Turning Inwards in Transformative Co-Design

Cultivating the Interconnectedness of Internal and External Change

Kirsi Hakio
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Abstract

This doctoral thesis examines how co-design as an enabling creative practice can contribute to the transformation toward eco-social sustainability. The focus of this research was on the inner dimensions and conditions of transformation and sustainability, and the so-called neglected inner worlds of individuals and collectives, which have been identified in the systems change literature as the most influential leverage points for transformation. They are also identified as the most challenging to reach and transform. This research aimed to explore how and by what means these source conditions of individuals and collectives can be cultivated and potentially shifted as part of development projects. The topic was examined from the perspective of capacity-building.

This thesis consists of four publications and an essay that complements them. The research approach was based on the dialectic epistemic tradition of constructive design research, and the data were collected via design experiments. In order to complement the design approach, the work also extensively explored literature from other fields on the concepts and various ways of understanding the different components of transformative change and its manifestation. These include approaches of care ethics and awareness-based system change, perspectives of reflective empathy, and exercises drawing from philosophical and eastern wisdom traditions, which are seen as ways of understanding of the interconnectedness of internal and external change.

Transformative co-design refers here to a process that takes into account the effects of these internal conditions on the formation of external responses. The approach is based on mutual learning and self-reflection, which includes exercises and components for turning inwards as part of the collaborative process and its development goals. Such exercises prepare favorable conditions for awareness-based co-creation and envisioning of the future, in which the collective transformation process goes hand in hand with the participants' personal, internal shift work. Based on findings, the thesis presents a collection of components and corresponding techniques and tools, by means of which such self-reflective and awareness-based internal shift work can be facilitated as part of co-design.

In terms of transformation toward eco-social sustainability, the main arguments highlight how transformative co-design can contribute to shifting inner conditions, as it helps participants adopt new, more caring and aligned internal postures that arise from the broader experiences of relating and connectedness with oneself, others and the world. Further, the work provokes to take into account the ever-present, ontological possibility of making an internal shift a conscious choice, which means that every encounter and interaction with others and the world presents an opportunity to practice an internal posture of care—if we want it to.

Keywords co-design, transformative change, eco-social sustainability, internal shift work, awareness-based systems change, self-awareness, reflective empathy, care ethics, internal and external change, capacity-building

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### Tiivistelmä

Tässä väittäskirjassa tarkastellaan miten transformatiivinen yhteissuunnitteluvaihe edistää muutosta kohti ekososiaalista kestävyyttä. Tutkimuksessa keskityttiin transformatiiviseen ja kestävyyden sisäisiin ulottuvuuksiin ja olosuhteisiin, sekä yksilöiden ja kollektiivien ns. laiminlyötyihin sisäisiin maailmoihin, jotka systemimuutoskerjallisuudessa on tunnistettu muutoksen vaikutusmiksi vippuvaikutuspiistiteisi. Samalla ne on myös tunnistettu kaikkein haastavimmiksi tavoiottaa ja muuttaa. Tämän tutkimuksen tavoitteena oli selvittää, miten ja millä keinoin näitä yksilöllisiä ja kollektiivien lähdeolosuhteita voidaan työstää sekä mahdollisesti muuntaa osana kehityshankkeita. Aihetta on tarkasteltu valmiuksien kehittämisen näkökulman kautta.

Tämä väittäskirja koostuu neljästä artikkelista ja niitä täydentävästä eseseestä. Tutkimusote perustui konstruktioon kohdalla muotoilun tutkimuksen dialogiseen epistemiseen perinteeseen ja aineistoa kerättyi muotoilu kokemuksesta avulla. Muotoilun lähestymistavan täydentämisiksi työssä tutkittiin laajasti myös muiden alojen kirjallisuuutta transformatiivisen muutoksen käsitteistä ja erilaisista tavoiista ymmärtää sen ilmenemistä ja eri osatekijöitä. Näihin kuuluivat mm. välittämiset etiikan (care ethics) ja tietoisoisuuslähtöisen systemisen muutoksen lähestymistavat, reflektiivisen empatian näkökulmat sekä filosofisia ja itämaisista viisauksen etiisiä arjentavat, joita voidaan pitää keinoina ymmärtää sisäisen ja ulkoisen muutoksen ytteenkiihdytunesuutta.

Transformatiivinen yhteissuunnitteluvaihe viittaa tässä työssä prosessiin, jossa otetaan huomioon näiden sisäisten olosuhteiden vaikutukset ulkoisten reaktioiden ja vastakaiken muodostumiseen. Lähestymistapa perustuu keskinäiseen oppimiseen ja itsetuntemukseen, joka sisältää sisäänpääkääntymistä edistäviä harjoituksia ja komponentteja osana yhteissuunnitteluprosessia ja sen kehitystavoitteita. Tällaisten harjoitusten nähden on valmistelevaa otollisia olosuhteita sellaiselle tiedotoinnuksesta sekä mahdollisuuksien kehittämiselle ja tulevaisuuden luomiselle, jossa osallistujien henkilökohtainen sisäinen muutostyyppi kulkee käsittyä yhteiskunnan, kollektiivisen muutosprosessissa kanssa.

Ekososialistaa kestävyyttä koskevan muutoksen valossa tärkeimmat argumentit korostavat kuinka transformatiivinen yhteissuunnitteluvaihe edistää muuntua osallistujien sisäisiä olosuhteita, koska se auttaa heitä omaksumaan uusia, välittävämpiä ja linjaanuempia sisäisiä asentoja, jotka syntyvät laajemmasta kokemuksista yhteisyydelle itseään, muihin ja maailmaan. Lisäksi, työ provosoi ottamaan huomioon alati läsnä olevan ontologisen mahdollisuuden tehdä sisäisiä muutoksia tiedotoinen valinta, mikä tarkoittaa, että jokainen kohtaaminen ja vuorovaikutus toisten ja maailman kanssa tarjoaa tilaisuuden harjoittaa sisäistä välittämisen asenneta - jos niin haluamme.

### Avainsanat

- yhteissuunnitteluvaihe
- transformatiivinen muutos, ekososiaalinen kestävyys, sisäinen muutostyyppi, tietoisoisuuslähtöinen systemin muutos, itsetuntemus, reflektiivinen empatia, välittämisen etiikka, sisäinen ja ulkoinen muutos, valmiuksien kehittäminen

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Acknowledgements

At the beginning of my research, when I started my Doctoral Candidate Position at Aalto University, I think I naïvely and over-positively said something along the lines of “I want to do this thesis work through joy” (“ilon kautta”, as we say in Finnish). Well, many times during the process I have returned to this idea with a small smile, as I can honestly say that completing this doctoral thesis has been one of my most challenging endeavors ever, and that it took its toll on my schedules, health, endurance, and family life. But on the other hand, it has given me just as much, and has been one of the most enlightening and memorable learning experiences of my life, during which I have had the privilege, over time, to ponder, embrace and internalize many of the insights and inspiring ideas I discovered during the research process. And luckily, my naïve joy hasn’t disappeared either.

Looking back now, one of the key themes of my research process has been making vague ideas and non-verbal experiences visible and understandable to others. The main challenge has been finding the right terms and expressions, but also a like-minded community and audience with a similar research interest. It goes without saying that numerous people along the way have contributed to shaping my work into its present-day form. My biggest thanks undoubtedly go to Tuuli Mattelmäki, who played a major role in my research as my supervisor and advisor. We have come a long way together and without her trust, patience, encouragement, and constantly available guidance and support, this thesis would not exist. When we work together, Tuuli has a wonderful ability to act as an interpreter for my sometimes high-flying thoughts and blurry explanations, translating them into more inclusive ideas. Under Tuuli’s guidance, I have also learned how to operate in the academic world, for which I am extremely grateful. I would also like to express my gratitude to Turkka Keinonen, Sampsa Hyysalo and Guy Julier of the Department of Design at Aalto University for the support and resources I received from the department during the different stages of my work.

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encouraged us to explore new project ideas and funding opportunities around the themes of self-awareness and sustainability education. Annukka, thank you! Like a snowball effect, this collaboration with Meeri led first to new encounters and ideas with Noora Jaakkola, and finally to the publication of Paper 2. I am so grateful to my co-authors Meeri, Noora, Tuuli, Lily-Ann Wolf and Mervi Friman for our zoom gatherings and inspiring moments of co-creating, co-learning, and co-writing.

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Orimattila, 2 May 2023
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List of Publications

This doctoral thesis consists of four publications and an essay that complements them. The publications are referred to in the text by their numerals.


Descriptions of key terms

Eco-social transformation toward sustainability

Eco-social transformation toward sustainability means a systemic change that understands that planetary and human sustainability are inseparable. In this doctoral thesis I relate to Houston et al.'s (2022) definition of eco-social transformation, which a) gives care ethics a central role in guiding people to search for alternatives to the market-driven paradigm, b) emphasizes creative practices and participatory, social and mutual learning processes, and c) reminds us how humanity as a species “has the power to change the world, but also to change itself” (ibid:2). Eco-social transformation is thus a fundamental process of change based on the adoption of a more pluralistic worldview, in which futures are created from different ontological starting points (Houston et al. 2022; Escobar 2018). In practice, it also means a capacity-building process that leads to a shift in the awareness of individuals and the collective, and thereby, the ability and willingness to act on the basis of this shifted, evolved, and broader (eco-systems) awareness (Scharmer 2016).

Transformative change

The term transformative change is often used in the context of climate change and in relation to conversations on the Sustainable Development Goals (United Nations SDGs) (Boström et al. 2018; Burch et al. 2014; Bentz et al. 2021). It signifies a change that is profound and fundamental, and thus refers to an important paradigm shift (Burch et al. 2014; Boström et al. 2018). Engendering such a shift involves institutional and societal changes from many perspectives, including transformative changes in “form, structure and/or meaning-making” (O’Brien 2018), but also transformations in social practices, in which focusing on cultivating human potential and agency to make changes for a better life plays a significant role (Boström et al. 2018; Bentz et al. 2021). From the perspective of this doctoral thesis, the internal shift related to transformative change is particularly interesting, as it may include changes in how we understand, experience and relate to ourselves and others and how we are situated in society, which in turn influences the way in which we understand and experience possibilities for change (Bentz et al. 2021; Boström et al. 2018; UNESCO 2020; see also Grocott 2022).
Internal posture

Internal posture in this doctoral thesis describes an inner space, stance, and condition through which a person perceives, experiences, and creates their own way of being in the world. Thus, it can be seen as a source condition for becoming and action, and defines the tone and quality of these becomings, actions and interactions in social contexts (Scharmer 2016). The term posture was adopted from Terry Irwin’s Transition Design framework (2015) which uses the expression “new mindset (worldview) and posture (approach/attitude)” to describe the characteristics of more holistic internal postures, which are needed for living in and through transitional times. Among other co-evolving areas of knowledge and capabilities in the framework, these internal postures call for self-reflection, and when internalized, lead to different ways of interacting with others, which also influences collaborative design and problem-solving (ibid.). In this way, they illustrate a connection between internal and external change, which is one of the cross-cutting themes of this doctoral thesis.

Interconnectedness of internal and external change

In this doctoral thesis, the interconnectedness of internal and external change means that external change—something that one can perceive and experience in the world as tangible solutions, societal structures, and social interaction and practices—first requires changes in the internal dimension and condition of individuals and collectives. This means that, for example, transformative change toward eco-social sustainability first requires a change in the system’s beliefs, attitudes, habitual patterns, mental models, and worldviews. This involves the individuals and the collectives engaged in the local and practical transformation work (see leverage points in Meadows 1999, 2008). To challenge the market-driven paradigm and envision and practice futures that transcend paradigms such as a culture based on care ethics and co-creation, it is essential to identify and integrate the connection between internal and external change into the transformation processes. Recognizing the effect that a person’s inner dimension has on learning and on their abilities to change is also vital. (See e.g., Grocott 2022; Bentz et al. 2021; Escobar 2018) In other words, by changing ourselves, we change the world (among others Light et al. 2019).

Internal shift work

The term internal shift work is adopted from Lisa Grocott’s (2022) work on design for transformative learning, in which she uses the term to describe a process of shifting perspectives and learning positions that lead to experimenting with new ways of being and acting in the world. Internal shift work can thus be seen as both a gentle and more radical process of inner growth and self-evolvement, in which eventually, at some point of the journey, one realizes that one cannot go back to being who one was before (Dirkx et al. 2006:132). Such shifts in inner conditions
and posture also affect people’s abilities to imagine different futures (Grocott 2022; Akama 2012). Internal shift work thus can be seen as an internal path of transformation that helps participants in transformative co-design embody and internalize change. Central to this kind of work is an open will to welcome and embrace change and participate in an experiential process that leads to changing attitudes, perspectives, and beliefs (Dirkx et al. 2006).

More-than-human

The term more-than-human refers to a concept and lens that invites us to look at the worlds of different beings and entities, who not only co-exist with humans, but have causal powers and capacities of their own (Oxford Reference). Thus, the term more-than-human transcends the views of human exceptionalism and reminds us that humans are members of multi-species communities (Takayama 2020 referring to Deborah Rose’s Indigenous Philosophical Ecology 2005), and that this encompasses the interdependence of all earthly beings, natural systems and forces (UNESCO 2020; Zylstra et al. 2014; Tronto 1993; Puig de la Bellacasa 2010). The concept of more-than-human offers the opportunity to explore and make sense of the worlds beyond Western modernity and its limits (Takayama 2020): Something that is forgotten or abandoned in Euro-Western epistemologies, but very inherent to, for example, the “Indigenous ways of knowing and being in a reciprocal relationship with the Land and all its creatures” (UNESCO 2020:4), and to nondualistic Buddhist teachings and practices related to experiencing an ecological sense of selfhood by transcending experiences of separateness and fragmentation (Edelglass, W. 2009).

Co-design

Co-design is defined in this doctoral thesis as an enabling creative practice that aims to facilitate transformative processes by building places and favorable conditions for participants (including designers) to emerge, become, and learn together (see Light and Akama 2014; Akama 2015; Grocott 2022; du Plessis 2015; Vink et al. 2019). Thus, co-design is a participatory approach that uses creative and empathic design tools and techniques to nurture mutual learning and collective creativity among all the parties and stakeholders involved through the tell–make–enact cycle (Brandt et al. 2013). Such an approach creates opportunities to change perspectives, adopt broader views, make visible, and enables imagination, experimentation, and reflective practices (e.g., Grocott 2022; Mattelmäki et al. 2014). Co-design as an enabling and creative practice is always case specific and context sensitive and builds on the facilitator’s own history and repertoire. It is
thus applicable to multiple design and development environments with various transformative aims and different scales.
This doctoral thesis is written at a time when globally, the pressure and need to transform toward more sustainable, just, and equal societies and ways of co-existing is strong in everyday debates as well as in political twists and turns. Such eco-social transformation recognizes that human and planetary sustainability cannot be separated, and requires people to rethink how they live with each other and the Earth (e.g., Bentz et al. 2022; UNESCO 2020). Because we, as the human race, are facing the greatest planetary challenges in modern history, this means not only profoundly changing what we do, but also acknowledging our agency and roles as active players in our social and ecological systems, and acknowledging how we do things, both alone and together (Light et al. 2019; Grocott 2022).

A term that often emerges in many related discussions is shift. The topic of shift can be approached from many angles, but the general consensus echoing from numerous voices from different fields and backgrounds is that the way in which we, as human beings and as humanity, think about how we act and how we relate to ourselves and to others needs to undergo a shift. Karen O'Brien (2018) has identified three areas of transformation in the context of rapid, large-scale systems change, with both practical and structural ways of reorganizing society, but also a more personal dimension of transformation, which involves a shift in both individual and shared beliefs, values and worldviews (see also Hedlund-de Witt et al. 2013; Horlings 2015; Leiserowitz et al. 2016). The field of sustainability education recognizes that such transformative change involves shifting personal consciousness and developing new capacities and qualities that enable people to participate in alternative behaviors, lifestyles, and systems, both individually and collectively (van Boeckel 2013:345 referencing Sterling 2012 and Wals 2010).

