Alter users' experience through service design:

Enabling self-awareness and responsibilities

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Abstract

User experience is widely used in the field of service design. The definition of 'user' and the scope of experience varies from person to person depending on the context in which the word is used. In real-life situations, people are most of the time unconscious about their daily experiences. When people are unconscious about their behaviors, they may harm themselves as well as to the environment. Therefore, it is important for people to understand their experiences, and be more conscious and responsible in their daily lives. In order to explore the essence of experiences, this thesis focuses on individual users, trying to explore how service design can enable conscious and responsible user experience. Moreover, the thesis will discuss what the role of service design is in change making. Three participants were selected for the research. In-depth interviews and experiments were conducted for the collection of qualitative data. This thesis argues that it is possible to alter people's experience with the intervention of design, and service design could enable users to be more conscious and responsible. However, the change of experiences is profoundly related to the understanding of previous experiences. Thus, design interventions need to be implemented at the core layer of the previous experiences. Future studies can explore the topic on larger scale with an increased number of participants over an expanded period of time.

Keywords

service design, experience, participatory design, conscious, responsible, user, change making

Further information

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Contents

Preface

It seems pretty difficult for humans to change. People know it is harmful to smoke, yet few people quit smoke successfully. People know excessive eating leads to obesity, yet it is hard to resist the temptation of food. People also know the earth is facing global warming and energy crisis, but the dominant usage of fossil fuels has not changed. We have all source of solutions based on our collective knowledge, but our actions and perceptions are altering extremely slowly. One year ago, I started this journey of seeking for the answers that I have always inquired. How to change not only our behaviors, but our perceptions and thinking patterns which determine our behaviors? How design, specifically service design can help in the process of change?

This thesis is a presentation of this long process. It cannot articulate the joy and happiness for the path of inquiring, the fulfilment for contemplation, the frustration and loneliness for the writing process and the astonishment for the fruitful results.

I would like to thank my supervisor Melanie Sarantou for the useful, patient and supportive guidance during this whole process. I also wish to thank all of the participants who have openly and truthfully shared their life stories with me, without their cooperation I would not have been able to conduct this research.

To my parents, I would like to express my gratitude for the unconditional support of my study. Furthermore, I would like to thank my loved one, my friends and myself, who have kept me motivated serene whenever I lost the faith in myself.

At the end, I would like to thank the readers who are interested of reading this thesis.
I hope you enjoy your reading.

Mèngchí Shǐ
04.2019

1. Introduction

1.1 Overview

This thesis deals with the understanding of experiences of users, and aim to use service design intervention to change unconscious experiences to conscious and responsible actions. In the second chapter, the thesis will review the recent literature that are related to the topic, including the role of design, service design tools, user experience from the perspective of service design, and understand experience from the viewpoint of neuroscience, the impacts of environments are presented at the end of chapter two. Qualitative research and participatory approaches were used as the overarching strategies in the research. Interviews, experiment, and mapping methods were used for data collection. The detailed methodology is presented in the third chapter. The fourth chapter demonstrates the results of the research, discusses the major findings and reveals the self-reflexivity. The outcomes of the research that is presented is important for individual users and service designers to understand experiences in real-life situations and for discussions on the relationship between the sense of consciousness and responsibility. A detailed discussion is demonstrated in chapter four, followed by the conclusion and recommendations.

1.2 The topic under investigation

Design as a means of change making is constantly shaping our physical body, the environment, as well as the intangible world. Design impacts on how we live, think and perceive (Papanek, 1997; Krippendorff, 2004). In recent years, design shifts its focus from producer-based to user-oriented, experience-based (Norman, 2004; McDermott, 2007). Service design in particular provides a means to understand users' perceptions and behaviours by creating meaningful experiences together with the users (Stickdorn & Schneider, 2011). In design practice, numbers of tools are used to engage and understand the users, as well as users' behaviors and experiences (Berg, 2004). Mapping techniques, such as journey and stakeholders maps, enable designers to unfold the experiences of users, and understand the variables that influence the experiences (Stickdorn, Hormess, Lawrence, & Schneider, 2018).

Experience, on the other hand, is a complex concept in the design sector. It consists of sensory perceptions, emotions, and it can be influenced by people's values, needs, desires, and their environments (McCarthy & Wright, 2004). Neuroscience offers us another interpretation of experience. Our brain receives information input from the outside environment, the sensory organs send the signals to our brain. After the brain has processed the signals, it gives an output in a form of behaviours to react to the environment. Our brain will learn to make sense of our surroundings through the feedbacks of the environment (Eagleman, 2015). However, most of the time people are unconscious about their experiences, including the incoming information, and the actions (Blakemore & Frith, 2003). This thesis will explore if service design can be implemented as an interface, offered not only to designers, but also

the users, a better understanding of experience, and create a conscious and responsible way to interact with their surroundings.

1.3 The significance of this research

This research can be implemented by individuals to understand their daily experiences, offering them the capacities to clarify the impact of influences on their lives. Also, this research expands the range of participation for users and designers by enabling designers to experience with the users. Moreover, this research explores practical means through which designers can work with users by co-creating a conscious experience for users in their everyday lives as it is essential for understanding the role of design in a real-life change making.

1.4 Research questions and methodology

The aim of this research was to provide an understanding of the participants' experience in a descriptive and comprehensive way, both for the researcher and the participants themselves. Moreover, the experiment was designed to engage and motivate participants to be more aware of the experiences in their life. Thus, a qualitative research combined with the participatory approach was the appropriate choice regards to conducting the research.

The research questions are

How can service design enable conscious and responsible user experience?

What is the role of service design in change making?

Qualitative research and participatory approaches were used as the overarching strategies in this research. Experiment, interviews, narrative inquiry, field notes, along with mapping techniques were implemented as the methods for data collection. Audio documents were recorded during the experiment and interviews. A small number of participants were purposefully and randomly selected as sampling for this study. A detailed presentation of the experiment is demonstrated in the Methodologies chapter.

1.5 Limitations of the research

This research contributes to users and service designers a comprehensive and systematic understanding of experience in a real-life situation and propose a method for change making. However, the concept of user is restricted to individuals. Thus, a wider range of users, such as a group of people or a community, is not included in the aim of this research. Due to the intensity of the data collection process over a series of workshops, design interventions and interviews with the participants, the research adopted a focus on individuals. This research can be extended to groups in the future.

2. Literature review

This chapter focuses on recent literature that was reviewed related to the research topic and divided into two sections. The first section deals with the role of design. Firstly, it presents the discussion in literature regard to the function of design in change making, from tangible change, such as tools and environmental change (Heskett, 2005), to intangible change, for instance, the change of our experience and way of thinking (Krippendorff, 2004). Secondly, it demonstrates the literature on design as a mediator, bridging the gap between people, culture, and our environment (Papanek, 1995), also presents the tools and methods in the design sector. Lastly, it discusses the relationship between awareness, responsibilities, and consequences in the practice of design. The second section of this literature review presents the insight on the topic of user and experiences. At the beginning of this section, it clarifies the term of stakeholder, user, and customer. Later, it presents the scope of user experience and the dynamics of experience in the design sector. The last part of this section deals with a broader definition of experience, from the perspective of neuroscience, and discusses the environmental impacts that shape people's experience.

2.1 The role of design

The emphasis of the role of design has been shifting throughout human history, from basic tool making to the environmental change on large-scales, from mass production to human-centred approach, design as the human capacity to altering the objects. Our surroundings as well as ourselves, plays an important, transformative role of the world that we live both at the present, and for the future (Papanek, 1997; Heskett, 2005).

2.1.1 Design in change making

Although we have been influenced by the activities of design for several centuries, some people see design is a rather recent phenomenon, stemming from the Industrial Revolution and mass production (McDermott, 1997). The Industrial Revolution has changed manufacturing techniques and processes, turning away from handicrafts to machine-driven mass production. The role of design in business evolved since the 19th century as designers emerged and quickly adapted to the industry and mass market, adopting design was seen as a means to increase capital and consumption (Perks, Cooper, & Jones, 2005; McDermott, 2007). Christopher Dresser was an important independent designer who created design for mass production, industrial designers such as Raymond Loewy, and manufacturing organizations were working on durables (cars, trains, hardware) for the market demand (McDermott, 2007). Gradually, people realized that to be commercially successful, designers should directly interact in the user's environment, to identify the potential needs of users and customers. Strategies such as empathetic design emerged as effective means to understand consumers (Leonard & Rayport, 1997).

In recent years, the design practise has shifted its emphasis from tangible products to intangible elements and more human-centred factors have been taken into consideration in the research and design process, such as human's intrinsic motivation, emotions and experiences that evolved through the use of certain products, systems and services (Krippendorff, 2004). Design fields such as user-centred design, service design and most recently the overarching field of human-centred design have evolved and thrived (Giacomin, 2014).

Stemming from fields such as engineering, ergonomics and computer science, the term user-centred design was originally used as an approach for better interaction between end users and machines (Norman & Draper, 1986). However, Gasson (2003) points out the limitations of user-centred systems by arguing that it has predetermined functions and usage patterns, which confined the human's interests in further interaction and exploration with the products, system or services. In the evolution of design practise, people have noted the importance other than ergonomics and human factor, such as the identification of users (stakeholders) and understanding of the contexts of use (Marguire, 2001). Moreover, emotional engagement also was identified as an essential element in the design process (Jordan, 2003; Norman, 2004). Some researcher (Krippendorff, 2004) suggests that object-oriented design is not viable because it only considers the extrinsic motivation, thereby ignoring the intrinsic motivation of users. The extrinsic motivation, which focuses on the means to reach goals, end results and functions serve for rationality and efficiency. It is motivated through the external world as well as social norms. The intrinsic motivation, on the other hand, is in one's personal values, attitudes, and meanings of one's life, regardless of the outcome or achievement, simply enjoy the process of engagement of being involved. Therefore, as Krippendorff (2004) claims, human-centredness is a design and research approach, which justifies the relationship between human behavior and understanding, that how people perceive and relate to the artefacts in their own terms, have huge impact on how they use it.

In recent years, the human-centred design approach has been wildly used and valued in businesses (Verganti, 2009). Studies (Von Hippel, 2007; Aaker, 2002; Hatch and Schultz 2008) have shown that understanding the emotional, perceptional and cognitive needs of the users is vital for the success of the business. Service design evolved under the condition of the transformation in design and economy. It is a multidisciplinary, empathetic, and iterative platform to meet the needs of various of stakeholders in the developing and using process of certain service (Moritz, 2009). The service sector is clearly different from the traditional manufacturing sector as services are not tangible, thus they cannot be transported nor stored. They are rather an ongoing processe, and often the production and consumption process appear simultaneously in a service. Thus, they are difficult to measure, especially the quality level of the service (Hollins, Blackman & Shinkins, 2003).

However, there are concerns that the design sector in its real use is not aiming to address human needs, but rather aims to stimulate the human desires. Fields such as advertisement and industrial design are

aiming to stimulate humans' desires of possessions in order to contribute to the economic growth. But the ecosystem is excessively consumed by placing the human's desires in the centre of design (Papanek, 1985).

Papanek (1995) notices the destruction that design activities can make cause, especially to our natural environment. He suggests that all design agencies must include ecological view, thus only a multidisciplinary design approach can lead us to a sustainable future. Plumwood (2001) points out that it is unsustainable and arrogant for humans to perceive the world in a dualistic human-centred viewpoint. The term *Anthropocentrism* is an attitude that accepts that humans are the most important species on this earth, and the value of nature is only valuable when it serves human interests (Casas & Burgess, 2012). Norton (1995) argues that *Strong Anthropocentrism* equals *Anthropocentrism* and that *Weak Anthropocentrism* has similar values to environmentalism, which is to behave in a way that benefits both humans and nature. Yet, from an *ecocentric* viewpoint, anthropocentrism ignores the intrinsic value of nature, independent of human developmental needs. It is the respect, awe and love for the environment embedded in the ecocentrism and distinguish it from anthropocentrism (McShane, 2007). The interaction between human and nature is inevitable, whether it is from the perspective of anthropocentrism or ecocentrism. However, these two modes of understanding contribute to different motivations that can lead to different experiences and consequences (Goralnik & Nelson, 2011; Diehm, 2008). It is crucial to expanding people's awareness, and presenting alternative choices in design education and activities, which widen visions and brings better planning and decision making to our futures (Papanek, 1995).

2.1.2 Design as a mediator

The function of design is no longer merely the means to produce, it is widely accepted that design should be the mediator, understand how to build the bridge between various of stakeholders; design has gradually become a means of inquire, trying to understand each stakeholder and translate the information into the common language so that everybody can communicate. Moreover, design has become the means of balancing the relationship between humans and nature (Moritz, 2009; Krippendorff, 2004; Papanek, 1995)

In the context of the market and business, the role of design needs to be seen as the bridge between organization and users, in other words, design needs to provide the linkage between production and use (Heskett, 2005). Design was seen as the platform of the translation of different values and needs: users, designers, engineers, scientists, and other kinds of stakeholders are various in the understanding of the world, it is the essential role of design to translate the internal perceptions of stakeholders into solutions for better usage (Krippendorff, 2004; Heskett, 2005).

With shifts in design focus, co-creation has become one of the principles of service design practice (Stickdorn et al., 2011). Co-creation refers to the conversation and interaction between users and supplier. Research suggests that the value of the product (service and system) embedded in the understanding of users, and learning how to enable users to co-create values, is essential for engaging users in the whole process of development of the products. This includes designing, producing to delivery and consuming duration, which enable users from the traditional passive accepting to active involving (Vargo & Lusch, 2004; Grönroos, 2000). The study (Prahalad & Ramaswamy, 2004) proposes that the meaning and creation of value are in the personalised user experiences. Co-creation offers the transparent information, networked community, engaged dialogue and understanding between users, companies and user communities. Users are empowered and active in the experience of co-creating the values, the value is embedded in the unique experience that users have in the co-creation process, the experience is what makes the product (service and system) meaningful to them (see Table 2.1.2.1). As Krippendorff argues that, "Humans do not respond to the physical qualities of things, but to what they mean to them" (p.8-9).

WHAT CO-CREATION IS NOT	WHAT CO-CREATION IS
• Customer focus • Customer is king or customer is always right	• Co-creation is about *joint* creation of value by the company and the customer. It is not the firm trying to please the customer
• Delivering good customer service or pampering the customer with lavish customer service	• Allowing the customer to co-construct the service experience to suit her context
• Mass customization of offerings that suit the industry's supply chain	• Joint problem definition and problem solving
• Transfer of activities from the firm to the customer as in self-service • Customer as product manager or co-designing products and services	• Creating an experience environment in which consumers can have active dialogue and co-construct personalized experiences; product may be the same (e.g., Lego Mindstorms) but customers can construct different experiences
• Product variety	• Experience variety
• Segment of one	• Experience of one
• Meticulous Market research	• Experiencing the business as consumers do in real time • Continuous dialogue
• Staging experiences	• Co-constructing personalized experiences
• Demand-side innovation for new products and services	• Innovating experience environments for new co-creation experiences

Table 2.1.2.1 The concept of co-creation.

Descriptive phrase that serves as title and description. Adapted from "Co-creation experiences: The next practice in value creation", by C. K. Prahalad et al., 2004, *Journal of interactive marketing,* 18(3), 5-14, p. 8.

Design has also been widely used in scientific academic research fields, design as research plays an important role for understanding and learning the world, as well as ourselves (Heskett, 2005). The common use of design in research is to serve as a means for testing theories and to implement, evaluate and eventually refine the theories (Cobb, 2001). The evolution of the role of design in research is, it is not only for testing, evaluating theories, but also the means to be involved in the development of theories. This approach allows design researchers to learn and reflect from their hypotheses and outcomes, therefore justifying the theories through the understanding of design experiments (Van den Akker, 1999; Brown, 1992). Furthermore, in recent years and in theoretical levels, design research has

been seen as an opportunity for reasoning to indicate the patterns and their interrelated impacts on a broad, contextual scale (Heskett, 2005; Edelson, 2002).

In understanding the relationship between human needs, culture and ecology, design plays its role as a bridge between three elements (Papanek, 1995). It is widely acknowledged in the fields of ecological engineering, ecological design and resilience design. Humans are dependent on the ecosystem, the increasing scale of the interaction between humans and the nature has made severe damage and stress to the global ecosystem. Through these practices, a theoretical framework and a series of overarching principles of design, people were able to enhanced their understanding, thus adapting and problem solving in their living environments (Bergen, Bolton, & Fridley, 2001; Shu-Yang, Freedman, & Cote, 2004; Curtin, 2014). Hester (2006) argues that in order to understand and solve real world problems, design needs to integrate interdisciplinary with community-based approaches. A shift from design as a means to provide goal-oriented sustainability is required to design as a means for the expression of the relationship between humans and nature. On the one hand, design enables the interaction and participation among communities, offering the accessibility of ecological information in a social context. On the other hand, design can encourage the interconnection of social and ecological life. The role of design is to build a platform of a hybrid of the collective shared experience, public participation and the assistant of science (Hester, 2006).

Accompanied by the role change of design towards a more human-centred and co-creative approach, changing roles of designers, which requires designers to become enablers by engaging users to co-create products or services, adapting them to their needs, users have become co-producers in chains of value (Heskett, 2005; Howard & Melles, 2011). In the context of mass-production, designers focus on the aesthetic as well as the function of the product, which potentially can maximise the profits for companies (Grant, & Fox, 1992). In the context of engineering, designers are solution oriented. They are free to explore different possibilities, and get to find solutions and define the function of the product (Rittel & Webber, 1984). In contrast, the changing of designer-ship implicates that designers should be the supporters for users to learn, but not to perform the main act during learning. Users are enabled to shape their experiences. Thus, designers should be participating as team members, therefore placing emphasis on the users (Bradburne, 1999).

One case study (Howard et al., 2011) demonstrates that there are four roles that designers can play in a complex project, those being the *design lead*, *teacher*, *facilitator* and/or *director*. Working in a complex project often requires the skills of a multidisciplinary team. Design lead implies that in the context of co-creation, a designer offers the platform for multiple team members to communicate with each other. Thus, the role of designer is to guide a team, being able to engage various stakeholders to co-create (Owen, 2006), rather than the conventional solo design professional role.

Design is a learning process (Dym, Agogino, Eris, Frey, & Leifer, 2005). Designers should take up the role as a teacher to assist with thinking and iteration within the design process as it will allow stakeholders to learn through the active participation in the design experience rather than passively accepting by explaining. This illustrates that the design process is part of educational procedures. Designers as facilitators provide an intangible environment for stakeholders. The design process relies on empathic listening, and mindfulness from designers, it assures that each participant feels safe, being valued and engaged, in the process of co-creation. The director role serves to create an orchestrated experience, especially during the prototyping phase. Designers offer participants a direct experience, of the enriched prototypes, this can help them to immerse in the setting of an environment. Furthermore, direct experiences provide participants a new way of perceiving the world. The dynamic roles require designers to switch their focus flexibly and respond to the design process accordingly, which allow creating successful co-design outcomes (Howard et al., 2011).

There are numbers of tools (see Diagram 2.1.2.2) that are used in the practice of service design. A service design toolbox is constantly developing with the growing of the human-centred, multidisciplinary approaches. These tools are means to help service designers to understand the problem, as well as the stakeholders in a complex context. Moreover, the tools offer flexibly form the appropriate combination of tools for different design phase to accomplish the design tasks (Berg, 2004; Alves, & Nunes, 2013; Stickdorn et al., 2011).

Diagram 2.1.2.2 Service design tools.
Adapted from *Service Design Tools*. Retrieved from http://www.servicedesigntools.org/repository

Giacomin (2014) argues, based on the purpose of use, that design tools can be sorted into three categories. The basic form of a tool is the means to collect data and form models based on ergonomics or human factors. The second category offers the verbal or non-verbal forms for the interaction with people to navigate the meanings, as well as the imperative and potential needs. The last column of tools are used for create the feasible outcomes in a reflective and debatable manner.

Similar ideas are revealed in a taxonomy of models (Mendel, 2012) (see figure 2.1.2.3), the role of models vary in different context of objectives in each phase of the design process, the models organized in 4 steps during the design procedure: D*iscover, Reframe, Envision* and *C*r*eate*. Discover and reframe phases serve for understanding the context and conduct an analysis in-depth, the third step is also exploring for the possible solutions, but in a conceptual phase, the purpose of envision is to evaluate and priotitize for the ideal outcomes, the next step is the actualisation of the concepts, testing prototypes in an iterative cycle.
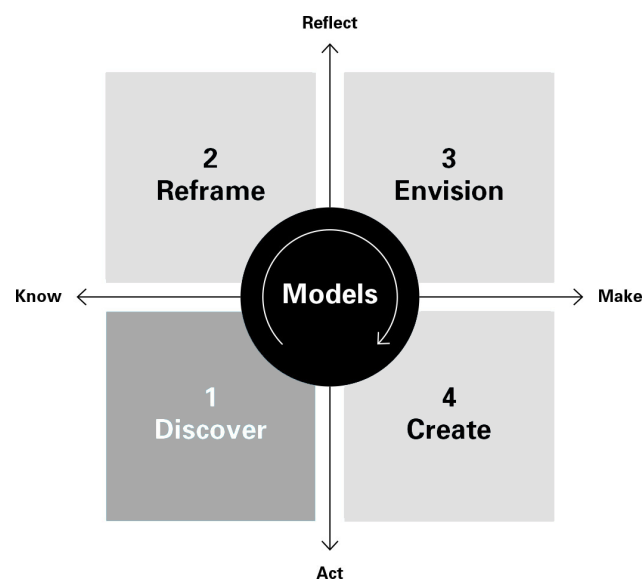
Figure 2.1.2.3 A taxonomy of models.
Adapted from "A taxonomy of models used in the design process," by J. Mendel (2012, p. 2).

Stickdorn et al. (2011) offer a slightly different order of the approaches, which are *Explore, Create and Reflect, Implement*. The stage of exploration is the fundamental step in a project, it is the means of discovery, empathic understanding each stakeholder in order to target the new perspectives of the project. Thereafter, the creation part focuses on visualizing concepts and plans, whereas reflection responsible for testing and evaluating these ideas. Prototyping is also included in this phase. The implementation phase is for transferring the concepts into actions as it needs to engage customers, staff and all the other relevant stakeholders in the new process of change. Furthermore, the consequent problems that occur at this stage, can be solved accordingly. It should be noted that the whole developing process is iterative approach itself, to ensure that designers can learn from the previous repetitions.

Participatory design (PD) as an approach that plays an important role in service design practice as part of the democratic movement of the Scandinavian countries. Participatory design evolved from the political context of the 1970s (Ehn & Kyng, 1987; Gregory, 2003). The standpoint of participatory design is to addressing the equal contribution both designers and the relevant stakeholders can make to the project by considering diverse users during the design developing period (Bjögvinsson, Ehn, & Hillgren, 2012). Unlike the user-centred design approach, which emphasises "design *for* users", participatory design changed the attitude to "design *with* users" (Sanders, 2003, p.18). This attitude blurs the boundary between designers and users (Luck, 2003; Titlestad & Braa, 2009). Another understanding of this blurring is a "hybrid Third Space" (Muller, 2003, p.11), which is an environment for various participants to exchange their information and needs. Designers, as part of the participation process, offer tools to users and together they create a common language to achieve effective learning, communicating and engaging with each other (Titlestad et al., 2009; Sanders, 2003). As the participatory design approach has been making contributions in business, the public sector and research contexts, it is crucial to target the effective and appreciated means of involving all kinds of stakeholders from different social context, experiences, values and professions in the project (Sanders, Brandt, & Binder, 2010).

Scenario techniques, such as drawing, prototyping, mock ups are the dominant means offered to engage participants. At the same time, more concern has been given for the non-designers to demonstrate their needs. A certain framework (see Table 2.1.2.4 and Table 2.1.2.5) has been provided to discuss the use of participatory design tools and methods, sorted into three categories: *form*, *purpose* and *context*. Form reveals the means have been used in the interactions between the participants in the event, while purpose is the reasoning of certain methods that have been used in this research project. The context addresses the setting of the participation process as it has been taking place (Sanders et al., 2010).

TOOLS AND TECHNIQUES	PROBE	PRIME	UNDERSTAND	GENERATE	CURRENT APPLICATIONS OF THE TOOLS AND TECHNIQUES	INDIVIDUAL	GROUP	FACE-TO-FACE	ON-LINE
MAKING TANGIBLE THINGS					**MAKING TANGIBLE THINGS**				
2-D collages using visual and verbal triggers on backgrounds with timelines, circles, etc.	X	X	X	X	**2-D collages** using visual and verbal triggers on backgrounds with timelines, circles, etc.	X	X	X	X
2-D mappings using visual and verbal components on patterned backgrounds		X	X	X	**2-D mappings** using visual and verbal components on patterned backgrounds	X	X	X	
3-D mock-ups using e.g. foam, clay, Legos or Velcro-modeling			X	X	**3-D mock-ups** using foam, clay, Legos or Velcro-modeling	X	X	X	
TALKING, TELLING AND EXPLAINING					**TALKING, TELLING AND EXPLAINING**				
Diaries and daily logs through writing, drawing, blogs, photos, video, etc.	X	X	X		**Stories** and **storyboarding** through writing, drawing, blogs, wikis, photos, video, etc.	X	X	X	X
Cards to organize, categorize and prioritize ideas. The cards may contain video snippets, incidents, signs, traces, moments, photos, domains, technologies, templates and *what if* provocations.			X	X	**Diaries** and daily logs through writing, drawing, blogs, photos, video, etc.	X		X	X
ACTING, ENACTING AND PLAYING					**Cards** to organize, categorize and prioritize ideas. The cards may contain video snippets, incidents, signs, traces, moments, photos, domains, technologies, templates and *what if* provocations.	X	X	X	
Game boards and **game pieces and rules** for playing		X	X	X	**ACTING, ENACTING AND PLAYING**				
Props and **black boxes**			X	X	**Game boards** and **game pieces and rules** for playing	X	X	X	
Participatory envisioning and enactment by setting users in future situations				X	**Props** and **black boxes**	X	X	X	
Improvisation				X	**Participatory envisioning and enactment** by setting users in future situations	X	X	X	
Acting out, skits and **play acting**			X	X	**Improvisation**	X	X	X	

↑ Table 2.1.2.4 The tools and techniques of PD organized by form and by purpose.

