Designing technologies for older-age well-being:

Relatedness and smart metaphors to track and regulate collective mood

Over the last decade, the intersection between technological development and healthcare has seen the introduction of smart tools to support mental health. Most of these tools consist of smart and digital applications orbiting meditation, mindfulness and mood tracking [1], with a primary focus on facilitating self-knowledge and management of emotional patterns. While the overall success of their use remains subject to research and further developments, their potential to embed mental and emotional well-being has brought concerns about their accessibility and use among the older population. Some of these concerns stem from the design of smart technologies themselves, as features and systems do not effectively support physical and cognitive limitations common to older adults. Others stem from the relevance of mental and emotional health during older age, since diverse life stressors have led to an increased incidence of loneliness, isolation and depression among older adults [2].

In this light, the thesis assignment "Designing technologies for older-age well-being" poses the question *"How can the design of smart technologies support mood tracking and regulation of older adults?* Throughout the thesis work, the question is approached with combined research and design methods, resulting in the connection of research insights and an iterative design exploration that materialises a final design concept.

In the research body of the thesis, the nature of mood and its regulation are explored and provide the theoretical foundation needed for an understanding of what makes mood support effective through the use of technologies. Consequently, an analysis of current technologies to track and regulate mood is developed with a primary focus on the characteristics that make their use effective among older adults. A second approach to the research resulted in analysing the user and their context. For this, older adults and their context were analysed by focusing on their experience of relatedness. This stemmed from relevance relatedness as a universal need, as well as the significance of social and environmental interactions during older age. The analyses were carried out through participant studies and resulted in context, empathy and experience maps. Overall, the research and analyses provide insights into the individual limitations and environmental factors that influence the experience of relatedness during older age, in addition to the potential of social and environmental interactions in facilitating the adoption of mood regulation strategies.

Insights from the research are further explored through a design process, by first defining requirements that guide the appropriate materialisation of design features to meet the needs and lessen the limitations of the target users. Based on this, a collaborative design session was developed to explore opportunities for the design of a public space experience which facilitates the experience of relatedness. Through ideating, conceptualising and detailing a product and design experience, the final design concept was defined. Overall, it proposes that the design of effective technologies to support mood during older age could harness social and environmental interactions to facilitate the adoption of mood regulation strategies. For this, the final design relies on collective rather than individual engagement, and on the facilitation of many, instead of a single, mood regulation strategy. The final design consists of a smart bench, suitable for

residential and recreational areas, which responds to the presence and proximity of its target users by blooming kinetic flowers. The design functions as a daily collective tracker of older adult engagement, and consequently their adoption of mood regulation strategies. Several features of the design, such as the implementation of ergonomic design guidelines to accommodate older adults, as well as the use of the blooming of kinetic flowers to enable collective tracking, support the physical and cognitive limitations of older adults. At the same time, aspects of the design experience, such as nudging outdoor exposure, engagement in low-intensity physical activity and facilitating access to a community network, facilitate engagement in activities that support mood regulation.

To evaluate the effectiveness of the final design, participant studies were carried out. The focus of the evaluation was placed on the *value* of the design experience; the extent to which the design concept could facilitate the experience of relatedness and the adoption of mood regulation strategies. In addition, the evaluation assessed the *understandability* of the design metaphor, the kinetic flower, in order to determine the extent to which the blooming of the flower could be used as a scale and tool to track mood. Based on the evaluation results, as well as consideration of the limitations and relevance of the thesis work, further recommendations are proposed. Overall, the research insights and design results highlight the relevance of using design metaphors to facilitate intuitive interaction between older adults and technologies, as well as the potential of design to support affective aspects of our daily life experiences.

References

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2. World Health Organisation (WHO), “Mental health of older adults,” Dec. 12, 2017. https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults