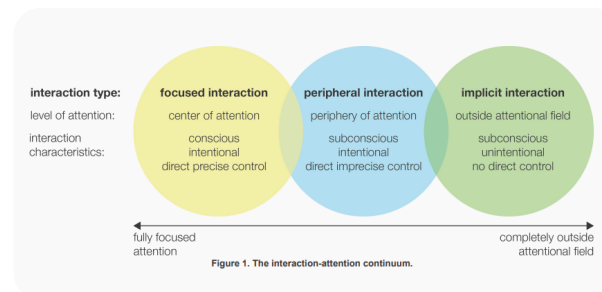


Figure 1. The interaction-attention continuum [2]

The paper further describes the possibility of interactions shifting between these 3 core levels, as interactions over time might e.g. become habitual [2]. Therefore, considering the user experience time spans, where the level of attention potentially plays a significant role, the additional factor of the prior accumulation of

experiences can further complicate the formation of a specific user experience. Based on the user, and where this user would rank on the interaction-attention continuum for each present aspect, a pertinent user experience is formed at that moment in time.

Following this realization, a fresh desire to acquire knowledge about the role of attention in user experience, particularly from a designer's perspective, surfaced. The article written by Martin Jancik about designing for human attention gave knowledge about how our attention operates on the human brain level. In conclusion of this article, it is explained that the focus of our attention is processed by our working memory; a rather small part of our memory system, capacity wise [15]. This part of our memory system, accordingly, narrows down its focus to the most relevant pieces of information;

*“Our brains receive about 11 million bits of data per second, but we’re only able to process roughly 50 bits per second.”*

— Martin Jancik, 2017

Consequently, our attention is selective, and perceptual or inattentive blindness should be avoided [15]. This could be achievable with various techniques, such as e.g. motion and contrast. Jancik lastly appeals to future designers that; “we should aim to design with interconnectedness in mind, for example by employing the gestalt principle of proximity” (Figure 2)[15].

In upcoming design challenges, I believe it

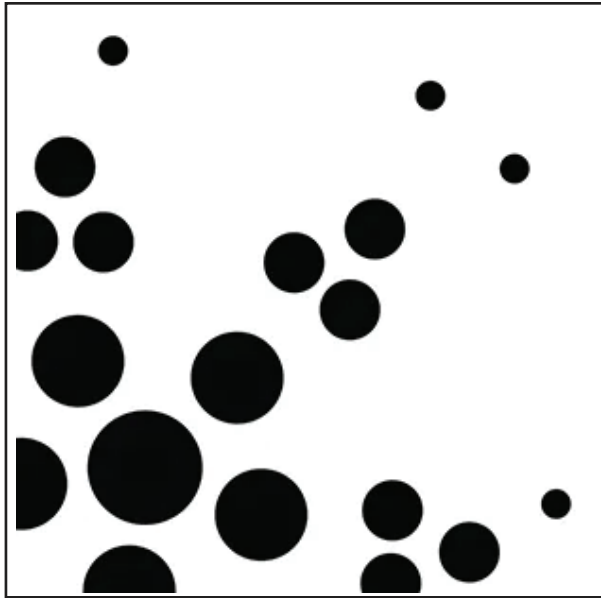


Figure 2 Gestalt principle of proximity. Circles closer together appear to be grouped [15].

would be valuable to incorporate greater specificity regarding the placement of the design on the attention-interaction continuum, and gain a deeper comprehension of how this can be impacted by various design methodologies. This approach namely, will aid in comprehending how a certain design shapes the user experience.

Human-centered design (HCD) however, is not always the solution. The paper 'Incremental and radical innovation: design research vs. technology and meaning change' gave a clear explanation on why this is the case [18]. The two types of innovation addressed in this paper; incremental and radical, both have a different build-up approach. Incremental innovation, tries to reach the highest point on the current

hill, such as iteration on already existing concepts. Radical innovation however, seeks the highest hill possible [18]. Subsequently, the implication for design is clear: Because HCD is a form of hill-climbing, it is only suited for incremental innovation [18]. Learning that, in order to create a vast amount of change i.e radical innovation, HCD is not the solution, fulfilled a designer's need that I didn't know I had. Understanding now, the blueprint and difference between these 2 types of innovations definitely has brought me a step closer to completing the understanding of the design field and its possibilities. Creating radical innovation within design, is a path in my imagination that is now unlocked.