Adapted from "A framework for organizing the tools and techniques of participatory design," by E.B.N. Sanders et al., 2010, In Proceedings of the 11th biennial participatory design conference. p. 2.

↗ Table 2.1.2.5 Current applications of the tools and techniques of PD described by context.

Adapted from "A framework for organizing the tools and techniques of participatory design," by E.B.N. Sanders et al., 2010, In Proceedings of the 11th biennial participatory design conference. p.3.

Visualization is an essential technique and a way of thinking in service design practice. Design tools, such as *Customer Journey*, *Stakeholders Map*, Service *Blueprints*, *Mobile Ethnography*, are helping designers to understand users and their context, while enhancing the communication with each stakeholder through a visualized common language (Stickdorn et al., 2011; Alves, et al., 2013). Segelström and Holmlid's (2009) study shows that visualization tools are frequently used in the user research phase and in the early stage of the design process. Visualization can help to convey the abstract, raw data into a descriptive, tangible understanding of users and the context. At the same time, it can be used as a communication tool to interpret the design concepts and process with the relevant stakeholders.

Other research (Mdes & Yeager, 2010) shows visualization is not only a tool for understanding and communicating of information, but also a tool for thinking, acting and testing the solutions as it has a dynamic role throughout different design phases while serving for different purposes. Moreover, one study (Diana, Pacenti, & Tassi, 2009) summarizes the main forms of visualization into 4 categories, and analyzes their "purpose, features and languages" (p.65), "in terms of level of iconicity and relation with time" (p.65) (see Diagram 2.1.2.6). According to a study by Diana et al. (2009), maps and flows, such as mind maps and customer journey maps, are represented in an abstractive way to simplify the design process and system. At the same time, they convey symbolic meanings, whereas images and narratives, mood boards and story boards, are more descriptive and detailed about the experience and atmosphere of the service. On the other hand, flows and narratives represent the service sequence, whereas maps and images can visualize the immediate scene of the service. Visualization is not only a tool for use by researches, but information visualization is essential for the human cognition of perceiving, processing, analyzing, relating and acting to the given information, it is important to acknowledge the relationship between information visualization and human awareness (Agutter, Drews, Syroid, Westneskow, Albert, Strayer, Bermudez, & Weinger, 2003; Fayyad, Piatetsky-Shapiro, & Smyth, 1996; Livnat, Moon, Erbacher, & Foresti, 2005).
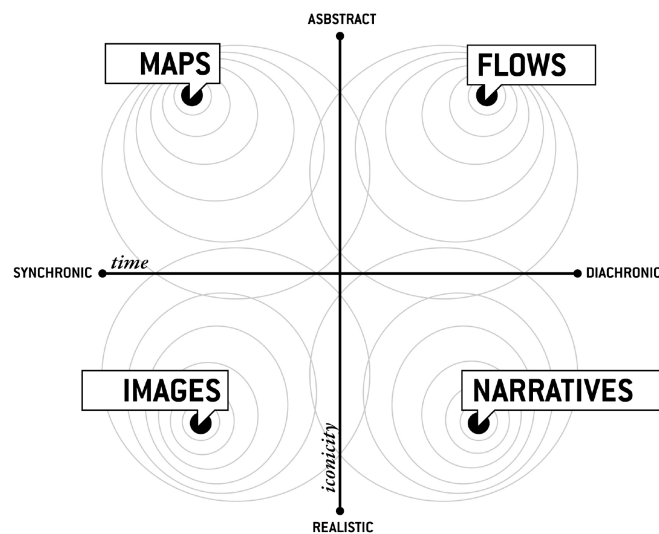
Diagram 2.1.2.6 Visualization forms.
Adapted from "Visualtiles: Communication tools for (service) design," by C. Diana et al., 2009, *DeThinking Service; ReThinking Design*; 24-26, p.68.

2.1.3   Awareness, consequences and responsibilities

Design is not merely a means to produce materials and services, it also produces meanings and values in the social context, it is constantly shaping the environment as well as the culture that we are living (Halprin, 1989; Hester, 1989; Horne, 1986). In the real-world, designers and manufacturers, are often operating without a comprehensive understanding of their actions and its consequences (Grant et al.,

1992; Heskett, 1993). It has been claimed that part of the responsibility of designers, is to ensure the products or services are accepted by the market. Yet more profoundly, designers must have their own ethical judgement and invest in the social and environmental consequences of design intervention, both in the past and the future. However, design itself cannot take the responsibility for all the human impact in our time, it needs the raising of individual, as well as the public awareness (Papanek, 1985; Heskett, 1993).

Research (De Groot & Steg, 2009; Stern, 2000; Steg, Dreijerink, & Abrahamse, 2005) about the relationship between consequences, responsibility and prosocial behaviors, suggest that the sense of responsibility comes after the awareness of the consequences regarding one's actions. This responsibility reinforces one's moral obligation, which raises the prosocial behaviors and motivations through personal norms (see Figure 2.1.2.7). The results of a series of experiments conducted by De Groot & Steg (2009) indicates firstly an increase the awareness of the consequences, then focuses on the responsibilities for the problem and finally, enhance moral obligations that would lead to prosocial actions.
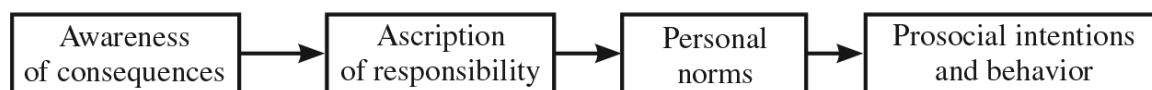
Mediator model

Figure 2.1.2.7 *Norm Activation Model* of prosocial behavior as mediator.
Adapted from "Morality and Prosocial Behavior: The Role of Awareness, Responsibility, and Norms in the Norm Activation Model," by J. I. De Groot et al., 2009, *The Journal of social psychology*, p. 427

Awareness refers to an understanding of a status quo in the present time that is based on evidence and experiences (Awareness, n.d.). One of the major aspects regarding conscious experience is that one is being aware of conducting and dominating his own actions. Yet, evidences (Libet, Gleason, Wright, & Pearl, 1983; Haggard & Magno, 1999) have shown that, in fact, our awareness appears after the action has been taken place, unless the action is anticipated in our brain. In other words, "Many aspects of action occur without awareness" (Blakemore et al., 2003, p. 223). Moreover, people can be aware of the expectation of the sensory consequences of their movements, yet, not the actual movements (Fourneret & Jeannerod, 1998).

To perform and operate in an effective manner in our daily activities, it requires people to have a conscious attention to the dynamic environment and situation, it is essential to have a good situational awareness in decision making and human performance (Endsley,1995). Endsley (1988) defines *situational awareness* as the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and a projection of their status in the near future. There are

three main components in the situational awareness. The first step is to perceive the relevant data in the environment. The second step is to target the current goals according to the understanding of the given information, while the final step is to anticipate the future status through the knowledge and awareness of the information and situation (see Figure 2.1.2.8). It is suggested that insufficient situational awareness increases the chance of obtain an undesired result (Jones & Endsley, 1996; Durso, Truitt, Hackworth, Crutchfield, & Manning,1998). Two main strategies are suggested to improve situational awareness. First, through the system and interface design to optimize the input of information and reduce the workload for human operators (Endsley, 1995). However, some studies suggested that situational awareness is a cognitive skill (Gaba, Howard & Small, 1995) that can be taught through training, as well as management programs among individuals and organizations (Salas, Prince, Bowers, Stout, Oser & Cannon-Bowers, 1999).
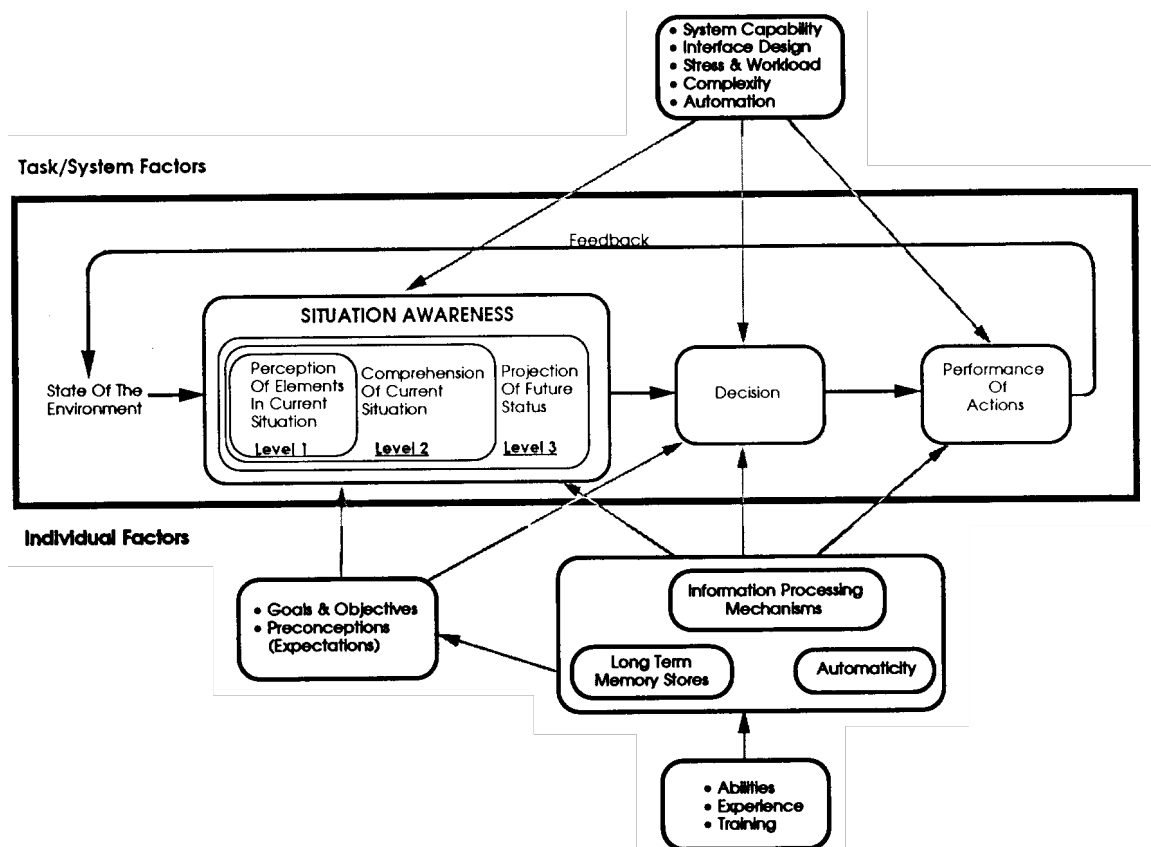
Figure 2.1.2.8 Model of situation awareness in dynamic decision making.

Adapted from "Situation awareness global assessment technique (SAGAT)," by M.R. Endsley, 1988, In Aerospace and Electronics Conference, p. 35.

2.2 Users and experience

In the previous sections, the roles of design and designers, various design tools, and the awareness of the consequences of design activities, were discussed. The next section will explore the clarification of stakeholders, users, and customers, the definition of user experience, the understanding of experience from the standpoint of neuroscience, and the environmental impacts on our experiences.

2.2.1   Stakeholder, users, customers

The term *Stakeholder* has been defined as any group or individual who has interrelated effected by the outcome of the goal within an organization (Freeman, 1984). Some authors suggest that *Stakeholders* should be sorted into different categories, from the perspective of engineering (Kotonya & Sommerville, 1998). Stakeholders have been categorized by their different goals in an engineering system, those who are affected by the system in the organizational process, such as end-users and managers. Those who are responsible for the progress and preservation of the system, such as engineers. Those who will use the system, for instance, customers; and last, regulators and exports from different fields are the external stakeholders. From the project management point of view, it (Hughes & Cotterell, 1968) suggests that, there are three categories in stakeholders: a) internal to the project team, means people who are directly under the control of the project leader, b) external to the project team but within the same organization, this type serves as the information management group or assistance for system testing, c) those who are external to both the project team and the organization, such as customers which will be using the system and contractors which will conduct the work for the project. Other authors propose that each stakeholder has different interests, motivations and roles (Sharp, Finkelstein, & Galal, 1999; Stickdorn et al., 2011).

However, they are also interrelated and intercommunicate with each other, it is important to identify and visualize not only the feature of each stakeholders, but also the relationship between stakeholders and between each stakeholder with the system. Sharp et al. (1999) propose an approach, to demonstrate the interaction between each stakeholder. The baseline stakeholders constituted by users, developers, legislators, and decision-makers. Supplier stakeholders are responsible for providing information and assisting works. The last group of stakeholders is called satellite, they interact with baseline stakeholders in various ways, such as communication, and search for information.

The term *User* is widely used in design sector, often people define *user* as those who directly interact with the system, products or service (Preece, Rogers, & Sharp, 2002). Holtzblatt & Jones (1993) suggest that *users* are those who manage direct users, those who receive products from the system, those who test the system, those who make the purchasing decision, and those who use competitive products. Eason (1987) identifies three types of users: primary, secondary, and tertiary. The primary users are those who most frequently use the system (products or service), the secondary users are occasionally use it or use it through an intermediary, the tertiary users are those who affected by the use of the system or make decisions about its purchase.

Although there are various kinds of people who are relevant in the system, the range of *user* or *stakeholder* is quite broad, yet, it is unnecessary to take all the stakeholders in the consideration of the design developing process, rather to make decision of who should be involved and to what degree (Preece et al., 2002).

The content of user varies according to the given scale. Hein et al. (2006) argues that the services within an ecosystem can be divided into different ecological scales, which expands the range of stakeholders, from individual to the global scales (see Diagram 2.2.1.2). Note that the term *user* in the *Discussion* section of this thesis is only focused on the level of the individual.
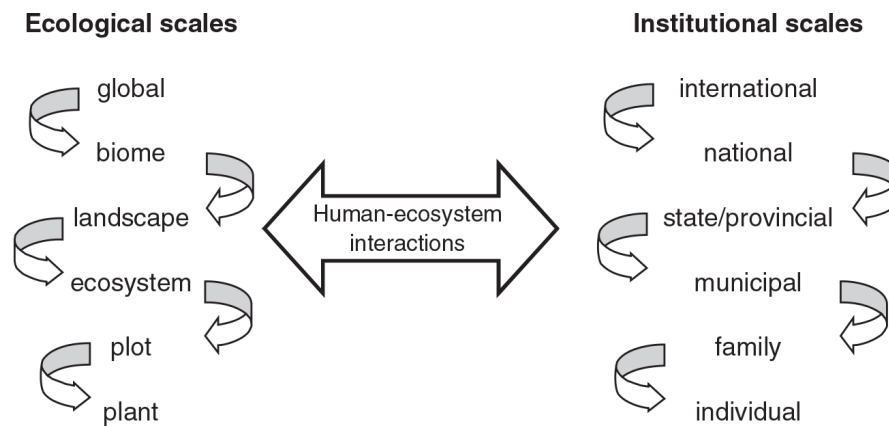

Diagram 2.2.1.2 Selected institutional scales.

Adapted from "Modelling of global land use: connections, causal chains and integration", by R. Leemans, 2000, *Inaugural Lecture*, p. 85.

2.2.2   User experience and design for experiences

User experience has been widely used in design, academic and industry, A survey by Law et al. (2009) suggests that the term *user experience* is an individual interacts with the products, systems, services and objects, through a user interface, it claims that many agree that user experience is "dynamic, context-dependent, and subjective" (p.719). Yet, it restricts the user experience to the interaction between a person and a product, a system, a service or an object which has a user interface (see Figure 2.2.2.1).
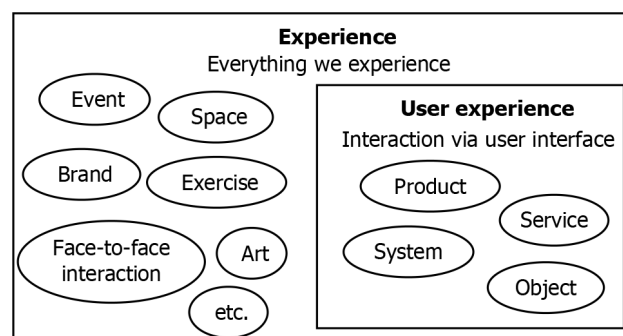
Figure 2.2.2.1. UX in relation to other experiences that we can study.

Adapted from "Understanding, scoping and defining user experience: a survey approach," by E.L.C. Law et al., 2009, In Proceedings of the SIGCHI conference on human factors in computing systems, p. 727.

McCarthy & Wright (2004) claim that four threads contribute to experience, which are sensual, emotional, compositional and spatio-temporal. The sensual thread is our sensory perception of the environmental situation. Emotions are inseparable in the experience, together they influence people to

making sense of the world through feedback. Action, on the other hand, is the result of one's values, needs, desires and goals. The compositional thread indicates that experience as a connected, flowing and whole event, and the change of time and space, is another feature of experience. A study by Hassenzahl, Dieffenbach and Göritz (2010) clarified the connection between emotions and positive experience. These authors argue that the positive experience is largely affected by the fulfilment of the stimulation, relatedness, competence and popularity needs. Moreover, the need fulfilment is highly related to hedonic quality of use rather than the pragmatic quality. Forlizzi and Battarbee (2004) argue that it is valuable to understand the user experience through an interaction-centred of view, a framework of the interaction-centred view describes the interaction between the users and the products (fluent, cognitive, expressive), as well as the range of experience (experience, an experience, co-experience).

According to a study by Forlizzi et al. (2004), there are three types of interactions, which are fluent, cognitive and expressive interactions. *Fluent* interaction is automatic. It indicates that users are familiar or skilled with the interaction. Users focus on the result of the interaction rather than the process of the interaction. *Cognitive* interaction needs users to pay attention to the products at hand. This type of interaction can produce knowledge or confusion during the process of interaction. *Expressive* interaction reveals that the product has been modified and personalised by users. Emotional attachment may occur in this type of interaction. Moreover, there are three ranges of experiences, which are experience, an experience and co-experience. *Experience* refers to a stream of thinking, perceiving and sensing process when we interact with the products. *An experience* refers to stories that we can articulate. This range of experience usually includes the change of emotions, behaviors and time and space. The third range of experience is *Co-Experience.* In line with a study by Battarbee and Koskinen (2005), co-experience emphasises the social context of the use of the products. This range of experience reveals how the interactions affect individuals and how the experiences are understood and interpreted in the interaction with other people. The dynamics of experiences in interactions are revealed in Figure 2.2.2.2.
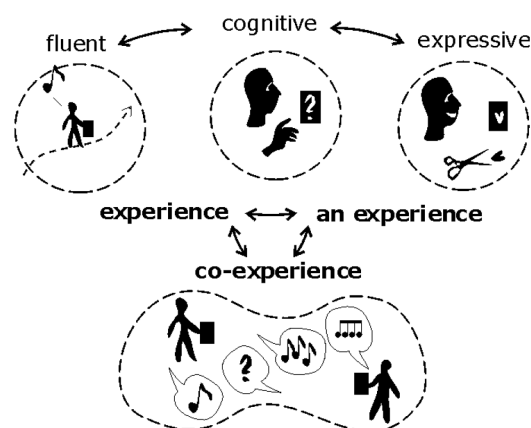

Figure 2.2.2.2. The dynamics of experience in interaction for individuals and in social interaction.

Adapted from "Understanding experience in interactive systems," by J. Forlizzi et al., 2004. *In Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques,* p. 264

2.2.3. Experience

Experience (noun) refers to (the process of getting) knowledge or skill from doing, seeing, or feelings; and something that happens to you that affects how you feel (Experience, n.d.).

Studies from neuroscience offer a sequence of mechanism of how we experience in our brain. In the first two years after birth, a new born baby's brain is dramatically stimulated by the sensory information from outside environment, the sensory organs: eyes, ears, nose, mouth, and skin absorb the information and transformed it into patterns of electrochemical signals in the brain (Sanes & Jessell, 2000; Eagleman, 2015). The brain receives signals, and form a series of intermediate processing, then releases the motor signals as the output to form certain behaviors (see Figure 2.2.3.1). Our brain making sense, perceiving and learning from the consequences of the interaction we have with the outside environment. The present experience is based on the iterative process of "sensory input - intermediate processing - motor output" (Kandel, Barres, & Hudspeth, 2000, p37). The brain forms the neural network to processing the sensory signals in an effective manner, and has the interconnection in the neural network itself (Kandel et al., 2000). Due to fact that mental states, past life experience and goals are different from time to time and from each other. The relationship between the stimulations (input) and behaviors (output) can vary dramatically (Kandel, 2000). The capacities of our brain are significantly shaped by our individual experiences, this helps humans to gain the skills for the adaptation of our physical bodies and the given environments (Sanes et al., 2000).
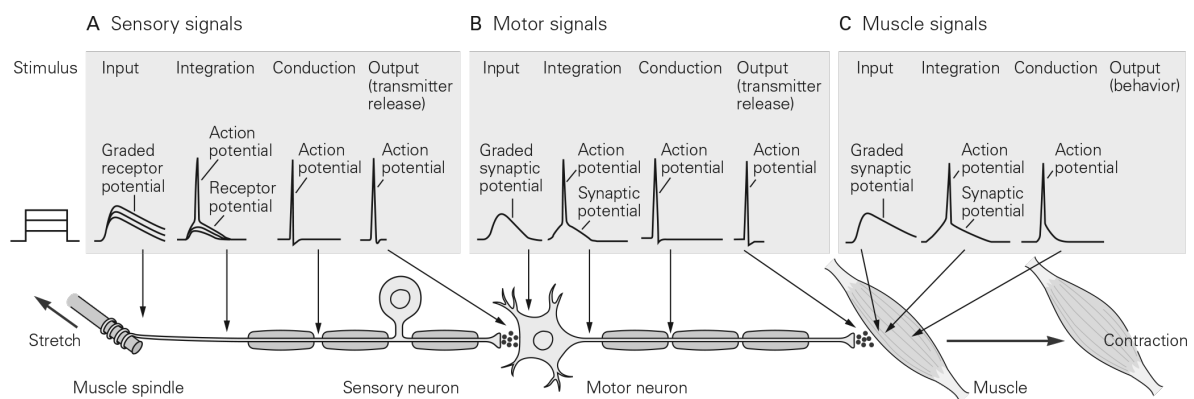
Figure 2.2.3.1. The sequence of signals that produces a reflex action.
Adapted from "Principles of neuroscience," by J.H. Kandel et al., 2000, *Principles of neural science*, p. 36.

Our perception of reality is based on the sensory input we have experienced from outside environment, our brain forms the internal model of the reality, to help us navigate the objective world efficiently. Not only our experiences of the world are subjective, each individual also forms different internal realities from one another (Coghill, McHaffie, & Yen, 2003; Eagleman, 2015). The experience of the sensory input varies, because of one's experience from the past and the expectations of the incoming stimulation (James, 1890; Posner, Snyder, & Davidson, 1980). A study by Koyama (2005) shown that the positive expectations can dramatically decrease the effects of the sensory experience of pain, and also alter the

activation of the related area in the brain. As Eagleman (2015, p. 35) says, "You don't perceive the objects as they are, you perceive them as you are".

Although human behavior is learned and our nerve system is exquisitely wired. Yet, the experience is changeable because of the feature of plasticity of the brain (Kandel et al., 2000). Throughout our life, the plasticity of the nervous system is determined by our life experiences and behaviors (Sanes et al., 2000). Hebb (1949) argues that the repetition of synaptic communication could reinforce the connection between the neurons, the neuronal circuits are modified by sensory experience. Researches have shown that both activities and sensory inputs are the contributions of synaptic plasticity. The *activity-dependent synaptic plasticity* induces short-term and long-term synaptic changes and it is highly related to the formation of learning and memory (McAllister, Katz, & Lo, 1999; Martin, Grimwood, & Morris, 2000). However, the experience-dependent plasticity is related to the environments, long-term sensory stimulation and deprivation (Holtmaat & Svoboda, 2009). A study by Kleim and Jones (2008) concluded the principles of experience-dependent plasticity (see Table 2.2.3.2). It claims that the change of experience as a whole, from the sensory input of the environment to behavioral change, the physical feature of people, and time period of the experience are the factors that can influence the plasticity of our brain.

Principle	Description
1. Use It or Lose It	Failure to drive specific brain functions can lead to functional degradation.
2. Use It and Improve It	Training that drives a specific brain function can lead to an enhancement of that function.
3. Specificity	The nature of the training experience dictates the nature of the plasticity.
4. Repetition Matters	Induction of plasticity requires sufficient repetition.
5. Intensity Matters	Induction of plasticity requires sufficient training intensity.
6. Time Matters	Different forms of plasticity occur at different times during training.
7. Salience Matters	The training experience must be sufficiently salient to induce plasticity.
8. Age Matters	Training-induced plasticity occurs more readily in younger brains.
9. Transference	Plasticity in response to one training experience can enhance the acquisition of similar behaviors.
10. Interference	Plasticity in response to one experience can interfere with the acquisition of other behaviors.

Table 2.2.3.2 Principles of experience-dependent plasticity.

Adapted from "Principles of experience-dependent neural plasticity: implications for rehabilitation after brain damage," by J.A. Kleim et al., 2008, *Journal of speech, language, and hearing research*, 51(1), p.227.

