
Digital Wellbeing: Evaluating Mandala Coloring Apps

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ABSTRACT

Over the last decade there has been a significant growth of consumer products to support and promote both physical and mental wellbeing. The most common approach consists of smartphone applications that can be easily adopted in daily life interactions. Generally, these apps translate traditional approaches for wellbeing into the digital realm, yet many times overlooking the importance of tailored design for wellbeing. We explore this translation from physical to digital by using the example of mandala coloring, a historic practice used as an instrument for mental wellbeing. In this position paper, we discuss the concept of *digital wellbeing* drawing from our findings from an auto-ethnographic and heuristic evaluation of the 14 best rated iOS apps for mandala coloring in the UK. We believe that future digital experiences should be designed with the aim of enhancing human potential, hence we consider key features for positive interactions that lead to digital wellbeing.

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MANDALAS: A PRACTICE FOR WELLBEING

A mandala is a spiritual and ritual symbol representing the Self within the universe [20]. In various traditions such as Hinduism or Buddhism, mandalas are employed for training focused attention, for establishing a sacred space, and as an aid for meditation and trance instruction. Through its balanced visual elements symbolizing unity and harmony, mandalas form a symbolic scheme that can help one to access progressively deeper levels of the unconscious [20].



Figure 1: Traditional sand mandala from Tibetan Buddhist monks (image from Wikimedia Commons).

Beyond spiritual traditions, the creation of mandalas has been adopted in psychotherapy for relaxation and increased self-awareness [20]. Lately, mandala coloring has been largely taken up by general population for mental wellbeing, mainly in the form of coloring books for adults [1,7]. Further, many smartphone applications have attempted to support this practice through mobile apps.

INTRODUCTION

Technology has become an important part of our daily life due to the proliferation of digital devices, the interactions with which have become an inextricable part of the experience that shape us. Over the last decade there has been a massive growth in HCI interest for emotional wellbeing and mental health [12,13,16,17] exploring technologies such as wearable sensors [19,21], lifelogging [9,10,15], brain computer interfaces [14,18], mobile applications [5,8]. There are plenty of dedicated consumer products to support wellbeing and promote both physical and mental health. Mainly, these take the form of smartphone applications and translate traditional physical practices into the digital realm. However, there is limited scholarly work evaluating their design or effectiveness [4]. The research question motivating our work is how tailored such digital interventions are to sensitively support the targeted emotional or mental wellbeing practice? How should these they key aspects of such practices could be leveraged and designed for to allow for positive digital experiences for wellbeing? In this position paper, we explore how digital experiences can and should support psychological wellbeing through an evaluation of a digital translation of the practice of mandala coloring (explained in Figure 1) into smartphone applications. The best 14 ranked iOS apps for mandala coloring were auto-ethnographically and heuristically evaluated, and preliminary findings are further discussed in the context of *digital wellbeing*.

EVALUATING MANDALA COLORING APPS

Findings

The main aspects that have been suggested to support and promote wellbeing in the practice of coloring mandalas (non-digitally) are (1) the fine and controlled movement to color in, (2) the detailed and layered geometry that provides structure, and (3) to express internal processes through color [6,20]. Nevertheless, most apps translated coloring a mandala into mobile interface as the creation of a perfect and beautiful image, overlooking the three key aspects for wellbeing of this traditional practice. Hence, when the first author (who has over 5 year experience in coloring mandalas regularly) tried these apps, she felt that the experience was completely different and did not provide the positive wellbeing outcomes.

First, half of the apps (ids 6, 9-14) did not allow the presence of fine and controlled movement to color in the mandala, as the different spaces could be digitally colored by merely tapping. That is, with a single tap the space would fill in with the color selected from the provided palettes. Further, some of the apps that allowed the continuous motion to fill in the different spaces, permitted blocking the target space to avoid coloring outside the lines (ids 3,4). Hence there was no need for the coloring movement to be fine neither controlled in order to avoid mistakes. In contrast, the traditional approach benefits from the mindful coloring movement which has been linked with wellbeing [3].

Evaluation Method of the Apps

Mandala coloring apps were evaluated using Nielsen's heuristics and an auto-ethnographic approach with the first author interacting with each app over two days on an iPhone 6S. The app search included keywords related to the practice (i.e. mandala, mandala coloring), and was performed in the UK iTunes app store. Only iOS apps with more than 500 ratings and an average rating equal or higher than 4 on a 5-point scale were selected, leaving a total of 14 apps (Table 1).