## UNDERSTANDING UX

In order to understand UX in its foundation, a deeper comprehensive analysis is required. In the book 'Experience Design: Technology for All the Right Reasons', a simple model to gain better understanding of experiential products is visualized, asking the questions; why, what and how? [12]. Concentrating on the 'why?' gives the first notion on the mentioned foundation; the question is answered, namely, with the phrase "people satisfying a need" [12]. But what exactly are those 'needs'? According to the Cambridge Dictionary, needs are "the things you must have for a satisfactory life" [5]. The basic human needs model gives examples of the needs applying to every human being [20]. Remarkably, it is not the case that human needs in the literal way of existing, i.e. biological and physical needs; such as nutrition, air and shelter, are directly corresponding with the needs

in user experience design [7]. Examples of autonomy, security, self-esteem popularity influence, and luxury, are regarded as basic human needs as well [20]. Meeting these needs requires the creation of value during the experience. To put it simply, there is a correlation between the needs and values that are addressed in user experience design; "User experience is about how products or services enable us to carry out activities that are meaningful to us (value) by satisfying our basic needs" [9]. On top of that, the model 'Rethinking value in a changing landscape' (as described in the Philips Design Paper) demonstrates an even greater level of value across the history of innovation [4]. In this model, the historical legacy of value creation is described across four eras. Firstly, the 'industrial economy' is described as delivering value through a cycle of mass product consumption and industrial production, as people were driven to urbanisation [4]. The following era, labeled as the 'experience economy', led brands to focus on filling the need of lifestyle guidance and the lost void of identity that had been caused by this urbanisation [4]. Thirdly, the 'knowledge economy', focussed primarily on empowering people to create and share ideas, communicate with their peers and produce their own value through providing platforms [4]. Finally, the current "transformation economy" era emerged as a result of a shift in the global socio-economic mindset [4]. While the model serves as a guide for businesses that are seeking to adapt changing market conditions, it also provides valuable insight into the fundamental underpinnings of value creation in a current time. For example, placing a spotlight on the current era we're in, the 'transformation economy', reveals that a certain

value for the first time in history is desirable within areas of the user experience; namely environmental sustainability [4]. This value is currently realized through means such as e.g. sustainable food production, the use of sustainably produced materials and packaging, and the adaptation of electric cars powered by solar panels [6]. As a designer, I believe that it is necessary to keep abreast with the current and upcoming changing value creation time periods, in order to meet the needs of the user and create positive user experiences.

Furthermore, it is essential to note that humans are social beings, meaning that emotions and feelings are an inherent part of how people deal with the world [10]. As noted by scholars such as Wispé [22], defining empathy can be challenging and subjective, as there currently are nearly as many definitions as there are researchers studying it [23]. This complexity stems from empathy's two sides: the object of empathy, which encompasses the feelings, emotions, values, and motivations of the individual, and the mechanism of empathizing, which refers to the person who understands or makes decisions based on the object of empathy [10]. Subsequently, in the case of UX design, the target user is considered as the object of empathy, and the designer or researcher the mechanism of empathizing. Moreover, during the design process, the manner of empathizing from the designer's point of view could bias the actual emotions and feelings of the object of empathy due to the first person's perspective. In the paper 'Navigating empathy' this occurrence is addressed; junior designer D mentions that her

project approach came from a designer's and a user's perspective, due to having experienced the loss of a loved one herself [21]. The disadvantage mentioned, is the design outcome being based on a personal experience, rather than including the perspectives of multiple stakeholders [21]. In other words, there is a risk that a limited frame of reference may unnoticeably emerge from the viewpoint of the designer, resulting in a misfitting or even negative user experience. Therefore, I believe this aspect should not be underestimated during the design process, and needs to receive the right amount of required attention.