2.2.4   The role of the environment in experiencing

The environment we are living has a profound impact on us. Humans have been shaping the environment throughout our history. Meanwhile, our surroundings are constantly changing us (Russell, 2012). The definition of the environment is broad, including the natural and built environments, social settings and informational environments (Proshansky, 1974; Kaiser & Fuhrer, 2003; Deng & Poole, 2010). The environment refers to any given settings, which could be understood as the physical environment that

men live, also the social contexts that provide the platform for enabling human relationships and engaging in activities (Proshansky, 1974).

The interaction between people and their environment is dynamic. People build the environment to express the nature of the self. On the other hand, the environment sends feedbacks to people that reinforcing self-identity or implicating a change (Cooper, 1974). Proshansky, Fabian, & Kaminoff (1983) claim that physical environment affects self-identity and the formation of personalities of the individuals. They (Proshansky et al., 1983) argue that one develops a sense of belonging and meaning to life, through the personal attachment to one's environment. The cognition of self and place is developing and changing, due to the shifting of the physical and social environment.

A study by Repetti, Taylor, & Seeman (2002) shows that social environments, such as family and friends, have a profound impact on individuals' physical and mental health across the life span. The healthy family environment provides a person with emotional security and social integration, consequently, enables the person to form and remain healthy self-regulation throughout life (Force, T. Basic Behavioral Science Task Force of the National Advisory Mental Health Council, 1996). Living in social environments that is characterized by conflict, aggression, and lack of nurturing, is highly hazardous of physical and mental disorders (Repetti et al., 2002). A study by Hundleby and Mercer (1987) reveals that inadequate parenting, such as lack of emotions, caring, connection, and disciplines, as well as exposed in friends' delinquent behavior are related to the increasing use of drugs in adolescents. In addition, social environments, such as commercial encounters and the online website interface are also capable of shaping people's emotions and behaviors (Deng et al., 2010; Hui & Bateson, 1991).

In the field of epigenetics, a research by Roth and Sweatt (2011) reveals that neural circuits, the structure and the function of the brain and behavior, are altered by environmental impacts and experiences. Environmental factors, such as toxins, diet and stress are capable of changing the DNA methylation patterns and behaviors (Franklin & Mansuy, 2010; Zhang & Meaney, 2010). More specifically, environmental influences in the early age of development, lead to profound changes in the brain throughout the lifespan (Roth et al., 2011). Authors Oberlander et al. (2008) and Schlinzig et al. (2009) claim that the prenatal environment, for instance, the experiences of the mother and the experience of birth are able to modify the brain of an infant. The brain, when adapted to environmental signals through the mechanism of epigenetic, can regulate epigenetic in the early development is essential for cognition, the formation of memory and behavior. Studies by Connor and Akbarian (2008) and Grayson et al. (2009) indicate that mental disorders, such as depression and schizophrenia, are associated with epigenetic modifications that triggered by the early life environment and experiences. To sum up, epigenetic mechanism can be understood as an interface between the environment and the genome (Herse & Vaissière, 2011). Environmental influences and experiences play a crucial role in the modifications of epigenetic, brain function, and behavior (Roth et al., 2011).

To conclude, the first section of this chapter reviewed the transformation in the design sector, the role of design, various tools and methods in the design practice, and the exploration of awareness on consequences and actions. The second section of this chapter dealt with the formation of experience, the understanding of user experience from different disciplines, and the role of environmental influences in experiences. The next chapter will present on the methodology of the research.

3. Methodology

The focus of this chapter is to present and discuss the research methodology for this qualitative and participatory study. The study explores how service design can cultivate conscious and responsible experiences for and with users. This approach provides both the researcher and the participants a detailed and interactive means to understand daily experiences, and how to be more aware of its impacts. The application of the qualitative research and participatory research are demonstrated in details, including the overall view of the research approaches, the research design and tools, the participants and contexts, procedures of the study, collecting of data and analysis, and the ethic statement.

3.1 Research purpose statement

The purpose of this research study is to explore the possibilities of service design in the change of user experiences. More specifically, to test if service design could enable users conscious and responsible experience in real-life situations. This research also explores the role of service design in the processes of experiential change.

3.2 Research design

The research design (see Table 3.2.1) reveals the research strategies selected for this study, including qualitative and participatory research. The methods selected for this study for data collection including experiments, interviews, narrative enquiry, field notes, and mapping. Data was documented primarily via audio recording and note taking.

3.2.1 The selected research strategies

The qualitative research approach is seeking for understanding and reflecting of the human being's experiences, it values the subjective meanings, experiences and meaning-making processes, while it also allows participants to express their experience in a detailed and constructed manner (Patton, 2002; Leavy, 2017). Participatory research as a research strategy within the umbrella of qualitative social research, is for engaging participants' knowledge and experiences into a partnership with the academic theories and methods, the purpose of participatory research is for offer more knowledge and conducting

action or causing change (Bergold 2007; Cargo & Mercer, 2008; Green, George, Daniel, Frankish, Herbert, Bowie, & O'Neill,1995).

Research design

Research strategies	Qualitative research			Participatory research	
Methods	Experiments	Interviews	Narrative enquiry	Field notes	Mapping
Tools	Audio recorder	Paper sheets	Pen	Paper stickers	Smartphone
Data analysis	Transcription	Visualization	In vivo coding	Theming	

Table 3.2.1 Research design

3.3 Research methods and data collection

- *Experiment*

The main part of this research was to conduct an experiment, as Fisher says (1937, p. 9) "Experimental observation are only experience carefully planned in advance, and designed to form a secure basis of new knowledge", according to Kirk (2007), "Experiments are characterized by the: a) manipulation of one or more independent variables, b) use of controls such as randomly assigning participants or experimental units to one or more independent variables, c) careful observation or measurement of one or more dependent variables" (p.23). The aim of an experiment is to understand the interrelationship and effects between each variable to address the knowledge emerged from the expense of resources.

This research study was conducted using experiment to exam whether the designed experience (independent variable) can shift users (dependent variables) into a conscious and responsible states through their experiences, by comparing the data (before and after the experiment) of the same activity. More details of this experiment are described in the *3.5 Action* section below. Note that all the interviews and experiments meetings were recorded into audio files, with the consent of the participants.

The participatory approach was employed in this experiment, the self-position of the researcher was a "facilitator, rather a dictator" (Clement 1996; Grossman 2002), the researcher explained the concept and function of Journey Map to the participants, and extended the degree of participation, empowered the participants to think, use and develop the map by themselves.

According to Spinuzzi (2005), there are three basic stages in the implementation of the participatory design method, stage one is the *initial exploration of work*, on this stage, designers conduct ethnographic methods on site, by using methods such as observations, interviews, walkthroughs, and visits, etc, to familiarize themselves with participants of the design work. Stage two is the *discovery process*, the interactions between users and designers are the most frequent in this stage, they utilize different method, tools and techniques to explore and create the meaning and value of the work, so that they can co-create the desired future together. Stage three is *prototyping*, which allows designers and users to developing models in a way that match the expectations in stage two.

In the implementation of this approach, firstly, the researcher presented the procedure of the experiment to the participants in the invitation letter. Moreover, the details of the plan of this experiment was explained in first meeting before the pre-interview, the purpose of this stage was to ensure that participants are familiar with the process of this experiment, and inform them of the role as a participant in this research. Stage two was an iterative process, which contained three parts, the first part of this discovery process was to exploring the past experience of the participants, the second part was to discover the connections of each sections, the third part was to find out the new information input of the targeted experience. The purpose for this stage was to allow participants to immerse themselves in the map developing process, and given enough time for them to process their past experience, and explore the new information to the future experience. The third stage was using for apply the new information in present, and experience how the new information input will change the past perception and behavior to form a new experience.

- Interview

"We interview people to find out from them those things we cannot directly observe" (Patton 2002, p. 340). Interview is used as a tool to learn about people's perceptions, emotions, sensations and motivations, the patterns in one's mind and the meanings of their worlds, interview allows the researcher to empathic understanding the experiences of participants (Patton, 2002; Leavy, 2017). There were two interviews in this research, the *pre-interview* intended to target a theme or experience from the daily life of the participants, and get the detailed description of the experience from four aspects. The *post-interview* was aiming to compare the results after the experiment, to find out the effects of the experiment on participants, and compare the degree of awareness, as well as the behavioral change of the participant. The interviews were using mixed approaches. In the beginning of the interview, the researcher used interview guide to target a theme or an experience that the participants are interested or concerned about, and get the basic information of each participants' lived experiences. An interview guide has a series of questions for each participant, to ensure that the same fundamental information is revealed and asked for every person (Patton, 2002). In order to find out an explicit description of certain experiences or theme that appears, the researcher employed the informal conversational interview, which allows the

researcher extend the information around the topic flexibly, simultaneously, explore the descriptive information in each direction (Patton, 2002).

- *Narrative Inquiry*

Participants were asked to describe their daily life experiences in an explicit, storytelling way, as Connelly & Clandinin (1990, p.2) says, "It is equally correct to say, 'inquiry into narrative' as it is '*narrative inquiry'*. By this we mean that narrative is both phenomenon and method. Narrative names the structured quality of experience to be studied, and it names the pattern of inquiry for its study […]. Thus, we say that people by nature lead storied lives and tell stories of those lives, whereas narrative researchers describe such lives, collect and tell stories of them, and write narratives of experience". In the interviews and experiment, participants were asked to describe their experiences in the details such as the environment of the events that has taken place, this is one of the dimension as places: "they occur in specific places or sequences of places" (Connelly et al., 2000, p.54), the mental activities that they were aware about, the interactions they had throughout the events which is another dimension as personal and social interaction (Connelly et al., 2000), in narrative inquiry, and the outcomes that they noticed after the interactions.

- *Field notes*

Series of *field notes* were collected throughout the process of research study, to help me processing, and memorizing the important questions that needed to be addressed, and further explored. The researcher used *on-the-fly notes* during the interviews, to memorize the further questions that needs to be answered during the description of the experience, thick descriptions were used after each meeting session with the participants, it is "highly detailed descriptions of the setting, participants, and activities observed" (Leavy, 2017, p. 137). The researcher recored the description of the settings, the physical and mental states of the participants, the emotional, perceptional and behaviral changes that occurred during the process, also included the language and the talking patterns that were used by participants. Due to the fact that this research lasted for two weeks, each meeting session had its goal and task. *Summary notes* were also used by the researcher to: a) record the learned information in the field and the aspects that need to be further addressed, b) to summarize the progress that occurred and the further intention or goals each participant needs to accomplish (Leavy, 2017). Moreover, during the research process, memo notes were used to develop the scheme about the collected data, synthesize the data, integrate the ideas, and identify relationship within the data (Hesse-Biber & Leavy, 2011).

- *Mapping*

Service design tools, especially mapping techniques were used to document the experiences of the participants. Mapping tools enabled the process of data collection. Journey maps and stakeholders maps were used as design tools in the experiment, they were not the data collection methods as such.

Journey maps

Journey maps are widely used in the service design domain, it helps to visualize the experience in a comprehensible and empathic way, so that designers can have better understanding of the users as well as each other within the team. Journey maps are flexible, according to Hazel White, service designers use them for three main purposes: the first is for the visualization and transparency of the data; next is to reveal the weak points and the potentials of the existing services; the third is for estimate the improved services in the future (Stickdorn, Hormess, Lawrence, & Schneider, 2018). A journey map created by a series of steps, such as events, moments, experiences, interactions, and activities. Designers are allowed to using different components to build the maps according to their goals (Stickdorn et al., 2018).

In the study, '*My experience map*' (MEM) is developed as one form of journey map, for understanding the experiences of the participants. The researcher used the journey maps as the basic frame, in the practice of service design, journey maps are used and developed by designers. However, in this research, the user and developer of the maps were the participants themselves, which is different from the transitional practice of journey maps. In the procedure of developing MEM, the researcher presented the components of journey maps to the participants, and assisted them to create the experience maps by themselves, to test if this change can increase the leave of consciousness and responsibilities in their chosen experiences.

The components in MEM were developed by the researcher, according to the formation of experience in neuroscience (see Literature Review 2.2.3). In an experience, there are several aspects to consider about - the informational input from the environment, the process of information progressing inside the brain, the body form certain actions and behaviors as the output, and the consequent outcomes caused by human behaviors. The researcher divided these aspects into four categories, they are (environmental) *Signals*, *Mental Activities*, *Behaviors* and *Outcomes*, these are the four components in MEM.

Stakeholders Map

Stakeholders Map was another service design tool that introduced in this research. According to Stickdorn et al. (2018) a stakeholder map makes all the involved stakeholders tangible, it helps designers to comprehend the different groups of stakeholders, understand the relationships between each stakeholder groups, and identify the impacts on the services. Most of the time, users are unaware of the stakeholders that are related to the services or products that they are interact with. Therefore, the purpose

of this map was for raising the users' awareness and empathy of the involved stakeholders, the relationship of each stakeholders and its impact on the experience that they were encountered. Stakeholder Map usually contains three groups, customers, internal stakeholders and external stakeholders, or depends on the degree of the influence, there are essential stakeholders, important stakeholders and other stakeholders (Stickdorn et al., 2018). Note that in this study, the researcher only asked the participants to identify the relevant stakeholders in the stakeholders map, the possible relationship and its impact within the stakeholders were discussed via conversations with the participants.

3.4 Sampling, participants and research setting

Participants were purposive randomly selected in this research. Purposive random sampling means randomly selecting a small amount of samples from a large potential target population (Kemper, Stringfield, & Teddlie, 2003). This research focuses on the change of human experiences, everyone is qualified as a sample for this study. However, age and gender differences were taken into consideration in sampling. The objective of sampling from different age and gender was because people live in different phases of their lives have different priorities and lived experiences. Another intension of sampling was to choose participants from the social network the researcher, because the trust between participants and the researcher was already established, therefore, the interview and exploration of their experience were open and in-depth. "The purpose of a small random sample is credibility, not representativeness. […] A small, purposeful random sample aims to reduce suspicion about why certain cases were selected for study, but such a sample still does not permit statistical genralizations" (Patton, 2002, p. 240-241). Participants were recruited from the existing social group of the researcher. A brief conversation was conducted within the group. People were asked if they were interested in change making, or had any problems and concerns. For those who showed interests, an invitation letter was sent to explain the purpose, plans and tasks for this research. Due to the intensive time schedule and workload of the experiment, only three participants were selected as the sampling in this research. Tasha and Raoul are friends of the research, while Guopu is a family member of the researcher. A detailed description of participants is given in *Discussion* chapter (see *Section 4.1*).

A natural setting where participants felt comfortable, safe and undisturbed was required for this research. Interviews, conversations and experience explorations were conducted in participants' location and venue of choice, which included spaces such as their apartments where they felt comfortable to express their experiences without disturbances.

3.5 Experiments

Three participants were chosen to participate as research subjects for the experiment which contains four meeting sessions, and three backstage tasks for each participant, the whole process lasted for two

weeks. In the meeting sessions (*meeting one* to *meeting four*) both the participant and the researcher were attended, and three backstage tasks (*recording, discovery and experiencing*) were completed individually by participants, the interval time between each meeting sessions were used freely by participants for finishing the tasks. The diagram below (see *Diagram 3.5.1*) is the summarized features of this experiment plan, the explicit explanation is presented in the next section.
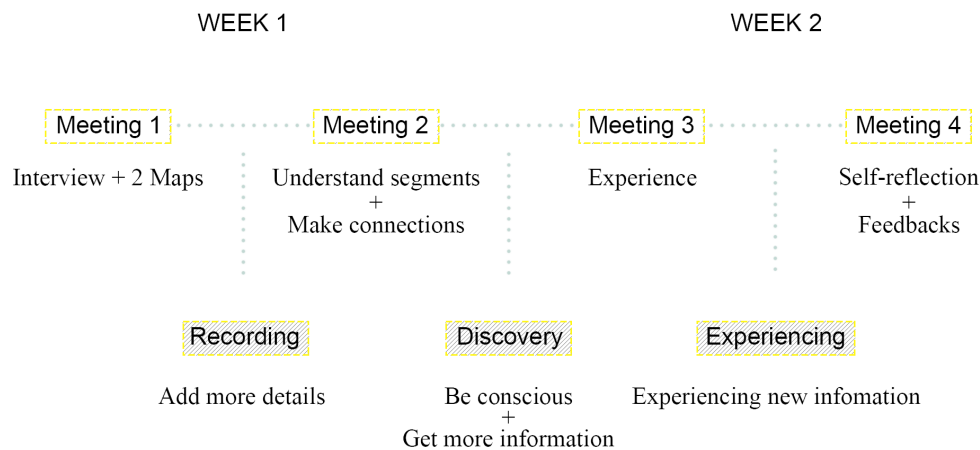
WEEK 1   WEEK 2

Meeting 1	Meeting 2	Meeting 3	Meeting 4
Interview + 2 Maps	Understand segments + Make connections	Experience	Self-reflection + Feedbacks

Recording	Discovery	Experiencing
Add more details	Be conscious + Get more information	Experiencing new infomation

Diagram 3.5.1 Summarized features of experiment plan

3.5.1 Execution of the experiment and time line

There were four meetings in total for each participant, the duration of one meeting varied from forty to seventy-five minutes, it depended on the situation in the field and the participants, in average, each meeting last for an hour for one participant. Audio recorded documents were taken on the site, which contained twelve hours documents for all the meetings. There were three backstage tasks for each participant, the time periods to accomplish tasks varied from two to four days, it depended on the time schedules of the participants, in average, each participant had three days for one backstage task.

Week 1

Meeting 1 (40 - 60 min for each participant)

The first meeting had two parts, one part was to conduct a pre-interview, the other part was to briefly build up "*My Experience Map*", and the "*Stakeholders Map*". The purpose for the pre-interview was to target a theme for each participant, the participants were asked series of questions according to the interview guide, the themes were choosing from their daily routine, interest-based, or problem-based experience. In the second part of this meeting, each participant explained what is "*My Experience Map*" and "*Stakeholders Map*", also they were showed the examples of these maps, each participant was assisted by the researcher to build "*My Experience Map*" and the "*Stakeholders Map*" according to their individual theme, they were showed how to sort each segments (stickers) they made into different categories.

Backstage task 1 - Recording (2 - 3 days for each participant)

The goal for this task was to develop more details (add more stickers / segments) for those two maps, if anything came to their mind before the next meeting. The purpose of this section was to give participants enough time to recall their memories of the theme they chose and learn how to develop the maps by themselves, they were able to add more detailed description of their experience.

Meeting 2 (60 - 75 min for each participant)

The second meeting also had two parts, first part was to get to know each segment, participants explained the added stickers from the previous task; in the second part, participants were assisted by the researcher to think of, and make the possible connections of each segments based on the categories they sorted.

Backstage task 2 - Discovery (2 - 3 days for each participant)

This period of time was given each participant to have enough time to process the details of their experience, and got more familiar with the use of the maps, they were encouraged to be more conscious of the connection between each category. Moreover, they were asked to search for new information input of the target theme.

Week 2

Meeting 3 (60 min for each participant)

The purpose of the third meeting was for participants to explain the new information they found from various sources, during the meeting, and they were asked to describe the details about the new information, and situate the new information in their old experience patterns.

Backstage task 3 - Experiencing (3 - 4 days for each participant)

This period of time was given for participants to experience the new information, they were asked to reflect on their old experience patterns, and be more aware of the new information and its affects in their daily life.

Meeting 4 (45 min for each participant)

The goal of the last meeting was to receive some feedback from participants, they were asked to describe their experience with the new information that they learned, describe the reflection on the before and after experiment, moreover, they were asked to give some comments on the experiment itself.

3.5.2   The process of the experiment explained

The whole process of this experiment was the same for all the participants, they followed the structure of the execution of the experiment (see *section 3.5.1*) step by step, however, due to the fact that each participant had different themes, progresses, and settings, the process of the experiment for each participant was diverse accordingly. Table below (see *Table 3.5.2.1*) shows the variations of the individual process, the columns of pre-observation and post-observation shows the change of personal relationship and the interaction between the researcher and the participants, while there were few differences need to be pay attention to.

Three participants had the same procedure for the first meeting as they all answered the questions according to the interview guide. The interview included a brief introduction to their current life by means of open-ended questions posed by the research. During this discussion the participants also chose a theme for their experiments. Pseudonyms will be used from here on in the thesis to de-identify the participants. Raoul was concerning about his sleep experience, Tasha chose to talk about her experience of living abroad, while Guopu was from the different age group than the rest, he decided to explore about how to live in a happy and healthy life in his elderly days. They were all introduced of the concept of *My Experience Map* (MEM) and *Stakeholders Map* (SM), therefore, they were able to build these two maps in the first meeting (see *section 4.1 Data comparison*). However, the setting for Guopu was via online video chatting, while Raoul and Tasha were through face to face meeting.

		Raoul	Tasha	Guopu	Researcher
	Pre-observation Before the Experiment	American, male, 20s, student, friend, had some conversations, but not related to personal topics	Japanese, female, 20s, student, acquaintance, small talk for few times	Chinese, male, 60s, retired, family member, used to living together for years	Invite people from the existing social network
	Setting	His own apartment, face to face meeting	Her own apartment, face to face meeting	His own apartment, online video meeting	Visit participants, with a computer, a notebook and mapping tools
W E E K 1	Meeting 1 Pre-Interview + 2 Maps (My Experience Map & Stakeholders Map)	Talk about his 'Sleep experience', briefly create the two maps	Talk about her 'Living experience in Finland', briefly create the two maps	Talk about his interest on 'How to live in a happy and healthy life in elderly days', briefly create the two maps	Audio record, interview, present how to build the maps, and guide the participants to create their maps
	Backstage 1 Recording	Add one more detail on 'My Experience Map'	Add more details on 'My Experience Map'	Add more details on 'My Experience Map'	Start the coding process by creating the maps for each participant, while writing field notes
	Meeting 2 Get to Know Each Segment & Making Connections	Answer few more questions, sort the experience into four categories, theme each category into different chunks, think of the connections of each category	Explain the added stickers in details, sort the experience into four categories, theme each category into different chunks, think of the connections of each category	Explain the stickers in details, sort the experience into four categories, theme each category into different chunks, think of the connections of each category	Audio record, discuss with participants about the stickers and assist them to think about the connection of each category

		Raoul	Tasha	Guopu	Researcher
	Backstage 2 Discovery	Get more information about 'the rewarding mechanism of brain', and 'how to have a good sleep', make video documentary about sleep experience	Get more information about 'Finnish food culture', add more stickers accordingly	Get more information about 'diet, exercise and disease', 'the physical and psychological features of elderly people', change the source of information, add more stickers accordingly	Add more stickers according to the previous meeting, sort them into four categories, make connections of each category for every participant, while writing field notes
W E E K 2	Meeting 3 Gain new information	Check through video documentaries, discuss the experience in-depth	Explain the added stickers, and new information about Finnish food culture	Explain the new information about diet, exercise and disease, the physical and psychological features of elderly people	Audio record, discuss with the new information with the participants, reveal the function of each category and their connections
	Backstage 3 Experiencing	Get more information about the rewarding mechanism of brain, and how to have a good sleep	Reflecting, and experiencing new information and their connection	Reflecting, and experiencing new information and their connection	Add more stickers according to the previous meeting, sort them into four categories, theming the codes, while writing field notes
	Meeting 4 Reflection + Post-Interview	Explain new information, discuss more about his previous experience, reflecting and give feedback of this experiment	Reflecting and give feedbacks of this experiment	Reflecting and give feedbacks of this experiment	Audio record, discuss the process and ask for feedbacks of the participants, explain the purpose of this experiment
	Post-observation After the Experiment	Deepened the understanding of the participant, and interact in parties after the experiment	Deepened the understanding of the participant, interactions significantly increased after the experiment	Deepened the understanding of the participant, the interaction with the participant remains the same after the experiment	Analyze and interpret data, self-reflection

Table 3.5.2.1 Summarized features of execution of the experiment of each participant.

This table shows that the participants chose different themes in the experiment. Raoul chose his sleep experience as the topic, Tasha chose her living in Finland experience as the theme, and Guopu chose a question "how to living in a happy and healthy life in elderly days" as the theme. The table shows that all the participants and the researcher followed the same schedule, and methods in the experiment. However, there were few steps that varies from person to person in the experiment.

In the experiment with Raoul, after the first meeting, he added one more sticker on MEM, while his SM remained the same. He was guided by the researcher in the second meeting, to sort his stickers into four

categories, and made some connections between each sticker. By the end of the second meeting, he was asked to search for more information about how to have a good sleep, including environmental conditions, mental states and the change of behavior. He was also asked to get more information about the rewarding mechanism in brain, because he talked about how the physical and mental tirelessness affected him with less desire to falling asleep while less motivation to get up from the bed. Nevertheless, his progress of the experiment was different from the rest of others after the second meeting. Due to him not completing the second backstage task, the goal of the third meeting was not achieved. In the third meeting the researcher was focusing on a further exploration of the theme with participant. Before the last meeting, Raoul was able to finish the backstage task, and explained the new information he learned in the fourth meeting. In addition, he was asked to give some feedback and his own reflection regard to the experiment.

In the case of Tasha, she explained the added stickers on her MEM in the second meeting, and she was guided to making connections of each categories in her maps. According to the conversation with the participant in the second meeting, the researcher noticed that Tasha preferred Asian food more than Finnish food, and she showed certain bias opinions, therefore, she was asked to searcher more information about Finnish food culture, including the physical environment factors of Finland, and the food culture in Finland. She explained the new information she learned in the third meeting, and she was asked to pay more attention to how the new information affects her daily experience in Finland. For the fourth meeting, Tasha was asked to give some comments and self-reflection of the experiment.