Table 1: List of the mandala coloring apps evaluated, and their average heuristic value in a 5-point scale.

| <i>App name</i> | <i>id</i> | <i>Avg</i> |
|--|-----------|------------|
| Colorfy: Coloring book | 1 | 3,2 |
| Color Therapy Adult Coloring | 2 | 3,7 |
| Pigment - Adult Coloring Book | 3 | 3,7 |
| Recolor - Coloring Book | 4 | 3,1 |
| ColorFly: Coloring Book | 5 | 2,8 |
| Adult Colouring | 6 | 2,7 |
| Colouring Book for Me | 7 | 2,9 |
| Lake: Colouring Books | 8 | 3,5 |
| ColorArt Coloring Book | 9 | 3 |
| Coloring Book for Adults | 10 | 2,8 |
| Tap & Color - Coloring book | 11 | 2,6 |
| Colorme: Coloring Book | 12 | 2,7 |
| Adult Colouring Books Anti Stress | 13 | 2,6 |
| Mandala Coloring Book Adults Calm Color Therapy | 14 | 2,4 |

In addition, the training of attention has also been linked with wellbeing and self-regulation processes [3]. In mandala coloring, the level of attention needed to color is usually determined by the level of detail of the geometry. Coloring complex geometries requires high level of attention and also fosters motivation as they provide a challenge (i.e. color within a limited area). Surprisingly, all apps evaluated aim to facilitate this challenge by allowing to zoom in. And although this might be done to leverage the smartphone small screen estate, as the mandalas are colored in the phone's screen usually with the finger which restricts precision, the balance for skilled attention is then broken.

To conclude, although the apps evaluated were the best ranked, we think they did not adequately translate the practice of mandala coloring for wellbeing into the digital realm (heuristic evaluation results in Table 1). Although coloring on the screen of a smartphone with a finger has many restrictions, it also offers affordances to support wellbeing through mandala coloring that have not been leveraged in these apps. Therefore, we make the argument that the digital experiences that draw from traditional practices for wellbeing should incorporate in their design the key features that support the positive outcomes, adapted to their new interaction medium.

DIGITAL WELLBEING

In today's modern world, technologies mediate our personal experiences in daily life with both negative (e.g. frustration from too many notifications from the mobile phone) and positive (e.g. allowing the experience of new possibilities for reflection and self-awareness) outcomes. Hence, the impact on our wellbeing grows as technology is inevitably turning more ubiquitous. A growing thread of consumer products and research in HCI and positive psychology has focused on designing technologies that elicit positive changes to improve our lives and wellbeing [2]. We believe that *digital wellbeing* concerns the conceptualization, design, and development of digital experiences with the main focus of fostering wellbeing. That is, technologies that aim to reduce their negative impact and design them to make humans thrive through a positive digital experience.

In the following decade, technology may drastically evolve from what we know nowadays, yet the key features for digital wellbeing may stay the same. Digital wellbeing involves digital experiences that can help us think, act, and evolve for the better towards healthier and happier versions of ourselves. Psychologists have defined the three main factors for mental wellbeing [11] which are autonomy, competence, and relatedness. Therefore, technologies for digital wellbeing should allow us to be in control over the system, allow us to improve and thrive, as well as foster our sense of belonging. We strongly believe that technologies of the future can do better, by focusing their design on how to support human flourishing. Especially when aiming to translate traditional approaches to support wellbeing into digital, it is important to evaluate the main features that lead to positive outcomes to then integrate them in the digital experience.

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Further, technology can offer new affordances beyond the traditional approach than can be enhance the digital experience for wellbeing. We also argue for the need for more scholarly work focused on the evaluation of such apps, and on the development of tailored heuristics that can inform more sensitive design and rigorous evaluation frameworks that researchers, designers and users can benefit from.