Concerned with the global challenges, many researchers have emphasized how the pursuit of flourishing and sustainable futures, as in sustaining life-affirming eco-systems, includes re-examining what it means to be human (e.g., Ehrenfeld and Hoffman 2013; Fry 2009; Sterling 2012). Ehrenfeld and Hoffman (2013:83) argue that humans need to shift toward viewing themselves as beings of care, instead of beings of having and needing. Care ethics contribute to these conversations by reminding us to re-examine what we hold meaningful in our societies (Tronto 2017, 2013; Puig de la Bellacasa 2010, 2012). By arguing that
care should be the foundation upon which society is built on, Tronto’s (2013:ix) message is in line with design scholars who criticize and raise awareness of designing for neoliberal values and a market-driven society (e.g., Julier and Kimbell 2019; Julier 2013; Fry 2009; Markussen 2013; Walker 2017). Likewise, Scharmer (2016) proposes an awareness-based approach to systems change, which calls for a profound renewal of civilization by addressing the major divides of our times: the ecological divide, the social divide, and the spiritual divide (Scharmer 2018:4-5). His approach to engendering transformative change and bridging these divides is to make a system see and sense itself by shifting awareness from ego-systems awareness to eco-systems awareness (ibid.).

Many of these shifts point to the personal, inner areas and dimension of transformation that are among the interests and focus of this doctoral thesis. These areas have also been recognized in systems thinking literature as the deep leverage points of systems change, containing underlying, individual, and collective mental models—the mindset and paradigm from which the system arises (Meadows 1999). Abson et al. (2017:30) define the concept of leverage points as “places in complex systems where a small shift may lead to fundamental changes in the system as a whole.” However, these underlying, inner dimensions and conditions of systems, which consist of very intimate and private areas of human life, such as individual and cultural worldviews, values, and beliefs, are considered the most powerful yet most difficult areas to reach and transform. Although the literature unanimously points toward activating and operationalizing these inner dimensions as part of transformation efforts (e.g., O’Brien 2018; Ives et al. 2020; Abson et al. 2017; Hedlund-de Witt 2013; Meadows 1999), there seems to be a research gap on the practical level. How and by what means can experiences of internal shifts be facilitated, fostered and potentially co-created? (See also the recent discussion on the “How” of transformation in the sustainability science community in Bentz et al. 2022.)

At the same time, there is a more general call for building the capacity for self-awareness and turning inwards (see Eight Key Competences for Sustainability Education in UNESCO 2017:10). In the context of thinking about the future of education, and the concerns about sustainable futures (and future survival), this involves learning new ways of becoming with the world around us (UNESCO 2020). This is in line with the observations on shift above and can be expressed in more detail, including learning new ways of being and becoming with oneself, and becoming with others and the world.

On a slightly different note, Terry Irwin has emphasized the need to educate a new generation of designers who have transdisciplinary knowledge of theories of change and a new mindset (worldview) and posture (approach/attitude) for collaborating through transitional times (Irwin 2015:232). Regarding design and designers’ roles in transformation processes, Tony Fry asks us to first become aware of how designers themselves have been designed and conditioned by culture and society to highlight the ontological and constructivist side of design-led future-making. In the same tone, Cameron Tonkinwise (2017) points out the difficulty of trying to influence change in the systems within which one is. He argues that a paradigm shift calls for the ability to shift oneself in terms of “being
alienated” from the current ways of being in the world, while simultaneously experiencing the new through personal self-experimentation of new visions of the world (ibid.), which is in line with Donella Meadows’ remarks on learning internal mastery to transcend paradigms (2008).

Cultivating abilities to shift oneself and one’s inner conditions has been the focus of the transformative learning field (see e.g., Mezirow 1991, and Paper 2). In the context of design for transformative learning, Lisa Grocott (2022) uses the term internal shift work to describe the process of shifting the perspectives and learning positions that lead to experimenting with new ways of being and acting in the world. Internal shift work can be thus seen as both a gentle and more radical process of inner growth and self-evolvement, in which eventually, at some point of the journey the person acknowledges that they cannot go back to being who they were before (Dirkx et al. 2006:132). This also affects their abilities to imagine different futures (Grocott 2022; Akama 2012). Although these observations address designers, from the perspective of eco-social sustainability, learning the ability to alienate oneself, practicing self-awareness, and developing new mindsets and internal postures certainly applies to everyone involved in the imagining and prototyping of alternative futures; not only designers. Rieckmann supports this by highlighting how it is important that everyone adopts the UNESCO Key Competences for Sustainability Education and that this is particularly important and essential “for thinking and acting in favor of sustainable development” (Rieckmann 2018:44).

Similarly, design is always representative of its own time. In order to better respond and contribute to current local and global challenges, there has been a paradigm shift in the design field from user-centered design toward community- and society-centered design (Bieling 2019:10), and even toward emerging planet-centered perspectives. Thus, new design areas have been developing, such as designing for (public sector) services and social innovation (Meroni and Sangiorgi 2011; Sangiorgi and Prendiville 2017; Manzini 2015; Julier 2018), and designing for sustainability and transitions (Egenhoefer 2017; Ceschin and Gaziulusoy 2019; Irwin 2015; see also Valtonen 2020). What these different fields have in common is that they all seek to promote and explore design-led transformation on different scales and levels from more local and small-scale perspectives toward large-scale systems change.

Of particular interest from the perspective of this doctoral thesis are local, small-scale and hands-on experiments, which make the challenge at hand more concrete (e.g., Valtonen 2020:523) and generate knowledge of how the experiments should evolve in order to achieve larger visions and “next-generation” prototypes of possible futures (Manzini and Rizzo 2011; Manzini 2015). These small-scale experiments are relevant because co-creation and interactions happen with and between people, and the focus is on collaborative and explorative activities aiming at individual and collective learning. The challenge is in the dynamics of different scales; the human-sized scale, including individuals’ experiences, values and lifestyles, and the more comprehensive view of societal and systemic questions. Small-scale experiments access human-sized experiences of large systems and personal
encounters between individuals. Buchanan notes on scales and experiencing systems that, as we do not experience systems, we only experience our pathway through them: “it can only be our personal pathway through the complexity of the situation” (Buchanan 2019:100). Such a perspective crystallizes the abstract and theoretical conception of eco-social transformation toward sustainability as closer to everyday life and practice, in which “transformation may be made up of several subtle, yet profound, individual changes” (Bentz et al. 2022:10).

**Motivation and overall aim**

The threads and streams above entwine the motivation and research questions of this doctoral thesis, which revolve around the transformative intentions of eco-social sustainability, the potentials of design experiments, explorations of the deep leverage points of paradigm shifts, and the related capacity-building of self-awareness and turning inwards. The overall aim of this study was to expand the existing co-design repertoire in the design field to more strategically take into account the inner dimension and conditions of people and the contexts involved. This involves exploring the underlying layers of transformation and constructing knowledge on how they can be better accessed and worked on as part of the collaborative process.

**Research questions**

The research questions changed form and developed as the process evolved and I myself embraced and internalized broader insights and understanding. The initial research interests focused on applying the empathic co-design approach to (at that time) a new context, namely public sector service development. The research aim also involved mapping not only the benefits of but also the barriers to embedding design approaches in the City organizations’ processes (Hakio and Mattelmäki 2011a, 2011b; Jyrämä and Mattelmäki eds. 2015, Hyvärinen et al. 2015). However, in line with the principles of constructive design research (Krogh and Koskinen 2020), the focus shifted as it was discovered through experiments that the service design approach to organizing and facilitating co-design needed to be readjusted in environments and engagements that go beyond the anthropocentric views and the related ontological foundation and worldview (see Paper 3). Hence, through a process of drifting (Krogh and Koskinen 2020), in which research and design intentions shift from original ideas in directions towards results that were not initially expected, the focus of the research shifted toward the contexts of transformative change and the inner dimensions of sustainability, and finally toward exploring prototypes of a possible future culture based on care and awareness-based co-creation (Papers 1, 3 and 4). The concept and process of drifting as part of the research approach is explained in Part 3 and in Figure 8.
The positioning of research questions follows Ezio Manzini’s thoughts on prototypes of possible futures in the context of sustainability and social innovation (2015). He sees on the one hand, how these prototypes offer an opportunity to study how the prototype should evolve in order to become the next, improved version, and ultimately the mainstream; and on the other hand, how the surrounding society should evolve, move closer and support alternative thinking or the (radically) new approach that the prototype represents. Considering the aims of the transformation toward eco-social sustainability, which recognize the importance of both personal transformations and shifting the inner conditions of individuals and collectives, as well as the potential restrictive influences of the prevailing paradigms (Meadows 1999; Abson et al. 2017; O’Brien 2018; Grocott 2022), such an approach based on experimenting, reflection and mutual learning seemed appropriate. The research questions in this doctoral thesis represent two courses:

One that looks at the pool of different fields and approaches contributing to change-making and shift work from the perspective of the design field, and proposes creative, empathic and collaborative design practices and processes as one potential approach to exploring transformative change toward eco-social sustainability:

**Research Question (RQ) 1.** How can co-design be involved in and contribute to transformative change processes that address the inner dimension of transformation?

**Research Question (RQ) 2.** By what means can experiences of internal shifts be facilitated, fostered, and potentially co-created in transformative co-design processes?

And another that opens the co-design approach to being receptive to expansions from other fields, paradigms and worldviews:

**Research Question (RQ) 3.** What can co-design learn and embrace from other fields such as awareness-based approaches and practices that recognize the connection between internal and external change in their ways of supporting transformation processes?
This doctoral thesis consists of four publications and an introductory essay that complements them. The structure and outline of the essay is depicted in Figure 1.

**Introduction section** lays out the underlying motivation behind the research aims, motivations and questions, and points in the direction of gaining practical knowledge on the internal dimension of transformation—the so called neglected inner worlds of individuals and collectives in systemic and transformative change. In addition, the research gap regarding the “how” of transformation is introduced.

**Part 1** then continues by presenting the roots of the doctoral thesis stemming from empathic design and co-design, and positions the work in the empathic design research program developed in Aalto University’s (formerly University of Art and Design Helsinki) Department of Design over two decades. In terms of the interests and questions of this doctoral thesis, this part presents key approaches and principles from the fields of co-design and empathic design research, which lay the groundwork for the following parts 2 and 3. In particular, this part considers the applicability of the co-design approach to the different contexts and challenges of each era, and makes connections between creative co-design practices and transformative change.
**Part 2** complements the discussion initiated in the introduction section, and reviews contributions to the transformation toward eco-social sustainability, and the kinds of ontology and worldview on which such ideas are grounded. This part ventures into areas beyond traditional co-design knowledge and expertise, to explore ideas, concepts, and practices from other (research) fields. These include sustainability science, environmental psychology, organizational change, systems change, care ethics, and awareness-based systems change. This part also visits more philosophical approaches and practices stemming from Eastern traditions. After this, it integrates the key ideas to the similar observations made by design researchers.

**Part 3** first reviews the methodological research approach of the doctoral thesis and the main features of the research process. The section also includes a description of the design experiments, called design *adventures*, as the whole construction of the collaboration process with the local stakeholders, including the designerly experiments, had an adventurous nature and was carried out with a learning-by-doing attitude. Thus, this part is called Applications, as it complements the literature reviews and discussions in Parts 1 and 2 by presenting practical design experiments conducted through exploratory fieldwork.

**Part 4** is called Discoveries, as it summarizes the conclusions and contributions of this doctoral thesis. These discoveries are presented as a collection of the different components and contributions that emerged from the various discussions, literature reviews and research findings presented in the four papers of this doctoral thesis. This part first introduces the components that were identified as relevant for facilitating and practicing internal shift work as part of the transformation aims of co-design processes. Next, it presents the four main contributions, after which the limitations and future directions of the research are addressed.

**Overview of publications and their role in the doctoral thesis**

**PAPER 1.**
**Hakio, K.** & **Mattelmäki, T.** (in review) Turning inwards for change: the role of inner conditions in transformative co-design.

**Conceptual bridge paper**—This paper (Paper 1), together with the following one (Paper 2) can be viewed as bridge papers, as they build connections between the empathic and co-design approaches and other development approaches that are interested in enhancing people’s inner capacity to embrace new ways of being and becoming with the world. Such self-reflective, internal shift work, which humanity needs to do in these challenging times, is seen as contributing to the transformative change toward eco-social sustainability and the well-being of all. One field that is explored is an awareness-based approach
to systems change; another is transformative learning in sustainability science and in (design) education contexts.

**Role in research process and contribution to the doctoral thesis**—The role of the paper is both that of an anchor in the empathic and co-design research traditions, and a stepping stone to the extensions of these traditions by "diving deeper into the individual". This includes paying attention to the “neglected” inner worlds that are highlighted in recent sustainability and systems change discussions (e.g., Ives, Freeth and Fisher 2020; Bentz, O’Brien and Scoville-Simonds 2022; Scharmer 2016). In this context, the focus of co-design has moved from human-centered perspectives to include more-than-human others, nature, and the Earth, thus also incorporating an ontological shift toward more pluralistic worldviews and paradigms, along with the expansion of contexts. Hence, this paper sees co-design as an enabling creative practice which, as an approach and method, can support and create favorable conditions in multiple environments and contexts for local development and transformation processes.

This paper also deepens our understanding of the different aspects of empathy and introduces a new, more critical component to the repertoire, namely reflective empathy. Another contribution comes from exploring the underlying components of transformative co-design by studying various ways of cultivating self-awareness and other ways of knowing in collaborative settings. Finally, this paper views the theme of gaining first-hand experiences from a new perspective, as one of the paper’s findings relates to building the capacity for deeply personal, subjective and holistic experiences of connectedness as a means of developing new internal postures and ways of relating and becoming with oneself, others, and the world.

**PAPER 2.**

**Second conceptual bridge paper**—This paper is another conceptual bridge paper that delves into the connections between self-awareness, transformative learning, and sustainability competencies through a literature review. The context is higher education and the related discussion on (future) capacity building in the light of the ‘how’ of transformation (see Bentz et al. 2022). This is also the only article of which I myself am not the first author, so my contribution and role are clearly confined to presenting examples from the areas of design education and creative practices on the above topics. However, devising the topic and structure of the article around the theme of self-awareness from a multidisciplinary perspective was a long co-creation process consisting of multiple phases, in which all the authors participated. Thus, together with the other authors, we constructed an image of the conditions, teaching environments, and means that transformative learning requires in sustainability education,
and of what engaging in a process of becoming self-aware might require from the participating students.

**Role in research process and contribution to the doctoral thesis**—The paper dives deeper into the topic of becoming self-aware and exploring in more detail what self-awareness means in the field of design research and how it is seen as both an intimate process of growing as a person, and as an outward-looking, relational process of becoming with others, in which one is aware of one’s position and role in society and the world. In the light of today’s capability-building needs and sustainability education aims, such positioning and perception of the self is extremely important.

The examples describing the creative design practices that facilitate self-awareness and transformative learning relate to the same themes of mutual learning and changing perspectives, building trust (in the course settings), the emphasis on gaining personal (learning) experiences, and the application of creative practices that are presented in Paper 1. Thus, this paper supports and complements the contribution of the other papers on transformative co-design and its relationship to learning. In addition, the findings of this paper contribute to and reinforce the construction of the argumentation in the doctoral thesis.

**PAPER 3.**

**Practical design experiments as design adventures**—This paper introduces the first part of the design experiments in the Elisaari project. The exploration of new contexts and the adventurous nature of the methodological applications were at the heart of the research presented in the case study section. The design experiments were carried out in the context of nature tourism, with developmental aims of building a new local culture, founded on care and awareness-based co-creation. The research objective approached these aims from the same angle of societal capacity-building as that addressed in Papers 1 and 2, which involved introducing an awareness-based approach to systems change to the picture. Thereby, the paper focused on exploring practices that foster self-awareness in collaborative projects through conducting co-design workshops and asking how such competencies can be integrated into co-design projects with transformative aims.

**Role in research process and contribution to the doctoral thesis**—The paper expanded and shifted the focus of empathic encounters and the quality of relating from human-centered perspectives to an interconnected worldview that takes into account the internal and external interactions with more-than-humans, nature, and the Earth. At this point, the literature and practices discussing the inner dimension of sustainability comes to the fore, as it focuses on developing internal capacities and practices that pay attention to creating and maintaining a broader and more holistic connection to oneself, to others,
and to the entire ecosystem. In other words, cultivating awareness-based practices based on mindfulness-type exercises and collective transformation journeys toward experiencing ecological selves.

The key contribution of this paper relates to the implementation of designerly experiments and discussions on the inner dimension of sustainability in a new context. The paper applies the methodological roots of co-design (presented in Part 1) and continues the theoretical discussions in a context-specific, concrete manner, by giving practical accounts of tools and methods.