For Guopu, the interaction with the participant was less effective than the rest, due to the fact that the experiment process was guided via verbal communication, while the rest two of the participants were guided both verbally and physically. The researcher was able to physically assist Gaoul and Tasha to create their MEM and SM in the first meeting, while the assistance of Guopu can only conducted via online video chatting. Guopu was shown the example of MEM and SM, which he needed to create the maps by himself. He was able to explain the stickers in his maps, and guided to make connections of each categories. Yet, the researcher had less impacts on the result of Guopu, because physically the researcher was able to move the stickers, while conducting the conversation with the other two participants. Due to the physical body and its ability to produce more visual language, in the experiment with Guopu the researcher's body was involved to a lesser extent as so less visual guidance and information was given to Guopu. The participant accomplished all the backstage tasks, and achieved the goals for each meeting. He was asked to searcher for more information about the relationship of diet, exercise and disease to search for the features of elderly people, and change the source of information. Guopu explained the new information he learned in the third meeting, and gave some feedbacks and self-reflection regards to the experiment in the last meeting.

3.6 Data analysis and interpretation strategies

Data were collected from three different sources. One major part of the data is the audio documents, which were recorded from interviews, and conversations with participants throughout the meetings. Another part of the source is the visualization data (see 4.1.1 Data comparison), which were collected from *My Experience Maps*, and *Stakeholders Maps*, that were made by participants. The third important source of data was the field notes. One of the purposes of field notes is to have a detailed description of the site, including, the observation of the settings, and the participants. Moreover, the field notes also used as the data for self-reflexivity of the researcher, record the researcher's thoughts and emotions in details. These were the data that could not be recorded by the audio equipment. The second purpose of field notes is to record the progress of the participants in different stages of the experiment, and help to make further development in the process of the experiment.

The transcription of the audio data started after the first meeting session with each participant. The recorded audio documents were transcribed manually, as the preparation of the raw data for the coding process. Visual data were documented in the form of photographs, photos were taken twice, for each participant. The first photo was taken after the first meeting with the participants, to demonstrate the awareness of the participants before the experiment. And the second photo was taken at the end of the experiment, to address the changes of the awareness and responsibilities of the participants, after the experiment. Field notes were documented after each meeting session. In the analyzing process, it helped in the second level coding process, mainly used to generate the patterns of the codes.

Coding is the process of outlining the essential information of the raw data (Saldaña, 2009). There were two levels of coding. In the first level of the coding segments of codes were directly selected from the transcripts (see Appendices 1). In vivo coding was used to facilitate the codes from the transcripts. In other words, to establish the descriptive codes. According to Strauss (1987), in vivo coding emphasizes the exact language that participants use to yield the codes. This approach to coding allowed the researcher to perceive and think from the perspective of the participants, and maintain the original meaning of their language. The second coding level coding started after sorting the first level codes into the developed categories (see details below) (see Appendices 2). Associated with the key memos in field notes, the second code levels generated the pattern of the first level codes, forming a series of abstract codes.

One of the purposes of the study was to compare the same experience of the participants, before and after the experiment. Thus, a group of the category was used to sort the first level codes, to demonstrate the time differences. According to the timeline of the experiences, three categories were developed in the process of analysis. They are *previous experience*, *added signals*, and *new experience*. Category - '*Previous experience*' was used to demonstrate the experience before the experiment, in addition, '*previous experience*' also referred to the experiences that happened before a certain environmental change in the description of the theme. Category - '*Added signals*' was developed to describe the intervention of the experiment. Also, it can be understood as the change of the environments in the

experiences. '*New experience*' was developed to reveal the experience after the intervention of the experiment, or the environmental changes.

Another group of the category was selected from the components in *My Experience Map*. As it was explained in the previous section (see *Section 3.3*), *My Experience Map* that the participants were asked to build by themselves, were focused on four categories, they are *signals*, *mental activities*, *behaviors*, and *outcomes*, they are the four aspects that to understand the experiences. Therefore, in the analyzing process the four categories were used as the sub-categories, under the category of *Previous experience*, *Added signals*, and *New experience*, to sort the codes in the transcripts.

Patterns and themes were build based on the second level of coding process and open coding was used to form patterns in each individual experience. The patterns and themes that are found in the analyzing process are discussed in the next chapter (see 4.2 Findings).

3.7 Validity of Research

The validity of the research underpins the quality of a research project, the integrity of the applied methodology, and the constructed trustworthiness that the audiences will receive from the research findings (Aguinaldo, 2004; Lincoln & Guba, 1985). In other words, the essence of validity is to prove that the assertions and conclusions claimed in the research are trustworthy and credible (Leavy, 2011). In this research study, the researcher chose three participants, thus representing a small sample number. However, in-depth interviews and experiments were conducted with the participants over four intensive participatory workshops. In other words, four research encounters were conducted over two weeks with each participant. Due to the fact that every participant had their own theme with their experience, the time period of the two weeks allowed the researcher to transcribe and code the data as the experiment progressed. This also enabled the flexibly to adjust the focus of the theme for each participant, thus to reassure that each experiment experience was appropriate for the purpose of this research. The time duration was designed according to the participants so that sufficient time was available to process the information by themselves and to assure the consistency in the experiences and process.

The participants who were chosen all have some personal relationships with the researcher. This brought the advantage of reducing the time for establish trust between the researcher and participants. On the other hand, the researcher was concerned about how the close relationships will affect the attitudes of the participants towards the experiment. In real life, they perceive the researcher in the role of a friend or a family member, but not in the role of a researcher. However, the interaction between the researcher (as a friend or a family member) and the participants was narrowly focused on self-selected topics. Additionally, the perceptions of the participants were limited in terms of the researcher being only a friend or a family member. Thus, the professional role of the researcher enabled her not only to participated as a facilitator during the meetings, but also to explored the participants' inner world with them. To conclude, the personal relationship offered the researcher and the participants a trusting and comfortable atmosphere (environment) for this research, while the role as a researcher provided an

opportunity to access to the information usually unavailable as a friend. Due to previously established relationships, which may result in biased outcomes that the researcher declares, the amount of time invested by each participant was possible due to the existing positive relationship between participants and researcher.

3.8 Ethics Statement

Throughout the research and study the researcher ensured that ethical considerations were met for the conduct of the experiment, as well as the processes of analysis. The informed consent confirmed by each participant, is included in Appendices B, which including the explanation of the purpose of this research and the procedure of the experiment. The possible benefits to the participants, as well as for the researcher, the responsibilities of the participants and the information that participants are free to withdraw at any time during the process, was also provided. All the participants were over 18 years of age. The names that are used in this thesis were adapted to the preference of the participants, thus their real names are not revealed to ensure the confidentiality.

In summary, the goal of this chapter is to reveal the methods that were used in the research to pursuit the research questions. A combinate methods of qualitative research and participatory approach were used to conduct the interviews and experiment, a demonstration of the data collection, participants, data analysis and interpretation strategies of this research, to reveal how this research study was conducted, and processed. All the participants shared their lived experiences, and devoted their time to the experiment, helped me to reveal the answer of the research questions, and inspired me as a researcher, as well as a designer in a long term. The results and findings are presented in the next chapter.

4. Discussion

This chapter is organized into four sections. The first section presents the key results of the experiment, including a brief introduction of each participant, and the data comparison. Next is the discussion of the main findings of the collected data, which reveals the regular pattern of experience and its reinterpretations in different contexts. It also discusses the extent that service design can enable the change of users' mental activities and behaviors. The following section deals with the self-reflection of the researcher, the impacts of the role of a researcher, as well as a designer in the experiment. The final section demonstrates the outcomes of the experiment.

4.1 Results

The results section is presented in two parts. The first part is the data comparisons of *My Experience Map* and *Stakeholders Map* with a brief introduction of each participant. The second part of this section is summarized feedbacks and comments from the participants regarding the experiment.

4.1.1 Interpretation of the data

Raoul - Sleep experience

Raoul is an American male in his late twenties who moved to Finland to study at university. Personally, he is a friend of the researcher. In the first meeting, he chose his sleep experience as the theme for the experiment because he had problems with falling asleep as well as problems getting out of bed. Raoul told the researcher that he usually goes to bed around three to four o'clock in the early morning because he does not feel tired during the night. He admits that after falling asleep he has trouble getting out of bed, preferring to sleep for as long as possible through the day. The researcher asked him to describe his sleep experience in details, such as his sleeping environment (see *Signals*), his thoughts and feelings (see *Mental Activities*) that are related to his sleep, his actions (see *Behaviors*) regarding his sleep experience, and the consequences (see *Outcomes*) of his behaviors. After the description, the researcher explained the concept of *My Experience Map* and its origin (see *section 3.3 Customer Journey Maps oriented My Experience Map*). He was given some stickers with different colors and a sheet of paper, then asked to write down some words from his description, and sort them into four categories (signals, mental activities, behaviors and outcomes). The sheet was divided into four areas, and he was asked to put the stickers on the sheet. The table below shows the comparison of results from the first meeting (see Table 4.1.1 light red color) and the fourth meeting (see Table 4.1.1 dark red color).

My Experience Map
Meeting 1 / Meeting 4

Mental Activities Lazy / Mindless Not tired / I like night Tired / Hate the world Need motivation	Signals YouTube, movies, music/ Light
Behaviors Go to bed too late/ Get up too late	Outcomes Sleeping too much or too little/ Wasting time
Reward	

Table 4.1.1 *My Experience Map* data comparison of Raoul.

This table shows that in the first meeting, Raoul wrote some words to describe his sleep experience (light red color). In the last meeting, he added one word – 'Reward' on 'My Experience Map' (dark red color).

In the first meeting, the researcher explained the concept of Stakeholders Map (see section *3.3 Stakeholders Map* for more details), and Raoul was asked to think of the factors and/or people that could influence his sleep experience. According to Raoul, the significant impact was that he has too much free time because there was no consistent schedule for him during the daytime. Other than that, his bed is another factor that influencing his sleep. Stakeholders map below (see *Table 4.1.2*) shows the possible environmental impacts on Raoul's sleep experience from his perception, which is the social responsibilities and his physical environment. Noted that data remained unchanged from first meeting (see light red color) to the fourth meeting (see dark red color).

Stakeholders Map
Meeting 1 / Meeting 4

Too much free time
No consistent schedule
Bed too comfy

*Remains unchanged in meeting 4

Table 4.1.2 *Stakeholders Map* data comparison of Raoul.

This table shows that in the first meeting, Raoul wrote few stakeholders that are influencing his sleeps. The amount of stakeholders remained the same in the last meeting.

Tasha - Experience of living in Finland

Tasha is from Japan, she is studying in Finland for few years and is in her mid-20s. Tasha and the researcher are not closely acquainted as their interactions have only been superficial before the experiment. Tasha talked about her life in Finland and mentioned the excitements and culture differences from her home country. She told the researcher about the different landscape and weather in Finland and the similar behaviors of Japanese and Finnish people. Therefore, we decided to choose this experience as the theme. Tasha described the living environment in Finland (see *Signals*), her feelings, thoughts and perceptions regarding the change of the environment (see *Mental Activities*). She also discussed exploration in the new environment, as well as she remained in contact with friends and families at home (see *Behaviors*). Moreover, she discussed the changes she noticed herself and some expectations (see *Outcomes*). Table 4.1.3 is the data comparison from the first meeting (see light blue color) and the fourth meeting (see dark blue color).

My Experience Map
Meeting 1 / Meeting 4

Mental Activities	Signals
Lonely/ Independent/ Unhealthy: Gaming, food, snacks	Dark/ Cold/ Slippery/ Dry/
Excited/ Interesting/ Seeking new experience/ Laid back, not in a hurry like I used to be in Japan	Shiny/ Bright/ Beautiful/
Peaceful/ Relaxed/ Stress free/ Motivated to go outside (summer)/ Fun	Quiet/ Warm(inside)/ Cozy/
Realizing my identity as a Japanese/ Seeing my own culture from different aspects/ Confused by culture different/ Hard to find food & snacks that I like to eat	Sweet/ Delicious! (Asian Food)
Hard to grow various vegetables/ Hard to get fresh food, seafood/ Food guides recommend a good diet according to person's weight: Fiber rich, low salt, avoid hard fat & sugar, low fat and salt meat, fat free, or low-fat milk, homemade food, products labels	Carbohydrates (potatoes, rice, pies, cakes)/ Organic natural products/ Vegan, vegetarian/ Inland soil fertility/ Allergy free, gluten free food choices
Dislike to be online for the whole time	Online gaming community/ Necessity of SNS/ Online communication

Behaviors	Outcomes
Dancing/ Having visitors in my place/ Talking to family, friends in Japan about my life here/ Studying languages/ Speaking Finnish/ Cooking at home and in friends' place	Expect to see more of it: Experiencing local events/ Seeing new cultures/ Making new friends/ Expect to see more Sami culture/ Improving Finnish skills/
Going out walking in nature/ Traveling/ Hiking, eating sausage around open fire/ Going out shopping with friends/ Sauna/ Playing game on the smartphone/ (Rarely but) Drinking/	Starting to somehow become or act like Finnish people: Keeping distance from each other/ Going for hiking, putting up fire/ Drinking coffee a lot/ Eating rye sandwich/ Value independency, individuality/ Sauna and diving into cold water/

Internship/ Work/ Going to the class/ Going to the library/	Not feeling comfortable when the difference becomes obvious/ Realizing my food preference
Reading books and articles/ Watching movies/ Listening to music/ Going out for lunch, dinner with friends/ Singing	Realizing Japanese or Asian food is rich in ingredients, flavors, seasonings, and cooking methods/ Realizing how I had no hesitation in consuming ready-made food in Japan: Non-organic/ Non-natural, artificial product
Browsing on the internet/ Checking SNS	

Table 4.1.3 *My Experience Map* data comparison of Tasha.

This table shows that Tasha wrote several words and phrases on 'My Experience Map' in the first meeting (light blue color) regradeding her living experience in Finland in general, and in terms of her experience of Finnish food, online communication and gaming. She added more words in the fourth meeting (dark blue color).

Table below (see Table 4.1.4) reveals the possible stakeholders in Tasha's experience of living in Finland. For her, the change of environment had a huge impact on her perceptions and behaviors. For instance, people around her, friends from the university and her working environment influence her experience largely after she moved in Finland. However, after the first meeting (see light blue color) the stakeholders map remained unchanged in the last meeting (see dark blue color).

Stakeholders Map
Meeting 1 / Meeting 4

Finnish people

School in Ustjoki

University in Rovaniemi

Work place in Rovaniemi

*Remains unchanged in meeting 4

Table 4.1.4 Stakeholders Map data comparison of Tasha.

This table shows that the social environment has a huge impact on Tasha's experience of living in Finland. Noted stakeholders map remained the same after the first meeting.

Guopu - How to live a happy, healthy life in elderly days

Guopu is a family member of the researcher. He is from China and in his late 60s, retired for few years already. He is concerned about how to live a happy and healthy life in his elderly days. He told the researcher that all his life has been a contribution for his family and work. Now that he is retired, he feels it is the time to be more concern about himself, living in a life in which he feels happy and healthy.

Therefore, the theme of his experience is related to his question about health and happiness. He wrote down on stickers notions that involves his surroundings, mostly related to his social relationships (see *Signals*). He described some of his values, beliefs and hopes for his future (see *Mental Activities*). He also documented his actions regarding a happy and healthy lifestyle (see *Behaviors*), as well as some of his achievements of his lifestyle (see *Outcomes*). Table 4.1.5 shows that MEM remained unchanged from the first meeting (see light purple) to the fourth meeting (see dark purple).

My Experience Map
Meeting 1 / Meeting 4

Mental Activities	Signals
How to living in a healthy and happy elderly life after retirement? / Should actively participate social activities, don't stay at home/ Cultivate a hobby, have the ability to entertaining myself/ Have a good stable mentality state, need to have a faith in my life/ Traveling, according to my financial and physical capacity/ Reach to the realization that my life is just a process of living/ Enjoy my life for the rest of the days, make good plans for it/ Continue learning/ Build a healthy body	Some of my retired friends are: participating social events/ still busy with their children's life/ suffering from their clinical disease/ still trying to make money, because they don't have enough money for living/ faithfully believing in religions/
Behaviors	**Outcomes**
Organize a classmates' circle, attend to meetings frequently/ Help friends with their problems of cellphone and computer/ Go for traveling every year/ Get to know Buddhism and Christianity, participate some events/ Taking health care medicine and healthy food/ Learning musical instrument/ Enrolled in the elderly university Play badminton, riding a bike/ Paying attention to social news and issues/ Participate in artistic performance in community	I'm not outdated in the modern society/ So far, my mentality and moods are stable and balanced/ My life is fulfilling since I participate a lot of social events/ Traveling offers me a wider vision of the world/ My body is strong and healthy/ I have a lot of friends, everybody likes me/ I have advanced skill of playing flute, everybody likes it/ I have many plans for my life, I am hopeful for the future

*Remains unchanged in meeting 4

Table 4.1.5 *My Experience Map* data comparison of Guopu.

This table shows that Guopu's experience of living a happy and healthy life in his elderly days. He wrote many phrases after the first meeting. The list remained the same in the last meeting.

Stakeholders map below (see Table 4.1.6) reveals the social environment in Guopu's current life: old friends and classmates, family members and relatives; these are the stakeholders that influence his

elderly days from the perspective of himself. The result remained unchanged from the first meeting (see light purple) to the fourth meeting (see dark purple).

Stakeholders Map
Meeting 1 / Meeting 4

Old friends since childhood/
Colleagues from old companies/
Classmates and teacher from junior high school/
Classmates from elderly university/
Friends from the musical group/
Neighbours/
Relatives and families

*Remains unchanged in meeting 4

Table 4.1.6 *Stakeholders Map* data comparison of Guopu.

This table shows that the social environment is the significant impact in Guopu's elderly life. The stakeholders' list remained the same after the first meeting.

4.1.2   Feedback and comments

Table below (see *Table 4.1.7*) demonstrates the feedbacks and self-reflections from the participants. One thing they had in common is they all mentioned that the experiment made them more conscious about their mental activities and behaviors regarding the same theme. However, there are more different perspectives. Raoul articulated that the process was interesting for him, the visualization of his experience offered him a direct understanding of himself. Yet, he did not discover anything new about himself, nor did he participate for his personal development. Rather, he participated because he wanted to offer a help for the researcher. He felt the purpose of the experiment was ambiguous. Whereas for Tasha, who discovered herself through the mappings and she had a better understanding of the relationship and connections of her surroundings, perceptions and behaviors. The process of the experiment was vague for her in the beginning. But as she participated with more meetings, the purpose of the experiment became clear as she felt she was capable to explore by herself in the future. Similar to Tasha, Guopu also gave the comment that the mapping tool was a comprehensive and systematic means to understand his experiences. He realized the impacts of the environment, and the effects on his daily experiences. However, he was questioning about the order of the categories in the map. To him the indicators were not always from the environmental signals to the mental activities, and responses to the actions to create the outcomes. A more descriptive presentation of data is given in the next section.

	Raoul	Tasha	Guopu	Researcher
Result Feedback + reflection	It is interesting, no new revolutionary ideas, a little pressure, and a bit unclear of the point of this experiment, but I have noticed I'm more conscious of my behavior in my living environment during the night.	It's like a diary, but in a longer term and in a more clarified way. I can see that maps, and the flows, the connections between what happened. The process was kind of unfamiliar for me, but the more we met, the more I started to understand. I think these four meetings are really good, because I like the process that I'm starting to understand what's happening. Your input helped me, I think I might have a different result (without your help).	Your method was helpful for me to understand my lived experience in a comprehensive and scientific way. However, the order of those four categories are not always the same, in real life the order can be very different, there are many factors that are irresistible to change the direction of your life.	

Table 4.1.7 - Summarized features of each participant's results

4.2 Findings

The aim of this section is to reveal the three major findings of the experiment. The first part presents the discovery of the regular pattern of experience, followed by its variations in the implementations in the experiment. The second part of this section discusses the degree that service design tools and participatory design empowered the participants in the experiment. The third part deals with the connection between consciousness and responsibility.

4.2.1 The regular pattern and its re-interpretations

According to the literature review (see 2.2.3 Experience), four aspects can be found in a regular pattern of experiences. They are affecting each other in the order as following: signals, mental activities, behaviors, and outcomes. Our body receives signals from the environment, the sensory signals stimulate the brain causing mental activities. The brain processes informational input and form certain behaviors as the output. Behaviors lead to changes as the outcomes to the environment (Eagleman, 2015). The changes in the environment become the signals that shape our experiences (Russell, 2012). Diagram 4.2.1.1 illustrates a model of this regular pattern of experiences.

Diagram 4.2.1.1 Regular pattern of *My Experience Model*.

In the regular pattern of experience, the (environmental) signals can affect mental activities, then the brain forms certain behaviors, which cause changes as the outcome to the environment. The changes in the environment become the added signals in the new experience.

The findings of this research strongly support for the regular pattern of *My Experience model*. Three participants were asked to describe their experiences in the four aspects of experiences and search for more information according to the theme they chose in the experiment. When new information was introduced, the level of their mental activities, such as the perceptions and consciousness, was increased among all of the participants. However, the changes in the other aspects of their experiences, such as behaviors and the outcomes, were different from person to person in the experiment.

In the following paragraphs, the findings are organized according to each experience that the participants described. In the case of Raoul, his sleep experience was the main focus in the experiment. Whereas, Tasha had her experience of the Finnish food culture invested in the experiment, along with another two

experiences of living abroad, which were shared in the conversation and interviews. Participant Guopu had one experience on live in a happy and healthy life in his elderly days and another experience was a review about his lived experiences in the past decades. The regular pattern of the model was found in the case of Tasha, while the variations of the model were found in the case of Raoul and Guopu.

Re-interpreation of Raoul: 3 progressive layers in the previous experiences

In the previous sections, the visually presented data of Raoul, including *My Experience Map* and *Stakeholders Map*, were demonstrated along with the results and feedbacks. Raoul chose his sleep experience as the theme for the experiment. He has irregular sleep-wake rhythm. Sometimes, he stays up until three or four o'clock in the early morning. On the other hand, he feels it is difficult to get up, that he might sleep for the whole day. In this section, detailed findings of the experiment with Raoul organized as follows: firstly, the discussion of his previous experience of sleeping. Secondly, the explanation of the added signals in the experiment. Thirdly, the presentation of his new experience.

Previous experience

Three progressive layers are found to interpret Raoul's sleep experience, based on the interviews and conversations with Raoul. The understanding of his sleep experience progressively went deeper as the experiment continued progressing. At the beginning of the meeting, interviews were focused on the inquiry of the irregular sleep rhythm. The participant was asked to describe his physical surroundings, thoughts and feelings, actions and the outcomes regarding his sleep rhythm. He told the researcher that he does not feel tired when it is time to go to sleep. In the daytimes he feels lazy to get up. The researcher developed a category named '*superficial layer*' to generate this level of understanding of his sleep experience. In the second time of meeting, the inquiry was focused on the discussion of mental and physical tiredness, the sense of business and emptiness, as well as the outside influences, such as his responsibilities, motivations and purposes. The researcher named this level of understanding as '*deeper layer*'. In the third meeting, the discussions were pointed on his sense of self. He has a high standard of himself, which restrained him from doing his favorite activities. This level of interpretation is named '*core layer*' in the previous experience. The following paragraphs are organized to demonstrate the details of these three layers in the order of signals, mental activities, behaviors and outcomes.

- Superficial layer: focus on sleep experience

The superficial layer is focused on the discussion of Raoul's sleep experience. These included: the environment of his living condition and his bedroom, the emotions and thoughts that occur before he goes to sleep and after he woke up, the actions that are influencing his sleep patterns, as well as the outcomes of his sleep rhythm.

There are four main aspects found in the *Signals* category: the inconsistent routine of his current life, lack of concrete responsibilities during the daytime, the extreme living environment in Rovaniemi, and the historical background regarding his sleep experience (see Diagram 4.2.1.2 Signals).

The interview started with a description of his daily routine. Raoul said he does not have consistent routine in his current life, this inconsistency is influencing his sleep rhythm. He has too much free time with only a few classes and does not currently have a job. *"Um…that's hard (to describe my daily routine), because it's not consistent. […] I don't have like, a normal time that I get up or a normal time that I go to sleep. I just […] sleep as late as I can (embarrassed laugh) and then go to bed really late most of the time. (My sleep pattern) is just a product of not having as many concrete responsibilities during the day".*

The motivations and purposes for Raoul to start the day is the responsibilities in his life. *"Motivation is important like I have to need to get up. […] I have really hard time getting up without a purpose. It's okay for me to get up early, but I have to have something to do. Or else, I just won't (get up)".*

The physical environment also has a profound impact on Raoul's sleep experience. The city - Rovaniemi has extreme living conditions. In winter the sun rarely rises above the horizon, in summer times it has 30 days of polar days. Raoul's brain gets confused under the circumstances. *"This town is really easy to sleep a lot. It's always too dark in winter and too bright in summer".* Another factor of the physical environment is his bedroom. His bed is on the floor which does not have a frame, it creates a sluggish and cozy atmosphere for him. He is sensitive to light during sleep, but his curtain is not effective to block the light.

