Life in Transitions: The Role of Technology in Supporting Well-being in the Heart of Change

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ABSTRACT

Life transitions, whether due to ageing, health conditions, or significant life events, pose unique challenges for individuals' health and well-being. These periods demand adjustments in physical health and self-care of mental states. Meanwhile, interactive technologies like personal informatics, self-tracking tools, artificial intelligence (AI) driven health monitoring systems and virtual reality can enhance well-being by helping individuals understand their bodily changes; their role in life transitions is under-explored. Therefore, this workshop aims to bridge the gap between the availability of interactive technologies for managing health and well-being and their meaningful use during life transitions. By examining current practices and gaps, we seek to identify opportunities for designing interactive technologies and develop a research agenda to facilitate the alignment of these technologies with the evolving needs of individuals.

CCS CONCEPTS

• **Human-centered computing** → **Interaction devices**; **Systems and tools for interaction design**.

KEYWORDS

Life Transitions, Health, well-being, Interactive Technologies, Digital Health, Health Data

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1 INTRODUCTION

Individuals experience multiple transitions throughout their life course, such as physiological (e.g., ageing, reproductive health, acute injuries, illnesses [1, 6, 11, 24]) and contextual changes (e.g., job changes, relocation, becoming a parent or carer [13, 21, 25]). Life transitions can present challenges, particularly related to health and well-being, which might result in adjustments in individuals' physical health (e.g., [5]), emotional well-being (e.g., [23]), and interpersonal relationships (e.g., [17]). Many transitions begin with individuals needing support to feel competent and confident, especially when they experience negative feelings, as pregnancy affects body reactions or injury reduces mobility [15, 26]. However, these transitions could instead be seen as opportunities for design and research, particularly when interactive technologies are used to support life transitions [8, 14, 19, 22]. For example, as individuals age or experience changes in life circumstances, maintaining daily steps goals can become more challenging. However, staying active in different ways other than only taking steps has significant benefits for both physical and mental well-being [7, 20]. This shifts the focus from using technologies to support individuals in managing their health to designing technologies to support better those who are already experiencing changes in their lives [10].

In short, interactive technologies for managing health and well-being, such as personal informatics and self-tracking tools, play a crucial role in supporting individuals and navigating significant life transitions [2, 3, 8]. Research shows that self-tracking tools enable individuals to collect data about almost every aspect of their health, fitness and bodily signals [4]. Other technologies, such as AI-driven health monitoring systems, can provide personalised guidance, track hormonal fluctuations or suggest tailored training routines [16]. Virtual Reality (VR) can offer immersive experiences that can aid in understanding bodily changes and help navigate life transitions (e.g. [18]). Mobile apps and online communities

often serve as invaluable resources, offering information, support and information-sharing among individuals undergoing similar transitions. These technologies can facilitate individuals to perceive and experience their bodies differently during these transitions [28]. While all these possibilities show a lot of promise to support life transitions [2], they also present challenges that prompt their critical examination. They are often designed for broad, generic use cases and do not address the particularities of individuals [12, 27] and lack the personalised touch needed to address the unique challenges presented by life transitions [9].

Therefore, this workshop aims to bridge the gap between the proliferation of interactive technologies for health and well-being and the meaningful engagement of individuals with them during significant life transitions. We will explore the current practices of engagement with interactive technologies designed to support life transitions that impact health and well-being. Our goal is to identify gaps and opportunities for enhancing the experience of human-technology relations in life transitions. The workshop will delve into the roles of Human-Computer Interaction (HCI) research in transforming these insights into innovative personal health and well-being technologies that are not only data-driven but also deeply resonant with the individuals' changing needs and contexts. To this aim, we will call for participants to submit short papers that address any of the following questions. The participants may also propose their provocations related to the interests of the workshop:

- What is the current role of interactive technologies in life transitions?
- What are the shortcomings, limitations and critical points of such technologies?
- How does interactive technology make us feel about life transitions?
- How might technologies evolve to address life transitions? What do we want interactive technologies to become in the future?

Our overall goal for this workshop is to chart opportunities and create a research agenda for technology to support life transitions better. In the end, we aim to establish a network for research and design where members of the NordiCHI community can engage, collaborate, and expand their understanding of life in change and the role that interactive technologies play in it. Workshop participants will have the opportunity to network and gain access to a variety of interdisciplinary perspectives and strategies related to working around the topics of the workshop.