## JESI FBP PROJECT

For the integration of new insights regarding UX in previous work, I will reflect on my final bachelor project named JESI Visualizing Fruit Freshness (Figure 3). This project had been performed in the Transforming Practises squad of Industrial Design at the TU/e, and was directed towards reducing fruit waste in high-income countries, such as the Netherlands. Ultimately, the design can be seen as an abstract notifying visualization that lets the user stay in touch with the sweetness of fruit at every moment of its ripening process by portraying recognizable color combinations and transitions. Accompanied with the visualization, is a digital app, that can be opened directly when the user holds their phone close to a Tag that is located on the left side of the physical design (Figure 4). The app is implemented in the design concept in order to enable users to retrieve data of the ripeness of fruit through scanning smart labels



Figure 3 JESI Visualizing Fruit Freshness

in the supermarket, fore-see the ripening stages of fruit during its ripening process, as well as keep communication with family members within the household.

Reflecting on the design process with a fresh perspective made me contemplate the value that the design brings by fulfilling a specific need. Due to the design being an informative



Figure 4 Tag linked to JESI app

medium about the freshness of fruit, it had been investigated how this information could best be communicated in an effective manner. The decision was made to instead of using e.g. graphics or text, use color as an informative variable. This decision was based on implementing subconscious thought processes in the 'window of opportunity', i.e. in the first few seconds of seeing the visualization. Therefore, in order to fulfill the need 'competence' within the user; having the knowledge about their fruit freshness, the information is communicated with a natural aesthetic. As a result, the design delivers the value of 'clarity', since it can be easily understood when locking attention with the design, making the interaction efficient and effective.

Furthermore, in order to verify which colors are recognizable for each well-known fruit type in the Netherlands, an online quantitative questionnaire had been sent out to 27 voluntary participants. For 18 different fruit types, the question was asked to choose one or two colors out of a color scheme, selected on what they believed best portrays a particular fruit type (Figure 5). When analyzing the results, it became evident that some fruit types had distinct results of recognizable colors, whereas others were dependent on the individual.

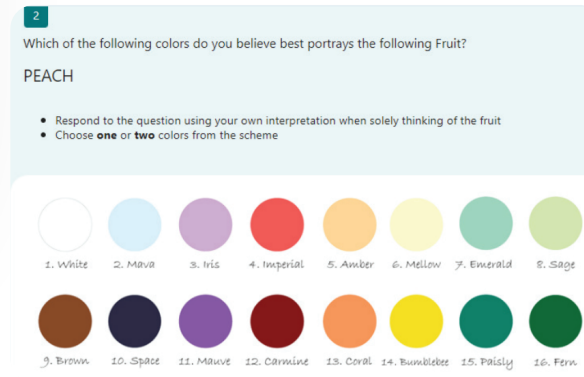


Figure 5 Online survey color recognition

While the online survey was utilized as a reference for selecting recognizable colors during the design process, a user test evaluating the user experience on the aspect of color recognition and learnability remained necessary. With the gained insights regarding UX during this course, I would employ the following methods for this UX evaluation. Firstly, in order to gain insight into the quality of the user experience I would focus on a qualitative evaluation method. I believe focus groups, instead of individual

interviews or questionnaires, could be used to obtain information verbally, as discussion from interaction with the design would be beneficial and advantageous. Namely, due to the design affecting higher levels of the subconscious mind, people might find it difficult to communicate their thoughts and feelings individually, but can more easily agree or disagree with others in a group setting. In addition, one or multiple iterated models can be created, and evaluation of the user experience can be performed utilizing carefully selected methods that focus on specific aspects of the design, such as e.g. the earlier mentioned learnability aspect.

Additionally, the contextual inquiry observation method could be employed to assess the usability of the design concept in which the user collects data with an app while in the supermarket. A focus will be laid on the 'aesthetics of interaction' aspect regarding the lay-out of the app, as well as the efficiency of the actions that are necessary. The role of the designer during the observation would be to not interfere with the participant during their actions, in order to be able to acquire valid results. Afterwards, the participant will be interviewed to gain qualitative data. Ultimately, when evaluating the quality of experience through obtaining qualitative data, a specific attention is laid on the fact if the design is able to provide value due to satisfying the needs of the user after iterated versions of the design concept. Lastly, particular emphasis is given to the impact of the first-person perspective on the subconsciously formed conclusions.