However, his sleep experience is not unique in this phase of his life, it has its historical background. *"I've always been like this since I was a teenager".* He mentioned the summer when he was in high school, his mom has to force him to get up because he spent the whole day for sleeping.
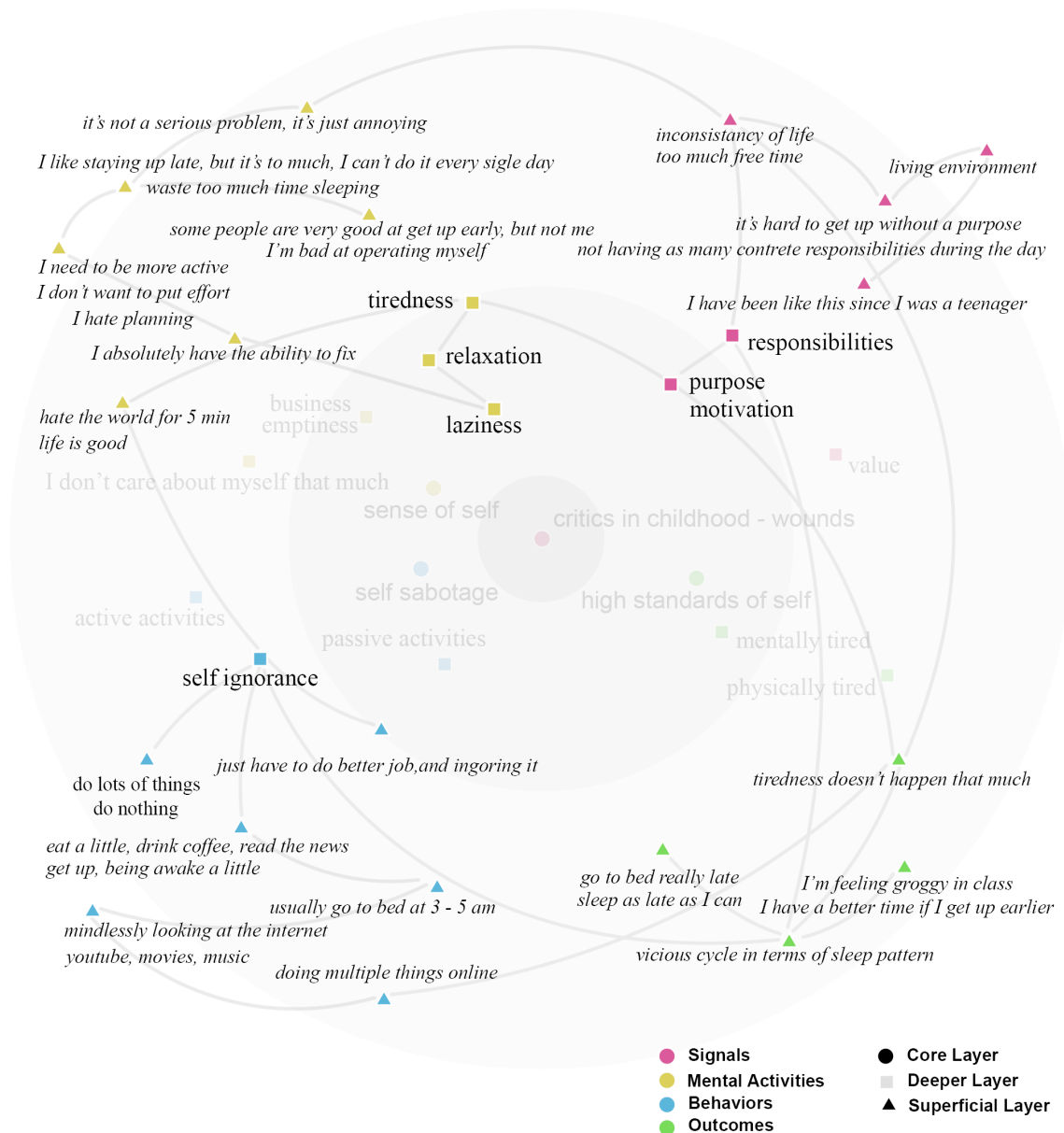
Diagram 4.2.1.2   3 Progressive layers - superficial layer.

This diagram demonstrates the major features of Raoul's sleep experience on a superficial layer and the relationships between each feature. This level of understanding is focused on his sleep environment, emotions and thought, behaviors and the outcomes in terms of sleeping.

Mentally, Raoul showed a series of struggles regarding his sleep experience. There are five categories needed to pay attention to: a) his attitude of this sleep experience, b) his negative self-image, c) the excess of relaxation, d) the role of tiredness in his sleep experience, e) the mental battle before he gets up (see Diagram 4.2.1.2 Mental Activities).

He does not perceive this sleep rhythm is a problem or an issue. *"It's okay, but not the best. […] It's not like a serious problem, it's just annoying".* On the other hand, he concerns that this lifestyle will damage his physical health and he is not using the time efficiently. *"I stay up all night, this is bad. […] I can't*

do that every single day. [...] I feel I'm not using the time productively. I have wasted too much time sleeping".

He has a negative self-image that he is a lazy person and lack of self-discipline. *"Some people are very good at get up early, but not me. I'm bad at operating myself".* He knows that he should make concrete plans and be more active during the daytime, *"but I hate planning, cause I don't want to put effort".* Facing this sleep rhythm, he firmly believes that *"I absolutely have the ability to fix it".* However, *"I'm kinda lazy".*

Raoul tends to excessively enjoy relaxation in his life, overly conducting activities such as sleeping and browsing the internet. *"I like to relax. I don't have a problem of doing things once I started doing them. But sometimes I take my relaxing too far. I love sleeping, sleeping is great. There's a level there, it's perfect and healthy, but I can never quite find it".*

He described the importance of *tiredness* in his sleep experience. His sleep rhythm largely depends on the extent of tiredness. It is easy for him to fall asleep when he has an intensive schedule during the day. But in this period of his life, he does not have concrete responsibilities during the day, he feels dreadful to go to sleep. *"When I go to bed and I'm tired, I'm happy that I'm tired. In December I was working a lot. So, when I went to bed, I was exhausted, I was tired. But it doesn't happen that much. (Tiredness) is more like sense of need, that I have to go to bed, like a dread, almost".*

There is a constant battle in his mind before he gets up. A notable sense of hatred when he wakes up and a delightful sense after he is fully awake. *"When I'm wake up, I'm [...], sort of hate the world. I just hate everything, for 5 or 10 minutes. Once I'm up, me, the actually me comes out. Life is good, I like being alive, become like a person. In between - being asleep and being a normal functional person, there's a monster there".*

Behaviorally, there are three important features. Firstly, he conducts an excessive use of the internet to increase the sense of tiredness. Secondly, the impacts of the daily activities on his sleep rhythm. Thirdly, a contradictory behavioral pattern of self-ignorance and the need for being accountable for the others (see Diagram 4.2.1.2 Behaviors).

Tiredness is crucial for Raoul to fall asleep. Before he goes to bed, he would try different kinds of activities, such as browse the internet, watch movies and read news, to make himself feel tired. Usually he goes to bed around three to five in the morning. *"Most of the time I'm doing multiple things online. Mindlessly looking at the internet. Watch movies, Youtube videos, listen to music, read news and Facebook pages".*

His sleep rhythm is inconsistent because of the changeable daily schedule. The daily activities are affecting his sleep patterns, he either sleeps inadequately or excessively. *"Sometimes I do lots of things and sometimes I do nothing. I could be extremely busy - having three classes in a day and go to play sports, drink beer with friends. Or work for a whole month. Now. I'm having too much free time but have nothing to do".*

Raoul showed a contradictory behavioural pattern that he tends to neglect the self-responsibilities, but he maintains to be reliable to other people. He ignores the sense of hatred when he wakes up and he does not care whether he feels good about himself or not. When the researcher asked him to explain the feeling of *hate the world for few minutes*. He said: *"I don't know what causes that or how to get rid of it. I think I just have to do a better job and ignore it"*. The ideal image of the morning for Raoul is *"get up and being awake a little, eat a little, drink a cup of coffee, and read the news"*. But the ideal morning is unlikely to happen. *"If I had to do things just to make myself feel better, I don't care"*. Despite the self-ignorance behavior, he showed a high level of reliability towards other people. *"I won't skip class or work, because I want to sleep. If I go to class […], I'm accountable to my teacher and my classmates that I'd be there. You know, the same as for my job, I made a promise to my boss whatever I'm working with that I would do this thing. So, it's like a relationship thing"*.

The outcome of these mental activities and behaviors is, he continuously living in the vicious circle of his sleep rhythm. He summarized by himself that *"I'm sleeping too much or too little, or I'm always tired at the wrong time"*. Intellectually he knows what he needs to do to have a regular and healthy sleep experience. But because of the self-image and attitudes, he is unlikely to change the situation.

- *Deeper layer: symptoms of inner conflicts*

The deeper layer explores the inner conflicts of Raoul's sleep experience. These included: feeling tired by seeking relaxation, the sense of business and emptiness, the choice of passive activities and active activities, the consequences of being mentally and physically tired.

In line with the superficial layer, tiredness is important for Raoul to fall asleep. Raoul is trying to increase the sense of tiredness by seeking relaxations. A night of good sleep for him is *"just a product of being busy"*. As mentioned in the superficial level, when Raoul has a busy schedule during the day, he would have a better sleep. However, when he does not have a concrete responsibility during the day, he needs to engage with multiple activities, mainly browsing the internet to obtain the sense of business. Therefore, he could gradually feel tired. For him, browsing the internet is a means to get tired, at the same time to get relaxed. He perceives himself as a lazy person when he takes the relaxation obsessively (see Diagram 4.2.1.3 Mental Activities).
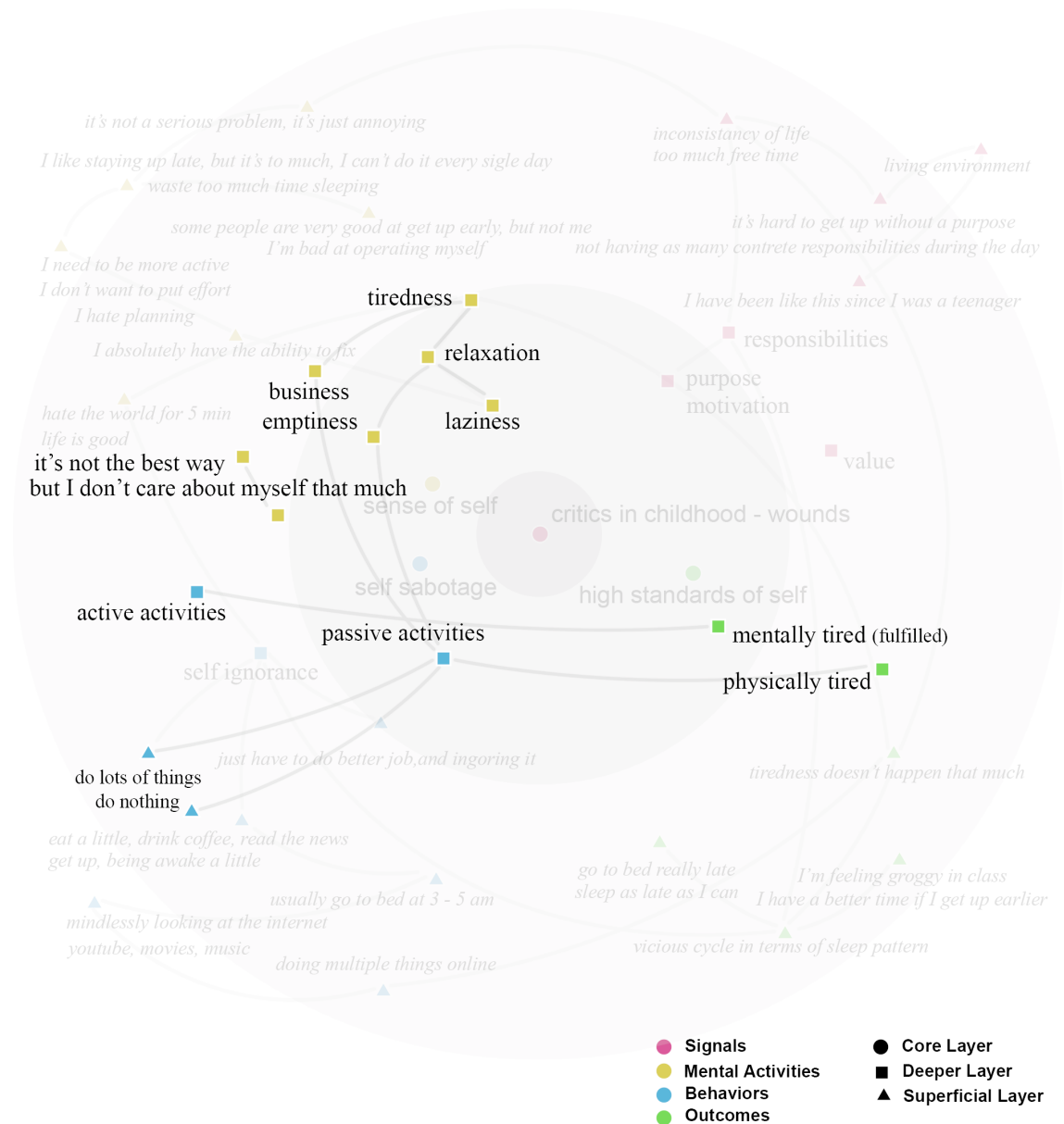
Diagram 4.2.1.3 3 Progressive layers - deeper layer.

This diagram demonstrates the major features of Raoul's sleep experience in the deeper layer and the relationships between each feature. This level of understanding focuses on his inner conflicts. Mentally, it reveals on the sense of tiredness and relaxation, business and emptiness. Behaviorally, it shows on his choices of active activities, and passive activities. These mental activities and behaviors lead to the outcomes of being mentally or physically tired.

Another contradictory mental activity is that he feels busy and empty at the same time after he engaged with multiple activities. While he is doing lots of things on his computer, he feels occupied by everything but not truly engaged with anything. *"I can be like watching the dumbest Youtube videos on earth and […] reading really serious news articles. And I'd be like, 'oh, I wanna hear this song right now'. It's just […] all of these things, […], doing everything and nothing all at once. […] It's kind of like, I'm with the computer always looking for something to do and I'm always doing something, but it's never like enough"*. After being intensively occupied by the computer, he feels lost and the empty. *"The movie*

I'm watching is really good, the video I'm watching is really good. And that ends, I can feel little lost. […], I don't know if that happens to you when you […] watch a movie or something, when it's over and you are like, 'Oh my God, that was my life for an hour and half, now I have to like find something else to do, to like, staying off the existential dread".

The deeper layer extents the understanding of self-ignorance in his mental activities. He explicitly expressed self-ignorance during the interview. He feels groggy in the class and it is a wasting of time when he sleeps for the whole day. Yet he habitually neglects these emotions. *"If it's like 'I have to get up to feel better', I don't care. Because it's just, the only person that benefit is me, I don't care about myself that much".*

In the second and third meetings, he realized that behaviorally he chose to engage with passive activities rather than the activities he truly prefers (see Diagram 4.2.1.3 Behaviors). He said: *"The thing is, I need more active activities and less passive activities during the course of the day to feel tired. Um, because relaxation and laziness are both passive activities, you know. Sometimes I get very investigated in watch movies. But still you know, not actually doing anything".*

For the outcomes, passive activities provide the physical tiredness, active activities bring him the mental tiredness. Physical tiredness cannot create sleepiness for him, he needs to be mentally tired to fall asleep. *"Physical tiredness and mental tiredness are not the same. Cause I can be physically exhausted, but my mind is not tired. Then I'm not tired. So, it's not like - I'm not sleepy and I go run around outside, then I'll feel even worse. Cause I'll be like, I feel like a crap, but it'll still not the right kind of tired. I think it's about the amount of time that I spend awake".*

- *Core layer: (distorted) sense of self*

The core layer discusses Raoul's sense of self. This layer is organized as follows: First, how the critiques from the social environment of Raoul's childhood influenced his sense of self and his understanding of responsibilities and motivations. Second, the reason that he chose to engage with passive activities during the daytime. Third, the consequences of being criticized during childhood.
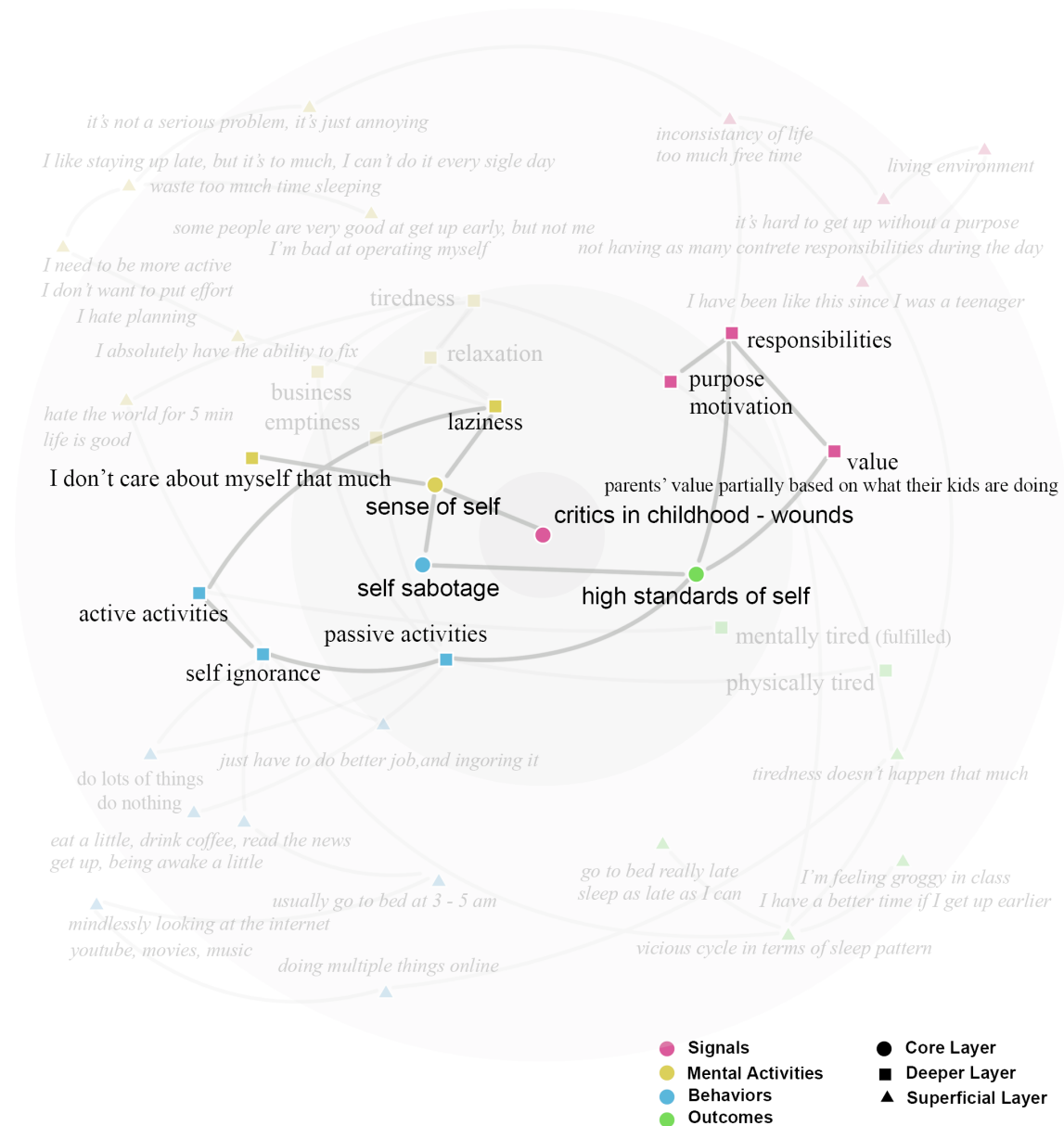
Diagram 4.2.1.4   3 Progressive layers - core layer.

This diagram demonstrates the major features of Raoul's sleep experience in the core layer and the relationships between each feature. This level of understanding focuses on his sense of self. The critiques in his childhood influenced his self-image, as well as his understanding of responsibilities, motivations and values. In terms of behavior, Raoul tends to choose passive activities and it is difficult for him to engage with the activities he enjoys. The reason behind it is he has a high standard of himself.

As explained in the outcomes in the deeper layer, in order to feel mentally tired Raoul needs to engage with active activities during the day. However, critiques in his childhood had a profound impact in his perception of himself and behaviors, this sense of self restrained him from engaging with active activities (see Diagram 4.2.1.4 Signals). He mentioned the critiques from his parents when he strived to achieve the goals. The critiques had a negative effect on his behaviors and eventually leaded to the collapses of his mental strength. *"They always wanted me to […] get better grades when I did, or, […], I think […] I did the absolutely best I could and didn't meet their standards. It was always they felt I*

wasn't trying hard enough and then my reaction to that would be 'well, I'm gonna try less hard now'".
He talked about his mother in particular, *"My mom would be mad if she thinks I'm not trying hard enough. […] My mom forced me to play (piano) when I was a kid. When I was in college, I forced myself to practice. I'm not gonna be able to play it by accident. In the end, I burned out"*.
Because of the standards that Raoul's parents gave him, he perceives purposes and motivations as the social forces, functions as the same as responsibilities. In his understanding, it is more important to be responsible to people around him, rather than to himself. *"I should do better job that motivating myself instead of waiting for someone else to motivate me. Yeah, I mean, […] that's correct. That's hard though, because […] I'm only accountable to myself"*.

Mentally, the critiques from his parents became his inner critical voices, he critiques himself when he engages with active activities (see Diagram 4.2.1.4 Mental Activities). This was reflected in the superficial layer that he has a negative self-image. He persuaded himself that he is not good enough to meet the standards and he feels distressed when he did not reach the standards. *"It's really, really hard for me to motivate myself, because […] I convince myself that I'm really bad at it. So, […] I rather do nothing than working on something that makes me feel bad about myself"*.
His self-image of being a lazy person also comes from the inner critiques. *"I convince myself, I can't do it at all. So, if I can't do this well, then there is no point to do it at all, so I rather do nothing"*.

The negative inner voices restrained his behaviors. He would rather choose passive activities, so that he can escape from the inner critiques (see Diagram 4.2.1.4 Behaviors). *"I have to […] be lazy all the time, by doing nothing. Then […] I'll just have enough time do it okay. Which is me […] protecting myself I guess, […] from my own high standards. Cause if I do something […] as well as I possibly can and it's not good enough […]. That would hurt"*.
He also explained the reason that he sleeps excessively. *"I just want to sleep, cause if I get up I won't be as happy, so I won't work as well. So, it's like cycle to me to […] justify my own behaviours to myself. So, I kind of sitting around and do nothing"*.
In the core layer of his behavior, he is unconsciously sabotaging himself by making small mistakes. This self-sabotaging behaviour matches with his sense of self that he cannot reach the standards. *"I just make dumb misdates a lot. Even to something that I know […] perfectly, even to the music I know all the time. I know exactly what this is, I know it perfectly. But it's just this little tiny stupid […] mistake would happen. I can never get rid of that. […] Yeah, I have like a way of sabotaging myself"*.

Eventually, as the outcome, the critiques from his parents framed his self-image and influencing his behaviors throughout his lifetime. The outside critiques become the inner critiques which restrains his perception of himself and behaviors (see Diagram 4.2.1.4 Outcomes). *"I think I have really high*

standards for myself. I don't like to do things badly. If I feel that I'm doing something that isn't good enough to my own standards, [...] I rather do nothing".

The high standards cause frustration for him when he is doing active activities. On one hand, he wanted to engage with the activities he enjoys, but the self-critiques would destroy the pleasure. *"I still get really frustrated when I'm just playing (piano) for fun by myself. Cause [...], in my head (I) will be have this self-criticism coming back - 'you are not doing anything, this has no value'. But then at the same time, I think to my head 'okay, put a reason why you are play piano right now is because you enjoy it, it's not because you are trying to actively create something. You are just doing it for yourself, this is like the same as watching TV, it's for fun'. So, it's like, I have to get out of my head, sometimes".*

To conclude, there are three progressive layers in Raoul's previous sleep experience. They were unfolded layer by layer during the experiment. The superficial layer revealed his sleep rhythm. He does not have a consistent sleep pattern. Either he does not feel tired enough to fall asleep, or he does not feel motivated to wake up. He tends to live in this vicious circle constantly. The deeper layer discussed his inner conflicts which are reflected on his mental activities and behaviors. In order to fall asleep Raoul needs to feel mentally tired. However, the activities he chose were not helpful for increase the level of mental tiredness. By engage with lots of passive activities, he feels physically tired, but mentally he does not feel tired at all. The core layer indicated the critiques from his childhood shaped his self-image and behaviors. The reason he chooses passive activities rather to active activities is that he wanted to escape from the inner critiques. Consequently, he formed high standards of himself and self-critiques, which hinders his choices of active activities.

Added signals

The experimental intervention started at the end of the second meeting. Raoul was asked to search for new information about 'how to have a good sleep' and 'the mechanism of the rewarding system of the brain'. The added signals were determined by the researcher based on the interview and the conversation of the first meeting.

For a good sleep, Raoul said he searched for the information by himself before the experiment. He explained, *"Most of the stuff is about the physical environment. [...] You wanna be calm, you wanna do stuff before bed that calms you down. [...] So, don't [...] do bunch of crazy stuff, like watching scary movies. [...] Do something that calms and relaxes you before you go to bed, which I do".*

For the rewarding system in the brain, he mentioned the topic is complicated, but he feels the information he found is interesting. However, the question itself is rather irreverent to him. *"I didn't write anything down, but I [...] looked in something. [...] I pretty much understood the concept of the brain, it's kinda*

[…], get addicted to the good feeling of the things that you like. So, like when you do something and it's rewarding, your brain releases happy drug and you get happy".

New experience

There is no clear evidence shown that new experience occurred after more information was added. Specifically, new experience did not occur in terms of behaviors and outcomes. Raoul commented that, *"I didn't have any [...] new revelation, I didn't [...] discover anything new about myself"*. Also, he explained the possible reason of this result. *"I didn't agree to do this because I really feel I wanna to change, I agree to do it because I wanna to help out my friend. So, it would be a little bit different, if I was in a position where I felt [...] this was really [...] affecting my ability to live in quality and enjoyable life. Which is not the case, it's just [...] a little annoying"*.

However, in terms of mental activities, Raoul reported the increase in the awareness of his sleeping environment. He said: *"I notice my process of moving from this room (study room) to this room (kitchen), [...] and I had become [...] very conscious about how I explained what I was doing […]"*. He said he became more conscious about the change of the environment.