The workshop is organised into three segments: establishing a shared base of knowledge, analysing current technologies and use practices in life transitions, and jointly creating and discussing opportunities for future research and creating impact in the field. To this end, we have identified several (tentative) themes for the workshop - that will be adapted depending on the participants' submissions.

- Design approaches to interactive technology for life transitions
- Role of health data during significant life transitions
- Role of AI in tailoring technologies to individual needs
- Impact of Virtual Reality and immersive technologies on understanding and managing life transitions
- Building and sustaining online communities for support and information exchange on life transitions
- Ethical considerations in the design and use of interactive technology for life transitions
- Methods for measuring the effectiveness of technology-supported interventions in life transitions
- (Alternative) Temporal scales of life transitions and long-term use of the technologies

2 PRE-WORKSHOP PLANS

To promote the workshop, we will develop a website featuring details about the event, key dates, the agenda, and questions for participants to consider before attending. The website is accessible at the University of Twente website: https://www.utwente.nl/en/et/lifechanginghci/

To participate in the workshop, interested participants will choose to submit (1) a one-page position paper responding to one of the themes above or (2) a one-page summary of their prior work that fits the goals of the workshop. Alongside this, we will ask the participants to include a short biography (max of 250 words) and up to five keywords summarising their research interests about the workshop. Position papers or paper summaries from accepted participants will be posted on our website with their consent.

We will encourage participants to do a pre-workshop preparatory asynchronous activity for them to get familiar with each other's work. A few weeks ahead of the workshop, we will post participants' submissions to a collaborative Miro Board that we will share with all participants. We will ask each participant to read each other's submissions and biographies. We will also ask them to add comments or reflections to individual submissions and highlight, for example, possible synergies between their work, shared topics of interest or interesting provocations. This pre-workshop preparation will save us time when diving into the presentation part of the workshop and will also help us create smaller groups with overlapping interests for discussions during the workshop.

A call for participation will be circulated via HCI email lists, social networks and our professional and personal networks. Direct emails will also be sent to researchers and practitioners in relevant fields. We seek diverse participation, selecting attendees based on the relevance of their submissions to the workshop's theme. This involves focusing on the use of technology and data in supporting individuals through life transitions, examining how personal health technologies can be designed to be more resonant with users' evolving needs, and identifying opportunities for innovation in human-technology interactions during these critical periods.

3 WORKSHOP DESCRIPTION AND STRUCTURE

To achieve the workshop goals, we plan to accommodate up to 20 participants in an in-person workshop. The organising team brings extensive expertise in leading workshops across academic conferences and other settings. The Miro board we will create will serve as a documentation and synthesis medium for all participants. This board will also serve to continue the discussions beyond the workshop. Below, we detail the workshop activities.

Our full-day workshop will start with a welcome and introductions session in which we will first set the stage for a day of collaborative exploration and learning (see Table 1). In the morning, we will discuss two challenges: (1) mapping the life transition space and (2) charting the current technology space to understand what exists to support, thwart, or undermine the challenges faced during life transitions. Participants will create their own documentation in Miro boards, during each challenge. This documentation aims to facilitate sharing of insights and learnings in a collaborative and productive environment. We will conclude the morning session with a short plenary discussion, which will provide the participants an opportunity for collective reflection and sharing insights.

In the afternoon, we will continue the discussions with two other challenges: (3) charting the future of technology to support life transitions and (4) reflecting on the day's challenges and discussing the way forward. In the last challenge, we will ask the participants to first think individually. Then we will pair them with another participant to discuss their thoughts together. Finally, we will ask all participants to share their insights with the whole group. The workshop will wrap up by summarizing the day's activities and outlining steps forward. We will conclude the day with an informal workshop dinner. This informal activity will offer the participants an opportunity for further networking and discussion. This way, we aim to foster collaborations among participants and hope to build a community focused on using interactive technology to support individuals through changes in their lives.

4 POST WORKSHOP ACTIVITIES

We aim to disseminate the outcomes of this workshop through a position paper that provides a visual and textual representation of the discussions, findings, and future directions identified during the workshop. We will update the workshop website after the workshop and keep it available as a source of information for future researchers. We believe this format is effective in communicating the insights gathered with a broader HCI community, such as the researchers and practitioners in the field.

