Aug 11th, 12:00 AM

Tuning into the Sound: Discovering Motivational Enablers for Self-Therapy Design

Eujeen Hwang  
*KAIST (Korea Advanced Institute of Science and Technology), South Korea*

Youn-kyung Lim  
*KAIST (Korea Advanced Institute of Science and Technology), South Korea*

Follow this and additional works at: [https://dl.designresearchsociety.org/drs-conference-papers](https://dl.designresearchsociety.org/drs-conference-papers)

Citation

Hwang, E., and Lim, Y. (2020) Tuning into the Sound: Discovering Motivational Enablers for Self-Therapy Design, in Boess, S., Cheung, M. and Cain, R. (eds.), *Synergy - DRS International Conference 2020*, 11-14 August, Held online. [https://doi.org/10.21606/drs.2020.287](https://doi.org/10.21606/drs.2020.287)

This Research Paper is brought to you for free and open access by the Conference Proceedings at DRS Digital Library. It has been accepted for inclusion in DRS Biennial Conference Series by an authorized administrator of DRS Digital Library. For more information, please contact DL@designresearchsociety.org.
Tuning into the Sound: Discovering Motivational Enablers for Self-Therapy Design

Eujeen HWANG*, Youn-kyung LIM*

* KAIST (Korea Advanced Institute of Science and Technology), Korea, Republic of (South Korea)

* Corresponding author e-mail: visionijc17@kaist.ac.kr
doi: https://doi.org/10.21606/drs.2020.287

Abstract: The burnout society we live in demands the need for us to be self-therapists in our everyday lives. We describe the design, implementation, and arrangement of Tune-in, a cultural probe inspired seven-day diary study, to discover how and what self-therapeutic enablers support experiences of reflection and mindfulness. Findings reveal potent motivational enablers for self-therapy design in the form of sequential process and applicable means. The enablers were accompanied with mundane sound as a reflective material whereby the participants could experience in-depth reflections and mindfulness in everyday life. This paper makes two contributions. First, with a practical set of enablers that can bring self-therapeutic value to the design, and second, it provides new insights on how mundane sound can be used to influence mindfulness and perceptions of value and meaning for individuals.

Keywords: self-therapy; enablers; mindfulness; sound

1. Introduction

We are living in a digital era of voluntary exhaustion and fatigue, driving ourselves towards achievements until we burnout. The growth of the digital age throughout the century is ironic in the sense that it negates its original purpose of saving time and space as users voluntarily sabotage self to fill the void and keep up with the meritocracy nature of our society (Han, 2015). Rates of mental illness such as depression, anxiety, addictions, and overall decreased performance of individuals is increasing rapidly over time (Jean et al., 2019), and the nature of this voluntary burnout and the acceleration of this hustle life demands the need for us to be self-therapists in our daily lives.

Motivated by the substantive negative effects of the digital age, attempts to trigger reflectivity, mindfulness, and living-in-the-moment in everyday life has been explored through recent design research (Cox et al., 2016; Grosse-Hering et al., 2013; Höök et al., 2016; Odom et al., 2014; Pierce, 2012). Although such research shares a common goal of encouraging mindfulness by creating awareness through evoking a new perspective on the
daily interaction, there lacks to be a study explicitly focusing on discovering a set of effective design enablers for the self-therapeutic experience to support experiences of reflection and mindfulness. While people are practicing more diverse ways of experiencing mindfulness, this paper focuses on the use of mundane sound, one of the most ingrained parts of life that its quality of experience is often missed. We use sound as a design material to discover sets of enablers for self-therapeutic experience through a diary study in support for self-reflection and mindfulness.

To investigate for the potential set of self-therapeutic enablers, we created Tune-in, a cultural probe inspired tangible diary that is used to make visual and written expressions of reflections from capturing meaningful sounds in a triggering moment. We then arranged this diary study with ten participants for seven-days, using it to open an in-depth dialogue with individuals about the experience of mindfulness with sounds and about the influence on self-therapeutic experience. The diary study revealed an interesting sequential process and means that enable self-therapeutic experience. Participants tuned in and recorded sounds that were meaningful to them to reflect on their present, past and future, and revealed to have experienced deep reflection from the therapeutic significance of the study.