**PAPER 4.**


**Following and making sense of the design adventures**—This paper introduces the second part of the design experiments in the Elisaari project. The contribution of this paper is the opportunity it provides to follow how the design experiments and insights gained from the collaboration began to live and evolve in the everyday practices of the place. Thus, the paper continues the theme of applying designerly experiments as a mindset that focuses on making future potentials visible here and now. Through a collaborative learning journey consisting of reflective dialogues and sense-making practices with the partner, the paper describes how the selected values reflecting the new culture, based on care and awareness-based co-creation, manifested and turned into different activities and embodied experiences. In this way, the paper also demonstrates a case in which the principles of the dialectic epistemic tradition of the constructive design research approach was utilized and applied.

**Re-inventing oneself as a manifestation of change**—The theme of trust has evolved into new meanings, and is seen as an element that draws from the concepts of care ethics, embedded in all-encompassing nature and the supportive forces of life. Thus, it can be perceived as an inherent component and principle of awareness-based approaches. This paper delves deeper into the potentials of the present moment. It illustrates, through case examples, how each moment carries an element of shift and hence offers an opportunity for embodied transformation.

The paper illustrates the connections between the inner condition and change, and the external outcomes. The paper also offers tangible examples of how, by learning to align with our inner movement of becoming as a constant potential for reinventing the self, we see how change happens here and now all the time. These concepts and practices have traveled far from the initial seeds and intentions of facilitating negotiations, collaboration, and envisioning in the public sector. However, they are relevant discussions in any context in which people interact with each other and co-create future openings and outcomes.
Role in research process and contribution to the doctoral thesis—This paper brings together the abstract literature concepts presented in the previous papers and highlights how they manifest themselves as potential future practices and embodied ways in which to pursue a desirable, flourishing future for all. In other words, a culture founded on care and awareness-based co-creation. It then presents a visualized description of these experiences to explain the different components of internal alignment, which in turn contributes to conceptualizing the outcomes of the doctoral thesis.
1. PART: Roots and Seeds

This part introduces the roots of the doctoral thesis stemming from empathic design and co-design, and positions the work in the related empathic design research developed in Aalto University’s (formerly University of Art and Design Helsinki) Department of Design over two decades (Mattelmäki et al. 2014; Lee et al. 2020). In terms of the interests and questions of this doctoral thesis, this part presents key approaches and principles from the fields of co-design and empathic design research, which lay the groundwork for the following parts 2 and 3. In particular, this part considers the applicability of the co-design approach to the different contexts and challenges of each era, and makes connections between creative co-design practices and transformative change.

1.1 Early sparks of the journey

I remember sitting as a Master’s student in my first design research conference in Seoul, South Korea, and listening to a renowned keynote speaker on stage. She was talking about co-creation through generative design thinking, and how co-creation can be an alternative way of seeing and being in the world. I was puzzled. She then presented an image to the audience, which contained a map of different approaches and schools of user-centered design and participatory design (PD) research. When people around me suddenly started digging out cameras and snapping pictures of this map projected on the stage screen, it became clear to me something interesting was going on. The speaker on stage was Elizabeth Sanders and the conference was IASDR 2009, where she presented (the now much referenced and well-known) “Current landscape of human-centered design research” framework (Sanders and Stappers 2008). See Figure 2.

At the same time, in my Master’s studies, I had attended a course on which, for the first time, I encountered thinking that did not focus exclusively on the designers’ own creative process. On the contrary, the focus shifted away from designers to other people; to users, and to understanding their experiences, life situations, future needs and desires, and to supporting their creativity through a variety of generative methods. The name of the course was UID–User Inspired Design and it was supervised by Tuuli Mattelmäki. My body still remembers the tremendous sense of “awakening” and inspiration I experienced on the course, and I can recall realizing I had finally found the reason I had applied for design
education. I have felt the same sparkling inspiration at every important turning point in the course of this doctoral thesis, and I am sure that every researcher has at some point in their path experienced something similar, which has their passion revealed to them.

Figure 2. Framework presented at IASDR’09 conference in Seoul 2009 by Elizabeth Sanders: The current landscape of human-centered design research (adopted from Sanders and Stappers 2008)

Both these events have had a notable impact on my choices, growth and becoming a design researcher, and are an important part of the process of positioning the roots of this doctoral thesis on the map of design research. Since then, my thinking and doing has been guided and shaped by the empathic design research program (Mattelmäki et al. 2014; Lee at al. 2020), which can be viewed as a family of studies that started to emerge in the design department of the University of Art and Design Helsinki (now Aalto University, School of Arts, Design and Architecture) in the early 2000s (see Figure 3). The foundations and development of the program were initially described by Mattelmäki, Vaajakallio and Koskinen (2014) who focused on outlining the core ideas of the long-term research program around which this program develops, which can respond to a wide range of new challenges and environments. This will be elaborated on in more detail in the next section. Later, Lee, Koskinen and Whalen (2020) expanded the mapping by looking at the case of empathic design as a long-term program of constructive design research, which has reached out to a variety of audiences simultaneously, such as design practitioners, research communities of user-centered design, service design, management and organizational development, municipalities, service companies, grassroots communities, and government agencies (ibid.: 58). Over the years, the empathic design research program and the development of constructive design research methodology have partly gone hand in hand with the work of some of the researchers involved. For
example, Ilpo Koskinen has used the studies in the empathic design research program as an example in constructive design research publications (e.g., Koskinen et al. 2011). This is visible in, for example, how he and his colleagues have mapped out how drifting works in the processes of design researchers, and how different epistemic traditions in constructive design research, such as the dialectic and participatory approach, utilize this ability to drift by intention (Krogh and Koskinen 2020).

1.2 Positioning my doctoral thesis in the empathic design research program

The approaches relevant to this doctoral thesis in reference to Sanders and Stappers framework (fig. 2) highlight the participatory, people-as-partners mindset and its collaborative, generative, and empathic research methods. Example of their roots are the dialogical and collaborative design probes process (Mattelmäki and Battarbee 2002; Mattelmäki 2005, 2006; Mattelmäki 2008, Elo 2012) and various design games (Vaajakallio 2012; Lee et al. 2018; Jyrämä and Mattelmäki (eds) 2015; Hakio and Mattelmäki 2011a), and their application in different contexts. The empathic design research program has evolved over the years, as a result of both key projects and research contexts.

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1 In the book, Drifting by Intention (Krogh and Koskinen 2020), Chapter 8—Design Practice, Programs and Discourse in Empathic Design (pp. 101–104)—highlights how different researchers have expanded the program and shifted its focus with their own explorations and (methodic) questions.
Introduction: The unanimous call for a shift and through research questions moving from product innovation projects to the development of organizations (e.g., Salmi and Mattelmäki 2019) and public sector services (Mattelmäki et al. 2014; Lee et al. 2020). At the same time, the focus has shifted from explorations of everyday life toward more social and societal issues (Mattelmäki et al. 2014; Sustar and Mattelmäki 2017; Lee et al. 2018; Garduño García 2017), and from understanding and interpreting user experiences toward a more shared imagination (Mattelmäki et al. 2014: 69).

However, certain characteristics have remained in the program despite changes in contexts and focus. Firstly, the idea that “people give meaning to things and act on these meanings, these meanings both arise and are modified in interactions” indicates a genuine interest in understanding others and their ways of perceiving the world, their everyday experiences, and what is meaningful to them. Secondly, design research is conducted in real contexts with people. Thirdly, the program’s research methods come from design that values tactile, playful approaches that include both subjectivity and objectivity. And fourthly, attention to cultivating sensitivity in contextual matters such as social, cultural and design space is needed. (Mattelmäki et al. 2014: 68, 76)

Figure 4. Pictures from one of the design adventures carried out in the context of public sector service development, in which collaborative, generative and empathic design research methods and tools were applied with the aim of supporting cross-sectoral collaboration and ideation for new public services. The tools and materials were used as scaffolds to support the participants’ negotiations, interaction and creativity (Sanders and Stappers 2008), but also to increase sensitivity in contextual matters and to sensitize them to being open and receptive towards the views, needs and wishes of others (See Hakio and Mattelmäki 2011a).

In line with the mapping by Lee, Koskinen and Whalen (2020:58), my earlier research work on design adventures in the public sector (Hakio and Mattelmäki
Introduction: The unanimous call for a shift (2011a, 2011b) is located in the empathic design research program in connection with the development of public service networks and cross-sectoral collaboration (see Figure 4). My doctoral thesis builds on the previous research in the program, but expands the research objectives and trends in less explored directions, namely transformative change toward eco-social sustainability. In this context, it also questions the program’s earlier views on empathy by introducing a more critical stance towards it, emphasizing the importance of self-awareness and self-reflection in the formation and expression of empathy. At the same time, this doctoral thesis makes an ontological shift toward a more pluralistic worldview and research contexts, as it transitions from human-centered design projects and perspectives toward engaging with more-than-human worlds and awareness-based practices that stem from Eastern philosophies and traditions², and demonstrate ways of turning one’s gaze onto oneself and working on one’s own inner condition and world in transformation and development contexts.

1.2.1 The roots of empathic design

To uncover my roots, I will first explain what empathic design means in my research and then continue to outline my relation to co-design. Koskinen and colleagues propose that the wider interest in empathic design has grown from the new kinds of possibilities offered by information technology and the need for designers to be able to better understand, capture and be inspired by the emotions and experiences of users (Koskinen et al. 2003; Lee et al. 2020). Empathic design applies user-centered design and experience design practices (Koskinen et al. 2003; Kouprie and Sleeswijk Visser 2009; Mattelmäki et al. 2014) for finding the design empathy toward the users of future designs. By using a variety of qualitative methods and empathic design tools (Koskinen et al. 2003; Mattelmäki 2006), designers focus on understanding people’s everyday experiences, individual unexpressed needs, dreams, and motivations (Dandavate et al. 1996; Leonard and Rayport 1997), and then translate their interpretations of these experiences and the rich, empathetic understanding of users’ aspirations and needs into design (Mattelmäki et al. 2014; Battarbee and Koskinen 2005). Such a process, which translates inspiration into insights and ideas, thus utilizes not only the users’ but also the designers’ ability to empathize (Battarbee and Koskinen 2005; Smeenk et al. 2016; Kouprie and Sleeswijk Visser 2009). The subjective components of empathic design have since also sparked criticism of the limitations of empathy (more detail in Section 2.2.3 and Paper 1).

Leonard and Rayport (1997) listed the qualities and skills that an empathetically oriented designer or a member of a design team should have in the search for new innovations. These include the ability to explore the worlds of people through the eyes of a fresh observer; the ability to be open, curious and open-minded about clients and their situations; and to have the unusual collaborative skills required to gather, analyze, and apply information collected

² Such as Buddhism (Senge et al. 2004; Macy and Brown 2014; Kaza 2003) along with Confucianism, Taoism (Xue and Desmet 2019) and Shinto (Akama 2012).
Introduction: The unanimous call for a shift from these observations (Leonard ja Rayport 1997: 104-110 in Mattelmäki et al. 2014). Others have later recognized that empathy refers to an ability and willingness to be sensitive and respectful to others (Kouprie and Sleesvijk Visser 2009; Mattelmäki et al. 2014), describing how empathy in design can be framed as a respectful, genuine interest in understanding fellow individuals (see Papers 1 and 2).

Although Leonard and Rayport’s proposals were made in the context of new product development more than two decades ago, and they speak of customer understanding and customer empathy as a way in which to promote the competitiveness of enterprises and their business, they remain relevant characteristics for co-design and anyone acting as co-designer in a collaborative design process: For example, in situations at which various stakeholder groups, different opinions and sometimes polarized attitudes meet at the same table (Sustar and Mattelmäki 2017, also Hakio and Mattelmäki 2011a). In other words, the ability to observe and perceive the other’s world through fresh eyes, to be curious, open and open-minded toward others, and the ability to capture, reflect and apply information from encounters for the benefit of working together, are features that empathic and participatory co-design processes attempt to support and foster among all participants through design facilitation tools and means.

The openness and willingness to change one’s own perspectives and to be respectful and sensitive to others can also be viewed from a broader eco-social sustainability angle, in which the other represents nature, more-than-humans and the Earth (Aaltola 2018). These are recent themes in the field of design research, and the literature and examples of their application in co-design are discussed in Parts 2 and 3 (and in Papers 3 and 4).

1.3 Co-design practices for changing perspectives and mutual learning

Co-design represents many scales and perspectives in the design field. As Brandt et al. (2013) remind us, it includes many design agendas. Similarly, the application of techniques and tools is always case specific and context sensitive, and builds on the design researcher’s own history and repertoire (ibid.:147; Akama and Prendiville 2013; Lee et al. 2018, Halse et al. 2010). The idea of repertoire is perceived here as pragmatic principles and solid tools for exploring the research project (Halse et al. 2010:10), which includes examples, images, stories, encounters, understandings, and actions—the whole of the person’s experience to date (Schön 1983: 138), transformed into skills and orientation (Light and Akama 2012).

1.3.1 The tell–make–enact cycle

From a method point of view, the co-design in this doctoral thesis is largely based on a practice described by Eva Brandt, Thomas Binder, and Elizabeth
Introduction: The unanimous call for a shift to gain knowledge on how to involve people who are not trained in design in the co-design process and to help them tell stories, make things, and enact possible futures (ibid., p.145). The central idea is that everyone is creative when they have the favorable conditions and tools to express it (Sanders 2006). The tell–make–enact cycle contains similar elements to those in empathic design tools and which stem from the same roots of the user-centered design approach. According to Brandt et al. (2013), these different stages of the cycle can be explained as follows:

- **Telling** – includes activities and visual material to encourage people to tell others about their experiences, needs and wishes through tools and techniques such as collages and design games (see e.g., Sanders 2000; Brandt 2006; Vaajakallio and Mattelmäki 2014)

- **Making** – includes generative toolkits such as make tools (Sanders and Dandavate 1999; Vaajakallio and Mattelmäki 2007, Sanders and Stappers 2012) and other tinkering materials for making discussions tangible, and constructing, experimenting with and reflecting on ideas (see e.g., Agger Eriksen 2012; Vaajakallio and Mattelmäki 2007; Sleesvijk Visser 2009; Buur and Matthews 2008)

- **Enacting** – includes techniques that can be used to and make existing situations and co-created future visions and scenarios concrete and visible through acting (e.g., Halse et al. 2010; also Paper 4). Techniques and exercises derived from improvisational theater and drama methods have also been used in the co-design field to foster empathy toward potential users (Brandt et al. 2013:165), as means to ask “what if” questions and to explore how alternative future scenarios and situations would feel and look through the embodied experiences here and now (see e.g., Halse et al. 2010; Vaajakallio and Mattelmäki 2007; Buchenau and Fulton Suri 2000). In the field of service design, similar techniques have been used to envision and experiment with service concepts (see experience prototyping and simulation in Miettinen et al. 2014; Blomqvist 2012; Lee et al. 2018)

In this context, it is also beneficial to talk about the principles of participation that are well known in the PD field, and that have influenced this doctoral thesis. This includes principles that emphasize how a) all those whose lives are affected by the end result of the design should be involved in the design process (Simonsen and Robertson 2013), and b) all the people involved in the design process, the designers and non-designers, are seen as partners and co-creators (Ehn 2008:93; Sanders 2008:6), which means that they also become the co-designers of the new solutions, concepts and future visions (Manzini 2015; Ehn
Introduction: The unanimous call for a shift (et al. 2014; Light and Akama 2014), and usually, also the implementers of these co-created visions and solutions.

The co-design definitions presented here also bear similarities to discussions that have already started in the early 1970s, and that have dealt with the use of design perspectives to involve citizens in social planning (Brandt et al. 2013: 147). For example, the theme of the 1971 Design Research Society conference was related to the broader citizen participation movement and is framed in, for instance, Arnstein’s Ladder of Citizen Participation (1969). In these contexts, varied types of operational planning games and the inclusion of representatives of different user groups were seen as having potential for the design process in the field of urban planning (Cross, 1971:12). With the help of mediators such as games, both designers and participants had the opportunity to explore different roles and contradictions in resolving design issues. What was significant in these games was that they were seen as an opportunity to involve individuals who represent a wide range of different groups and perspectives (Armillas 1971:40). Through gaming, it was also possible to organize and simulate carefully structured encounters that enabled the interaction of different (institutional) standards and people’s values (ibid.). Of course, today, such participatory workshops and interventions have gained much criticism, especially with regard to power issues and recruitment. Questions such as who has the power and control over participation and decision-making, and whose voice is heard in the process transcend the discussions on the involvement and participation of people in design processes and define the political and social paradigms of our time in terms of how societies are shaped and developed. (See, e.g., Nordes 2017 conference theme on relations between design and power, Krüger et al. 2019; Hedemyr 2017; critique of modern/colonial world system and design in Escobar 2018; and tensions between the creative class and democratized innovation in Ehn et al. 2014: 181–182).