5 WORKSHOP ORGANISERS

Dr. Armağan Karahanoğlu is an assistant professor in the Interaction Design research group at the University of Twente. Her research focuses on understanding, developing and enhancing the interaction in the context of physical well-being. This encompasses research on understanding the motivational effects of technology in physical activity and exercise behaviour and developing self-tracking tools that facilitate data sensemaking in the context of physical activity, sports and well-being. www.armagank.com

Dr. Laia Turmo Vidal is a Digital Futures Postdoctoral Fellow at KTH Royal Institute of Technology. Her research centres on multisensory technologies that enhance body perception towards physical, social and emotional well-being. Her research interests include wearable computing, personalization, material interactions, participatory design and developing design methods.

Dr. Daniel Harrison, is an assistant professor in the School of Design at Northumbria University. His research interests are in the design of technologies to inclusively support lifelong health, well-being and physical activity while avoiding negative unintended consequences. www.dbpharrison.com

Jamie Steane, is an Associate Professor in Communication Design and Head of Education in the School of Design at Northumbria University. His research interests include design pedagogy, user experience design and personal informatics related to eHealth and SportsHCI. https://www.jamiesteane.com/

Tina Ekhtiar is a PhD candidate at the University of Twente, focusing on goal setting with personal informatics in the context of health and well-being. She is an industrial designer and design researcher passionate about creating interactive, playful designs that empathise with people's needs, specialising in health and well-being. https://www.tinaekhtiar.com/

Dr. Teresa Almeida is an associate professor at the Department of Informatics at Umeå University in Sweden and a research member at the Interactive Technologies Institute/LARSyS in Portugal. Her work is interdisciplinary and explores research through design and participatory methods to research sensitive topics and design with marginalized communities of practice. https://sites.google.com/view/teresa-almeida/

Dr. Anna Vallgårda is an Associate Professor and Head of the IxD Lab at the IT- University of Copenhagen. She works on developing design practices for interaction design which enables designers to engage deeply with the entangled relations of the situations they design into. The research draws on relational feminism and new materialism but is firmly grounded in material form-giving and doing design as the basis.http://www.akav.dk

Dr. Madeline Balaam is a professor of interaction design at KTH Royal Institute of Technology. Madeline's work extensively focuses on the design of digital technology for health and well-being, with a particular focus on intimate health. Over the last 15 years, Madeline has undertaken and supported research in relation to multiple life and health transitions, including motherhood, the onset of menstruation and menopause.

6 CALL FOR PARTICIPATION

We invite practitioners and researchers to participate in our workshop entitled "Life in Transitions: The Role of Technology in Supporting Well-being in the Heart of Change". The goal of this workshop is to bring the NordiCHI community together to discuss and map out the role of interactive technology in life transitions. Therefore, we call for participants to submit short papers/abstracts that address one/all of the following questions:

- What is the role of (health) data in life transitions?
- What role does the technology play in / support life transitions?
- How does technology (and our data) make us feel about life transitions?
- How might data 'transition' itself to address life changes?
- What will be/do we dream of the role of data/technology in the future?

Participants can also propose their own provocations related to the workshop's interests. We will contact a list of potentially interested authors and share the CfP within our networks and channels. Submissions made to the workshop will receive a light review from

Table 1: Activities of the Workshop

Time	Activities
09:00-09:15	Welcome and introductions
09:15-10:15	Challenge 1 - Mapping the life transition space (e.g. physical, mental, emotional challenges of life transitions)
10:15-10:30	Coffee Break
10:30-11:30	Challenge 2 - Charting the current technology space (what is currently out there that supports / thwarts / undermines the challenges people experience in life transitions)
11:30-12:00	Plenary Discussion
12:00-14:00	Lunch
14:00-15:00	Challenge 3 - Charting the future of technology to support life transitions. (e,g. what should be the role of interaction design and HCI research)
15:00-15:15	Coffee Break
15:15-16:30	Challenge 4 - Reflection on the challenges, way forward (think, pair, share activity)
16:30-17:00	Workshop wrap-up and steps forward
18:00-21:00	Informal Workshop dinner

at least two of the workshop organisers. Accepted authors will be invited to participate in the workshop, and their submissions will be archived on the workshop website upon their consent.