To conclude, three progressive layers are found in Raoul's sleep experience. In the beginning, the interviews only focused on his sleep experience. Including his living environment, current lifestyle, emotions, thoughts and behaviors regarding the sleep experience. These are the factors that affecting his sleep rhythm. Raoul goes to bed around three to five in the morning and sleep as long as he could. Before he goes to bed, Raoul usually browsing on the internet and doing multiple activities. Is it difficult for him to get up without a concrete responsibility during the day. According to the transcription of the first meeting, the researcher analyzed his living environment and behaviors that influenced his sleep rhythm. In order to change his sleep experience, the researcher tried to raise his awareness of the outside environment and his own mind with two questions. 'How to have a good sleep' and 'how does the rewarding system work in our brain'. However, this attempt did not alter his sleep experience. Because there are more than one layers embedded in this sleep experience, the added signals were only trying to alter the whole experience based on the superficial layer. There are other two layers in his sleeping experience. The deeper layer of his sleep experience indicates the strong effects of his inner conflicts that leads him to think and behave in a contradictory manner. The core layer reveals the self-criticism and high standards of himself, which hindered him from doing the activities that he enjoys. It is understandable that the experiment failed to change his sleep experience. Due to the fact that the experimental intervention was based on the superficial layer, which in fact, the core layer is the essence that determines his sleep experience.

Re- interpretation of Tasha: confirms the regular pattern of 'My Experience' model

In the previous sections, visually presented data of Tasha, including *My Experience Map* and *Stakeholders Map*, were showed along with the results and feedbacks. Tasha chose her experience of living abroad as the theme for the experiment. In the experiment, Tasha talked about the changes in her brain and behaviors after she moved to Finland. There are three examples found in the experiment with Tasha that evidenced the regular pattern of 'My experience' model. In this section, comprehensive findings of the experiment of Tasha are organized by these three examples. Previous experience, added signals and new experience will be discussed in each example.

- *Finnish food culture*

The first example is Tasha's experience of Finnish food culture. In the first meeting, Tasha mentioned the food she prefers is always the Asian food. After she moved to Finland, she misses food from Japan all the time and does not enjoy the Finnish food. In the experiment, Tasha was asked to search for more information about Finnish food culture. As the result, new experience occurred after the experiment (see Diagram 4.2.1.6).

Previous experience

In the first meeting, Tasha wrote a sticker says: "Delicious Asian food". She said: *"Asian food is delicious. Whenever I'm gathering together with Asian people, we cook together. I realize that Asian food is really good"*. Whereas, her perception of Finnish food was: *"I don't like Finnish food at all"*.

In terms of environmental signals, the Finnish food she encountered with are the food in school cafeteria and the Finnish transitional Christmas dinner which she had in a small town of northern Finland. She said: *"The Christmas week that I had with my Finnish friends, […] that week there were only Christmas food there. During Christmas they only eat […] those carbohydrates. Mostly, bake something, cakes, cookies, potatoes, potatoes and potatoes, I was like 'oh my goodness, there are only carbohydrates! No vegetables, even […] in salads, there's only […] potatoes and potatoes'"*.

Behaviorally, she chose Asian food whenever she cooks food. Also, she does not hesitate to consume ready-made or unhealthy food when she was in Japan. She said: *"It's a really common thing for Japanese people to do so. I think, we have too much products, especially in Tokyo, I guess, where I came from. There are so many restaurants, so many shops and so many ready-made food shops. And it's not that expensive, it's easier than cooking (by yourself) and you don't have to prepare the ingredients. Yeah, I didn't hesitate to buy, because everyone else does"*.

As the outcome, she preferred Asian food to Finnish ones. She always enjoys to cook Asian food with her friends and by herself.
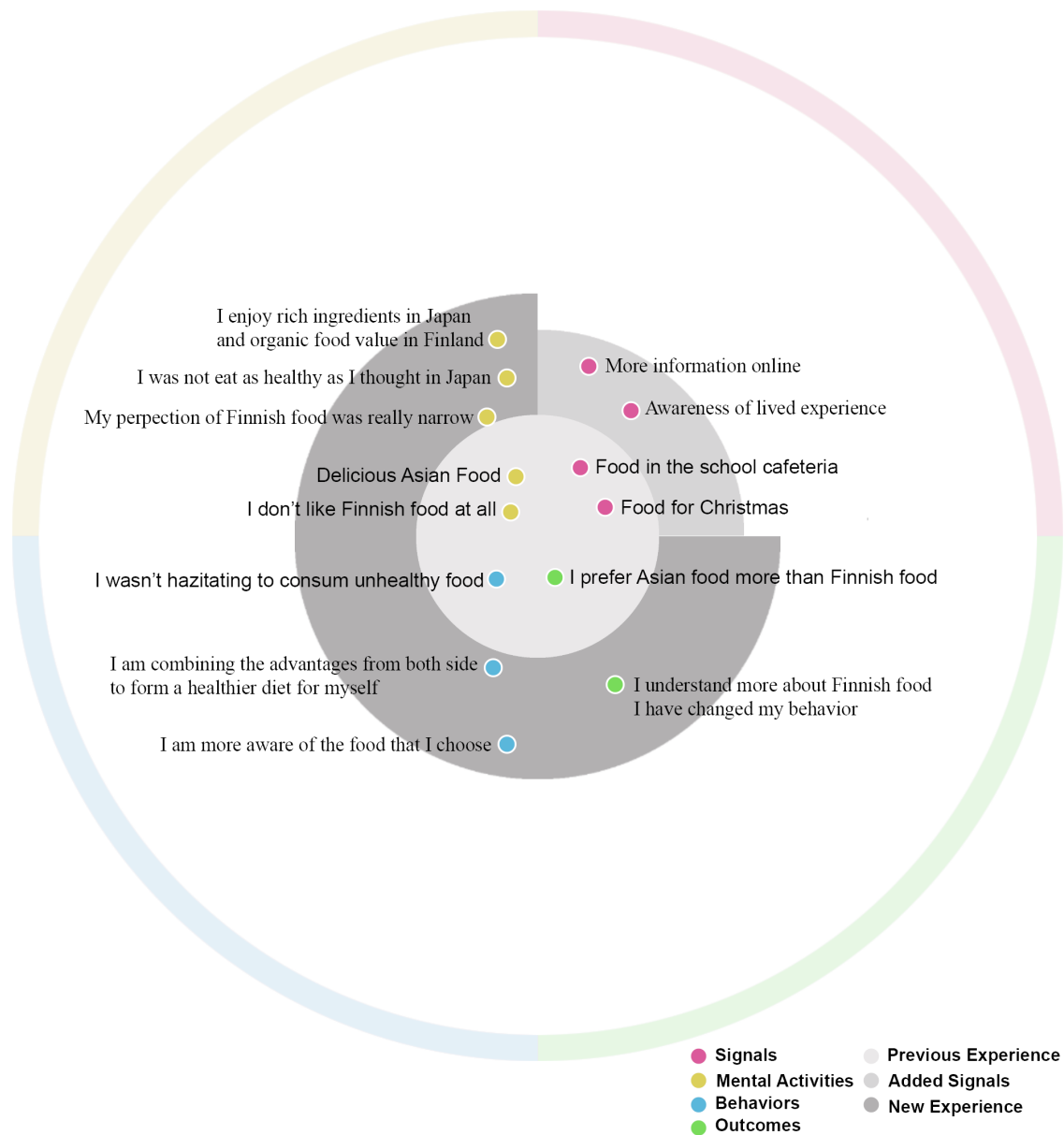

Diagram 4.2.1.6 Experience of Finnish food culture.

This diagram reveals Tasha's experience of Finnish food changed after the experimental intervention. The inner circle reveals her previous experience. One quarter of the outer circle illustrates the added signals. The rest of the outer circle demonstrates the changes of mental activities, behaviors and outcomes. In the previous experience, she held a negative experience of Finnish food. After she searched for more information and became more conscious about Finnish food culture, she changed her perception and behavior.

Added signals

In order to understand more about the Finnish food culture, Tasha was asked to conduct a small research about Finnish food and she was able to reflect her lived experience in Finland. Tasha found a Finnish

dietary guidance from the internet. She said: *"There is a list for what they should be taking. So, like fibre-rich, low salt, avoid hard-fat and sugar, (consume) low fat and low-salt meat and so on"*.

She searched about the soil fertility in Finland. *"I think, why people choose to eat carbohydrates and breads, and those things, is […] because of the soil fertility. In Japan, we have rich soil and mountain. Food from mountains, seas and rivers. […] We have various of nature. So, we have huge choices of ingredients. Elsewhere in Finland, it's pretty hard to grow anything here, in this kind of mountains. Also, they have to import food which is hard for them to keep the food fresh"*.

She memorized that her Finnish friends who are living around her prefer to eat organic and healthy food. She noticed from her lived experience that Finnish people (her Finnish family friends from Utsjoki, her Finnish roommate and her dancing classmates) value organic food. They pick up berries, go hunting and fishing by themselves. *"In Utsjoki where I have my Finnish family friends, they are really trying to stick to the organic food and all of them, I guess, have their own tea that they picked up from nature"*. In addition, she said: *"In Utsjoki, […] they don't choose (the organic food). But the organic food seems the only choice they have"*.

New experience

Tasha dramatically changed her perception of Finnish food after more information was added. She realized the decisive factor about Asian food she enjoys is the rich ingredients. She said: *"I'm […] making it clear right now […] I really love sea-food and all kinds of vegetables"*.

Tasha became aware that her previous experience of Finnish food was pretty narrow which shaped her biased perception regarding the Finnish food. *"When I was searching online about Finnish food, I actually thought 'not as bad as I thought'. I'm […] recognizing […] what I thought is […] only some part of Finnish food. There are lot of things that I haven't even tried. When I thought about Finnish food, I mostly thought about the food in the school restaurants. According to my Finnish friend, it's not actual 'Finnish food'. So, I think I was just looking at a really narrow part of Finnish food culture"*.

She reflected her mental activities of the previous experience. She acknowledged that she was unconscious about her own perception. *"I also realize that […] I wasn't really look at the reality when I say that 'oh, Asian food is the best'. […] I was thinking about the Christmas dinner that I had with my Finnish friends. That week there were only Christmas food there. So, that gave me the strong impact on the Finnish food culture image. I think that […] given me the biases. […] I think I haven't really seen the reality of Finnish food"*.

Tasha also became more aware of her behaviors that she was combining the advantage side of Asian and Finnish food already before the experiment. *"I was unconsciously taking the advantages of both sides. So, by doing this (the experiment), I'm like 'oh, I'm taking both, I thought I just […] don't like Finnish food at all. I wasn't really blending into the Finnish food culture'. But I was pretty much doing so, I […] have changed some of my behaviors (already)"*. Furthermore, Tasha said she will pay more attention to the food that she consumes in the future. *"At least I will try to look at what's inside"*.

To conclude, in the previous experience, Tasha had a limited understanding of Finnish food. It built a narrow perception and behaviors regarding the food choices and preferences. During the experiment, she was asked to search for more information about Finnish food and was able to reflect on her previous experience. As a result, Tasha became more conscious about her previous experience and formed a new experience of Finnish food.

- Online communication and gaming experience

In this example, Tasha described her experience of online communication and gaming after she moved to Finland. When she was in Japan, she rarely used online communication or played computer games. After she moved to Finland, her emotions, thoughts and behaviors have changed regarding the means of communication and self-entertainment (see Diagram 4.2.1.5).

Previous experience

When Tasha was in Japan, she lived with her parents and benefited from the convenience of the public transportation. She had an easy access to her family and friends. She talked about the differences of the social environment in Japan. There were lots of entertaining activities to take part with her family and friends, online gaming was not one of the options when she was in Japan.

In her understanding, constantly using the internet to communicate and play games was unhealthy and time wasting. She said: *"It feels like I haven't done anything and I feel regretted after that. And it's bad for my spine and eye sight because I only sit and watch the screen, not going outside"*.

Behaviorally, Online communication and gaming were unnecessary in her daily life. Tasha mentioned: *"I don't really like to being online for the whole time. Even when I was in Japan, I didn't really login Facebook for, I don't know, more than 3 months. I don't even open the laptop for months. It's totally fine"*.

Naturally, as the outcome of her previous experience, she did not use the internet frequently, nor did she play computer games while she was in Japan.

Added signals

The added signals were the change of her living environment. After Tasha moved to Finland, she started to use online communication frequently. Due to the long distance from her family and friends, as well as the social norms in the new environment. She said: *"Because of the distance from my home-country. And the system - school system, governmental, official applications and emails are there online. I had to be online most of the time"*.

Another added signal was when she was living in a small town of northern Finland. The town regularly holds a weekend online gaming event in winters, where she had the chance to experience online gaming. *"When I was in Utsjoki school, lots of students, especially boys, they tend to play online games when*

they are at hom. Because there is really nothing to do. Many friends, they are kind of living far away, the game weekends are the time that they kind of gathering together to hangout, which I also tried sometimes".
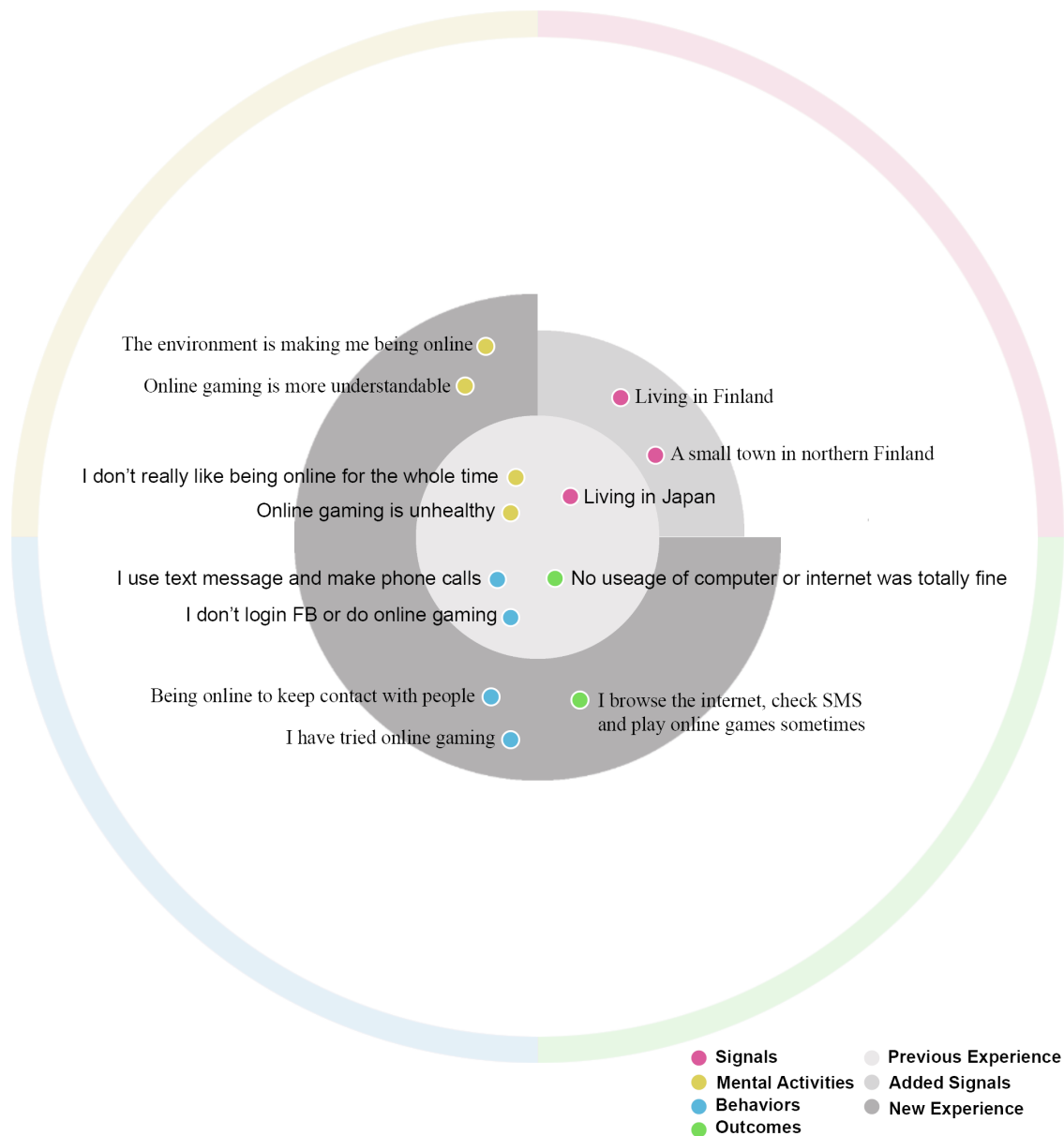

Diagram 4.2.1.5   Online communication and gaming experience.

This diagram illustrates Tasha's experience of online communication and gaming. The inner circle reveals the previous experience. One quarter of the outer circle illustrates the added signals. The rest of the outer circle demonstrates the new experience of mental activities, behaviors and outcomes. In her previous experience, she rarely being online when she was in Japan, she did not use the internet frequently. She perceived it as a wasting of time and could create an unhealthy lifestyle for her. Yet, after she moved to Finland, she changed her behaviors and developed a more comprehensive understanding of this experience.

New experience

The change of the environment forced her to adapt to her surroundings. Despite her perception of the online communication and gaming activities, she changed her behaviors in the new environment. *"It's*

like the environment is making me to get online. For now, I use Facebook for university things, like studies and getting contact with teachers and friends. So, I have to be there".

Although, in terms of mental activities, she still perceives being online as unhealthy. But Tasha has a better understanding of this behavior after she talked with people who are living in Utsjoki. *"I still perceive this as unhealthy, I don't really like it. (But) I didn't have to being online to communicate with my friends. Unlike the boys here, they don't really have anything else to contact with their friends"*. She gave the researcher a detailed reason behind this phenomenon: *"Basically, (because of) the location and where their friends are living. Their mothers and the planners who manage the game events, they are saying [...], they (the boys) always want to play with their friends, but because they are living really far from each other, they cannot play (together). And usually, in Utsjoki it's really cold. So, if you wanna play in winter times, it's easy to get online and talk to friends online. Sometimes they also have co-players from abroad, they can actually learn languages from computer games. So, it's really nice for studying and having a relationship together. It's really nice"*.

In the end, she expressed her concerns of this activity. *"Just, they tend to stay longer online. It's hard to keep their posture straight for the whole time. I saw this news that Finnish boys, [...], they have really weak back bones right now because they play computer games a lot and not really going outside to play"*.

As the result, she changed her behaviors and understanding of the usage of the internet and computer games. *"I usually brows on the internet, SMS, sometimes even also playing games online, it's not a big thing for me"*.

To conclude, in the experience of online communication and gaming activities, Tasha altered her behaviors and developed her understanding of this experience because of the environmental change. Before she moved to Finland, she did not spend lots of time being online, nor did she play computer games. After she moved to Finland, especially lived in northern Finland for few months, she started to use online communication more frequently and developed an empathic understanding of gaming activities.

- Making friends with Finnish people

This example reveals Tasha's experience of making friends with Finnish people. In her previous experience, living as an international student in Rovaniemi, she felt it is difficult to make friends with Finnish people in the university. After she moved to Ustjoki for an internship, she developed solid bonds with the local people and formed a more comprehensive understanding of Finnish people. (see Diagram 4.2.1.7)
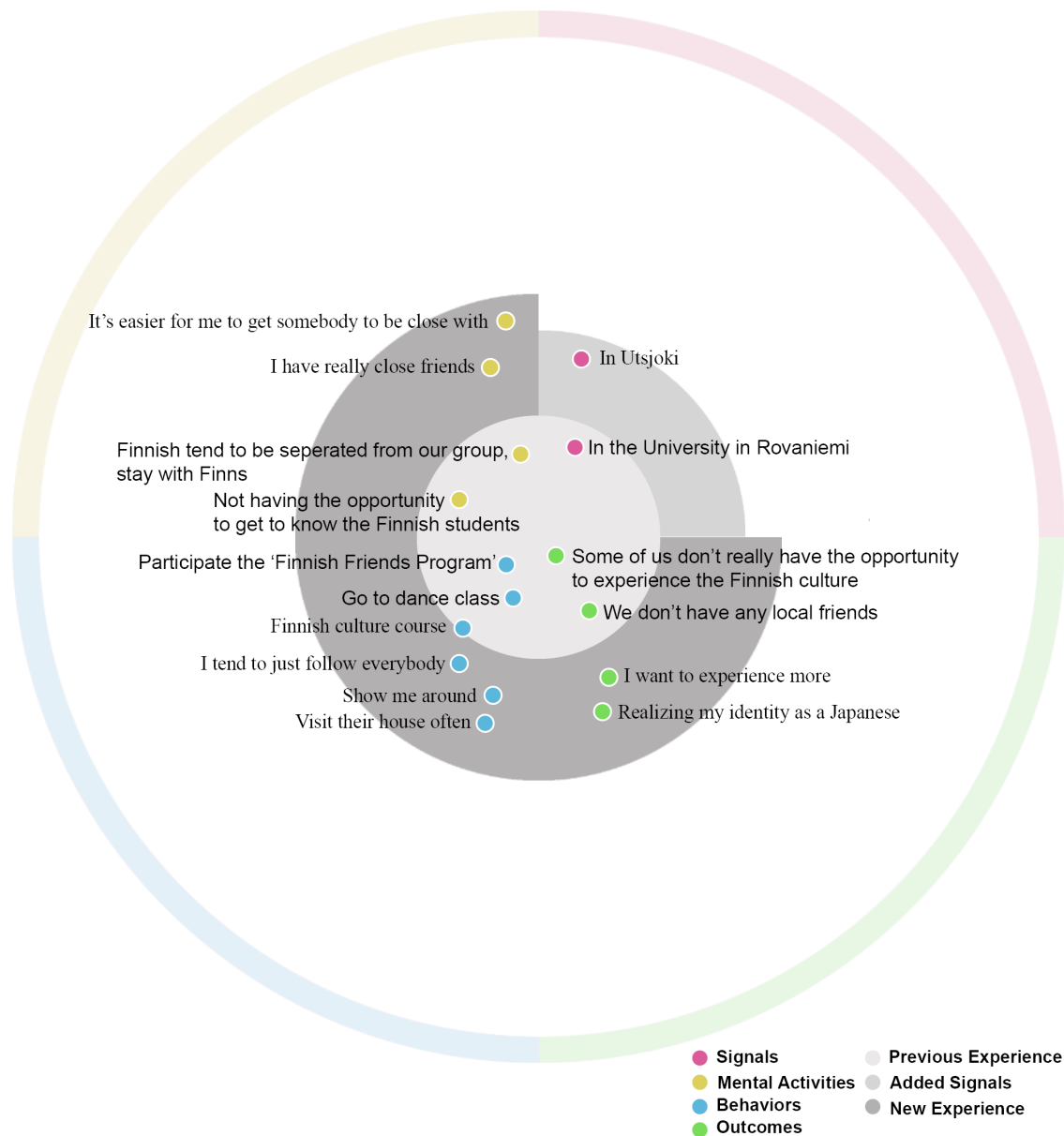
Diagram 4.2.1.7   Experience of making friends with Finnish people.

This diagram illustrates Tasha's experience of making Finnish friends in two different places. The inner circle reveals the previous experience. One quarter of the outer circle illustrates the added signals. The rest of the outer circle demonstrates the new experience of her mental activities, behaviors and outcomes. In her previous experience, her social environment is mainly in the university. The mobility there is higher than the social environment in Utsjoki. In the university, it was difficult for her to develop stable friendships. After she moved to Utsjoki, the new environment altered her experience. She developed some close relationships with the local people there.

Previous experience

After Tasha moved to Finland, the first place for her to live was Rovaniemi. Tasha felt it is difficult for her to make friends with Finnish people in the university. She participated the 'Finnish friend program' and tried to make some local friends, but she felt the friendship faded away quickly. Not only Tasha, also her international friends felt the same that they do not have any local friends. *"Something came up*

to my mind is, something about the Finnish culture and the life of exchange students, especially life of Master's students. Cause we have been talking about not having the opportunity to get to know the Finnish students. Especially for me, (in my faculty) we don't have many Finnish classmates. I guess lots of my classmate - except for few of them, we don't have any local friends".

The researcher pointed out that there are a few Finnish students from her class. Tasha said she feels Finnish tend to stay within their own groups and the international people did not have the chance to integrate with them. *"There are some Finnish classmates, but they are there for few classes. They are mainly taking the Finnish courses. […] (Because) we are already really close - those international classmates. But then, there are Finnish students, they tend to be separated from our group, […] they tend to stay with Finnish people. We talk, of course, but it's not like we get really close that we can go to each other's places and have party. It's not like that. So, some of us don't really have the opportunity to experience lot of Finnish culture here. Though, […] we are all in Finland".*

Behaviorally, she went to the local dance class and participated the 'Finnish friend program' held by the university. Yet, it is quite rare for her to initiates the conversation in social events. It was difficult for her to maintaining the relationship with the people in the dance class and the friend program. She told the researcher: *"The relationship tends to fade away. I think it's really a rare case that somebody from Finnish friend program are keeping contact with each other for more than one semester".*

The possible reason behind the difficulty of making local fiends is the social environment. In the university, the mobility of the students is pretty high and they are oftentimes occupied by their studies. She said, *"Mainly because they are busy, and we are busy. Usually, Finnish people they kind of move a lot, 'oh I have an exchange program there', 'oh, I just changed my work place'".* In addition, she said she made some friends from the program, but they needed to be separated when their relationship is not stable yet. Gradually, she lost the contacts with them. *"Yeah, I think it's hard because you have to keeping contact online. […] You can't really get to know each other by one meeting. It's not really a natural relationship, isn't it? You have to be lucky to find somebody getting along with you. It's not about the shared interests when you have a good friend, (it's) more like a personality thing. But they (the university) organize it based on interests. Yeah, mostly, from interests".*

Beside the factor of the social environment in the university, another element that influenced her experience of making friends is that she is an introverted person. She explained: *"Well, it's not only about Finnish culture, but also I have people from other country or other culture that I tried to get close as much as I can. It's quite hard for me, because I tend to be, really (introverted). I'm not really outgoing. I'm not like 'hey, let's go for a drink' kind of person. It's quite hard, but yeah, once we get to know each other, I try to be really close".*

Added signals

The added signal in this experience was the change of her living environment, from Rovaniemi to Utsjoki. Utsjoki is a smaller and community-based town. Compare to the university-based environment in Rovaniemi, Tasha had the chance to experience a whole different kind of friendship in Utsjoki. *"I'm lucky that I had the chance to go to Utsjoki. I was the only one who's from foreign country. That was the first time they have somebody that is from other country to live there. So, everybody was quite interested in why I was there. That was easier for me to get somebody to be close with. And whenever they say […] 'what are you doing this weekend?'. I tend to, just follow everybody, wherever they go".*

New experience

In the new environment, the mobility is much lower than in the university. It is community based and people tend to have long lasting relationships in a relatively stable environment.