This paper makes two contributions. First with a practical set of enablers (sequential process and means) that can bring self-therapeutic value to the design, and second, it provides new insights on how sound can be used to influence mindfulness, perceptions of value, and meaning for individuals.

2. Background and Related Work

The burnout society refers to the contemporary society we live in. As Han (2015) critically describes this society in their essay, The Burnout Society, we live in a dictatorship of positivity and therefore hyperactivity followed by burnout. Han (2015) suggest that “the complaint of the depressive individual, ‘Nothing is possible,’ can only occur in a society that thinks, ‘nothing is impossible’” (p.11), to accentuate the matter of self-exploitation, the paradox of positivity, and meritocracy which wrecks.

The above burnout society gets worse as it enters the digital-enhanced society, and more design research attempts to tackle these issues in a variety of ways to mitigate the consequences on the individuals. The increasing ubiquity of everyday living experiences affected by these issues, along with the growing interest in the design research field designing for contexts of everyday life, has influenced to a study exploring how mindfulness and reflection can be better supported in the design process. The theory of slow technology through the use of artefacts (Odom et al., 2014), negating technology in the form of undesigning (Pierce, 2012), designing necessary frictions (Cox et al., 2016), exploring how mindful interactions can lead to meaningful reflections (Grosse-Hering et al., 2013) and applying somaesthetic phenomenology on designs to deepen self-engagement, bodily sensations and internal reflective experiences (Hook et al., 2016) contribute to the theme of encouraging and exploring mindful interactions by creating awareness through a change
in perspectives. However, the design research applications mentioned do not target self-therapeutic options, and it is yet unclear how and what design applicable enablers leverage the self-therapeutic and mindful experience.

Today, time is a rare commodity affected by the frame of voluntary self-sabotage (Han, 2015), thus there is a need to research for accessible and effective ways in which the self can take care of oneself in their daily lives. Considering the adverse growing rates of mental illness in today’s burnout society (Twenge et al., 2019), we see an opportunity to explore how and what can help individuals experience self-therapeutic experiences in everyday life. Self-therapy intends to help experience mindfulness, which is a term referring to a psychological state of awareness or practices that promote this awareness (Hopko et al., 2015). Several well-known self-regulating practices that cultivate mindfulness are meditation, yoga, and tai chi. These practices focus to gain attention and awareness in order to achieve mental well-being and complementary positive amplitudes such as concentration, calmness and clarity (Walsh & Shapiro, 2006), contributing to effective emotion-regulation strategies (Davis & Hayes, 2001).

We also see an opportunity to explore the role of sound as a meditative tool in the design process. Sound meditation uses vibrational instruments with typical repetitive sounds and has historical affinity with meditation and healing, known as a form to promote focused awareness (Goldsby et al., 2017). Sound therapy has been used throughout the history for the purpose of distraction and healing with the belief that sound can bring physiological changes, act as a mental guidance or aid to relaxation (Hobson et al., 2010). In other respects, sound is a form of language and a source of connection, comprehension and an emotional gateway. However, the presence of everyday sound is such an ingrained part of life that its quality of experience is often overlooked. We believe such accessible presence of sound can be a prominent factor in self-therapeutic experiences without the constraint of time or space, as well as draw one’s attention to the present moment in a natural and immediate manner. We want to explore how sounds within mundane moments affect people’s perception of ordinary sounds, and how it can be used as a design material for self-therapeutic experiences.

These areas of research open a space for exploration to understand how mindfulness can be experienced through self-therapeutic approach with the use of everyday accessible material such as sound. We describe in the following section how we integrated these considerations into our study.

3. Methodology

We designed the Tune-in diary study in order to explore what process, means and quality aspects of active reflection on mundane sounds can promote self-therapeutic experience. We intended to create a tangible design artefact for this drawing on reflective design (Sengers et al., 2005), cultural probes (Gaver et al., 1999; Wallace et al., 2013) and research through design (Hopko et al., 2015).
3.1 Process, Rationale and Implementation

The design process of Tune-in diary study consisted of reviewing theoretical literature and empirical studies mentioned in the previous section, and iteratively analysing the collected data to result with contributions and discussions.