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REFERENCES

[1] William Bridges and Susan Bridges. 2019. *Transitions: Making sense of life's changes*. Hachette UK.

[2] Sunny Consolvo, Predrag Klasnja, David W McDonald, James A Landay, et al. 2014. Designing for healthy lifestyles: Design considerations for mobile technologies to encourage consumer health and wellness. *Foundations and Trends® in Human–Computer Interaction* 6, 3–4 (2014), 167–315. http://dx.doi.org/10.1561/1100000040

[3] Aykut Coşkun and Armağan Karahanoğlu. 2023. Data sensemaking in self-tracking: Towards a new generation of self-tracking tools. *International Journal of Human–Computer Interaction* 39, 12 (2023), 2339–2360. https://doi.org/10.1080/10447318.2022.2075637

[4] Tina Ekhtiar, Armağan Karahanoğlu, Ruben Gouveia, and Geke Ludden. 2023. Goals for Goal Setting: A Scoping Review on Personal Informatics. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference* (Pittsburgh, PA, USA) *(DIS '23)*. Association for Computing Machinery, New York, NY, USA, 2625–2641. https://doi.org/10.1145/3563657.3596087

[5] Samar R El Khoudary, Gail Greendale, Sybil L Crawford, Nancy E Avis, Maria M Brooks, Rebecca C Thurston, Carrie Karvonen-Gutierrez, L Elaine Waetjen, and Karen Matthews. 2019. The menopause transition and women's health at midlife: a progress report from the Study of Women's Health Across the Nation (SWAN). *Menopause* 26, 10 (2019), 1213–1227. https://doi.org/10.1097/GME.0000000000001424

[6] Glen H Elder and Monica Kirkpatrick Johnson. 2018. The life course and aging: Challenges, lessons, and new directions. In *Invitation to the life course*. Routledge, 49–81.

[7] Don Samitha Elvitigala, Armağan Karahanoğlu, Andrii Matviienko, Laia Turmo Vidal, Dees Postma, Michael Jones, Maria F Montoya, Daniel Harrison, Lars Elbæk, Florian Daiber, et al. 2024. Grand Challenges in SportsHCI. In *Conference on Human Factors in Computing Systems, CHI 2024: Surfing the World*. https://doi.org/10.1145/3613904.3642050

[8] Catrin Feron, Tina Ekhtiar, and Ruben Gouveia. 2022. Transitions in Personal Informatics: Investigating Self-Tracking During Moments of Change. In *Adjunct Proceedings of the 2022 Nordic Human-Computer Interaction Conference* (Aarhus, Denmark) *(NordiCHI '22)*. Association for Computing Machinery, New York, NY, USA, Article 43, 5 pages. https://doi.org/10.1145/3547522.3547686

[9] Mayara Costa Figueiredo, Thu Huynh, Anna Takei, Daniel A Epstein, and Yunan Chen. 2024. Goals, Life Events, and Transitions: Examining Fertility Apps for Holistic Health Tracking. JAMIA Open 4, 1 (Mar. 2021), ooab013.

[10] Oliver L. Haimson, Bryan Semaan, Brianna Dym, Joey Chiao-Yin Hsiao, Daniel Herron, and Wendy Moncur. 2019. Life Transitions and Social Technologies: Research and Design for Times of Life Change. In *Companion Publication of the 2019 Conference on Computer Supported Cooperative Work and Social Computing* (Austin, TX, USA) *(CSCW '19 Companion)*. Association for Computing Machinery, New York, NY, USA, 480–486. https://doi.org/10.1145/3311957.3359431

[11] Yuko Hara, Elizabeth M Waters, Bruce S McEwen, and John H Morrison. 2015. Estrogen effects on cognitive and synaptic health over the lifecourse. *Physiological reviews* 95, 3 (2015), 785–807.

[12] Daniel Harrison, Paul Marshall, Nadia Bianchi-Berthouze, and Jon Bird. 2015. Activity tracking: barriers, workarounds and customisation. In *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*. 617–621.

[13] Douglas A Hershey and Kène Henkens. 2014. Impact of different types of retirement transitions on perceived satisfaction with life. *The Gerontologist* 54, 2 (2014), 232–244.