Although the early visions of participation and the potential of gaming techniques may sometimes seem slightly naive, they contain ideas that are still very relevant to the increasingly polarized global atmosphere of our world today. For example, the ideas of the 1971 conference echo the basic principles and practices of PD, which have not significantly changed to this day. In line with the practice of the tell–make–enact cycle, Alberto Feo, for example, described how games, as a tool for participation, can be used to “explore a range of alternative futures when dealing with socio-technical problems at community level” (Feo 1971: 43). He later envisioned how through simulations, experimental gaming sessions can be helpful as a tool for evaluating policies or for resolving various conflicts in the context of, for example, industrial strikes (ibid.: 44). These ideas of visual and tangible gaming techniques are today used to increase citizen participation in not only the public sector (Helsinki Participation Game 2019), but also in other areas such as in the field of sustainability education (Karvinen et al. n.n.), activism in topics of care and commoning (Dolejšová et al. 2021), and in sustainability governance contexts (Vervoort et al. 2022). In addition, regarding the increased political and societal tensions around global issues, and the increasing complexity of co-design contexts and challenges, Terry Irwin
Introduction: The unanimous call for a shift (2018) has recently returned to the theme of conflict resolution in co-design processes, and argues that design education needs to prepare future designers to face increasingly challenging problems in their work (Irwin 2015), such as conflicts related to water shortages in local communities (Irwin 2018). These are examples of how co-design, as a participatory method and process, is applicable to the contexts and challenges of each era, even though the basic practices for organizing and facilitating participation, mutual storytelling, making things, and enacting possible futures described in the tell–make–enact cycle have remained substantially the same.

1.3.2 Changing perspectives, mutual learning, and transformation

Helping participants shift perspectives together and through each other, and thereby explore alternative ways of knowing together, is a topic on which the co-design research community has years of experience (e.g., Simonsen and Robertson 2013; Smith et al. 2016; Halse et al. 2010; Mattelmäki et al. 2014). These practices are usually associated with speculative and generative imagining activities, in which various co-design tools and facilitation techniques are used to help people shift from thinking of the current situation, experiences and reality to imagining future possibilities (Brandt et al. 2013:153; Mattelmäki et al. 2014:76; Halse et al. 2010; also Dilnot 1998; Schön 1983), as in the tell–make–enact cycle.

Creating new openings and visions is one aim, but the co-design approach is also strongly associated with journeys of mutual learning, consisting of sensitization to listen to others and understanding their perspectives, and changing one’s own perspectives. Grocott (2022) sees how perspectives change and shift in collaborative processes via participants sliding back and forth between their own personal experiences and worlds and the worlds of others. Such sliding back and forth between one’s personal views and those of others is also connected to discussions on the many forms of empathy, which I elaborate on more in Section 2.2.3. In addition to being sensitive toward other people and their experiences and contexts, Mattelmäki and colleagues (2014) also see the element of sensitization as the ability to be sensitive toward co-design practices and generative design techniques, and the ability to be sensitive and open to collaboration and its possibilities (ibid.:76). Thus, the ability to step out of one’s own perspective and see and hear the point of view of others plays an important role in co-design interactions.

The topic of change and change-making is part of design’s core and has always been embedded in design processes, practices, and profession (e.g., Cross 2006; Dilnot 1998; Halse et al. 2010). How design can be involved in promoting transformative change has been the object of research and discussions in many design fields, such as design for services (Sangiorgi 2011), design for social innovation and sustainability (Ceschin and Gaziulsouy 2020), design for transitions (Irwin 2015), and design for transformative learning (Grocott 2022). Sangiorgi (2011) stresses the need to explore the catalyst factors that make change transformative in context design processes, emphasizing
that design should adopt theories and principles from the disciplines that are specialized in the study of transformative change, such as organizational change and community action research (Sangiorgi 2011: 29; also Irwin 2015).

When these ideas are woven into the co-design context, many design scholars have stressed how change, especially transformative change, emerges from a co-creative capacity-building process through mutual learning, when different stakeholders and designers work together as co-learners (e.g., Sangiorgi 2011; Light and Akama 2014; Irwin 2015, 237; Grocott 2022). According to Brandt et al. (2013:139) the mutual learning theme is a distinctive feature in PD, in which both designers and non-designers have the opportunity to learn from each other by together exploring the experiences and needs of the participating people, of the technical possibilities (ibid.), and of the creative design process (Manzini 2015). Claudia Garduño García calls such mutual learning the double-sided mirror perspective, which illustrates how different groups, including designers, learn about themselves by observing each other (2017:371).

What is important here is that the connection between the individual and the collective is understood. Akama frames this perspective by stating how “co-designing is an activity based on emergence where constituents are mutually changing toward purposeful outcomes” (Akama 2015:262). These outcomes can be mutual empowerment of local stakeholders and designers (Garduño García 2017), or organizational change that takes shape from small components that emerge within and between the people involved (Salmi and Mattelmäki 2019). Senge and colleagues support these observations by highlighting how individual and collective transformation goes hand in hand with “a living system for learning”, in which “all those involved with it individually and together, will be continually enhancing and expanding their awareness and capabilities” (Senge et al. 2012: 7).

Part 2 dives deeper into the ideas of expanding awareness and capabilities and looks into the role of reflection, especially the role of self-reflective processes in transformative change. It also draws a clearer picture of what is meant by the connectedness of individual and collective transformation journeys.

1.4 Summary of key points of Part 1

In terms of the following sections and the overall interest of this doctoral thesis, the most important takeaways from Part 1 are:

- Empathic design and co-design research have long traditions in engaging people in collaborative change and future-making activities. These activities include helping participants tell stories, make things, and enact possible futures (Brandt et al. 2013), and sensitize them toward new contexts and alternative ways of knowing and learning form the perspectives of others (Mattelmäki et al. 2014).
• As a participatory method and process, co-design is applicable to multiple design contexts and the challenges of each era. For example, in the empathic design research program (at Aalto ARTS) the focus of engagement and collaboration has shifted from explorations of everyday life toward social and societal issues, and from understanding and interpreting user experiences toward a more shared imagination. Similar developments can be seen in many design fields, as they use collaborative and engaging methods to facilitate the interaction of multiple stakeholder groups such as the design for services (Sangiorgi 2011), design for social innovation and sustainability (Ceschin and Gaziulusoy 2020), design for transitions (Irwin 2015), and design for transformative learning (Grocott 2022).

• As a vehicle for transformation, mutual learning among all the parties involved plays a central role.

• As Grocott (2022) depicted, mutual learning in collaborative processes is connected to participants shifting and changing perspectives as they slide back and forth between their own personal experiences and worlds, and the worlds of others. This can be seen as a co-creative capacity-building process, in which all those involved continuously enhance and expand their awareness and capabilities (Senge et al. 2012). For transformation toward eco-social sustainability, and design projects which, instead of working toward the goals of the prevailing paradigms aim to transcend the status quo and contribute to alternative paradigms and futures, this is essential.

• Cultivating sensitivity as a genuine interest in understanding others and their ways of perceiving the world, their everyday experiences, and what is meaningful for them, stems from empathic design research traditions. It emphasizes paying attention to cultivating sensitivity in social and cultural matters. (Mattelmäki et al. 2014: 68, 76) This kind of genuine interest and sensitivity to understanding experiences, viewpoints, perceptions, and social interaction, can also be linked to genuine interest and openness to turning inwards.

The next part presents these connections more clearly and highlights how, in order to better understand others, one must first understand oneself (Grocott et al. 2019; Akama, 2012; du Plessis, 2015).
2. PART: the Bridge

This part complements the discussion initiated in the introduction section on how new ways of being and becoming with oneself, with others, and the world might look. It reviews the contributions to the transformation toward eco-social sustainability, and the kinds of ontology and worldview on which such ideas are grounded. The section is called “The bridge”, as I venture into areas beyond traditional co-design knowledge and expertise, to explore ideas, concepts, and practices from other (research) fields. These include sustainability science, environmental psychology, organizational change, systems change, care ethics, and awareness-based systems change. It also visits more philosophical approaches and practices stemming from Eastern traditions. After this, it integrates the key ideas of similar observations made by design researchers. For example, an examination of Schön’s ideas on the reflective practitioner opens a window into the various views on reflection in design research, and into the nature of the whole research process and the dialogic epistemic tradition of constructive design research in this doctoral thesis (presented in Part 3).

2.1 Review of key theoretical and philosophical concepts

Choi and Galloway (2021) emphasize that any eco-social transformation must start with the self. In the same vein, this section starts with the premise that external change—something that one can perceive and experience in the world as tangible solutions, societal structures and social interaction and practices—first requires changes in the internal dimension and condition of individuals and collectives. This means that, for example, transformative change toward eco-social sustainability first requires a change in belief system attitudes, habitual patterns, mental models, and even worldviews, as was explained through the leverage points in the Introduction. In other words, catalyzing such a societal, individual transformation first requires understanding how internal and external changes are interconnected; and then recognizing the effect that a person’s inner dimension has on learning and on their abilities to change. According to O’Brien (2018) the inner dimension of transformation defines what is both individually and collectively imaginable, desirable, feasible, and achievable. This is based on “different understandings of causality, levels of social consciousness and future consciousness, perceptions of agency, and assumptions about leadership” (ibid.:156). In this context, Grocott emphasizes
how the identification and transformation of personal inner conditions is connected to people’s abilities to explore and imagine something not yet known, just as the underlying mental models, beliefs, attitudes, and habitual patterns influence how openly or limitedly people are able to imagine potential future worlds (Grocott 2022: 213).

In the following, the theme of interconnectedness of internal and external change is first addressed from the perspective of the inner dimension of sustainability, which in turn prepares the discussion for the theoretical and philosophical concepts used in this doctoral thesis.

2.1.1 Inner dimension of sustainability

The topic of the inner dimension of sustainability and its connections to individual and cultural mental models and worldviews, and to the deep leverage points of systems change is described in Paper 4, and the main points are outlined below.

A person’s inner dimension, consisting of their values, mental models, worldviews, beliefs, assumptions, and attitudes, have been identified as a significant leverage point for transformational systems change (Meadows 1999, 2008). On a day-to-day practical level, the inner dimension becomes visible in how we encounter and interact with others. In other words, the inner, invisible world animates our actions through these sometimes hidden, tacit or even unconscious operating systems (du Plessis 2015), but at the same time they greatly influence how we interpret, experience, and co-create social realities and paradigms together (Meadows 2008; Hedlund-de Witt et al. 2013; O’brien 2018; du Plessis 2015).

In the context of environmental sustainability research, Horlings (2015) defines the inner dimension of sustainability as values in connection with action. A particularly critical point is the well-known gap between expressed values or attitudes and actual behavior at both individual and collective levels (Leiserowitz et al. 2016). Addressing this gap by recognizing and activating conscious human agency is seen as significant in terms of catalyzing rapid and large-scale systems change toward eco-social sustainability and life-affirming futures (e.g., O’Brien 2018). Senge argues that if we lack the skills to inquire into these underlying and hidden structures, both our own and those of others, our experience of collaborative new ways of thinking are limited (Senge 1990: 203).

In addition, the inner dimension of sustainability is connected to our abilities to deal with the unpleasant and difficult side of transformation journeys and global issues related to the environmental crisis, which can be paralyzing or even cause environmental melancholia (see Lertzman 2015; du Plessis 2015; Senge et al. 2004: 231-232). These themes are connected to Haraway’s (2016) emphasis on building the capacity to “stay with the trouble”, as she suggests eschewing futurism, and points out how neither despair nor hope helps us embody the required experience of thick co-presence (ibid.: 4). In line with Haraway, Hannah du Plessis argues that the ability to face and stay with the lived experience of unpleasant feelings and sensations is seen as a leverage
point for engendering systemic change (du Plessis 2015). This idea of being able to stay, pause and experience the situated and multilayered lived experience of the embodied present moment, without the cognitive activities of escaping into future hopes or dreams or dwelling in the past, is at the heart of this doctoral thesis, which is discussed further in Section 2.2.

In a slightly different context, but in the same vein, the literature on organizational change (e.g., Senge 1990, Jaworski 2011, Scharmer 2016) points out how capturing and working on the underlying inner dimension and condition includes paying attention to the core structures, mission, purpose, and culture of the organization in question. In other words, there is a relationship between invisible inner structures and visible external structures (Meadows 2008; Scharmer 2016). Du Plessis (2015) notes that learned patterns of feeling, thinking, and reacting have become habits to us and thus have a generative nature in cultures and societies. In this sense, people’s inner conditions are not inherited, but built (du Plessis 2015: 2). These ideas connect to the concept of the social construction of reality by Berger and Luckmann (1966), as they remind us that all social structures and institutions are based on common beliefs and meanings that are human made, and hence, changeable. Thus, to engender transformative change in any context, we need to acknowledge how “everything we think we know about the world is a model” and that “our models fall far short of representing the real world fully” (Meadows 2008, 87).

2.1.2 Social construction of social realities

There are many orientations in social constructionism (Cunliffe 2008), of which this doctoral thesis focuses on Berger and Luckmann’s (1966) take on the social construction of reality. Their work represents a phenomenologically oriented sociology of knowledge in which the seamless integration and interaction of internal and external reality creation is central. This section describes how their ideas are related to the co-creation of internally and externally experienced social realities.

The central idea is that all human knowledge is socially constructed and developed, and that this socially layered knowledge of reality is transmitted, maintained, and shaped in social situations (Berger and Luckmann 1966:15). This means that through a process of meaning-making such as externalization, establishing these meanings as solid reality through objectification, and finally internalizing this objective reality as part of an internal subjective world, people form an idea of the reality that they experience without much questioning it. In other words, the prevailing social structures and commonly accepted ways of organizing environments, societies, and culture, which humans subjectively experience as everyday reality, are all grounded in common belief systems that have gradually become a socially established “hard” reality.

What is interesting from the co-design perspective is that the concepts of social constructionism can also be utilized to expose and challenge current social conditions and structures, and thus to rethink how to “design alternative structural solutions” (Aittola and Raiskila 1994: 229-230; Cunliffe 2008).
As these social structures are maintained in social interaction, in which the encountering and experiencing of others takes place (Berger and Luckmann 1966: 43), co-design and designers have an undeniable role to play in promoting such processes of exposing, challenging, and redesigning (see e.g., the approaches of Irwin 2015 and Vink 2019). In addition, applying the ideas of socially constructed realities in practice to, for example, transformative co-design processes, requires a relationally responsive approach to social constructionism (Cunliffe 2008) and a self-reflective and dialogical process to reveal and explore how people’s own conversational practices create and sustain experienced realities, belief systems, assumptions, and particular ways of relating (ibid.)

The design research literature offers connection points to these ideas, as design is one of the professions involved in gradually and continuously constructing and developing the human-made world through collaborative efforts. Transformative design approaches are part of these collective movements of reshaping and becoming with (Akama 2012, 2015; Akama and Prendiville 2013), and seek to contribute to constant societal shaping in different ways and on different scales (see e.g., Ceschin and Gaziulusoy 2020; Irwin 2015). Schön (1983) recognized that the reflective element and movement of becoming with is built into design practice. According to him, and in line with Binder, the way in which designers work is “intrinsically connected to the generative cycle of constructing and perceiving the world” (Binder 2002: 460). It is not merely about solving problems that emerge from externally generated needs (ibid.). In line with the continuous co-evolving of humankind and the formation of society, Papanek saw that everyone is a designer and that design is the basic element of all human activity (Papanek 1971: 3). These processes are fundamental to how the actions of individuals and groups affect the shaping of the experienced environment (see also Scharmer 2016).