The form and aesthetics of the Tune-in diary facilitate channels for creative reflections, and the tangibility of the diary structure reflection itself. The layout of each diary entries is named *Tuneinstagram*, inspired by the layout of the well-known Instagram user interface to evoke a sense of visual guide on a subconscious level (Figure 1).

![Figure 1](image)

**Figure 1** Several layout components inside the Tune-in diary (From left to right: Front page, positioning statement, directions, seven day guides, Tuneinstagram entry card layout).

Tune-in diary was given to every participant to go on a sound treasure hunt for seven-days and make entries on the reflections. The study was inspired by cultural probe (Gaver et al., 1999) although our study does not have the identical approach as we include the post interviews for the participants’ explicit explanations of individual experiences. Regardless, the important aspect of the cultural probe was applied to trigger deep reflections and explore complex experiences of the individual participants. As Gaver puts it, the nature of cultural probes “disrupt expectations about user research and allow new possibilities to emerge” (Gaver et al., 2001, p.23). We regard Tune-in diary study as directed craft object study used for empathic engagements with the individual participants centered on genuine self-reflection.

Guides were given on the first three days out of the total seven to help the participants mentally exercise tuning into the sounds around them, experience being in the moment and reflect on the present, past, and future. The remaining four days encouraged the participants to search for meaningful sounds themselves (Figure 1).

We wanted to explore how might people experience cognitive reflection through behaviour, a technique profoundly used in Behavioural Activation (BA) procedures, which is an action-oriented brief structured treatment for depression that aims to increase rewarding experiences in life by addressing cognitions and emotions indirectly and bringing the individual into contact with more positive consequences through overt behaviour (Hopko et al., 2015). We intentionally designed the study to evoke genuine reflections and enable bona
fide experiences by encouraging the participants to put more focus on the physical activity of capturing sounds rather than on experiencing mindfulness.

3.2 Participants, Data Collection and Analysis
We recruited 10 participants with a mean age of M=21.8 (SD=3.0). Balanced gender was considered into the recruitment process; thus, five participants were female and five were male (Table 1). We recruited foreign international students (Ecuador, Finland, India, Kazakhstan, Sweden) between the ages of twenty to thirty for a few key reasons. First, the percentage of young adults experiencing certain types of mental health disorders has risen significantly over the past decade, with no corresponding increase in older adults, according to research published by the American Psychological Association (Twenge et al., 2019). Second, the situational stance of foreign students studying abroad exposes them to high levels of external and internal stress and pressure due to the additional factors such as the language barrier, cultural differences, monetary limit, time limit and homesickness.

Tune-in diary study took seven-days for each participant, during which the participants continuously tuned in to the mundane sounds and noted their genuine reflections. We intended to capture moments of reflectivity by examining participants’ interaction between the diary usage and act of tuning in. Figure 2 shows examples of how the participants expressed their reflections in the diary.

![Figure 2](image)

Figure 2  Diary entries showing the visual expressions of reflections triggered by sound (From the left to right: P1, P3, P8, P10)

At the conclusion of the study, we organized discussion sessions with each participant which lasted between 1-2 hours. A semi-structured interview approach was used, in which the researcher posed questions designed to prompt discussion on the overall experience rather than obtain specific answers. We aimed to understand deeper about their experience and of the specifics of their reflections for each diary entries assisted with the captured sounds. The discussion session served as an extension of the study as participants experienced a deeper quality of reflection and mindfulness through verbalizing their reflections. All of the ten interview sessions in total were audio recorded, producing 15+ hours of content.
To analyse the data, we applied qualitative analysis using open coding on the transcribed interview recordings, and searched for patterns across the diary entries to derive insights as well as underlying themes. We proceeded with several rounds of open coding where 400+ descriptive codes were generated from which two themes, sequential process and mean-based enablers, were found. We validated the descriptive codes followed with analytical coding and analysed the data through several iterations and revision sessions to discover implicit and implied meaning (Creswell & Poth, 2018). In response to our main objectives, the following sections present the results of our diary study induced to discover the motivational enablers for self-therapy design.