Environmentally, it was not easy for her to develop friendships in her surroundings in the very beginning because people were conservative and suspicious about her present. *"They are quite shy I guess and some people doesn't really want to speak English, some teachers didn't want to. They kind of avoided me. I think they are really afraid when I was there for the first day, everybody was like (whispering) 'why is she here' and some teacher were like, I said 'Hi', they were like 'hi…' (in a timid and suspicious way)".*

In terms of mental activities, she felt after few weeks later, she became more accepted by the community. She said: *"After two weeks, I sort of understand […] why they are acting like that. Because after two weeks, they kind of get used to my existence, they started to greeting naturally. […] But before that, they were kind of observing what I am doing there […] It's quite hard to get into the community right away, but once you get to know them, then it's really easy. They […] accept other cultures, or values easily".* She felt joyful integrated into the community and excited to explore the new environment. *"I usually enjoy it - being the only one (foreigner). Kind of throwing into a totally different world […] or community, kind of enjoyable. There are a lot of things to see, […], every single second was interesting for me and I have a lot of things to absorb".*

However, she also pointed out that there were few moments she felt uncomfortable in the social encounters. One situation was she feels shy when she becomes the centre of the communication. *"But, because of my characteristic, […] I can't be in the centre of the communication So, whenever I get too much attention, I get too shy, (I) […] tend to be 'no, no, don't look at me' (she laughed). So, I try to be one of them, not […] one foreigner, standing out. I tried to blending into the community".*

Tasha also felt uncomfortable when she perceives herself as a disturber of the social norms. *"Sometimes, they […] paid attention to me - (to) my existence. For example, they have been talking in Finnish and it's okay for me. But at some point, they are like, 'ah, should we speak in English for her, should we…', they paid too much attention to me. I don't really like that because I just like the way they do the things*

themselves - […] in their way. But I don't want them to change the way they do because of my existence there".

Another situation she felt uncomfortable is when her identity becomes too obvious in social encounters. *"When there is a little kid comes here. For example, she has been hugging everybody, (saying) 'see you, see you'. Suddenly, she noticed me and she, I think she wasn't familiar with the Asian kinda look, she was like 'should I hug her or not'. Yeah, so, there's one moment I noticed that I'm different and that's when I don't really like. It's natural that I'm different and people are noticing this, it's a usual thing. But when it becomes obvious, then I don't really like it I think"*.

During the time that Tasha live in Ustjoki, a significant change in her mental activities and behaviors are shown in her description. Behaviorally, she participated lots of events with the local people. Her friends took her to all kinds of places, invited her to their home and spent holidays together. *"In Utsjoki, I have close connections there. I have friends there and Finnish family. I was there for Christmas, spent time like 3 weeks there. I was always visited to their house, cook something for them, they also cooked something for me"*.

Notably, the friendship was not maintained on a superficial level. She had intimate conversations with her close friends, shared her personal lives and culture with her local friends. Tasha knows more about the similarities and the differences between Japanese and Finnish culture. For instance, they discussed how divorce has been managed differently in their cultures. *"One of my friends, she got divorced, but everybody doesn't really […] gossip. It's not how it happens in Japan, […] where everyone kind of blames this person. Like the relatives and parents, […] 'you can't get divorced, it's kind of ruining your reputations and your life'. And if you get divorced, it's quite hard to live after that, […] (If) you have children, hard to get married again. Yeah, your reputation kind of goes down. But in here, it's more like, 'oh, I got divorced because I wanted to enjoy my life more'. And I really think it's different - the lady and how their (the Finnish people) mind works"*.

Consequently, Tasha took some Finnish culture courses after she came back from Utsjoki, the courses helped her understand the culture better. *"Mostly I get those 'why they are acting like this', kind of basics. So, I think it's helpful"*. She thinks that she was lucky compare to some of her international friends that she had the chance to have a different experience. *"I was lucky to have that opportunity. But other than that, if I only stayed in here (in Rovaniemi), try to do my best, I think I wouldn't be able to find anybody that close"*.

To conclude, in the previous experience of making Finnish friends, due to the social environment, including mobility and norms in the university, Tasha was not able to develop close friendships with Finnish people. After she changed her living environment to Utsjoki, Tasha had a completely different

experience of making Finnish friends. She understood the culture better and was able to integrate and experience the culture on an intimate level.

To sum up the case of Tasha, there are three examples in her experience of living in Finland. Including Finnish food culture, online communication and gaming and making friends with Finnish people. According to the data, these examples indicate Tasha obtained the new experiences due to the change of the environment. In the first example, the added signals were designed by the researcher. In the second and third examples, the added signals were the change of her social environment. In all of these examples, Tasha had new experiences after the environmental change. Her experience altered in the order of (environmental) signals, mental activities, behaviors and the outcomes. Evidences are conherent in all of the examples.

Re-interpretation of Guopu: reverse feature of the regular pattern of 'My Experience' model

In the previous sections, visually presented data of Guopu, such as *My Experience Map* and *Stakeholders Map* were presented, along with the results and feedbacks. In this section, two examples will be presented to demonstrate the case of Guopu. He chose to question 'how to live a happy and healthy life in his elderly days' as the theme for the experiment. In *My Experience Map*, he revleaed his understanding of a happy and healthy lifestyle and shared his perception and behaviors regarding his goal. A detailed description of this example is presented down below. The second example was a real-life experience. At the end of the experiment, Guopu described his lived experience throughout the past sixty years. This real-life experience challenges the regular pattern of 'My Experience' model. Different from the regular pattern of experience, another re-interpretation of the regular model is found according to the data. The finding of this lifetime experience is presented as the second example down below.

- How to live a happy and healthy life in elderly days
In this example, Guopu chose to ask 'how to live a happy and healthy life in his elderly days' as the theme of the experiment. In the previous experience, he received different answers to that question, yet, he felt confused about those answers. Because the information he received is contradictory. He did not have standardized rules for his goal. The researcher purposefully designed the added signals as the experimental intervention. According to the data, Guopu changed his mental activities after the intervention. However, no clear evidence in the change of his behaviors and outcomes regarding this experience (see Diagram 4.2.1.8).

Diagram 4.2.1.8 How to live a happy and healthy life in elderly days.

This diagram reveals Guopu's experience of 'how to live a happy and healthy life in the elderly days'. The inner circle reveals the previous experience. One quarter of the outer circle illustrates the added signals. The rest of the outer circle demonstrates the new experience of mental activities. In his previous experience, he received lots of information from his friends, and family. Which made him confused, he did not know how to approach his goal. After the experimental intervention, Guopu learned a new way of searching for information and changed his perception of his lifestyle and life goals. However, no new behaviors nor outcomes occurred after the experiment.

Previous experience

Guopu is a Chinese male in his late 60s who has a reasonably healthy body and agile mind. During the day, he likes to speculate in the stock market, practice cucurbit and meet with his friends. In the night, he likes to stroll on the street or scrolling on his phone. He was retired few years ago. The only thing concerns him is how to live happily and healthily.

In terms of environmental signals, all the information Guopu got is mainly from an application called Wechat. He spent a lot of time on scrolling his phone. WeChat is the most important tool for him to keep contact with his friends, as well as the source to get information. He could receive hundreds of unread messages and shared articles every day. With enormous amount of information that he consumed every day, he felt confused. Because the information is promoting contradictory values. *"I don't read books nowadays and rarely watch TV. The main source is from WeChat - the internet. There are lots of information for me to read every day - 'Chicken soup for the soul', 'health care', 'Fitness', all kinds of information written by some professionals or experts. Many of my friends on WeChat are forwarding those articles to me. You will find they are contradictory after you've been reading a lot. Every article has its point, but each of them is pointing different directions. I feel confused and I don't know who to trust. Now I just gave up on the rules. I think it's not that complicated. Just eat when you are hungry, drink when you are thirsty. There is no restrictions"*.

Even though his attitude towards life was 'no restrictions', he still concerned about his physical health. *"I don't have any requests or plans of my life because I know, as we grow older, our body gets weaker. There's no doubt that our abilities gradually decrease"*.

Goupu had his own understanding of how to being healthy. He said: *"Regulate your lifestyle, pay more attention to the diet and nutrition, a balanced mental state is also very important"*.

Behaviorally, he participated different kinds of activities for entertainment. For instance, play cucurbit is not only a good exercise for his lungs, also a means to socialize and self-amusing. Oftentimes he was asked to teach his friends, also he was offered the opportunities of commercial performances for the communities.

He likes to learn new technologies, such as about computers and smart phones. He said usually his peers know really little about it. He always got the chance to help them with technical problems. It made him feel he is not outdated, he can help people and he is still useful for the society. The realization that he is not a burden to others made him feel happy about himself.

However, he mentioned some parts that he did not follow his rules. He did not take good care of his diet and sometimes he eats food that are not fresh. *"Food occupies in a tiny percentage of our life. We don't spend a lot of money on it, nor do we eat a lot. One reason is because I don't have much appetite nowadays. Another reason is because my wife is often not at home, she is either in some classes or meet with her friends. It's quite a work to cook just for myself, so I usually feed myself with whatever we have at home. It's not a big deal to me. Sometimes I eat food that are not that fresh, I don't like to waste food, but I know it's not a good habit"*.

Regarding the outcomes in his previous experience, he realized that the lack of physical exercise had a direct influence on his appetite. *"I'm lacking of physical exercise recently. It doesn't affect my mentality,*

nor my body. However, I don't feel hungry and I don't eat as much as before. Sometimes my legs are so sour if I have ridden my bike".

Despite the diet, Guopu mentioned he gets irritated easily and it violated his rule of having a balanced mental state. *"I get angry so easily nowadays. Towards my friends, co-workers, especially towards my wife. Sometimes I get really mad that I totally lost my mind. She always likes to do all kinds of things at once, few days later she will leave those things to me. I had to take care of those things that she was supposed to take care of. She is always not at home, she doesn't clean and take care of the family anymore".* Not only does he get angry to his family and friends, but also to the politicians. *"Sometimes, I post some aggressive articles on WeChat. I didn't write it by myself, I just forwarded it. But sometimes it gets too aggressive. I can be too serious about those things and got angry with it".*

Added signals

In the previous experience, Guopu intellectually knew that lack of physical exercises leads to the decline of his appetite. He consumes rotten food when he knew it is harmful, yet he does not want to waste food. He noticed some changes in his body as he grows older. However, his understanding and perception remain ambiguous regarding those problems, also the source of information was narrow and limited. According to his previous experience, three aspects were focused in the added signals. Firstly, search for more information about the relationship between diet, exercise and disease. Secondly, get to know more about the physical and mental changes of elderly people. Thirdly, widen the source of information. Not relying on WeChat for the source of information, but using a comprehensive and scientific search engine instead.

Guopu was inspired by two scientific research that he found on the internet. A study by Ellen Langer who is a psychology professor, did an experiment called 'Counter-clockwise study' in 1979. It suggests that the environmental change could influence the mental set and behaviors of the elderly people. Another research is about the relationship between epigenetic and cancers. It claims that genes are not the decisive aspect in getting disease such as cancer, epigenetic as the environmental factors has the direct impact on human body.

Except the scientific research, Guopu also gained a comprehensive knowledge of how the body and mind will be changing among the elderly people, what to expect when people aging, how to slow down the process and how to improve the current situations.

New experience

After the intervention of the added signals, Guopu showed some changes in terms of mental activities. He felt more hopeful about his elderly life as he learned lots of useful information from the research. He felt affirmed by the research that some of his own understandings are no longer simply fuzzy thoughts in his head, but rather they were scientifically approved and demonstrated. *"Those are a huge*

encouragement to us. Knowing that people's mindset can affect how we age. Our body can actually be changed through the environment and our mind. I'm happy to learn this useful information. They're scientific, people have done experiments on that. It's reliable and trustworthy".

He became aware about the influences from his friends on his perceptions about the elderly life. Regarding the limited source on Wechat, passive attitudes were spreading among his social circle. *"You know, among our friends' group there is a saying – You should eat and drink while you still can and make yourself happy for one more second. Because you'll never know what's going to happen in your life. It's full of this kind of passive energies, it seems elderly people have given up on themselves. They tend to escape from the reality and lying to themselves. Those are just from their limited experiences and very subjective perceptions".*

Despite the scientific studies were inspiring and he became more aware of his surroundings, he does not feel motivated to seek for answers from the roots anymore. *"I liked to explore and loved to understand the world from its origins and roots. But nowadays, I just want to do things that are easy, simple and fun. I don't want to do the experiment myself, I only wish to see the result immediately".*
However, due to the limited time of the experiment, there was no clear evidence showing new behaviors and outcomes occurred after the experiment. Guopu did not report any behavioral and changes in results.

To conclude, in the previous experience, Guopu received numerous information from a narrowed source and it caused confusions and contradictions in his mind and behaviors. In the experiment, he was asked to change the sources of the information and search for the comprehensive and reliable knowledge regarding his theme. After the experiment, he changed his perception of how to living in a happy and healthy life and became more aware of the impacts from his surroundings. Yet, there was no significant changes on his behaviors and the outcomes.

- ***Lived experience in real life***

This example reveals the experience in a real-life situation. In the end of the experiment, Guopu challenged the regular pattern of 'My experience' model, he said that according to his lived experiences, it did not follow the order of signal, mental activities, behaviors and outcomes. In this section, a detailed description of Guopu's real-life experience will be presented (see Diagram 4.2.1.9).
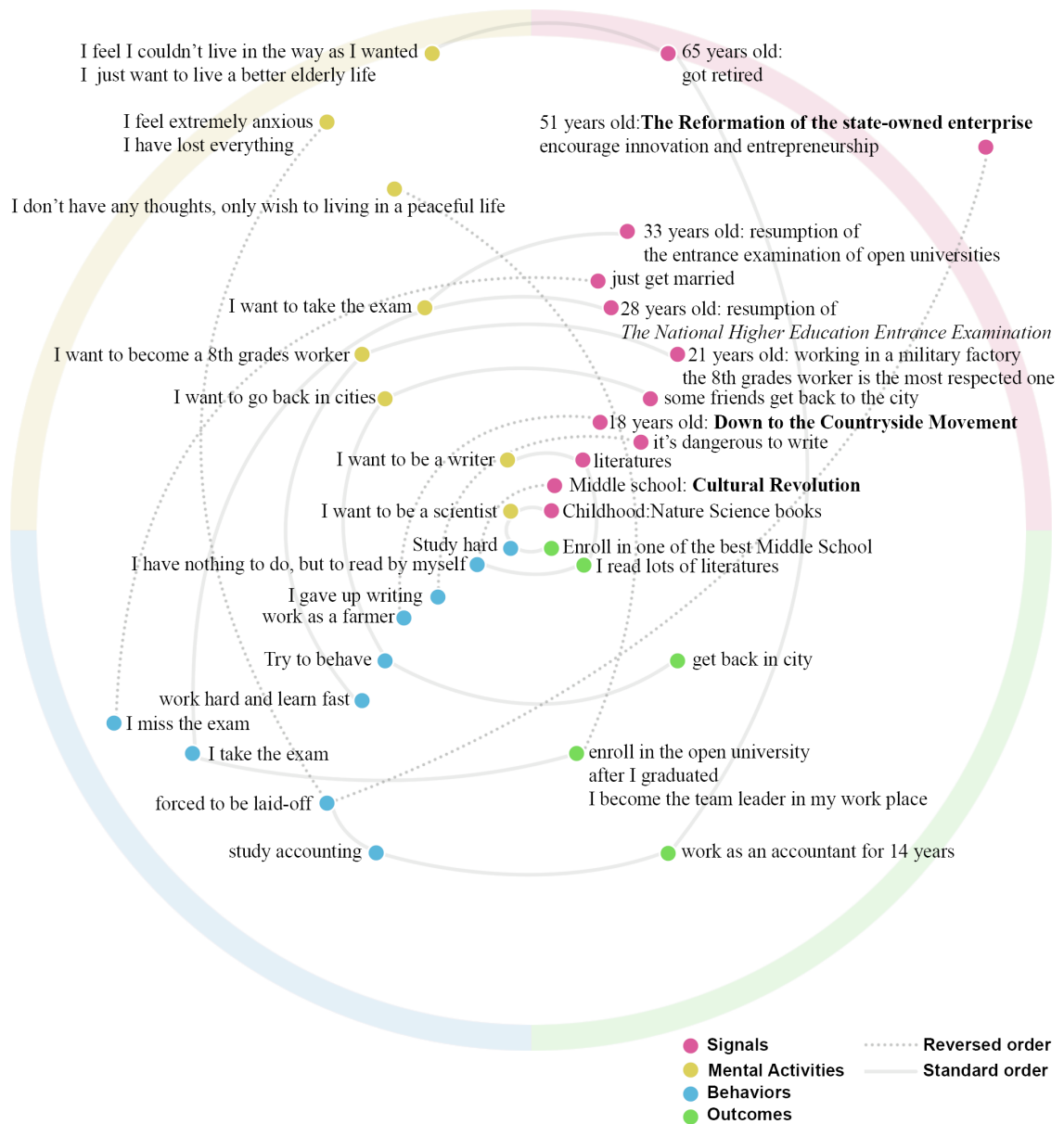
Diagram 4.2.1.9   Lived experience in real life.

This diagram illustrates Guopu's life changed due to the change of the (social) environment. Throughout his life, the dominant force to change Guopu's life were the policies in China. The solid lines demonstrate the order that match with the regular pattern. The dotted lines demonstrate the revered order of the regular pattern.

When Guopu was exposed to all kinds of books of nature science when he was a child. He was always curious about questions such as why the Earth is round, how big is the universe and what caused the rain. Guopu said: *"There were so many things happening around me. Those were pretty fascinating and unique for a small kid. Kids are often curious about everything. I thought that scientists are those who can uncover the secrets of the nature. So, I wanted to be one of them, I wanted to explore the secrets of the universe"*.

Behaviorally, he studied hard, fortunately he was good at math and nature science. Consequently, after the elementary school, he enrolled in one of the best middle school in the town. He thought that was one step closer to his dream.

In the third year of middle school, he was forced to drop off his study, due to the change of the policy in China. It was a turbulent period in Chinese history. Started from the Cultural Revolution. The whole society was in chaos and panic. Guopu was forced to leave school. *"The third year was the beginning of the Cultural Revolution. Teachers and the headmaster were either denounced or arrested. My school was closed, students were left alone"*.

Behaviorally, Guopu chose to read books by himself. He said, *"I had nothing to do. I can't work, can't go to school. Books were taken out from the library by the Red Guards and scattered into the public. So, I got the chance to read some of it"*.

He read all kinds of books: novels, proses, poems and philosophical essays. This environmental change led to the change of his dreams. He decided to be a writer. *"So, I had another idea, I wanted to be a writer!"*.

He started to write novels, but the political situation was dire for a writer, people needed to be extremely careful of the way they spoke and behaved. *"But it was dangerous to write back then, during the Cultural Revolution you need to be extremely careful of what you are saying, and writing, people might use your words against you, they might claim that your words are against the value of the revolution. Writing and even speaking were highly risky, I couldn't write whatever I wanted to express, so I didn't become a writer, neither a scientist"*.

The policy changed his life again, due to the movement called 'Down to the Countryside Movement'. Young students were forced to learn farming and working in the countryside. Guopu was sent to a farm and he worked as a farmer for 3 years. *"Chairman Mao sent us to the countryside, made us working as farmers, from the year 1968 to 1970, I have been there for 3 years. Only during the Spring Festivals can we go back to home, to the city"*. In terms of mental activities, he missed the time when he was still living in the city. *"I felt the life in city was like the paradise - abundant goods and food, familiar culture, everybody had a decent job with higher income (compares to the countryside), I desperately wanted to go back to the city"*.

Behaviorally he attempted to act in a good manner in the farm. Fortunately, he passed the assessment of the recruitment of a military factory. In 1971, he got back to the city.

When Guopu's living environment changed into the factory, his dreams shifted once again. The most respected people in the workplace were level-eight workers, who are highly skilled and productive. Guopu wanted to be a level-eight worker in the factory.

Behaviorally, he studied tirelessly and worked hard. However, the social environment changed his path one more time. He was sent to another apartment, forcing him to change his job, and he also lost the opportunity to become a level-eight worker.

In his age of twenty-eight, the Chinese policy resumed the National Higher Education Entrance Examination. It means people have the chance to enrol into the universities. Guopu wanted to take the chance. *"I felt my dreams were ruined by the reality, mostly the policies from our government, but I also knew by heart that 'knowledge can change my faith', I want to study, I need education".* Embedded with this perception in mind, Guopu wanted to take the exam.

On the other hand, he just got married in the same year. His first priority was to take good care of his family and by doing so, he had to compromise his dreams. *"If I got into the university, I might need to leave home. I can't do that. Now I felt regret and sorry for my loss. I think if I got in the university, my life would have been much different".*

At the age of thirty-three, the open university started to accept applications. He and his wife both took the exam at the open university. Fortunately, they both enrolled into the open university. After they graduated, they were promoted in the leadership positions in their respected working groups.

Despite that Guopu was graduated from the open university, he continued his job in the factory. He did not have his dream life there, the only wish he had was to live in peace. *"In the factory, I had no direction anymore. I can't go to the proper university, can't be a scientist, nor a writer. I only had one wish, that was to live in a peaceful life, take care of my family, save some money and build our home. But, unexpectedly, this simple thought couldn't be reached as well".*

The policy shifted his life without any doubt. In the 80s, the leader of China - Deng Xiaoping opened the Chinese market, encouraged private business and entrepreneurship. *"After the 80s, Deng started the economic reformation, encourage workers to build their own business, people started to become entrepreneurs businessmen".* In 2001, in his age of fifty-five, many state-owned enterprises were reformed to adapt to the new policy. Guopu and his colleges were forced to leave their jobs. It was a great shock for them. He said helplessly: *"They didn't allow me work in there anymore. They dismissed the contract, we became free men, no job, no organization, no sense of belonging".*

Emotionally, he felt extremely scared and being abandoned. *"I felt extremely scared and paniced. It seemed like just for one night, everything had turned upside down. I felt I lost everything: my status, my reputation, my honour, my income, my benefits from work, everything. I thought work as a worker in a state-owned company offers as a life time promise, I've never thought that could change. I had no dreams, I didn't know where to go. Despite all the effort that I made, studies, works, everything in the past has completely vanished, what to do?".*

Policies as one form of environmental signals can change people's lives. Guopu's life was profoundly influenced by the restless policies. In order to survive, he needed to adapt to the social and political environment, to the environmental signals.

In the age of fifty-one, Guopu began to learn accounting, a new job that supported him for the rest of fourteen years. Guopu revealed the reason he chose to be an accountant rather to a businessman. *"I didn't want to be a businessman. I wanted to be a scientist, a writer, things to do with knowledge and culture. I knew that I can't bear the anxiety and pressure of being an entrepreneur. I'm good at technologies, not business"*, he paused a little bit and said, *"I found out actually if you are willing to work, don't be afraid of hard work and don't be lazy. You can easily find a job, the salary and welfares are pretty good. Even better than those who stayed in the state's companies. So, I became an accountant for fourteen years after that and I am still good at it"*. After he reached the age sixty-five, he finally retired from work.

To conclude, in the collection of experiences that Guopu lived, a pattern was found to explain the reverse order of the regular pattern of 'My experience' model. The environmental signals (mainly policies in Guopu's experiences) directly forced the change in his behaviors. It means Guopu did not have enough time to process the environmental changes in his mind, nor choose the policy. Rather, he was forced to react to the new environmental signals in order to survive in the given social environment.

Each outcome of the previous experiences became the signals of the next experience in his life. Guopu's dreams and desires in his life changed according to the change of the environment. From 'becoming a scientist' in his childhood to 'I only wish to live in peace' when he worked in the factory.

The social environment changed dramatically throughout his life, it forced him to change his behaviors immediately, regardless of his mental activities. This kind of experience declined his confidence and vacillated his believes that he has the power to shape his life. At the end of the experiment, Guopu said: *"I don't have any thoughts anymore, I really don't. Our country is a mess, it always has been a mess, I feel that I can't live in the way I wanted, I can't walk by myself, I've always been drifting"*.

As it was demonstrated in the previous example, Guopu wanted to live a happy and healthy life in his elderly days. Yet, he lost the interests to explore and he only cares about the results. Consequently, this passive attitude has been embedded to his mentality, which continuously shapes his life experiences. *"After decades of living, experiencing ups and downs, good and bad, I am old now, the only thing I am concerning is how to live in a better life in my elderly time, as for the dreams, they are already in the past"*.

To sum up this section, a regular pattern of 'My experience' model was found in all of the participants. Normally, experience follows the order of (environmental) signals, mental activities, behaviors, and outcomes. This cycle of experience is a complete experience, which could be understood as the previous experience. The changes of the previous experience are possible when the environmental signals changed. The change of the environmental signals could be understood as the added signals in the experiment. The added signals could lead to the next cycle of the new experience.