## UX PROPOSITION

*Leveraging the subconscious mind in UX design*

During the design process, research is key. Well-known methods in UX design are applied in order to gather the opinions of target users or stakeholders. Nevertheless, I am of the opinion that delving deeper into the subconsciously performed actions or associations, rather than relying solely on explicit verbal input, can enhance the alignment between the created value and the user's needs. When following the course 'Brain, Body & Behaviour', offered by the Psychology & Technology department of the TU/e, theory about i.a. the functional development of the brain, neural representations, and the manner of how humans remember had been addressed. Learning how input from the outside world is addressed and processed by our brains made me realize that an array of answers can be found here, regarding difficult UX challenges. As a designer, I strive to include the investigation of subconscious mental operations in the design process through researching the mental models of the target user. Methods that could be used for this investigation would be based on the insights provided from i.a. this course, and would depend on the context or the scenario. An example can be given within the earlier addressed design JESI Visualizing Fruit Freshness; in order for the user to directly understand an abstract visualization that displays fruit, color is used as an informative variable. This decision is made due to the subconscious processing manner of the brain; 50% of a

human's cerebral cortex is devoted to visual processing in the 'window of opportunity' concept, i.e. the first few seconds of locking attention [8]. As a consequence, the user is presented with direct information, resulting in an exceptionally effective user experience.

Due to the concept of the subconscious mind being so extensive, I still would very much like to progressively gain a better perspective on how this aspect could best be implemented in the design process. Furthermore, during the RDD master track of the TU/e, I have developed the intention to follow an internship in the second year of my master's at either Philips or Signify after being introduced to the 'second challenge' of this course. Exploring the potential of the subconscious mind in UX design in such an innovative corporation could help my personal investigation and would be incredibly interesting.

## REFERENCES

- [1] Berni Aurora & Borgianni Yuri. 2021. From the definition of user experience to a framework to classify its applications in design. *Proceedings of the Design Society*. 1. 1627-1636. 10.1017/pds.2021.424.
- [2] Saskia Bakker & Karin Niemantsverdriet. 2016. The Interaction-Attention Continuum: Considering Various Levels of Human Attention in Interaction Design. (n.d.). *International Journal of Design*. Retrieved February 12, 2023 from <http://www.ijdesign.org/index.php/IJ-Design/article/view/2341/737>
- [3] Olga Bias. 2021. Your subconscious mind creates 95% of your life. Thrive Global. Retrieved February 7, 2023 from <https://community.thrive-global.com/your-subconscious-mind-creates-95-of-your-life/>
- [4] Reon Brand & Simona Rocchi. 2010. Rethinking value in a changing landscape. A model for strategic reflection and business transformation. Philips Design. Retrieved March 1, 2023 [https://www.researchgate.net/publication/272941478\\_Rethinking\\_value\\_in\\_a\\_changing\\_landscape\\_A\\_model\\_for\\_strategic\\_reflection\\_and\\_business\\_transformation](https://www.researchgate.net/publication/272941478_Rethinking_value_in_a_changing_landscape_A_model_for_strategic_reflection_and_business_transformation)
- [5] Cambridge dictionary. 2023. needs. Retrieved February 16, 2023 from <https://dictionary.cambridge.org/dictionary/english/needs>
- [6] Aline Chahine. 2022. Innovative Examples Of Sustainable Design. Architecture Lab. Retrieved March 1, 2023 from <https://www.architecturelab.net/innovative-examples-of-sustainable-design/>
- [7] Alan Chapman, Maslow's Adapted 8-level Hierarchy of Needs (2001). ResearchGate. Retrieved February 21, 2023 from [https://www.researchgate.net/figure/Alan-Chapman-Maslows-Adapted-8-level-Hierarchy-of-Needs-2001-Source\\_fig1\\_313629895](https://www.researchgate.net/figure/Alan-Chapman-Maslows-Adapted-8-level-Hierarchy-of-Needs-2001-Source_fig1_313629895)
- [8] Jenn D. Connolly. 2015. The Color-Flavor Connection. Jenn David Design. Retrieved March 17, 2023 from <https://jenn david.com/the-color-flavor-connection/>
- [9] Harm Essen. 2023. User Experience Theory & Practice [24]. Industrial Design. Technical