4. Findings on the Process Supporting Self-Therapeutic Experience

We discovered that the self-therapeutic experience is supported through the following sequential process: Tangible Entertainment, Unexpected Reward, and Moments of Epiphany (Figure 3). Each process serves a shared purpose of conveying motivation for sustained usage. Motivating factor helps create, strengthen and maintain engagement, which is a contribution factor in creating habits by time (Schunk, 2012). We describe the detailed findings of each case in sub paragraphs below.

**Figure 3 Sequential process unit for self-therapeutic experience**

### 4.1 Tangible Entertainment

We discovered that entertainment through tangible design acts as a self-therapeutic enabler by forming ownership and sense of achievement, ultimately acting as a successful motivator to sustain participation and enhance self-therapeutic experiences.

Tune-in enabled personal space for voluntary participation of each participant throughout the study. Entertaining tangible tasks made it an attraction point, as the participants perceived the study as a treasure hunt activity. P1-20-female said, “It was like a fun game searching for something special...however if I was told to do it, I wouldn’t have done it. I
did it because I was interested in it, which makes me realize that you don’t and can’t really pay attention unless you pay attention.” Also, P3-21-male described how his actions were spontaneously influenced by the engaging activity: “I was leaving class and heard the birds in the woods, to which I could connect, and I just took the lead, running to the woods...picked up my phone and I was so determined to have this.” Participants emphasized the importance of having independent control throughout the design experiment as they realized the initial step of decision making for participation activated ownership, which operates as a motivator, thus enabling self-therapeutic experience.

Finding for sounds acted as an entertainment factor from which the participant engagement increased with the sense of achievement. We discovered that the sense of achievement sustained participants’ interest and increased motivation. Participants realized that the tangible entertainment were essential for self-therapeutic experience as it sustained their attention and led to subtle changes in their routine to find meaning from mundane sounds: “I acknowledged myself for finding them...I like how it made me go out of my routine and search for sounds...that thrill when I find one is amazing” (P7-20-female). Collectively, these reflections helped highlight how entertaining tasks and guides of the study evoke a sense of achievement and completion with each sound collected, assisting the self-therapeutic experience.

“I felt that this was like an award...I completed a piece of work I was in charge of” (P10-30-male)

4.2 Unexpected Reward

Unexpected reward mechanism within the design acts as a self-therapeutic enabler through the meaningful and personal memories recalled, thus evoking new meaningful realizations. We define unexpected reward as a motivational element for self-therapeutic experience, given in recognition of achievements without regarding the likelihood to happen. Overall, the nature of unexpected reward acts as a powerful motivator in creating self-therapeutic experiences through appreciation. Below, we explain how the unexpected reward performs as a motivator for self-therapeutic experience by recalling memories and through extended understandings.

Unexpected rewards helped appreciate the unexpected sets of personal memories recalled and restored connectivity on a personal and social level. Participants were pleasantly surprised with the quality and quantity of the reflections triggered from mundane sounds, reminding them of their youth, transporting them in time, and triggering intimate memories: “Sound of the coffee pot in the morning triggered memories of when I used to sit on the kitchen floor next to my mum as she was cooking” (P9-20-female). Also, P4-21-male reflected back and described the liveliness of the triggered memories: “When I heard the sound, it was not only the memories or the emotions I felt, but also the smell...the long-forgotten memory as a whole just suddenly struck me.” In further reflecting on the recalled memories, he noted how unexpected rewards weren’t necessary immediate responses from sounds as some
sounds took time to form a meaning: “At times, after thinking about a sound for a couple of days, I realized that it makes me feel something and recall on a specific memory.”

Unexpected rewards helped gain appreciation in the moment through unexpected new realizations that deepened and broadened one’s understanding of self. The more participants discovered new meanings from mundane sounds, the more they grew appreciative about their life in general, thus were motivated to continue tuning in: “I’ve never realized before this experiment, but the sound of turning pages is actually very beautiful…I have now become more sensitive to sound and can appreciate much more sounds than before” (P7-20-female). Participants also commented on the formation of new meanings of sound: “…now I realize, every sound is a memory and a meaning for me. It’s part of my life. I start noticing everything around me…” (P6-20-female). Additionally, new realizations were personalized as it was densely reliant on individual’s values and interpretations: “From sound of waves crashing back and forth to create another, I realized they influence the things that are behind them as well as in front of them…it’s like my life…just like the life cycle and its consequences.” (P1-20-female) Collectively these quotes highlight how the realizations from unexpected moments and sources enable self-therapeutic experiences.