In the co-design context, facilitating and building scaffolds to support the interaction and collective creativity of people (Sanders and Stappers 2008) is one way in which to contribute to the ongoing process of societal form-giving in a targeted way in a specific environment. Another is building places and favorable conditions for emerging, becoming and learning together (Akama and Light 2014; Akama 2015; Grocott 2022; du Plessis 2015; Vink et al. 2019). In these settings, the purpose of helping and enabling people to turn inwards and become self-aware is to lead them to an internal path of transformation. Such internal processes and practices then manifest as external, visible changes in the way people perceive and approach the world, themselves, and others. In other words, by changing ourselves we change the world (Light et al. 2019, also Paper 3). This has been emphasized by authors from various fields: in the integral philosophy of Ken Wilber (Wilber 2005, see also Ives et al. 2020), Terhi Takanen’s relational constructionist view of co-creating change (Takanen 2013), the framework for changing practices by Caroline Hummels and colleagues (Hummels et al. 2019), and the design philosophy and practice of Yoko Akama (2018, 2015).
This section pays more attention to the interconnectedness of individual and collective transformation, and to the structures and dynamics of internal and external change highlighted above. In order to move from external change and from what is visible to the eye toward investigating internal change and the invisible dimension of collective experience, one needs to use different levels of attention (Scharmer and Pomeroy 2019). The concept of form follows consciousness (Scharmer and Pomeroy 2019; also Scharmer 2018:16 and 2016: 94) has been introduced to depict this interconnectedness. This concept and its application are also discussed in Paper 4.

The ideas behind the concept of form follows consciousness are based on the work of Otto Scharmer and his colleagues in the context of awareness-based systems change, and describe one of the key themes of the related transformation framework—Theory U (Scharmer 2016, 2018): A person’s inner dimension has a collective agency in how the externally perceptible solutions and results of our society are shaped, which connects to Berger and Luckmann’s concept of the social construction of reality mentioned above. Theory U is later presented in more detail.

![Figure 5. The concept of form follows consciousness (purple—adopted from Scharmer and Pomeroy 2019, this work is licensed by the Presencing Institute) and how it applies to co-design approaches (orange—author’s own addition).]

The basic idea of the concept of form follows consciousness is depicted in purple on the left in Figure 5. As we begin to read the figure from the bottom up, it is important to note how the inner conditions, i.e., cultural and individual qualities are seen as source conditions. The middle part of the figure depicts...
how these source conditions then give rise to qualities of relating, that is, qualities through which individuals relate to themselves and others, which then affect the patterns of their thinking, conversing, and organizing. This includes models and practices for co-creation, development, and innovation. The top of the framework depicts how the quality of these patterns and their ways of relating affect the production of the practical results, solutions, and outcomes that we see in the world. By practical results, solutions and outcomes, Scharmer is referring to the current situation of the modern world, and how it reflects the dominant worldwide neoliberal culture and market-driven value system, based on political, ecological and social divisions, disruption, and inequality (Scharmer 2018: 4-5; also “absencing” in Scharmer 2016: 243-244). The concept reflects a similar idea put forward by Peter Senge in his well-known work The Fifth Discipline (1990), which describes the practices of the five disciplines of a learning organization and highlights, among other things, how mental models are deeply rooted assumptions and generalizations about how people understand the world, and how these models affect people’s actions. In addition, Senge emphasizes how it is important to develop personal mastery to become aware and continuously learn about how individual and collective activities affect the world (ibid.).

The process depicted in orange on the left in the figure illustrates how the framework applies to co-design approaches, especially when the interest is to include transformative and self-reflective components in the process. The process depicted in the middle-layer of the figure is the co-design activity, during which participants relate to each other and to the topics that are discussed and the things that are co-designed. These activities are affected by the source conditions at the bottom of the picture, including the mental models, values, assumptions, beliefs, and worldviews of the participants. As co-design processes aim to create new openings, future visions, practical outcomes, and solutions, the top of the framework depicts how the qualities of inner conditions and of relating give form to these outcomes.

The concept demonstrates how the outcomes of the co-design processes are rooted in the mindset of the paradigm “out of which system arises” (Meadows 1999:2), which is in line with the thinking behind the deep leverage points of systems change mentioned earlier (Meadows 1999, 2008). In this context, the central idea is that if something is changed at the bottom of the frame, it will affect the other layers depicted in Figure 5 (Scharmer and Pomeroy 2019).

2.1.4 **Ontology of becoming (as choice of reinventing oneself)**

Building on the above ideas of how social systems are continuously constructed through our everyday actions and by believing and interpreting the lived experience through these structures, this section approaches this topic from a more philosophical view.

Takanen and Petrow (2013) see the ongoing collective event of the continuous construction and reconstruction of social systems and realities as something that emerges moment by moment through our encounters. They see these
encounters as the opening of a relational space, in which we relate to ourselves, each other, and the world around us, thus making realities here and now (Ibid.). Many authors have addressed this ongoing event of co-creating reality as becoming and have studied the concept in their texts (e.g., Puig de la Bellacasa, 2017, 2010; Deleuze 1953/1991; Haraway 2016; Akama 2015, 2012).

In his early writings, Gilles Deleuze (1953/1991) viewed the concept of becoming from an ontological angle, and reflected on the nature of the subjective empirical experience and the process of its creation. He explored the process of becoming by speculating on the idea of a plane (of immanence) that exists outside the subjective experience from which—through the process of becoming—the illusion of time and space is formulated. From this plane, the subject invents itself to experience itself in a linear time horizon, enabling constant becoming in the time-space realm that Deleuze calls “the given”. He writes: “This subject who invents and believes is constituted inside the given in such way that it makes the given itself a synthesis and a system” and continues: “In this formulation (...) we discover the absolute essence of empiricism.” (Deleuze, 1953/1991: 86–87). However, it should be pointed out that for Deleuze, becoming does not possess the transcendent status that being holds in many traditional philosophies (May 2003: 147). Instead, Deleuze offers us a concept that: “promotes a way of seeing reality that diverges from the traditional view, and, in the form of specific becomings (...) opens onto other ways of seeing, thinking, and acting in the world” (ibid.: 149).

What we can take from Deleuze’s thinking from the perspective of this doctoral thesis is the idea that becoming is something that can be influenced in the formulation of the empirical experience of everyday life. The idea that we invent and reinvent ourselves each moment through the constant phenomena of becoming in the time-space realm is related to the ability to transform oneself and one’s consciousness. If we look at Deleuze’s thoughts through the interconnectedness lens of one’s inner dimension and external empirical experience, becoming can be seen as a critical and simple, yet latent choice. We can only access this choice by building the capacity of self-awareness, as Dayna Cunningham highlights:

“Every moment is a crossroad—or parting of the ways—leading to a choice. The question is, are we aware of the moment of choice happening inside us, as well as the tone and nature of our mindset when making the choice. These are basic principles of self-awareness and consciousness of being present in a moment.” (Dayna Cunningham, Transforming Capitalism lab, 14.6.2018)

When exploring new ways of being and becoming with oneself, others, and the world, it is important to understand the ontological perspective and ever-present choice it offers to rebuild and reinvent oneself. The examples in Paper 4, and somewhat also Paper 3, depict moments, experiments, and prototypes in which these thoughts become more visible and tangible.
2.1.5 Care ethics

Care ethics provide an opportunity to perceive and experience the world through different, more connected “lenses”, by paying attention to various connections and relationships in one’s own environment and life. At various stages in the research process, care ethics was one of the concepts that, almost unnoticed, grew to have an increasingly important and central role. The first ideas for exploring whether care was a transformative theme for individuals and in public sector service development, were teaching experiments parallel with the second Design Adventures experiment (presented in Part 3 of this doctoral thesis). These experiences gave rise to the idea of Lenses of Care (Hakio, et al. 2019), which has since been developed in Paper 4.

Care Ethics guide us to look at the relationship and attitudes we hold toward ourselves and toward others—people, more-than-humans, nature, and the Earth (e.g., Puig de la Bellacasa 2010; 2017). From this premise, care ethics also offer an excellent way to think, envision, and experiment with different kinds of future prototypes (Manzini 2015), as the central theme of care ethics is to critically question the values and approach of the Western, market-driven paradigm. This can be done by becoming aware of and challenging the social structures and mental models we use to interpret our reality, i.e., housing, work life and education. As the opposite to neoliberal economic policy—promoting free markets, free trade and the “imperative of self-mastery” as the best way to enhance the wellbeing of people—care ethics calls for a radical alternative, centered around care and appreciation of the value of life (Tronto 2017; 2013).

The care ethics literature points to diverse perspectives that allow critical reflection through the three lenses; perception of the self, the surrounding context, and the broader, life-sustaining force. Thus, these three lenses can also be used to re-examine and rebuild new ways of experiencing life and one’s way of being and becoming with the world.

Starting from the lived experience and perception of the self, care ethics strongly highlights the fact that a worldview based on individualism and detachment is an illusion. All humans owe their lives to the fact that someone has cared for them (Yeandle et al. 2017). Humans are always dependent on others, and in this dependency, care is both given and received, even if it goes unnoticed (Tronto 2013; Hankivsky 2004; Sevenhuijsen et al. 2003; Mol 2008). However, the care event (such as that perceived in care-giving) is not always a direct action between two parties, but rather a movement that returns to its giver in various forms (Tronto 1993, 2013; Bellacasa 2010). For example, in modern Western societies we easily conceive the world as centered around ourselves, and do not see or perhaps remember how we are all parts of a larger whole. In Western cultures, people often think they are autonomous individuals; however, many Westerners no longer cultivate their own food, sew their own clothes, or bury their own dead (Mol 2008: 4).

The themes of individuality and detachment come to the fore more broadly in discussions of interconnectedness and human-nature relations (e.g., Puig de la Bellacasa 2010, 2017; Zylstra et al. 2014). These are concepts that are
easy to discuss on an abstract level, but eye-opening and revealing experiences when embodied in person through, for example, wilderness experiences (Aaltola 2015), permaculture (Puig de la Bellacasa 2010) or relational mindfulness and ecological-self practices (Tull 2018; Akama 2018; Macy and Brown 2014). Western societies and lifestyles are built in a way that masks interconnectedness and dependency on nonhumans (Zylstra et al. 2014). As an example, we cannot generate the substances needed for our physiological survival without natural systems and the elements of which they are comprised, such as different materials, fresh water, or oxygen (Ibid.). Puig de la Bellacasa (2010) demonstrates how her take on care ethics translates into tangible form through the everyday practices of permaculture. She sees the practices as doings that transform the way we feel, think, and engage (Ibid.: 160), and regards individual practices as closely related to collective ones. In this context, care is seen as an act that creates relationships between humans, non-humans, and the Earth, thus generating relationality (Ibid.:164).

Finally, from the perspective of alignment and connectedness to a life-sustaining source, care can be seen as a phenomenon without which there would be no life. From this perspective, care is present in every action, every breath, every interaction; the planet would not exist without an all-encompassing, ongoing cycle of care. Joan Tronto comprehensively defines this essentiality of care by seeing care as “a species activity that includes everything that we do to maintain, continue, and repair our ‘world’ so that we can live in it as well as possible” (Tronto 1993:103). This interconnected world “includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web” (ibid.). Thereby the premise of care ethics is that humans and more-than-humans are not competitors but co-habitants, who co-exist with the eco-system and are tightly linked to recognition and appreciation of each other. As care is present everywhere where there is life, it is somehow ubiquitous (Yeadle at al. 2017) and unavoidable (Puig de la Bellacasa 2012).

2.2 Practices for shifting internal postures

This section highlights practices and frameworks, particularly from the areas of awareness-based systems change and Eastern philosophies, in which the contemplative practices and traditions of inner shift work, such as today’s expression of mindfulness, has a long tradition of shifting internal postures and ways in which to relate. In this doctoral thesis, awareness-based describes a transformation and development process that pays attention to and builds the capacity to turn inward. In more detail, this means cultivating inner capabilities to connect with oneself and others, and ultimately with the larger whole, which can be perceived as a source condition for all action and inspiration and open will. An awareness-based perspective also means being aware of the paradigmatic structures within which the development work is being done, and thus the abilities to transcend these paradigms through the experience of alignment and connectedness to ecosystems and the larger whole. An important
element is the ability to stay, pause and experience the situated and multilayered lived experience of the present moment, without distractive cognitive activities of escaping to future hopes or dreams, or dwelling in the past (as stated by du Plessis 2015).

2.2.1 Relational Mindfulness

As a way of turning one’s gaze onto oneself, many approaches describing what it means to work on one’s own inner condition and state of being in a transformation and development context seem to have the common denominator of mindfulness-type exercises originating from contemplative practices and Eastern philosophies (see e.g., Akama 2018, 2012; Aaltola and Keto 2017; Senge et al. 2004; Kaza 2003; Rojas et al. 2012).

The type of mindfulness exercises to which we refer do not necessarily require silent meditative contemplation, but involve being consciously present in everyday action (Takanen 2013, 45; Tull 2018; Saarinen and Lehti 2014). These approaches typically include practices of self-awareness and introspection, guiding participants to shift their focus from external events and occurrences in the world to internal events and dialogue, in a non-judgmental way. In other words, mindfulness can be seen as the “capacity to attend to your experience, while paying attention to your attention” (Scharmer 2016: xxvii). Scharmer and Kaufer (2015) define such practices as presencing, which according to them is the “blending of ‘sensing’ and ‘presence’; it describes the act of letting go and connecting with the source of one’s highest future possibility – sensing it – and operating from the presence of this connection in the now” (p. 4). They continue by explaining how presencing refers to mindfulness practices that allow people “to connect to their deeper sources of knowing and to ask the two questions ... Who is my Self? What is my Work?”

Many authors have noted that the practice of releasing and letting go—the releasing and letting go of personal stories and the mental limitations that provide reference points for one’s actions—enables an inner shift to take place (e.g., Tull 2018; Akama 2018; Scharmer 2016; Macy and Brown 2014). It is this intimacy with oneself and others that increases the shared capacities to navigate through challenges and conflicts, which in turn contribute positively to situations (Tull 2018:42). Akama summarizes the experience:

When I am present-in-the-moment, I feel most open, receptive and sensitized to phenomena. Instead of a clenched fist, grasping and holding on to certainty, it relaxes into an open palm of emptiness, ready to receive and be part of the world in its continual becoming. (Akama 2018:228)

Creating a connection to the inner self may sound difficult in a rationally attuned environment. However, if the conditions of the collaborative and participatory setting are perceived as safe and supportive (du Plessis 2015:6), even very simple exercises like guided moments of mindfulness may enable such a shift in internal focus and awareness. Scharmer calls this the “capacity to hold the space for profound transformation” (Scharmer 2018, 2016).
2.2.2 Awareness-based systems change

There are many practices and principles in awareness-based transformation processes and methods from which transformative co-design approaches can draw inspiration when designing practical exercises for simultaneously facilitating individual and collective transformation journeys. These include approaches such as the aforementioned transformation framework of Otto Scharmer (Theory U, 2016) and Terhi Takanen’s co-creative process focusing on relational constructionism and the power of being present (CoCreative Process Inquiry, 2013). In philosophical and practical terms, both these approaches are grounded in awareness-based practices and techniques such as mindfulness exercises that build the capacity to turn inwards and connect to self and source conditions (as explained in e.g., the concept of form follows consciousness), which distinguish them from more conventional development frameworks. Part 3 opens up the concept of mindfulness as used in the context of this doctoral thesis (see also Paper 4). In this section, I take a closer look at Theory U, as it played a central role in the various stages of this study.

Scharmer and colleagues first developed the framework in the context of organizational change and leadership studies (Senge et al. 2004), but its focus has changed to building the capacity for profound systemic and societal transformations. The process of Theory U teaches participants to transform perception, self and will, and action (Jaworski et al., 2004) through five movements (Figure 6). This is done by paying attention with a set methodology to the inner qualities and mindsets that are part of the paradigm from which a system arises (Meadows 1999). A central focus in the transformative processes is the interconnectedness of individuals and the collective, internal and external change highlighted above in the section describing the form follows consciousness concept. In this way, Theory U also highlights how the transformation from one culture and system to another is related to the shifting and co-evolution of systemic consciousness (Scharmer 2018).

The left side of the journey, down toward the bottom of the U, builds a vertical alignment in individuals and groups with themselves, with their set intention and “presence of their highest future possibility” (Scharmer 2016:5), and ultimately with a source of broader awareness and inner knowing that emerges from the larger whole. The shape of the U metaphorically illustrates such a process of connecting and aligning beyond the rational mind, by activating body awareness (called also embodied intelligence, Dutra Goncalves and Hayashi 2021) and inner knowing as a source that produces experiential knowledge through pre-verbal sensing, which is a relevant element of being human (Hayashi 2021).

These acts of mindful grounding (Scharmer 2016:387-389) are key elements that carry the later stages of the process. They root the intention and the highest future possibilities in people, places, and the living planet, which is typically not done in development processes aiming for innovation and change through connecting people and collaborators at the systemic and societal levels. In other words, processes that are “framed in terms of horizontal development”
Introduction: The unanimous call for a shift (Scharmer 2019). As Meadows points out, even people within the system do not recognize what whole-system goal they are serving (1999:16). Thus, practicing “vertical alignment” helps participants take a helicopter view, broaden their perspectives, and align with the ongoing phenomena of the world to which they feel connected.

The right side of the journey follows a similar structure that is typically used in design processes (e.g., service design, human-centered design). The movements are closer to a co-design approach, in which the focus is to learn together through experimentation and experiencing future possibilities through building prototypes (see Halse et al. 2010; Buchenau and Fulton Suri 2000; Manzini 2015). Arturo Escobar sees connections between the concept of ontological design and Scharmer’s work, noting that it can be considered an ontological design framework (Escobar 2018:126). With a touch of criticism toward the contexts in which Theory U was developed, he points out that Theory U “is unusual in that it tackles the inner work designers need to do in order to take seriously the challenges of presencing and nondualism” (ibid.:246).

Figure 6. The five movements of the Theory U framework (this work is licensed by the Presencing Institute).

1. **Co-initiating:**
   Uncover common intent
   Stop and listen to others and to what life calls you to do

2. **Co-sensing:**
   Observe, observe, observe
   Connect with people and places to sense the system from the whole

3. **Co-sensing:**
   Connect to the source of inspiration and will
   Go to the place of silence and allow inner knowing to emerge

4. **Co-creating:**
   Prototype the new
   In living examples to explore the future by doing

5. **Co-evolving:**
   Embody the new in ecosystems
   That facilitate acting from the whole
**2.2.3 Reflective empathy**

Empathy, which is familiar in the co-design field, also requires a closer look in connection with eco-social transformation and when exploring new internal postures on how to relate and become with others. In this doctoral thesis (see Paper 2), I chose to more closely examine philosopher Elisa Aaltola’s research on empathy as an ability to act reflectively, respectfully, and morally toward other humans and more-than-humans (Aaltola and Keto 2017, Aaltola 2018).

Aaltola (2018, 2014), as many before her, argues that empathy is a multidimensional capacity that takes different forms, some of which may be contradictory. An especially interesting aspect in Aaltola’s work is the division between 1) forms of empathy that feed the immediate, ethical, and moral opening into a state of other-directiveness, and 2) forms that strengthen the self-directed mode. In design research, Aaltola’s thinking seems to resonate with the way in which Hess and Fila (2016, see also Smeenk et al. 2016) propose navigating between affective and cognitive empathy, with their understanding of self-orientation and other-orientation and with their interrelationships.

Briefly summarizing Aaltola’s work, affective empathy and embodied empathy both foster the capacity for other-directiveness, which is considered a good candidate for moral agency (Aaltola 2014, Aaltola and Keto 2017). The common denominator of these two forms is that, as if the other individual steps inside our own mind, we start resonating and sharing experiences with them for a brief moment through our imagination and through our bodies. Aaltola writes: “affective empathy opens us to the influence of others by causing us to resonate with their emotive states” and, “facilitates embodied immediacy, within which our bodies become open and attuned toward each other and communicate experiences from one individual to another” (Aaltola 2014:247). In this experience, we forget our own self-centered aspirations and become attuned, present for the other (Aaltola and Keto 2017:67). In other words, a movement carries the other toward us.

In projective empathy and cognitive empathy, on the other hand, the movement carries us toward the other. Projective empathy takes our own mind toward the other, setting—projecting—our mind and self on the other’s shoes, and thus imagining how we ourselves would feel in these shoes with our subjective experiences, cultural background, and personal history. As Aaltola puts it: “Although [projective empathy] can be used to inspire concern toward others, ...in simulation, we use our own mental contents to figure out those of another individual” (2014:246). Similarly, cognitive empathy can be somewhat distant, pure, mental observation without the element of embodiment: “we do not feel what they feel, but rather acknowledge what they feel” (ibid.:245). This kind of self-directed imagination can be problematic, as it risks losing touch with the other individual (ibid.:247).

The limitations of empathy and empathic design have been featured in recent years. For example, in the superficial framing of empathic design as commercial and harnessed to the use of market forces (Tellez and Gonzales Tabon 2019 after Michlewski 2008), or in focusing on naïve judgements and individualistic
decisions (Bloom 2016). Some observations have also recognized empathy and its limitations. Lee (2013), for example, studied young students who had very limited presuppositions about the everyday life of older people, and had imagined it very stereotypically. To extend her observations, similar challenges can occur in other radically different life situations, such as substance abuse problems or serious illnesses.

In the design research community, Heylighen and Dong (2019) have recently explored the limitations of empathy, especially its features that feed distinction and dualistic views. Empathy can be discriminating, as we inherently (and subliminally) only experience empathy toward those who are like us (Edmonds 2017:209). Such discriminating factors as to why the criteria of empathy might not be met could be geographical proximity, ethnic background, country of residence, or lack of emotional connection such as family membership (Aaltola and Keto 2017:117), not to mention otherness in the form of non-human species such as fish, trees or nature in general (Aaltola 2018). Thus, in this sense, empathy does not bring people together, as may be misleadingly expressed in everyday language. Instead, it fosters distances between individuals “as it does not promote inclusion” (Heylighen and Dong 2019 citing Cipolla and Bartholo 2014:97). By also citing Bloom (2016:68), Heylighen and Dong confirm the notion of empathy always being modified by our inner conditions and dimensions—our beliefs, expectations, motivations, and judgements (2019:115).

In line with the above-mentioned limitations of projective empathy, these critical notions question whether we are actually able to stand in others’ shoes, as the often used expression in the empathic design discourse goes. Thus, in line with Lee (2012:96) one should rather first identify the boots in which one is standing oneself and think through one’s own abilities to settle into another’s position, before aiming to experiencing others’ shoes. This leads us to think about how to educate our awareness of such boots through reflective empathy.

Some researchers argue that empathy carries an element of shift if it is understood as a skill. Persson and Savulescu (2018) respond to Bloom’s (2016) case against the shortcomings and weaknesses of empathy by noting that it is better to reform empathy than remove it by shifting our perceptions of it through our reason. They argue that we can modify its direction and develop a more reflective form of it to overcome the shortcomings of our spontaneous feelings of empathy (Persson and Savulescu 2018:5). Empathy can be viewed from the perspective of transformative learning (Mezirow 1997), which helps people identify their own frame of reference, such as collective ideas taken from culture. By identifying and questioning these frames, we can develop the ability to ask new questions, imagine new solutions, and work collaboratively with others (Gamman and Thorpe 2015).

Aaltola sees the idea of reflective empathy (Aaltola 2018, Aaltola and Keto 2017) as consisting of rapid, dynamic and repetitive movements between 1) the immediate level of empathy, at which we recognize and share the emotional states of others, and 2) the reflective meta-level of empathy, at which we are able to detect how our assumptions and feelings affect our abilities to empathize and how they direct and shape the experience of empathy (Aaltola and Keto 2017:96;
see also Smeenk et al. 2016). Thus, reflective empathy can be understood as a transformative practice, as it involves movement toward oneself but can also redirect our own tacit beliefs and mental concepts, and ultimately trigger us to alter pre-established desires, belief systems, stereotypes, and misleading emotions (Aaltola 2018:135)

Practicing such a reflective form of empathy requires adopting the role of an external observer (cf. the act of transcending paradigms by Meadows 1999 or the act of alienating by Tonkinwise 2017). In other words, developing the capability to align with one’s own reflective mental movements by adopting a meta-level perspective from which it is possible to critically observe and identify one’s own frames of reference and the inbuilt cultural and social mechanisms that inhibit empathy (Aaltola 2018; Aaltola and Keto 2017; Gamman and Thorpe 2015). According to Aaltola, learning from empathy in such a profound way that it challenges and transforms individual and cultural worldviews is key if we want to develop our abilities to understand others, and ultimately, to change through empathy (Aaltola and Keto 2017:99). Therefore, the immediate experience of empathy based on cultural and emotional biases and learned mental models, can be repealed, and altered through reflective and self-aware observations, thus making empathy a conscious choice and deliberate practice that can be cultivated.

2.3 Self-reflection and self-awareness in design research

Topics such as the inner dimension, self-reflection or self-awareness are not unknown in design research. Below I present a few examples of how they have been addressed in the context of design research and education, in different design approaches, and in the personal explorations of design researchers on their own path to becoming an “interconnected practitioner”.

Before entering into these conversations about self-awareness and becoming, I briefly review Donald Schön’s well-known concept of the reflective practitioner and its connections to the themes of this doctoral thesis.

2.3.1 Schön’s legacy of the reflective practitioner

Donald Schön’s seminal theory of reflective practice (1983) has influenced the design field in many ways and has been widely used as a theoretical frame of reference to describe design professionals’ situated practice. One of its key concepts is reflection-in-action (Schön 1983:54), which means the ability to think about what one is doing while doing it. This is different from reflection-on-action (Schön 1983), which refers to reflecting in retrospect on what has been done, thereby offering insights into how the next steps and future practices can be improved (Akama 2012, see also reflection-action cycles in design research e.g., in Sleesvijk Visser 2009).
According to Schön, the reflective practice can be performed with or without words, but what is central is that reflection-in-action is about a certain type of knowing that is not expressive or available to the practitioner in consciousness. Instead, it can be achieved by observing oneself. (Schön 1989) He further explains how reflection-in-action is based on an internal learning process of practical and experimental problem-solving, which does not take technical rationality into account (Schön 1983). As an example of such an approach, Schön refers to a jazz-band, the members of which connect with each other through improvisation. Immersed in their joint experience, they have the ability to listen and make sense of what they are doing, and experiment with it in the very midst of the action (Schön 1983:55-56). In other words, they have a conversation with the situation, using their music as their reflective material.

A reflective conversation with the situation effectively sums up what happens in the design process. The designer “shapes the situation, in accordance with his initial appreciation of it, the situation ‘talks back’, and he responds to the situation’s back-talk” (Schön 1983:79). Koskinen et al. point out how in the 1990s, inspired by the idea of reflective practitioner, a few design researchers began to talk about designers as sense-making beings instead of seeing them as only problem-solvers (Koskinen et al. 2011:17 referring to the works of Kees Dorst and Henrik Gedenryd). Today’s interpretations of sense-making and reflection-in-action also emphasize reflective practices in groups, which shifts the reflective conversation between the designer and their materials into a broader context. For example, having a reflective conversation with the design situation can be seen as an essential co-design practice (Agger Eriksen 2012:117), in which it might be a dialogue within a group using the materials at hand as reflective mediums (ibid.; Halse et al. 2010; Gardien et al. 2014; Hummels and Frens 2011).

This brings us to how Schön’s thinking has arguably had a significant impact on the field of design research in both practice and theory building. His influence is illustrated by how his theory of reflective practice is still recognized as a significant reference in different branches of design research. From the perspective of the interests and literature of this doctoral thesis, we can take the following examples from Schön’s legacy:

- **Influence on Theorizing**—approaches such as Constructive Design Research (Koskinen et al. 2011), Research Through Design (Stappers and Giaccardi 2017), Experimental Design Research and Programmatic views (Brandt and Binder 2007; Bang and Agger Eriksen 2014) have all been influenced by Schön’s theorization of the design process. In addition, Schön’s legacy is also noted in pluralistic and ontological design views (Willis 2006; Escobar 2018), which emphasize the knowledge that emerges and accumulates from situated experience.

- **Influence on Participatory Design (PD)**—visible in the user-technology domain (Simonsen and Robertson 2013) but especially in the pragmatic learning-by-doing perspective adopted by PD practitioners
Introduction: The unanimous call for a shift (Bannon and Ehn 2013). Schön’s influence appears in genuinely reflective and conversational design engagements, which have room for humans and non-humans (design materials and socio-material things) to participate equally in the dialogues (Binder et al. 2015). However according to Binder, Schön himself did not entirely endorse PD due to its issues related to power and management (Binder 1996) and its difficulty acknowledging how designers must be understood as themselves, situated in a reflective cycle with the materials and the context at hand (Binder 2002).

• **Influence on Co-design**—the themes of asking what if questions and thinking what could be for changing the frame of the situation and thereby constructing alternative ways of setting the design problem and nurturing open-endedness (Halse et al. 2010:143; Agger Eriksen 2012; Mattelmäki, Brandt and Vaajakallio 2011; Grocott 2016; Ehn et al. 2014). Naturally these also apply to PD.

• **Influence on Method building**—especially the reflective process and the element of sensitizing toward people and contexts in, for example, Design Probes (Mattelmäki 2006), Contextmapping (Sleesvijk Visser 2009), Design Games (Vaajakallio 2012), and Empathic Formation Compass (Smeenk 2019)

• **Influence on building Self-Reflective Capacity**—becoming aware of and acknowledging inner reflective conversations and experiences. Not only emphasizing professional design capabilities, but also highlighting the reflective practice as something one experiences and feels through the body (Akama 2012). In other words, learning about oneself and others by looking inward (Akama 2012; see also Lee 2012; Smeenk 2019; Vink et al. 2017). There are also some connections to learning through mutual reflective practice, such as the double-sided mirror perspective of Garduño García (2017) and the design researchers’ introspection on their subjective experiences during the design processes (Xue and Desmett 2019:45).

The main take-away from this short introduction is that, at its core, design is a reflective practice. Although Schön focused on looking at and articulating the professional design process that takes place in a design studio and the related reflective, generative interaction with the design situation and materials, his work bears similarities to the kind of self-reflectivity that is needed for transformative change, especially transformative change through collaborative actions and mutual learning. The jazz band example above describes how the band members are perfectly present for themselves and each other and are thus able to improvise and experiment by listening and making sense of what they are doing. To learn from activities like this, one must open up to the situation and to others. At the end of his lecture in Iowa State University in 1984, Schön...
responded to the audience’s question about conflict situations in the design studio by emphasizing the importance of becoming vulnerable and open instead of being defensive, which he sees as the great obstacle to mutual learning (Schön 1989). He continued that openness and vulnerability need to be mutual not only between people but also toward the situation, as often the situation requires doing something before one even knows how to do it (ibid.). These are key issues in the processes of mutual learning; people have the opportunity to go through their own transformation process by also learning about themselves through their interaction with others, and thus how to become with others in a broader sense.

Next, I explain the themes of openness, vulnerability, reflection, and becoming in the light of transformative change from the perspective of self-awareness. Papers 2 and 1 also discuss these themes.

2.3.2 The practice of turning one’s thoughts back to oneself

In this doctoral thesis, self-awareness and self-reflection are seen as abilities to turn inward. Others have used different terms such as reflexivity to refer to similar internal discussions, in which an embodied actor in a social context bends her thoughts back to herself (Vink et al. 2017; Steen 2008).

In the context of service innovation, Vink and colleagues (2017) have studied how guided acts of turning one’s thoughts back to oneself, and to the specific design practices at hand, can evoke a broader awareness of constructed and adopted collective, contextual and personal mental models (referring to Senge 1990 and Meadows 2008). They call their design practices aesthetic disruptions, in which it is specifically the embodied component, including materialization, visualization and enactment activities that allow participants to have bodily and tactile experiences (Vink et al. 2017). These experiences may then stimulate their capacity to reflect. According to Vink and colleagues (2017), aesthetic disruptions have the potential to engender paradigmatic change by revealing and questioning key assumptions, mental models, and worldviews (after Sangiorgi 2011, see also Sengers et al. 2005). However, they point out that although aesthetic disruptions are potential ways in which to capture participants’ inner dimensions and their roles in development processes, more precise means are needed in collaborative design processes to support participants’ self-awareness in perceiving mental models and their potential fallibility (Vink et al. (2017: S2174).

2.3.3 Self-awareness in design education

Many authors have studied how designers can develop their own self-awareness and self-reflection abilities to study their own actions (Smeenk 2019; Tomico et al. 2012; Hess and Fila 2016; Xue and Desmet 2019, Akama 2012, 2018). Irwin points out how designers’ mindsets (worldview) and postures (approach/attitude) often go unnoticed and unacknowledged even though they “profoundly influence what is identified as a problem and how it is framed and solved.
Introduction: The unanimous call for a shift within a given context” (Irwin 2015:235). She continues by noting how design methodologies and processes rarely take these important factors into account (ibid.)

In line with Irwin’s observations, in the design education field there is a growing interest in educating the next generation of designers to be able to gain a deeper understanding of human experiences, understand and navigate unfamiliar cultural contexts, face and tackle sensitive social issues, and work effectively with multidisciplinary groups (Grocott and McEntee 2019:141; also du Plessis 2015; Irwin 2015). Irwin calls these qualities Transition design abilities, which are needed for collaborating through transitional times (Irwin 2015:232).

In this context, self-awareness is seen as the ability to understand oneself in order to better understand others (Grocott et al. 2019; Grocott and McEntee 2019; du Plessis 2015; Akama 2012, 2018) which is more related to the theme of evolving the self. Teaching design students inner shift practices helps them “gain awareness of their inner world, shift perspective, build new habits and establish practices that will continue to support a life-giving and whole human” (du Plessis 2015:7). This is a new nuance in design education and has traditionally been more a part of students’ professional growth and development than of growing as a human or learning to turn inwards. Self-awareness can also be linked to features of creative design activities (Grocott and McEntee 2019; Grocott et al. 2019; du Plessis 2015; Akama 2015): more specifically, not only how the designer creates but also how the designer acts and becomes in the world (Grocott et al. 2019: 107). This includes both understanding social interactions in the design situation and becoming aware of personal inner dialogue and experiences.

As a practical example, Grocott and colleagues created an experimental course called the Transforming Mindsets Studio (Grocott and McEntee 2019), which focused on teaching design students self-awareness and intrapersonal skills to explore “how their own habits and mindsets influence their capacity to thrive in community-based work” (ibid.:141). During the course, the students studied self-awareness through a series of case clinics and serious play workshops, where they engaged in various individual and group exercises such as writing and non-analytical, judgement-free embodied activities (ibid.). According to Grocott at al. (2019) the Transforming Mindsets Studio model gives students the space and tools to surface and become aware of their restrictive beliefs, to explore and tune behavior patterns, and to propose preferred (personal) futures. For example, the students were asked to observe how their own mindsets affected their activities, creativity, and behavior with others. They were also asked to reflect on these experiences and return to them through learning diaries and follow-up interviews (ibid.). However, although encouraging results were observed during the course in regard to, for example, building self-confidence and improved communication skills, Grocott and McEntee describe how the students seemed to find it difficult to transfer and apply the learned self-awareness skills to other contexts outside the safe and supportive studio environment; for example, to other courses, project work, and social situations. The issue of transferability
Introduction: The unanimous call for a shift is in line with the broader debate on how to create lasting change through experiential interventions (e.g., Bragg 1996).

Hannah du Plessis’s experimental approach is similar to that of the Transforming Mindsets Studio. She emphasizes teaching design students the capacity to face the difficult and unpleasant side of change processes (du Plessis 2015). According to her, the ability to deal with the unpleasant feelings, emotions, pain, and trauma that surface from personal and collective histories is a crucial part of the process, and aims to engender transformative change (ibid.). The students engage in various exercises in which they work with the mind, body, feelings, and intuition, which in du Plessis’s terms helps them access the wisdom of their whole self, and to move toward a more integrated state of being: “a more life-affirming self” (ibid.: 9).

Even though du Plessis does not directly use the words self-awareness of self-reflection, her teaching approach describes similar activities to those in which one turns one’s gaze toward oneself to gain insights into and to prototype new ways of engaging with the world (ibid.:7).

2.3.4 Self-awareness and becoming an “interconnected practitioner”

According to Xue and Desmet (2019: 42) who have studied research introspection, the early roots of taking a first-person perspective, i.e., being self-aware, stem from Eastern philosophies and the teachings of Confucianism, Taoism, and Buddhism, which all involve introspective self-observation. The first-person perspective can be defined as an epistemic stance that allows experiential and subjective phenomena to be explored by the observer looking inward, while at the same time looking outward into the world, backward into the past, and forward into the future (ibid.: 41; see also Smeenk 2019 for first-person perspective). By quoting Gould’s (1995) interpretation of introspection, Xue and Desmet summarize the essence of self-awareness in action as an “ongoing process of tracking, experiencing, and reflecting on one’s own thoughts, mental images, feelings, sensations, and behaviours” (ibid.: 37).

In line with these observations, Yoko Akama emphasizes the embodied aspect of knowing that arises from action. According to her, reflection is itself something that is felt through an immersive experience, not just a cognitive activity of reflecting on the experience (Akama 2012). In the context of transformative change, Akama defines transforming oneself as an experience and process that takes place through reflective practice, which in turn enables self-awareness through a situated, affective, and engaging reflection experience. She emphasizes how the inner recognition and perception in learning and understanding oneself and the world are as important as external senses and intellect. (ibid.)

Her approach to self-reflection and self-awareness as a means to build the capacity to become with the world is presented here as one potential example, in which “embodied reorientation to design through the practice of reflection could have transformative agency” (Akama 2012:7). In her considerations of what it
Introduction: The unanimous call for a shift means for a designer to be part of the continual becoming of the world (Akama 2018), Akama understands humans as relational beings, which, according to her, is the central framework for her notions of self and being human (2012, see relational mindfulness above). In contrast to the ideas of anthropocentric position and emphasis on the individual (Akama 2012; 2015; 2018), she draws her thinking from her own Japanese cultural heritage and Eastern philosophies, Zen Buddhism and Shinto, from which she combines ideas into concepts corresponding to those of Western philosophers and thinkers focusing on the relational and intertwined nature of life (such as Goethe’s phenomenology, Merleau-Ponty’s views on embodiment and perception, or Latour’s Actor–Network Theory).

Akama’s way of working as a design researcher and PD practitioner is rooted in her own mindfulness practices (2018) and the recognition of how being human is to constantly shift and transform (2012). At the same time, it is also a recognition of how personal shifts and changes relate to transforming and co-evolving with the world—including other humans, animals, objects, and the environment. She sees how such a continuous process of transformation is more than cognitive learning or professional development. It is a process of self-awareness, which arises from constant reflection and being aware of how we act, react, behave, and above all, how we are and become with others. (Akama 2012:1; 2018) Hence, intentions to change the world also require our own reorientation and transformation, simultaneously (Akama 2018: 221). While this may sound quite poetic, it is actually a very mundane way of being present in everyday routines and encounters. Thus, for Akama, mindfulness is not only a meditation exercise, but an ordinary practice of self-awareness and presence in everything from academic work and workshop facilitation to housekeeping tasks. It is “something that one acquires and experiences by doing” (Akama 2012:7).

In this context, it is beneficial to elaborate on the mindfulness experience in more detail. It refers to a state of being in which there is “no thinking”. This releases the practitioner to be able to experience the phenomenon just as it is (Akama 2018: 223). According to Akama, this involves inner shifts within the practitioner, who is “immersed within an unending experience of flux and impermanence” (ibid). Such an internal experience changes what is being experienced and thereby enables a transformative process to occur (ibid.). Quoting Kasulis, Akama highlights the importance of building trust and intimate relationships by opening oneself up to “let the other inside” (Akama 2018: 220). Through the conscious act of making such connections, one can become aware of internal relations that already exist (ibid.), thus revealing the self-imposed boundaries of separation (Jaworski 2011; Jaworski et al. 2004). These observations of being open and receptive are linked to the earlier mentioned discussions on empathy and preconditions for mutual learning.
2.4 Summary of the key points of Part 2

The purpose of this section has been to promote an understanding of what the idea of the inner dimension of sustainability entails in terms of transformation toward eco-social sustainability, and what kind of action and practices are needed to reach, capture, and cultivate the inner conditions in transformative co-design. Therefore, I reviewed a wide range of theoretical and conceptual ideas, frameworks, and practices used in both the design research field and elsewhere, which I see as making connections to the research aims and questions of this doctoral thesis. To summarize:

- Discussions on the inner dimension of sustainability bring out the invisible and hard-to-reach, but also the generative dimension of transformation, presented here as a continuation of the themes presented in the introduction, such as that of deep leverage points. It sheds light on the well-known gap between values and actions, and takes into account the challenging and the difficult, as well as the shadow side of transformation processes.

- From a systemic point of view, when aiming for radical and paradigmatic change, co-design processes require the ability to pause together and observe how, for example, our social realities are constantly being constructed through common agreements and operating models. Something that we (imperceptibly) consider to be an established, self-evident way of organizing culture, organizational practices, or community activities may require re-examination in the face of great pressure to transform. What transformative co-design processes could adopt from this is the acknowledgement that all social structures are created by people and can therefore also be changed by people. Becoming aware of the nature of social constructions and how paradigms come alive through the generative inner dimensions of individuals and collectives, is also the way in which they can be transcended and transformed, as individuals and as collectives. This does not mean creating revolutions; it is an exercise on observing reality and human-made social structures from a more mobile, fluid, and malleable perspective.

- The form follows consciousness concept enables us to understand but also monitor how, by guiding participants involved in the transformative co-design process to shift the tone and quality of their inner conditions, the co-created outcomes and the tone and quality of these outcomes also shift. In the context of eco-social transformation, this could mean, for example, how new solutions spring from different worldviews and ontologies, how they convey the culture of care, how people relate to more-than-human worlds and different ways of knowing, and what kind of relationships the solutions represent and promote in their local environments.
• Care ethics and the ontology of becoming reminds us that in every encounter and interaction lies the opportunity to choose the lenses of perception one uses to experience life, and the tone and quality of one’s own internal posture. This includes becoming self-aware and asking questions such as: what do I carry with me when I come into a situation, and how does that affect the co-evolving and interactions of the situation? How am I in relation to others—people, more-than-humans, and nature—and do I perceive others through the experience of separation or through the experience of connection?

• Internal shift work requires such exercises of becoming aware and making visible, so that the generative nature of the inner dimension and conditions, and thus the source conditions for making change, can be transformed. Here, transformation frameworks like Theory U, but also contemplative and guided practices like (relational) mindfulness and reflective empathy, are important. They play a role in preparing favorable conditions for the awareness-based co-creation process, first by guiding the participants to become aware of their personal as well as collective inner conditions, and then by helping them become sensitized, open up and connect to broader perspectives, views and experiences. Only after these intentional practices of turning inwards and alignment are future possibilities explored, imagined and experimented with from a shifted place of deeper sources of knowing. In other words, the internal shift work process runs parallel to the co-creative transformation process, which distinguishes awareness-based system change approaches from development frameworks that focus on creating new innovations, solutions, and systemic change without paying attention to the inner dimension of transformation.

• Similarities to these issues can also be found in the field of design. Creative, empathic, and reflective (co)design practices are easily suited to facilitating internal shift work together with the creative development process. It seems to be more a question of whether design practices and techniques are applied in a targeted and strategic manner to support the process of turning inwards and self-awareness with transformative intentions. Reflective practice has multidimensional traditions in the development of the co-design repertoire. Creative practices are being increasingly applied as a means of making visible and of critically examining personal and joint activities, structures, and mental models, such as the concept of Aesthetic disruption.

• In the design education context, self-awareness is seen as the ability to understand oneself in order to better understand others, which is related more to the theme of evolving the self than developing professional skills. From the perspective of capacity-building, interesting experiments have
been carried out in which, inspired by the principles of transformative learning, students have been guided to explore their own inner dimensions and conditions and how they are and become with others and the world.

In conclusion, it seems that with appropriate and competent facilitation, all these findings are relevant, meaningful, and applicable exercises for internal shift work in transformative co-design.
3. PART: Applications

Part 3 first reviews the research design and the methodological research approach of the doctoral thesis. I first describe the underlying research paradigm. Then, I move on to introduce the constructive design research approach and give an outline of the basic features of the concept of drifting and the dialectic epistemic tradition.

This part is called "Applications" as it complements the literature reviews and discussions in parts 1 and 2 by introducing a practical design experiment. It is largely based on my understanding of constructive design research according to Krogh and Koskinen (2020), and on how I have applied their views in my work.

3.1 Research Design

In this section, I first describe the underlying research paradigm and worldview to better help the reader understand the methodological choices I have made along my way.

3.1.1 Underlying research paradigm

As Juha Varto (1992) points out, scientific research is one way through which people make sense and try to understand the world. The results of research can thus be seen as an understanding of our living world, in which each research result is quickly intertwined with the general world of meanings and the way in which people understand their experiences (ibid.). According to Varto, research work does not form any detached or separate island in the human–world relationship. Instead, he maintains, what we choose to study and how we understand the results of our research are always directly related to our own lives. (Varto 1992: 18) On a similar note, he points out that conducting research and making the involved choices are part of a person’s relationship with the world as much as any other everyday experiences and chores (ibid).

In this context, it is meaningful to identify the underlying and sometimes hidden philosophical ideas that influence the practice of research, namely worldviews and paradigms as a “basic set of beliefs that guide the action” (Creswell 2007:19), which are also interconnected to research methodology and method choices (ibid.). For this reason, the following section presents a
metaphorical map of my research perspectives to facilitate the communication of the factors that influence my thinking and the choices I made for this doctoral thesis. This map can thus be seen as an interpretation and a guide to my worldview as a researcher. The codependence of these philosophical positionings can be mapped and illustrated in multiple ways in a doctoral thesis, and depending on the source, these terms often also overlap. As I am a supporter of visual communication, I adopted James’s iceberg metaphor (2015) in Figure 7 to highlight the visible and underlying invisible aspects of study design.

Starting from the bottom of Figure 7, the different layers of the iceberg can be read as follows: According to constructivism, human knowledge of reality is constructed, not discovered. In other words, subjects construct their own meaning in different ways, even in relation to the same phenomenon, hence multiple accounts of the world can exist. (Grey 2018: 22) This also correlates with the relativist view on ontology which stresses that there are multiple realities and multiple ways of accessing them (Grey 2018: 21). An example of such an ontological perspective can be found in, for example, Escobar’s definition of a “pluriverse, a world where many worlds fit” (Escobar 2018: xvi). What it means to be human from the perspective of ontological becoming, is to be open, receptive, and engaged in a constant process of redefining and reinventing oneself and one’s practices in relation to a changing and emergent world. It is a relational movement, in which humans construct their world and the world constructs them back (after Anne-Marie Willis’s idea of ontological design (2006) in Escobar 2018: 4; see also Part 2. for the ontology of becoming).

![Diagram of the iceberg metaphor](image)

**Figure 7.** Iceberg metaphor to illustrate the visible and underlying invisible aspects of the research design for this doctoral thesis.
An epistemology based on the stance that social reality differs from natural reality and scientific laws thus requires different methods and theoretical approaches to those of positivist theoretical perspectives (Gray 2018; Varto 1992). A phenomenologically oriented research paradigm regards the researcher and the subject of the research as belonging to the same human world, and that in this world, everything is constructed on the meanings that people have given or give to events and phenomena, at any given time (Varto 1992:13). Thus, any attempt to understand the social reality of this human world must be based on people’s experiences of that social reality (Gray 2018: 25). In this context, the intent of constructivist and phenomenologically oriented researchers is to make sense of the meanings that others have of the world, while acknowledging how their own backgrounds and histories shape their interpretation (Creswell 2014).

The basic beliefs and characteristics of a phenomenological research paradigm are that:

- the world is socially constructed.
- the observer is party to what is being observed.
- the research focuses on meanings.
- the researcher tries to understand what is happening.
- multiple methods are used to establish different views of a phenomenon
- qualitative methods and small samples are used to research a phenomenon over time.

(Gray 2018:26)

The following sections bring to the fore how these above-mentioned definitions and underlying aspects of the research paradigm became visible during the research process via the chosen research methodology and its practical application.

### 3.2 Methodology: Constructive design research

The methodological approach of this doctoral thesis is based on constructive design research. In the following I first draw an outline of its basics according to my take on it, and then I define how the research experiments were conducted in line with the approach. Other established definitions of designerly ways of conducting research, such as research through design (Stappers and Giaccardi 2017) and design research through practice (Koskinen et al. 2011), may cause confusion regarding the positioning of the methodological part of a doctoral thesis in the field of design research (which was certainly the case in my doctoral thesis process). For example, Krogh and Koskinen claim to define the term constructive design research similarly to the way in which, for example, Brandt and Binder (2007) and Redström (2017) define the research through design approach (Krogh and Koskinen 2020: 60). However, in this doctoral thesis I chose to use the term constructive design research due to its recent contributions to methodology literature, which describe the dialectic epistemic
tradition (Krogh and Koskinen 2020) and the research process on the basis of drifting by intention (Krogh et al. 2015; Krogh and Koskinen 2020). These are explained below. Hence, this section is largely based on my own understanding of constructive design research methodology according to Krogh and Koskinen (2020) and on how I have applied their views in my perception of the structure and my way of doing my own work.