[14] Sam James, Miranda Armstrong, Zahraa Abdallah, and Aisling Ann O'Kane. 2023. Chronic Care in a Life Transition: Challenges and Opportunities for Artificial Intelligence to Support Young Adults With Type 1 Diabetes Moving to University. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA, Article 559, 16 pages. https://doi.org/10.1145/3544548.3580901

[15] Matthias Jerusalem and Waldemar Mittag. 1995. Self-efficacy in stressful life transitions. *Self-efficacy in changing societies* (1995), 177–201.

[16] Armağan Karahanoğlu, Aykut Coskun, Dees Postma, Bouke Leonard Scheltinga, Rúben Gouveia, Dennis Reidsma, and Jasper Reenalda. 2024. Is it just a score? Understanding Training Load Management Practices Beyond Sports Tracking. In *Conference on Human Factors in Computing Systems, CHI 2024: Surfing the World*. ACM Press. https://doi.org/10.1145/3613904.3642051

[17] Renske Keizer and Niels Schenk. 2012. Becoming a parent and relationship satisfaction: A longitudinal dyadic perspective. *Journal of marriage and family* 74, 4 (2012), 759–773.

[18] B. S. Lange, P. Requejo, S. M. Flynn, A. A. Rizzo, F. J. Valero-Cuevas, L. Baker, and C. Winstein. 2010. The Potential of Virtual Reality and Gaming to Assist Successful Aging with Disability. *Physical Medicine and Rehabilitation Clinics of North America* 21, 2 (May 2010), 339–356. https://doi.org/10.1016/j.pmr.2009.12.007

[19] Michael Massimi, Jackie L. Bender, Holly O. Witteman, and Osman H. Ahmed. 2014. Life transitions and online health communities: reflecting on adoption, use, and disengagement. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing* (Baltimore, Maryland, USA) *(CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 1491–1501. https://doi.org/10.1145/2531602.2531622

[20] Jamie S McPhee, David P French, Dean Jackson, James Nazroo, Neil Pendleton, and Hans Degens. 2016. Physical activity in older age: perspectives for healthy ageing and frailty. *Biogerontology* 17 (2016), 567–580.

[21] Kei Nomaguchi and Melissa A Milkie. 2020. Parenthood and well-being: A decade in review. *Journal of Marriage and Family* 82, 1 (2020), 198–223.

[22] Annu Sible Prabhakar, Erik Stolterman, and Selma Šabanović. 2019. Understanding Life Transitions: A Case Study of Support Needs of Low-Income Mothers. (2019), 1–10. https://doi.org/10.1145/3290605.3300878

[23] Nurul F Praharso, Morgan J Tear, and Tegan Cruwys. 2017. Stressful life transitions and wellbeing: A comparison of the stress buffering hypothesis and the social identity model of identity change. *Psychiatry research* 247 (2017), 265–275.

[24] Margot Putukian. 2016. The psychological response to injury in student athletes: a narrative review with a focus on mental health. *British journal of sports medicine* 50, 3 (2016), 145–148.

[25] Noora J Ronkainen, Anastasiya Khomutova, and Tatiana V Ryba. 2019. "If my family is okay, I'm okay": Exploring relational processes of cultural transition. *International Journal of Sport and Exercise Psychology* 17, 5 (2019), 493–508.

[26] Katariina Salmela-Aro. 2009. Personal goals and well-being during critical life transitions: The four C's—Channelling, choice, co-agency and compensation. *Advances in life course research* 14, 1-2 (2009), 63–73.

[27] Katta Spiel. 2019. Body-positive computing as a means to counteract normative biases in fitness trackers. *XRDS: Crossroads, The ACM Magazine for Students* 25, 4 (2019), 34–37.

[28] Laia Turmo Vidal, José Manuel Vega-Cebrián, Amar D'Adamo, Marte Roel Lesur, Mohammad Mahdi Dehshibi, Joaquín Díaz Durán, and Ana Tajadura-Jiménez. 2023. On Futuring Body Perception Transformation Technologies: Roles, Goals and Values. In *Proceedings of the 26th International Academic Mindtrek Conference* (Tampere, Finland) *(Mindtrek '23)*. Association for Computing Machinery, New York, NY, USA, 169–181. https://doi.org/10.1145/3616961.3616991