### 4.3 Moments of Epiphany

Moments of epiphany experienced, such as through the designed questions given to participants during individual discussion sessions, deepened the level of reflection and insights that are personal and meaningful. It shunned different perspectives onto a thought and supported the organization and regulation of the reflections, resulting in an increase of satisfaction level.

External input, such as the questions given to participants in discussion sessions, triggered reflections from different angles and thus helped experience deeper levels of self-therapeutic experience. During the discussion sessions of the study, participants commonly described the therapeutic quality of the questions leading to moments of epiphany, and regarded the session as an extension of the self-therapeutic intended study of Tune-in: “I would have never thought that I was being mindful…this discussion was a different experience. Now my understanding of things would be very different than what it was an hour ago” (P7-20-female); “The questions really made me realize something about myself from a perspective never thought before…a great insight” (P8-22-female).

Expressing reflections from auditory experience with visuals and finally in verbal format opened opportunities for organizing and regulating reflections. Participants described how the scattered reflections were connecting together through the discussion session: “The questions really helped me make sense out of what I was thinking as a whole…” (P8-22-female). Also, P1-20-female described the necessity of verbalizing thoughts despite its difficulty: “I felt and experienced a whole lot of stuff and emotions but sometimes it’s really hard to express what you really feel about…deliberately putting it into words organized it so much more.” These examples highlight that verbalizing thoughts stabilize and organize one’s
reflections on a confident level.

Collectively, these sequential process help illustrate how the Tune-in successfully provoked the participants to experience self-therapeutic experiences in their everyday lives and experience the increases in motivation of participation, appreciation and satisfaction in consecutive order of the sequential process.

5. Findings on the Means Supporting Self-Therapeutic Experience

We discovered that analogue tangibility, tangible accessibility and mundane sound performed as enabling means that support the self-therapeutic experience. Each mean contributed a unique set of characteristics which were found to be effective for supporting mindfulness through reflection when incorporated into the sequential process of the design. We describe the detailed findings of each enabler means in sub paragraphs below.

5.1 Analogue Tangibility

Analogue interaction is different with that of the digital as it involves an additional preparation process for optimal usage, such as sitting down and grabbing a pen. Participants experienced the preparation process promoting reflective depth as it put one into the mode for deep reflections: “When I sat to write or draw, it was more comprehensive. I needed to dive into it and really think about it” (P4-21-male). Also, the participants reported that the preparation process created a metaphorical pause to reflect: “When drawing and writing, I needed to pause and sit down...I felt really focused on completing this” (P9-20-female), which triggered deeper and more comprehensive reflections as if the act of physical preparation also performed as a mental preparation for reflection. Collectively, these reflections helped highlight how physical preparation ultimately can assist the reflection process.

The friction caused from the inconvenience of analogue also enabled reflection. While the participants initially experienced frustration by the relative inconvenience of the analogue tangibility of the diary, referred to as paper-ness, overtime they appreciated how the inconvenience provoked quality reflections: “I think that ‘uncomfortable’ helped me because I started focusing on the reflection itself, isolating the reflection from the situation. It was instructive. The friction helped” (P2-22-male). Additionally, P10-30-male reflected on his changed preference of analogue over digital regarding the nature of reflectivity by inconvenience: “If this was an app... It would’ve been so much easier. But because I had to express it on paper, it took much more time...but thinking does take time. I was so used to the speed of everything that I thought thinking could be done like so.”

Expressing the auditory reflection into visual expressions by hand enabled unique and abstract self-expression. During the individual discussions, most of the participants described how drawing on paper provoked them to tune into themselves and express their reflections uniquely. P7-20-female participant described that the act of visually expressing her reflections and emotions on paper positioned her to feel authentic about her reflections:
“Sketching is a different experience...emotions come mostly while I sketch. I don’t feel photographs and digitals fully represent my authentic abstract thoughts in that moment.” Additionally, P6-20-female perceived analogue visual expressions as a portal to her inner self: “It’s like my own world...when I sketch I forget about other things and I’m in my own world.”