However, in the implementation of the experiment, a series of the re-interpretation of the regular pattern was found in each individual's example. Raoul's re-interpretation revealed, the previous experience could consist of different layers, if the added signals are not implemented in the core layer of the previous experience, the cycle of new experience will not occur. There are three progressive layers in Raoul's previous experience. Yet the added signals were only trying to shape his understanding on the superficial layer. Because the added signals ignored the other two layers, the deeper layer and the core layer in his previous experience, no new experiences occurred after the experiment.

Tasha's examples demonstrated the standard of the regular pattern. One example was the experimental intervention, the other two examples were from her lived experiences. The common pattern of these examples are her previous experiences were all changed by the added environmental signals, in addition formed the new experiences. Her experiences changed in the order of added signals, mental activities, behaviors and outcomes. She found new understanding of her previous experiences, became more conscious about her perceptions and more responsible to her behaviors.

Guopu's real-life example demonstrated a reversed order of the regular pattern. When the added environmental signals forced him to adapt to the new environment, he immediately shifted his behaviors. The outcomes were not what he wanted in the first place. Gradually, he lost the sense that he could control his life because the social environmental signals (policies) were more powerful and dominant in changing his life. His previous experiences modified his attitudes and perceptions in his elderly lifetime. Even though he wanted to live a happy and healthy life, he did not want to put in the effort to understand himself and behave according to his goals anymore. In fact, he thought the less he needs to think, the happier and easier his life would be.

4.2.2   Enabled users

This section deals with the requirements of enable users. Three features were found in the experiment that contributed to enable users. The first feature reveals the actions and assistance of the researcher in the experiment. Followed by the presentation of the initial actions of the participants. The third part deals with the importance of the time period that given to the participants.

In the first meeting, the researcher described the purpose of the experiment, the meaning of 'My experience map' and 'stakeholders map' and explained how to build these two maps in details. This offered the participants the first impression of how to build the maps and the contents in the maps.

As the experiment progressing, more detailed descriptions were given to the participants. After the first meeting, the researcher made experience maps for all of the participants according to the audio documents. Each map was presented to the participants in the second or third meeting. Raoul felt he was in a therapy session during the meetings as he was asked to describe a lot of his emotions and thoughts. *"It was definitely interesting for me […] to get it out of my mind and then into someone else's mind. And, because you mapped all these stuffs out, […] that's […] something that I would never do in a million years. So, it's interesting to see it's done in that way, and […] have, someone really try to understand what's going on in my mind".*

In the third meeting, the discussions of the connections of each component in 'My experience' map were guided by the researcher. Tasha felt the guidance from the researcher was largely influenced on her experience throughout the experiment. It provided her the tools to understand herself. The interactions between her and the researcher offered her a means to reflect on her previous experiences. *"Your map really helped me to see what's happening inside of me. I haven't really thought about to visualizing or making it so clear to myself. Because I've always had it inside somewhere, but it was all over the place. So, it's now more organized and much clearer".*

In the last meeting, a detailed explanation of the experiment was presented by the researcher, these including: the formation of experience, the connections of each conponent in 'My Experience map', the meaning of the maps and the possible implementation of the methods. Guopu said the tools helped him to organize his inner world and be more aware of himself and his lived experiences. *"First thing came to my mind is, in our daily life experience, we never pay attention to the experience itself or bother to organizing our thoughts regard to life experience. After this experiment, I have learned how to use the scientific methods to understand my life experience and to find the rules that governs the experience and the connections of each aspect. It helps me to living or experiencing my life in a scientific or systematic way in the future".*

The amount of time which was given to the participants was crucial for the results of the experiment. The whole experiment continued for two weeks and there were two to three days in-between each meeting session. This schedule allowed the participants have enough time to process the informational input from the researcher and to react to the tasks after the meetings. This long-term process progressively deepened the participants' understanding of their experiences as well as the experiment itself.

Tasha said the time that given to her was necessary for her to develop a concrete understanding and system in her brain, also she was able to build the confidence and interests to use the method by herself. *"I think having four meetings (experiment) is really good because I like the process that I'm starting to*

understand what's happening. So, for the first meeting, I was like 'hm, I'm not really sure, but maybe I will just find something'. Then the next meeting, I stared to understand what's going on, so I knew what to write more. And then for the third meeting, I was pretty sure, so I could […] add a lot more than the second meeting. Right now, I feel I can add a lot more if I wanted". Raoul also agreed that he would not be able to understand the whole process and the experiment by the first or second meeting, the amount of time was helpful and necessary for him in experiencing the experiment.

In the experiment, initial inputs such as actions and thinking processes were required from the participants. All of the participants were asked to create the experience map and stakeholders map by themselves. It created the sense of ownership and empowered them to think and use the tools throughout the experiment. This expanded the degree of participation, offered not only integration of the participants, but also empowered them to take the initial actions to understand themselves.

They were asked to finish the background tasks after each meeting and devote lots of time to discuss their experiences with the researcher, in terms of the environments, thoughts, feelings, behaviors, and outcomes. They were asked to reflect on the whole process of the experiment in the end of the study. All the participated reported that they understood themselves better than before and 'My experience' map offered them a systematic way to interpret their experiences, they were enabled to see the connections in their experiences.

To conclude, the design methods that were used in the experiment, as well as the experimental process both contributed to enable the participants. The researcher as a facilitator assisted and guided the participants throughout the experiment. The amount of time was given progressively deepened the understanding and build the interests and confidence for the participants. The initial inputs from the participants created the sense of ownership for the participants and enabled them to process and react to the experiment.

4.2.3   Being more conscious leads to being more responsible

This section discusses the increase of the consciousness among the participants and the relationship between being more conscious about the environmental signals and being more responsible of one's behaviors.

According to the data, all the participants reported that they felt more conscious about their previous experiences, specifically they become more conscious about the environmental impacts on their mental activities and behaviors. A study by Blakemore & Frith (2003) shown that often times people are unaware of their actions and experiences. The consciousness of the actions tends to occur after the actual actions. 'My experience map' offered a visualized means for the participants to review their experiences.

More specifically, the participants were able to understand themselves and their experiences by mapping the mind. The participants were guided to analyze the connections of the four components in their experiences' maps. This helped them not only to articulate their experiences, but also to see their experiences in a tangible means. By doing so, the participants were able to understand the experience as a whole event, also review it from diverse and detailed angles. All the participants explicitly articulated that they felt more conscious about their previous experiences, especially their mental activities and the environment after the experiment.

The increase of responsibilities for the actions and the results are found different from person to person in the experiment. Tasha showed an increase of the sense of responsibilities after the experiment, whereas, Raoul and Guopu showed no significant change. According to the studies (De Groot & Steg, 2009; Stern, 2000; Steg, Dreijerink, & Abrahamse, 2005), the sense of responsibility occurs after the awareness of the outcomes of one's behaviors.

Raoul did not perceive the outcomes of his sleep rhythm is problematic nor did the outcomes affect his life, it is reasonable that no significant improvement in his sense of responsibility. *"If I was in a position where I felt […] this was really […] affecting my ability to live, a quality and enjoyable life, which is not the case. It's just kind of […] a little annoying"*.

In the example of live in a happy and healthy life in the elderly days, although Guopu noticed some of the outcomes are unappreciated and could harm him in a long term, yet he did not experience the consequences of the small vicious results. Intellectually, he knew that if he continuously behaves in certain way, it would sabotage his goal. But emotionally, he is detached from the harmful consequences, since he did not experience it, nor was he willing to explore it in the experiment.

On the other hand, Tasha not only raised her awareness, but also profoundly analyzed the relationship between her living environment and the outcomes of her actions. There were two examples in Tasha's case which completed the cycle of previous and new experiences. It allowed her to reflect on her experiences and the outcomes both on intellectual and emotional level. In the end of the experiment, she said: *"It's becoming more and more clear to me. I know what to do in the future so I can get the pleasant outcomes"*.

To conclude, after the experiment, all the participants showed an increase of the consciousness level. The most significant change is they became more aware of the impact of the environmental signals and their mental activities after the experiment. Due to the fact that the increasing sense of responsibility is highly related to the awareness of the consequences regarding the experiences, only one participant showed the improvement in the sense of responsibility, the rest of the participants did not reveal a notable change.

4.3 Self-reflexivity as a researcher

Self-reflexivity is be self-aware of the role as a researcher. The subjective attitudes, beliefs, emotions and the relationships with the participants are the features that can influence the research process (Ellis, 2007; Leavy, 2017). Three features will be presented in this section. Firstly, discusses the impact of personal relationships with the participants that shaped the experiment. Followed by the self-reflexivity on the subjective attitudes and beliefs that crafted the research process. Thirdly, the limitation as a researcher that designed the structure of the research.

The researcher has personal relationships with all of the participants. This feature helped the researcher easily build the trusting and harmonious atmosphere throughout the research. The sense of trust and safety are important in this qualitative-based participatory research. In the interviews and conversations, participants were willing to share their personal experiences, emotions and thoughts. Some of the contents were intimate and surprising. Because of the personal relationships that were established before the experiment, the researcher was trusted and appreciated by the participants.

On the other hand, the researcher concerned about personal relationships might affect the participants' perception of the researcher in an academic role. Fortunately, when more professional information was given to the participants, the role as a researcher was more accepted and respected. All the topics, maps and patterns were discussed exquisitely by the participants and the researcher together.

In order to maintain the professional and neutral voice, minimize the subjective and emotional influences on the participants, subjective emotions of the researcher were not shown to the participants in the experiment.

The experiment was largely influenced by the researcher. All the interviews and conversations were conducted according to the subjective attention of the researcher. The conversational interviews determined the themes and direction of the experiment. The researcher functioned as a facilitator in the introduction of design tools, presenting the purpose and meaning of the experiment and guidance throughout the experimental process.

The added signals as an essential component of the experiment were determined by the researcher according to the transcript of the first meeting session. The researcher endured great amount of responsibilities in the experiment by determine the direction of the experiment.

In order to proceed the experiment according to the progress of each participant, data analyzing process started after the first meeting. Including the transcriptions of the audio data, creation of the experience maps and field notes, the analysis of data. This created a large workload for the researcher. On the other hand, starting the analyzing process in the beginning of the experiment also helped the researcher to understand the participants progressively and formed a comprehensive mental image of the participants.

One limitation of the researcher is that she was largely focused on the discussion of *My experience map*, and so ignored the contents on *Stakeholders map*. Stakeholders map was discussed only in the first meeting and explained at the end of the experiment. Most participants felt confused about the purpose of stakeholders map. Stakeholders map was used to offer the participants a comprehensive understanding of their environmental influences in their experiences. Due to the limited time given for the experiment, stakeholders map was not used as the main discussion of the experiment, the purpose of this map was explained by the researcher at the end of the experiment. The contents of this map were vomited in the experiment.

To conclude, the researcher used the personal relationships with the participants formed a positive and trusting atmosphere throughout the experiment. Meanwhile she maintained a professional and neutral role among the participants. The researcher was fully responsible for the progression of the experiment, the interpretation and presentation of the participants' experiences. The analyzing process was conducted by the researcher early in the experiment, in order to individualize the progress for each participant. This allowed the researcher unfold the intimate contents of the participants' life, at the same time, built great amount of workload for the researcher. One notable limitation is that the stakeholders map was neglected by the researcher, due to the time limitation and the focuses in the experiment.

4.4 Outcomes

This section sums up the main outcomes regarding the experiment. These including: a)the formation of regular pattern of 'My experience' model, its re-interpretations and the possibilities of change the experiences, b)the requirements of enabling users, c)after the experiment the increase of the consciousness is notable, while the increase of the sense of responsibility various from person to person.

In the experiment, one regular pattern of 'My experience' model was found according to the data. First of all, the formation of experience follows the order of environmental signals, mental activities, behaviors, and to the outcomes. The change of the experience can be interfered by altering the environmental signals, also named as added signals in the experiment. This can be understood as the physical environmental changes, for instance, change of the living space or geographical areas. It can also be understood as the intangible environmental changes, such as get more information or knowledge, change the source of information and change of the social environment. When the environmental signals altered in the previous experience, new series of experience would occur. The formation of the new experience also follows the same order as the previous experience.

However, re-interpretations of the regular pattern of 'My experience' model were found according to the data. Experience could be consisted by different layers as the interview and conversation progress.

New experience would not occur when the added signals are not targeting at the core layer of the previous experience. It takes certain amount of time to obtain a comprehensive understanding of the previous experience. The superficial layer is the most obvious one, which easy to get access in a short-term interview. The core layer of the experience, however, is ambiguous and difficult to discover without analyzing and making connections of the data. It is important for researchers to understand the whole spectrum of the experiences. In order to change the experience, the added signals need to applied on the core layer of the previous experience.

Another re-interpretation of the regular pattern is that experiences are not always follow the order of signals, mental activities, behaviors and outcomes. Environmental signals such as policies and culture norms could force the behavioural changes. This behavioural change could lead to unappreciated outcomes when the behaviors are not the products of the mental activities, rather it is directly stimulated by the environment. The more forced behavioural reactions occur throughout one's life, the more one would feel incompetent in controlling one's life. This pattern tends to shape people's brain structure profoundly with negative attitudes and believes.

The second outcome of the experiment is the requirements of enabling users. Firstly, the guidance of the researcher is important in the extent of the participatory design. Participants were provided sufficient information and interactive communication in order to progress in the experiment. The amount of time that given to the participants is essential for them to process the information and reflect on themselves. The progressive change of mental activities and behaviors would occur when enough time is given for the brain to process the information and react according to the mental activities. Thirdly, the initial inputs from the participants, such as usage of design tools and active reflection on one's experiences, enable the users with the sense of ownership, actively experience the experiment and understand themselves.

The third outcome is the increase of the consciousness among the participants is notable, while the improvement of the responsibility various from person to person. A significant change of mental activities was found after the experiment. According to the data, all the participants became more conscious about their previous experiences, especially about the environmental signals. After more information was added in the previous experience, all the participants showed the increase of the awareness.

Nevertheless, no evidences indicate that the emergence of the new behaviors and outcomes are necessary after they become more conscious about their experiences. The responsible behaviors could occur when the participant is aware of the outcomes in their experience, both on an intellectual and emotional level.

5. Conclusion

This research offers a comprehensive understanding of experience. A systematic experiment was conducted to answer the research questions. Findings of the research strongly support that service design is capable to enable the users with conscious experiences in the real-life contexts. Diagram 5.1 illustrates the formation of experiences and the role of design in altering users' experiences. More specifically, the diagram reveals the methods that can be implemented in design practice to enable conscious and responsible user experiences.
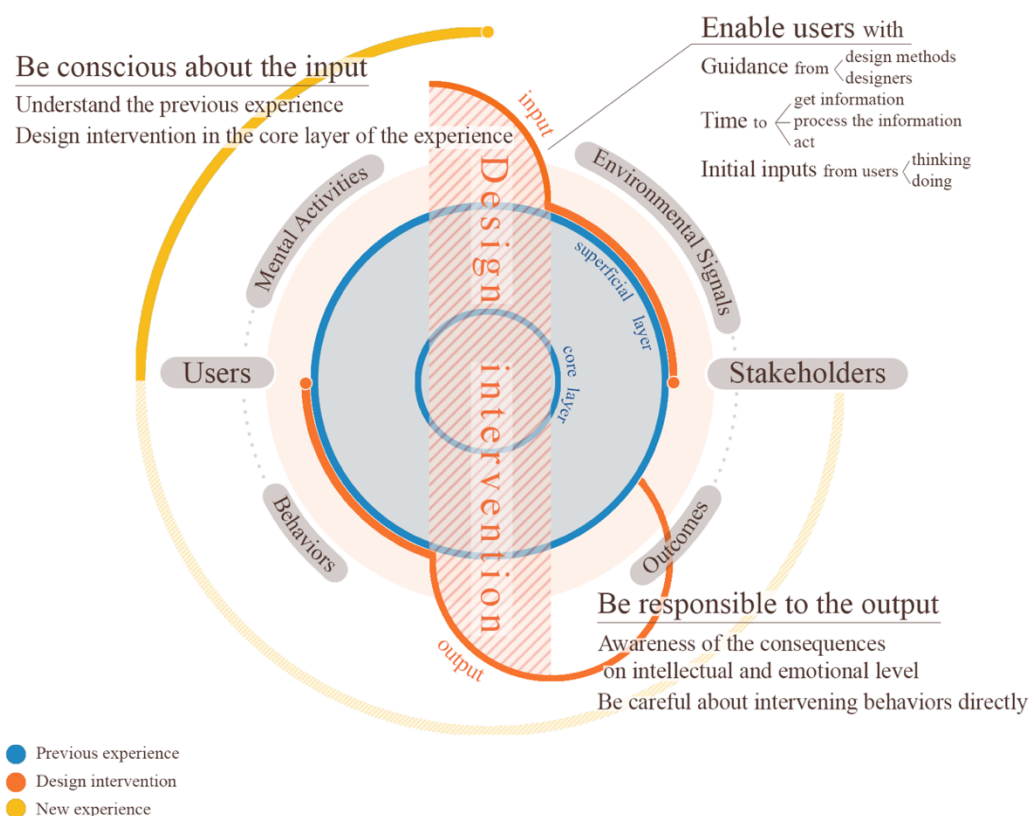

Diagram 5.1   Design intervention in changing to conscious user experiences

Design intervention is the role of design in change making. By altering the signal input and shaping the behavioral output, design intervention is able to change users' experiences. Three factors are effective to enable users in the process of transformation. These included: guidance, time and initial input. In order to enable users to be more conscious, both the users and designers need to understand the previous experience and design intervention needs to be implemented in the core layer of previous experience. Users tend to be more responsible to their behaviors when they are aware of the consequences of their behaviors. This indicates that design intervention can enable users to be more aware of the consequences on both intellectual and emotional level.

The formation of experience consists of four components. The findings of this research are consistent with Sanes et al. (2000) and Eagleman (2015). The sensory organs receive signals from the outside environment as we see, hear, smell, touch and taste. The brain processes the informational input and

forms a series of mental activities, then releases motor signals as behaviors that react to the environment. People learn to navigate and interpret the world from the outcomes of their behaviors. The knowledge people gain from the previous experiences become the informational input for the future encounters.

The change of experience is possible when design intervention is introduced to users. The role of service design in altering users' experiences is that it can be used as a means of intervention to break the old patterns in previous experiences. According to the findings, by modifying the signal input and interfering with the behavioral output, service design is effective to enable conscious and responsible user experiences.

Design intervention is a means to enable users. Instead of presenting users with the end results of design products, services or systems, design intervention emphasizes a platform that should be used by both users and designers for initial exploration and collective contribution in design practice. Design intervention is not a means to decide for the users, but it is a medium to enable users to decide for themselves.

According to the findings, three factors are found essential to enable users in the process of design intervention. Firstly, the guidance from designers and design methods. It is important for users to obtain assistance from designers, along with the introduction of design methods. Designers play a role as a facilitator in the process. Designers need to help users to understand the basic concept of design methods and adjust the schedule according to the progress. Meanwhile designers need to build a sense of safety for the users that they are guided in a systematic way of self-exploration. Empathic listening is fundamental in design intervention. The interactions between users and designers are important for self-reflection of the users. Secondly, sufficient time for users and designers to obtain and process the information, then react on it. Change is a process. The brain needs time to absorb the information from its environment and digest the information internally. Furthermore, progressive understanding of the information helps to create the confidence in the changing process. Thirdly, enablement requires a large extent of initial inputs from users. Instead of passively participate in the design practice, such as attend to the interviews in exploration phase and test for prototypes in reflection and implementation phase. Users are guided to utilize design methods. In other words, they need to be actively thinking and acting in the process of design intervention. This enhances the sense of ownership and competence of the users.

In order to raise the consciousness of users, both the users and designers need to be conscious about the informational input in the beginning of design intervention. The first step is to understand the previous experiences. According to the findings, experience map is an effective tool to comprehend the previous experiences. It provides a tangible way to visualize complex experiences. The components in experience map help to break down the experience in large details, also the visualization offers a direct perspective to analyze the connections of each component. Meanwhile, in the process of creating the map helps the

users to reflect on their previous experiences. In line with the studies by Libet et al. (1983) and Haggard et al. (1999), users become more conscious when they are given the opportunity to review the experiences, in particular to reflect the actions and outcomes.

The second step is to alter the environmental signals at the core layer of the previous experiences. The findings about layered experiences are coherent with Kandel et al. (2000), that our present experience is based on the experiences we had in the past. More specifically, it depends on the environmental signals at the core layer of the previous experiences. It is worth noting that environmental signals have a profound impact on experiences. Environment ranges from nature landscape, artificial buildings to social settings and informational environments (Kaiser et al., 2003; Deng et al., 2010). It largely determines the mental activities and behaviors of the users (Proshansky et al., 1983; Roth et al., 2011). Hence, designers undertake the responsibility in determining the contents of signals that need to be changed. It is crucial for designers to understand the users' previous experiences in a holistic way, and able to disclose the core layer in the experiences.

Use design intervention to enable responsible user experience is intricate. The increasing sense of responsibility requires users be aware of the consequences both on the intellectual, as well as the emotional level. The finding of one of the participants is consistent with the studies by De Groot et al. (2009) and Steg et al. (2005). It suggests that people become more responsible after they are aware of the consequences of their behaviors. According to the data, intellectually understand the consequences of the actions has negligible influences on users' sense of responsibility. Experience map is a useful method for users to review the consequences of their behaviors. Yet, it cannot help the users to emotionally experience the consequences before it has happened. However, this research suggests that service design can help users to increase the emotional awareness by visualizing the foreseeable consequences.

It is noteworthy that if the design intervention directly implemented on users' behaviors and without a thorough consideration of the mental activities, it can lead to undesired outcomes. In other words, the order of the alteration is important. It is possible to achieve single behavioral change through design without the change in mental activities. But this will cause negative impacts on users' experiences, especially on the mental activities. It decreases the sense of control and increases the passive attitude of users' lives.

6. Recommendation

For further studies, the focus could shift to mainly three aspects. Firstly, the research can be expanded in two directions, these included: the duration of the experiment and the number of samplings. In the future, the same experiment could be implemented with a larger number of participants, including different groups of genders, age, occupations and cultural background. Longer period of time would be another direction for future studies, extend the experiment up to one month or one year to test the reliability of the experience model and the possibilities of change making in the circumstances of design intervention.

Secondly, stakeholders map could be emphasized in the future studies. Stakeholders as the crucial feature of the environmental signals would help the users to have a more comprehensive understanding of their experiences, as well as help the users to develop an empathic understanding of their surroundings, which would contribute to problem solving in a complex context.

Thirdly, further studies can focus on the question of how to increase the emotional awareness of the future consequences through service design. It is difficult for people to feel the consequences before it happens. People are given advice and suggestions from different sources. However, it rarely leads to the change of mental activities and behaviors. How can service design help people to experience the consequences before it happens, could be one of the key elements leads to responsible behaviors.

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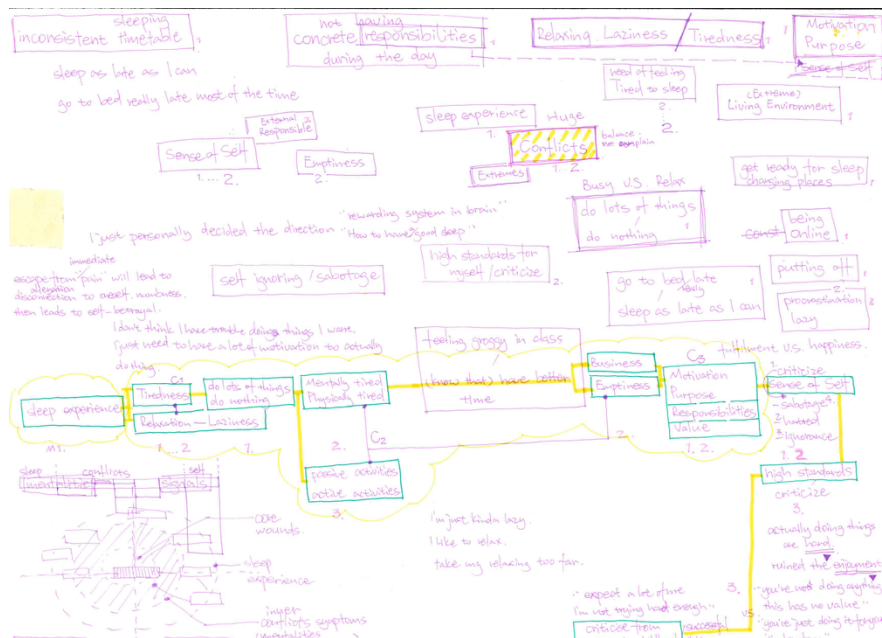
Appendices 1

Participant Raoul

Participant Tasha

Participant Guopu

Appendices 2

Participant Raoul

Participant Tasha

Not having the opportunity to get to know the Finn students we don't have any local friends

Finns tend to be separated from our group, stay with Finns

We are all in Finland

In the University, Rollo

in Utsjoki

⓪ not influencing at all

① too much attention, get too shy

② When the difference became too obvious thrown into the totally different world

they always changing work site have a lot

info. from culture course / new signals from outside changed behavior?

Finns & Japanese are quite similar

there are some culture shocks

quiet / feel like I have

"extreme individualism" I enjoy being the only one

"conservative"

not showing emotions

maturity

I'm (introverted)

not outgoing

I have really close friends

'left out' feeling but it's okay

easier for me to get sb. to be close with

Finn Friend Program

dance class

culture course

my kind of friends quite rare

music

language

It's not like we visit each others house

movies

I tend to just follow everybody

showing around

for Christmas

Some of us don't really have the opportunity to experience Finnish culture

want to experience more

realizing my identity as a Japanese

---

more understandable

don't like it

online gaming

is unhealthy

working time

online unnecessary

didn't login

FB. / gaming

use text message

phone call

tried gaming

being online to keep contact

Utsjoki — community (relationship)
          language

in Finland — friends / family
             environment — winter system

in Jap. — close to friends / family
          governmental system

no pc & internet was totally fine

brows Internet

play games sometime

Participant Guopu