University Eindhoven. Retrieved March 1, 2023 from <https://canvas.tue.nl/courses/21266/files/-folder/presentations?preview=4539871>

[10] Harm Essen. 2023. Part 1 User Experience DDM150 week 3 [3]. Industrial Design. Technical University Eindhoven. Retrieved March 8, 2023 from <https://canvas.tue.nl/courses/21266/files/-folder/presentations?preview=4620560>

[11] Experience Research Society. 2023. UX Definitions • EXPRESSO. EXPRESSO. Retrieved February 10, 2023 from <https://experiencesearchsociety.org/ux/ux-definitions/>

[12] Marc Hassenzahl. 2010. Experience Design: Technology for All the Right Reasons. Chapter 3. Retrieved February 10, 2023 from <https://www.interaction-design.org/literature/-book/the-encyclopedic-of-human-computer-interaction-2nd-ed/user-experience-and-experience-design>

[13] Interaction Design Foundation. (n.d.). What is User Experience (UX) Design? The Interaction Design Foundation. Retrieved February 10, 2023 from <https://www.interaction-design.org/literature/topics/ux-design>

[14] ISO. 2019. Ergonomics of human-system interaction — Part 210: Human-centred design for interactive systems. ISO 9241-210:2019. Retrieved February 10, 2023 from <https://www.iso.org/standard/77520.html>

[15] Martin Jancik. 2020. Designing for Human Attention – UX Planet. Medium. Retrieved February 12, 2023 from <https://uxplanet.org/de>

signing-for-human-attention-acoabe3d657d

[16] Lollypop Design. 2018. The Importance of Defaults — Leveraging the user's subconscious mind in design. Medium. Retrieved February 10, 2023 from <https://uxplanet.org/the-importance-of-defaults-leveraging-the-users-subconscious-mind-in-design-6ff4a235b55e>

[17] Gail Marra. 2022. 9 interesting facts about your subconscious mind – Gail Marra Hypnotherapy. Gail Marra Hypnotherapy. Retrieved February 10, 2023 from <https://www.gailmarra-hypnotherapy.com/9-interesting-facts-about-your-subconscious-mind/#:~:text=Today's%20science%20estimates%20that%2095,that%20lies%20beyond%20conscious%20awareness.>

[18] Donald A. Norman & Roberto Verganti. 2014. Incremental and Radical Innovation: Design Research vs. Technology and Meaning Change. Design Issues; The MIT Press. Retrieved February 16, 2023 from [https://doi.org/10.1162/desi\\_a\\_00250](https://doi.org/10.1162/desi_a_00250)

[19] Roto, V., Law, E. C., Vermeeren, A. P., & Hoonhout, J. (Eds.). (2011). User Experience White Paper: Bringing clarity to the concept of user experience. Outcome of Dagstuhl Seminar 10373: Demarcating User Experience

[20] Kennon Sheldon. Andrew Elliot. Youngmee Kim. Tim Kasser. 2001. What Is Satisfying About Satisfying Events? Testing 10 Candidate Psychological Needs. Journal of personality and social

psychology. 80. 325–39. 10.1037/0022-3514.80.2.325

[21] Wina Smeenk. 2019. Navigating empathy: empathic formation in co-design. [Phd Thesis 1 (Research TU/e / Graduation TU/e), Industrial Design]. Technische Universiteit Eindhoven. Retrieved March 17, 2023 from <https://research.tue.nl/en/publications/navigating-empathy-empathic-formation-in-co-design>

[22] Lauren Wispé. 1986. The distinction between sympathy and empathy: To call forth a concept, a word is needed. Journal of Personality and Social Psychology, 50, 314–321. doi:10.1037/0022-3514.50.2.314

[23] Jamil Zaki. 2014. Empathy: A motivated account. Psychological bulletin. 140. 1608–47. 10.1037/a0037679.