The separate tangibility acted as a unique individual object which behaved as a powerful reminder. One of our designer participants reflected on the role of tangibility as an essential mean for self-therapeutic experience: “I thought combining designs inside the phone was a way to go for maximum accessibility and user participation. However, I realized the separateness and uniqueness other than my usual phone engages attention...subconsciously” (P5-22-male). Additionally, P2-22-male reflected on the forgetful experiences with the digital: “...because I had this diary, I was reminded to do it again. As an app, it would have been forgotten among the many other.” Collectively, these reflections highlight the influence of analogue tangibility on sustained self-therapeutic experience.

5.2 Tangible Accessibility

Tangible accessibility supported capturing the genuine reflection of the moment. Participants voiced the necessity of having a platform to make immediate entries as they experienced the temporality of reflections alternating at a fast and unpredictable pace: “When I recorded the sound and filled in the diary later, I did not feel the same about that sound and moment a while ago” (P1-20-female). P6-20-female similarly described her experience with the inconsistent nature of reflections: “I had a reflection in a typical moment... but I didn’t have the diary with me and I forgot what I wanted to note.”

Reflections come and go randomly and the accessible nature of the design can capture unexpected and unplanned moments throughout the day as the participants commonly experienced reflective moments in unplanned and unexpected times: “Reflecting on the sound of the flattering of the bird was very unexpected...It happened when I was just walking by...I tried to catch their sounds but it was unexpected and momentary” (P10-30-male); “Usually finding sound was really unexpected to me because regardless of my location, sound triggered memories at random times, catching me off guard” (P1-20-female). Collectively, these examples highlight the need for tangible means to help capture the genuine reflections and unplanned moments.

5.3 Mundane Sound as Self-Therapeutic Material

Sound awareness enabled self-therapeutic experience as it naturally prompted attention on the present moment and triggered reflections: “Sound was a medium that helped me understand things I couldn’t see visually in the moment. When I focused on a sound, I was becoming more observant of the environment beyond this vision of mine” (P7-20-female). Additionally, P1-23-female described how sound enhanced quality of the moment and the depth of reflection: “There are more fantasies, thinking and imaginations involved in reflecting with sound...it adds more depth into the present moment” (P1-20-female).
Collectively, these examples highlight that sound is ultimately successful at opening up imaginations and triggering rigorous reflections.

Reflecting on mundane sounds not only helped the participants experience being in the moment but also acted as a memento, building appreciation and meaning over time. During the discussion session, participants were able to recall most if not all of the emotions, reflections and other complementary details of the context: “I can remember the details of that moment when it triggered memories and emotions of my grandpa...and what I felt through sound back then” (P10-30-male). The participants referred to tuning into the sounds and recording it as means to recall back on the moment later in time: “Recording sounds are necessary for recalling memories later in life.... It’s like a diary, but also with visual and audio...we sometimes rely too much on human memory but we tend to forget basic things” (P6-20-female).

Collectively, when these enabler means are used together as a design material within the proposed sequential process introduced in the previous session, it successfully supports the unobtrusive and emotional self-therapeutic experience for the individuals in their everyday life routine.

6. Discussion and Implications

A key contribution of our study is to discover the process and means that can be applied into the development of self-therapy design. The Tune-in was ultimately successful at providing a platform for participants to reflect through the use of sound which enabled participants to experience being in the moment. Translating reflections from auditory trigger (tuning in) into visual (diary entries) and verbal (deep discussion) expressions supported deeper reflective experiences. The self-therapeutic enablers highlight the potential of designing for mindfulness and reflection on an intimate level. In what follows, we present several research and design considerations.