REFERENCES

- [1] Heidi Blackburn and Claire E. Chamley. 2016. Color Me Calm: Adult Coloring and the University Library. *Kansas Libr. Assoc. Coll. Univ. Libr. Sect. Proc.* 6, 1
- [2] Rafael A Calvo and Dorian Peters. 2014. *Positive computing: technology for wellbeing and human potential*. DOI:<https://doi.org/10.1021/acs.molpharmaceut.8b00354>
- [3] Dav Clark, Frank Schumann, and Stewart H. Mostofsky. 2015. Mindful movement and skilled attention. *Front. Hum. Neurosci.* 9, (June 2015), 297.
- [4] Claudia Dauden Roquet and Corina Sas. 2018. Evaluating Mindfulness Meditation Apps. In *CHI'18 Extended Abstracts on Human Factors in Computing Systems*.
- [5] Gavin Doherty, David Coyle, and John Sharry. 2012. Engagement with online mental health interventions. In *CHI '12*
- [6] Susanne F. Fincher. 2000. *Coloring mandalas: For insight, healing, and self-expression*. Shambhala.
- [7] Jayde A. M Flett, Celia Lie, Benjamin C Riordan, Laura M Thompson, Tamlin S Conner, and Harlene Hayne. 2017. Sharpen Your Pencils: Preliminary Evidence that Adult Coloring Reduces Depressive Symptoms and Anxiety. *Creat. Res. J.* 29, 4
- [8] Ellen Isaacs, Artie Konrad, Alan Walendowski, Thomas Lennig, Victoria Hollis, and Steve Whittaker. 2013. Echoes from the past: how technology mediated reflection improves well-being. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '13*, 1071–1080.
- [9] Chengcheng Qu and Corina Sas. 2018. Exploring Memory Interventions in Depression through Lifelogging Lens. In *British HCI '18*
- [10] Chengcheng Qu, Corina Sas, and Gavin Doherty. 2018. Exploring and Designing for Memory Impairments in Depression. In *CHI Proceedings 2019*.
- [11] Richard M. Ryan and Edward L. Deci. 2000. The Darker and Brighter Sides of Human Existence: Basic Psychological Needs as a Unifying Concept. *Psychol. Inq.* (2000).
- [12] Pedro Sanches, Axel Janson, Pavel Karpashevich, Camille Nadal, Chengcheng Qu, Claudia Dauden Roquet, Muhammad Umair, Charles Windlin, Gavin Doherty, Kristina Hook, and Corina Sas. 2018. HCI and Affective Health: Taking stock of a decade of studies and charting future research directions. In *CHI '19*
- [13] Corina Sas. 2018. Exploring Self-Defining Memories in Old Age and their Digital Cues. In *DIS '18*, 149–161.
- [14] Corina Sas and Rohit Chopra. 2015. MEDITAID: a wearable adaptive neurofeedback-based system for training mindfulness state. *Pers. Ubiquitous Comput.* 19, 7, 1169–1182.
- [15] Corina Sas, Tomasz Fratzczak, Matthew Rees, Hans Gellersen, Vaiva Kalnikaite, Alina Coman, and Kristina Höök. 2013. AffectCam: arousal- augmented sensecam for richer recall of episodic memories. In *CHI '13 Extended Abstracts on Human Factors in Computing Systems on - CHI EA '13*, 1041.
- [16] Corina Sas, Shuang Ren, Alina Coman, Sarah Clinch, and Nigel Davies. 2016. Life Review in End of Life Care: A Practitioner's Perspective. In *CHI EA '16*, 2947–2953.
- [17] Corina Sas, Steve Whittaker, John Zimmerman. Design for rituals of letting go: An embodiment perspective on disposal practices informed by grief therapy. *TOCHI'16.* 23, 4, 1–37.
- [18] Chris D Shaw, Diane Gromala, and A Fleming Seay. 2007. The Meditation Chamber: Enacting Autonomic Senses. In *Proc. of ENACTIVE/07*, 405–408.
- [19] Anna Ståhl, Kristina Höök, Martin Svensson, Alex S. Taylor, and Marco Combetto. 2009. Experiencing the Affective Diary. *UbiComp.* 13, 5 (June 2009), 365–378.
- [20] Giuseppe Tucci. 2001. *The Theory and Practice of the Mandala: With special reference to the modern psychology of the subconscious*. Courier Corporation.
- [21] Muhammad Umair, Muhammad Hamza Latif, and Corina Sas. 2018. Dynamic Displays at Wrist for Real Time Visualization of Affective Data. In *Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility - DIS '18*, 201–205. DOI:<https://doi.org/10.1145/3197391.3205436>