6.1 The Relevance of Motivation for Self-Therapeutic Experience

A core aim of our study was to explore how and what enablers can evoke self-therapeutic experiences. It appeared that the sequential process and means was effective. Participation through motivational impact of the enablers was a key necessity to build and sustain self-therapeutic experiences as the motivating factors help create, strengthen and maintain engagement, and contribute in creating habits by time (Schunk, 2012). Motivation appeared throughout the sequential process in the form of tangible entertainments which initiated voluntary participation, unexpected rewards which built appreciation, and moments of epiphany which triggered reflections from new perspectives and increased satisfaction. Also, the means of analogue tangibility, tangible accessibility and mundane sound helped experience meaningful reflections in the moment by supporting the motivational effect of the sequential process. While these means ultimately led to self-therapeutic experiences, they were also the source of inconvenience as participants struggled at first to appreciate the
analogue in a digital society, with which they were more accustomed with. This highlights the complexity of balancing the multiple set of enablers and thus accentuates the need for harmonious design.

More generally, the topic of mindfulness and reflectivity has been of consistent interest in research through diverse ways (Cox et al., 2016; Grosse-Hering et al., 2013; Höök et al., 2016; Odom et al., 2014; Pierce, 2012), yet there lacks direct exploration on what specific set of enablers provoke self-therapeutic experiences and how they are sustained through the leverage of motivation. With the burnout society demanding the need for us to be self-therapists from moment to moment (Han, 2015), our study contributes to this potentially important area of DRS research.

6.2 The Role of Sound as a Design Material for Self-Therapeutic Experience

The study has also revealed how tuning into mundane sound played an important role in influencing mindfulness, perceptions of value, and meaning for individuals throughout everyday life routine. Unlike sounds designed specifically for therapy sessions (Goldsby et al., 2017; Hobson et al., 2010), mundane sounds appeared to be an effective design material for unobtrusive but immediate trigger in situating the individuals in the present moment. Reflecting with mundane sound enabled participants to better experience their everyday life and incorporate meaning into their lives without the limitations of time and space. Interestingly, participants described how tuning into mundane sounds also connected them to other sensory experiences for deeper and richer reflections and imaginations. Clearly there are opportunities of sound for increasing the chances of self-therapeutic experience. These findings suggest a future opportunity for the DRS community to explore more diverse ways sound can naturally and smoothly be imbedded into the design as primary tools and enhance ways to experience self-therapeutic experiences in daily moments. We imagine that sound as design material could be applied across different kinds of archives and potentially be incorporated into everyday objects or interactions to support reflection on a moment to moment basis. Further, mundane sound being one of the self-therapeutic means found from this research, explorations on how to intertwine with the other means could evoke meaningful reflections that subtly and effectively enable self-therapeutic experience.

6.3 Self Therapy Future Research Considerations

The Tune in assisted participants to reflect and experience self-therapeutic experiences moment by moment, and throughout the study participants experienced subtle changes in their routine while capturing meaningful sounds. It is important to point out that the duration of the Tune in diary study for each participant (seven-days) poses several limitations. For example, it is unclear how the subtle changes and interactions overtime would have impacted the quality or the style of the self-therapeutic experience. Although the seven-day diary study followed with an in-depth discussion session was an appropriate scaling for this study considering the goal of the study was to explore and discover sets
of surface enablers, if the duration of the study extends, we imagine the possibilities of new findings in relation with time, and habit formation which can be meaningful as future research direction.

7. Conclusion
We conducted a cultural probe inspired diary study to discover the set of enablers for self-therapeutic experience and contribute to designing for overall mindfulness on a moment to moment basis. The findings show that the enablers motivate self-therapeutic experiences in the form of sequential process and means. The sequence of the process was considered important as the process performed as a mental guide for the individuals to experience mindfulness in an effective way. Also, analogue tangibility, tangible accessibility, and mundane sound operated as means for self-therapeutic experience, ensuring smooth reflections to take place. Our study intends to contribute to the ongoing initiatives of research by exploring how the forms of interaction can be designed to shape people’s enhanced experience and contribute in the articulation of how the use of self-therapeutic enablers betters the quality of everyday moments in this burnout society. We hope this research can inspire the community to explore design research in the future on the context of celebrating everyday moments.

Acknowledgements: First and foremost, we would like to thank our participants for their time and heart. We also gratefully acknowledge the support of CIxD lab colleagues who have given us feedback along the way. This work was supported by Institute of Information & Communications Technology Planning & Evaluation (IITP) grant funded by the Korea government (MSIT) (No.2016-0-00564, Development of Intelligent Interaction Technology Based on Context Awareness and Human Intention Understanding).

5. References
Cox, A. L., Gould, S. J. J., Cecchinato, M. E., Iacovides, I., & Renfree, I. (2016). Design Frictions for Mindful Interactions: The Case for Microboundaries. Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems, San Jose, California, USA. https://doi.org/10.1145/2851581.2892410
Creswell, J. W., & Poth, C. N. (2016). Qualitative inquiry and research design: Choosing among five approaches. Sage publications.
Davis, D. M., & Hayes, J. A. (2011, Jun). What are the benefits of mindfulness? A practice review of psychotherapy-related research. Psychotherapy (Chic), 48(2), 198-208. https://doi.org/10.1037/a0022062
Douglas, C. (1998). Visions: Notes on the Seminar Given in 1930-1934. Routledge.
Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: cultural probes. Interactions, 6(1), 21-29.
Gaver, W. H., Hooker, B., Dunne, A., & Farrington, P. (2001). The Presence Project (RCA CRD Projects Series). London: RCA Computer Related Design Research.
Goldsby, T. L., Goldsby, M. E., McWalters, M., & Mills, P. J. (2017). Effects of singing bowl sound meditation on mood, tension, and well-being: an observational study. Journal of evidence-based complementary & alternative medicine, 22(3), 401-406.
Grosse-Hering, B., Mason, J., Aliakseyeu, D., Bakker, C., & Desmet, P. (2013). Slow design for meaningful interactions. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Paris, France. https://doi.org/10.1145/2470654.2466472

Han, B.-C. (2015). The burnout society. Stanford University Press.

Hobson, J., Chisholm, E., & El Refaie, A. (2012). Sound therapy (masking) in the management of tinnitus in adults. Cochrane Database of Systematic Reviews(11).

Hofer, P. D., Waadt, M., Aschwanden, R., Milidou, M., Acker, J., Meyer, A. H., Lieb, R., & Gloster, A. T. (2018). Self-help for stress and burnout without therapist contact: An online randomised controlled trial. Work & Stress, 32(2), 189-208.

Höök, K., Jonsson, M. P., Ståhl, A., & Mercurio, J. (2016). Somaesthetic Appreciation Design. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, San Jose, California, USA. https://doi.org/10.1145/2858036.2858583

Hopko, D. R., Ryba, M. M., McIndoo, C., & File, A. (2015). 14 Behavioral Activation. The Oxford handbook of cognitive and behavioral therapies, 229.

Odom, W. T., Sellen, A. J., Banks, R., Kirk, D. S., Regan, T., Selby, M., Forlizzi, J. L., & Zimmerman, J. (2014). Designing for slowness, anticipation and re-visitation: a long term field study of the photobox. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Toronto, Ontario, Canada. https://doi.org/10.1145/2556288.2557178

Pierce, J. (2012). Undesigning technology: considering the negation of design by design. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Austin, Texas, USA. https://doi.org/10.1145/2207676.2208540

Schunk, D. H., & Zimmerman, B. J. (2012). Motivation and self-regulated learning: Theory, research, and applications. Routledge.

Sengers, P., Boehner, K., David, S., & Kaye, J. J. (2005). Reflective design. Proceedings of the 4th decennial conference on Critical computing: between sense and sensibility, Aarhus, Denmark. https://doi.org/10.1145/1094562.1094569

Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E., & Binau, S. G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. Journal of Abnormal Psychology.

Wallace, J., McCarthy, J., Wright, P. C., & Olivier, P. (2013). Making design probes work. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Paris, France. https://doi.org/10.1145/2470654.2466473

About the Authors:

Eujeen Hwang is a Master’s student at the Department of Industrial Design at KAIST. She is interested in designing meaning and experience for the mental, emotional, and the environmental sustainability.

Youn-kyung Lim is Professor at the Department of Industrial Design at KAIST, where she leads the Creative Interaction Design lab. Her research interests include experience-centred design and aesthetics of interaction as well as prototyping in interaction design.