Constructive design research is a research approach that focuses on exploring design when it transitions from the construction of, for example, products, services, and interactive systems to constructing knowledge (Krogh and Koskinen 2020: v). In the well-known grounding work on constructive design research, Koskinen and colleagues define it as design research in which the construction of the aforesaid design contexts takes center stage and becomes the key means of constructing knowledge (Koskinen et al. 2011: 5). This task approaches research practices and epistemological questions through different pathways, which Krogh and Koskinen (2020) have recently categorized into four epistemic traditions: the experiential, methodic, programmatic, and dialectic traditions of constructive design research. Each of these traditions discuss, in their own way, the process of producing knowledge through acts of designing, and the related issues of achieving certainty and reliability in research, as well as the means of evaluation. It is important to note that here, as a research outcome, knowledge refers to an “understanding about the world which can be shared” and does not directly refer to the design researcher’s own private learning, which is often intuitive, left tacit, and not shared with others (Stappers and Giaccardi 2017: 40). Indeed, one challenge that constructive design researchers face is incorporating such an inherent, intuitive and reflective process into knowledge production (among other means of generating knowledge through acts of designing), and to make it visible and understandable to others. In this sense, according to Krogh and Koskinen, a key contribution of the constructive design research “handbook literature” (such as Koskinen et al. 2011; Krogh and Koskinen 2020; Stappers and Giaccardi 2017) is to guide designers and design researchers to document and communicate their research approach and processes so that they are better able to “participate in the language games of science by using vocabulary and terminology that is familiar to surrounding research cultures” (Krogh and Koskinen 2020: 82).

As the research approach is rooted in design of which the researchers are usually the designers, much of its literature and example cases deal with making and experimenting through physical objects. It is a discipline grounded in artefacts and the building of something (Krogh and Koskinen 2020: 109). It tackles design problems with design-specific means to produce design outcomes (Koskinen and Krogh 2015: 122), and instead of working with abstract concepts, it actually puts something to use (Koskinen et al. 2011: 7). These definitions echo the frequently presented example cases of selected doctoral thesis projects, which concretize these ideas, such as Joep Frens’s rich interaction camera (2006), Kristina Niedderer’s performative objects (2004), Stephan Wensveen’s alarm device (2005), Bill Gaver’s drift table (in Zimmerman et al. 2010) and Ianus Keller’s inspiration Cabinet (2005), which are explained in more detail in
the “Lab and Showroom” categories of constructive design research by Koskinen et al. (2011, see also Stappers and Giaccardi 2017; Brandt and Binder 2007).

However, other examples presented in the literature, such as Tuuli Mattelmäki’s design probes (2006) and Froukje Sleeswijk Visser’s framework for making user experiences useful for designers (2009), deviate from the path of designing objects and artefacts to treat materiality and make them into a starting point for conversations and joint activities between designers and non-designers (i.e. people not trained in design).

In line with the perspectives presented in mutual learning in Part 1, these can be considered examples of how design projects become processes of mutual learning in which expert designers draw inspiration and learn from the people for whom they design, and the people in turn learn from them through shared interactions (Krogh and Koskinen 2020: 27; Mattelmäki 2006). Koskinen et al. (2011) call this the Field category of constructive design research. It is characterized by field research in the real world and involves stakeholders beyond researchers and designers, as Sleeswijk Visser aptly sums up (Sleeswijk Visser 2018: 371).

### 3.2.1 Dialectic epistemic tradition

The views on mutual learning and opening the design process up to stakeholder participation, which were discussed in Part 1, also apply to the dialectic epistemic tradition of constructive design research. The methodological part of this doctoral thesis identifies with this tradition. Quoting philosophical practices from Ancient Greece, Redström (2011) conveniently opens the term dialectic in a more precise way that fits this context.

> “In the dialectic, participants start with different views, but unlike debate, in which the participants typically remain with their original opinions trying to win each other over, what then happens is a matter of reaching a deeper understanding by using the opposing views to discover short-comings and flaws in the original argument.” (Redström 2011: 2)

These words correlate well not only with the essence of the dialectic epistemic tradition, but also with the whole core of constructive design research. In addition to creating dialectical space between the world that is and the world that could be (Margolin 2007), design research is also about challenging initial assumptions, convictions, and theories in the pursuit of identifying the actual underlying issues, concerns and questions (Krogh and Koskinen 2020:5). The dialectic epistemic tradition has its own ways of conducting research in comparison to the other three epistemic traditions in constructive design research. This way is explained below through the concept of drifting.
3.2.2 The concept of drifting in constructive design research

To view the various epistemic traditions through design research processes, Krogh and Koskinen have created a structure inspired by thoughts from new experimentalism in the philosophy of science (Mayo 1996). In this structure, constructive design research consists of an iterative process with three main activities; **1) Hypothesis construction, 2) Experiments, and 3) Evaluation** (Krogh and Koskinen 2020: 9). What distinguishes constructive design research from other research fields is how the means and ways of thinking, working, and sense-making characteristic to design researchers are manifested in these three different steps. Krogh and Koskinen call this characteristic way of conducting research drifting by intention (2020; see also Krogh et al. 2015).

Although design experiments are at the heart of research through design, it is still often unclear how these experiments are carried out to test a hypothesis and create and share knowledge (Krogh et al. 2015, see also Brandt and Binder 2007; Bang and Agger Eriksen 2014; Mattelmäki and Matthews 2009). Sleeswijk Visser emphasizes the importance of communicating, documenting, and structuring “designerly ways of doing” so that all choices and decisions made during the design process are understandable and visible to the people involved (Sleeswijk Visser 2018), including non-designers who bring their own expertise from other domains to the process, or are otherwise involved as stakeholders and experts of their own lived experiences. Another challenge might be how stakeholders from different backgrounds and (research) fields might have more formal expectations of how research should be carried out (ibid.: 371) or what counts as, for example, research data in different research traditions (Lucy Kimbell in the Aalto winter school lecture 2020), referring to material co-explorations and sense-making practices in, for example, co-design workshops.

In the constructive design research approach, the concept of drifting is an attempt to clarify these issues by presenting a set of typologies that describe different design practices and navigation methods to carry out design experiments. Krogh and Koskinen argue that “drifting is typical to design, and cannot be avoided in it” (2020:1). They base their argument on their professional backgrounds and their long history of work in the design research community. By examining more than 60 doctoral theses in the field of design research, they investigated how observations of drifting were repeated in these different works and in the experiments, research interest and usage of theory. To conclude, drifting can be defined as actions that:

- every design researcher carries out in every research project.
- take design away from its original brief and lead to a result that was not initially anticipated.
- are a conscious process that happens intentionally and depends on a certain epistemology.
- are crucial for understanding design and constructive design research.

(Krogh and Koskinen 2020:v)
The concept of drifting thus attempts to describe the way in which researchers with a design background work in research processes, and to give this value and recognition as a relevant and typical design (research) skill and capability.

However, in multidisciplinary environments and when interacting with non-designers such as researchers or publishing channels in other fields, one may have difficulties with the concept. This is something I have also personally witnessed and experienced when trying to get research papers published. Krogh and Koskinen note how the classical scientific methodology encourages researchers to create interesting, new hypotheses, but to use well-established methods in the pursuit of such knowledge (Krogh and Koskinen 2020: 60). Drifting, even by intention, does not meet these requirements, because it introduces method variance that makes the results of a study unreliable (ibid.). Krogh, Markussen and Bang (2015) address the same concern by noting that the science literature sees drifting as “bearing the touch of randomness, the uncontrolled, illogical and inconsistent”, and that in other research fields, drifting could be “regarded as watering down the research contribution” (Krogh et al. 2015: 42). However, they see it as the pursuit of alternatives, which is a built-in way of achieving appropriate, relevant and high-quality work in design (ibid.) I also link such a methodology and ways of searching for alternatives to design research’s potential to respond to the unanimous call for a shift (as expressed in the Introduction section), in particular, the call for capacity building, which emphasizes the ability to imagine beyond paradigms, the capacity for awareness-based action, and the experimentation of alternative futures through prototypes.

Next, I present the outline of the research process and examine the three activities of the constructive design research process from the perspectives of both the literature and my own work to clarify how I applied drifting as hypothesizing, experimenting and evaluating.

### 3.3 Outline of research process

Figure 8 describes how the research process of this doctoral thesis was outlined using Krogh and Koskinen’s dialectic epistemic tradition in constructive design research and the three main activities: hypothesis construction, experiments, and evaluation. The process is depicted in linear mode to clarify the different activities, concurrent drifting and positioning of the papers in the process. Naturally, the design research process was considerably more complex, ambiguous, fuzzy, and iterative, as emphasized by many (e.g., Krogh and Koskinen 2020; Sanders and Stappers 2008; Kolko 2010). Below, each of these three activities is examined separately, both through the literature and according to how they manifested as the research progressed through the different phases of the process.
Introduction: The unanimous call for a shift

Figure 8. Outline of research process according to dialectic epistemic tradition and three main activities: hypothesis construction, experiments, and evaluation. The process is depicted in a more linear form to clarify the different activities, the concurrent drifting, and the positioning of the papers in the process. Naturally, the process was considerably more complex, ambiguous, fuzzy, and iterative.
3.3.1 Hypothesis construction as sensing the emergent

Bang et al. (2012) studied the reasons that motivated constructive design researchers to initiate projects to better connect the general concepts of constructive design research and the detailed research activities in the field. Building on the work of Zimmerman and Forlizzi (2008), they defined a set of underlying motivational contexts, such as taking a grounded approach in which the focus is on ethical, political, or technologically provoked real-world problems. These motivational contexts influenced the constant reframing of the research activities, including the articulation of the research questions and the planning and execution of the experiments, in addition to the formulation of the hypothesis (ibid.: 9).

Even though some views maintain that qualitative research should not contain hypotheses but remain open-ended and free from any presuppositions (e.g., Grey 2018), the approach in constructive design research differs from more traditional qualitative research perspectives. In line with Alasuutari (1999), who argues that hypotheses are discovered during the research process, Krogh and Koskinen (2020) have laid down some key characteristics of hypothesis construction in the dialectic tradition:

- A hypothesis is the result of a dialogue between a multitude of agents
- When the object of research is seen as participation rather than strict methodic knowledge production, the hypothesis is seen as an emergent phenomenon
- Because a hypothesis is an ongoing process that evolves through participatory encounters, it cannot be fully controlled

(Krogh and Koskinen 2020:56)

Figure 9 illustrates how the hypothesis was formed over a fairly long period of time, influenced by both the lessons learned from the Design adventures with the public sector (Hakio and Mattelmäki 2011a; 2011b, also Jyrämä and Mattelmäki eds. 2015, Hyvärinen et al. 2015), and the experiences gained outside the university and doctoral candidate position, which are depicted in the figure as “other feeds for drifting”. I see these learnings and influences as feeds and inputs for hypothesis construction as they represent various insights, nascent hints, literary observations, and personal experiences gained over several years.

In this context, design adventures with the public sector meant co-design experiments in which empathic and co-design approaches were introduced and applied with new collaborating partners. More specifically, the City of Helsinki was interested in piloting the collaborative and human-centered service design approach in its cross-sectoral development projects, and thus design researchers were invited to enter (at that time) a new arena of public sector services and the City organization’s external and internal development projects. The adventures consisted of four co-design workshops and the related mutual learning process among design researchers and City officials, which were carried out as part of
the Service Journey project (2009-2010), as well as the preparation process for the World Design Capital, WDC 2012 Helsinki application process.

During these experiments, emergent, broader glimpses of the relevance of mutual learning to fostering change began to form. Especially the idea of a process of change that can take place through openness and willingness to place oneself in another’s situation, shifting perspectives, and learning from others. The focus was therefore on the encounters and interactions of the participants, and on the facilitation of these interactions through means of design, such as the utilization of generative materials and visualizations as scaffoldings for negotiations between different parties, for gaining an understanding of the various perspectives and people’s roles in the whole, and for envisioning new openings in multidisciplinary settings (see Figure 10).
Figure 10. Early hints about the relevance of mutual learning to fostering change via the co-design approach. Left: A co-design workshop in one of the design adventures with the public sector, during which, through joint activities, the participants learned about each other’s views, backgrounds, and ideas. At the same time, they were also able to mirror their own views through others in a broader perspective and context. Right: A participatory project meeting in one of the design adventures with the public sector, in which different stakeholders tried to achieve consensus of the project’s research goals, and gain an understanding of each other’s perspectives and needs related to the project (Hakio and Mattelmäki 2011a, 2011b).

Hypothesis construction was also greatly influenced by my personal interest in exploring awareness-based co-creation approaches, such as Terhi Takanen’s CoCreative Process Inquiry (2013), as well as by my personal experience of shifting the internal posture through self-awareness and contemplative meditation practices. The former led me to a development process that also took into account the so-called latent and invisible aspects of transformation journeys, such as the shadow side of co-creation processes (see Figure 11). The latter included not only personal daily exercises, but also, for example, mental training in a group, which taught me how an important part of self-understanding was the group itself, as it is often easier to see and hear oneself through others.

In terms of hypothesis construction, the design adventures with the public sector were carried out during a period when the initial research aim of this doctoral thesis was to explore the possibilities of embedding design into public organizations. Therefore, the lessons learned from these experiments served primarily as the foundation and roots of the original methodological approach and the related co-design repertoire. Later, these insights and feeds became intertwined with the aforementioned personal interests and experiences and emerged as inputs for asking unexpected and surprising new research questions. In other words, they removed the original motivation and research questions from their original research aim, and led me to research ideas and a hypothesis I did not initially anticipate; first associated with awareness-based attuning methods for co-design, and later related to the inner dimension of sustainability, transformation and shifting internal postures.
Introduction: The unanimous call for a shift

Figure 11. Other feeds for drifting: The hypothesis construction phase included studying the shadow side of development processes (see Takanen 2013 and the awareness-based co-creation framework called CoCreative Process Inquiry). The cards in the pictures are from The Cards of CoCreation deck by Terhi Takanen and Sari Komulainen, in which black and white images represent the underlying shadows, such as unconscious thought patterns, emotions, fears or conflicts, that influence the co-creation process beneath the surface. This was my first encounter with a development approach that takes into account the deeper, hidden aspects of transformation journeys in collaborative settings.

3.3.2 Drifting as experimenting

The methodological basis of constructive design research is in designerly experiments (Brandt and Binder 2007), the focus of which was exploring and explaining things through various ways of making (Koskinen et al. 2011; Krogh and Koskinen 2020; Stappers and Giaccardi 2017). Later, Binder and Brandt added that constructive design research follows certain methodologies that produce knowledge through prototyping new possibilities more consistently than broad concepts of research through design or research through practice (Binder and Brandt 2017:101). Experiments are seen as an opportunity to challenge existing cultural and societal conditions, but also as opportunities to challenge research programs (Binder and Redström 2006).

Krogh and colleagues (2015; also Krogh and Koskinen 2020) created a typology of the ways of drifting in design experiments, which contains five types of design experiments. The aim of such a typology is to demonstrate how designerly experiments build up in different ways to a broader whole to be examined and analyzed.

According to Krogh and Koskinen (2020:9-10, 111–112), characteristically, these experiments:

- are vehicles for exploring potential futures.
- do not stem from the need to test a theory, but instead arise from the needs and interests of the design process. In the dialectic tradition, this
means the local and situated needs and interests of the collaborating parties.

- are informed by inspiration, but also by the literature and what others have done.
- are a mindset in which activities are given priority, which in turn encourages design researchers to explicate their theory afterwards when they are developing frameworks.

**Figure 12.** Design adventures in Elisaari as an experiment to explore potential futures with local stakeholders.

The research activities during the design adventures in Elisaari are described in Papers 3 and 4 and summarized in the next sections, Sections 3.4–3.6. They comprise the experiment phase of the research process (see Figure 12). Before we go into them, I would also like to highlight the parallel experiments carried out before and during the Elisaari project as a result of the drifting process. These include the various inputs and inspirational insights gained during the years of doctoral studies, which then guided the direction and thinking behind the design adventures in Elisaari.

These experiments were conducted in a “learning by doing style”, which enabled new observations, literature discoveries, or inspiring ideas to be tested and applied rapidly in a collaborative setting–usually with the help of our research group or fellow doctoral students. At the same time, these experiments enabled me to gain valuable experience and knowledge about the essential new facilitation skills in the context of co-design. Below are two examples.
Introduction: The unanimous call for a shift in design thinking towards sustainability and social justice has been increasingly evident in recent years. This shift is not only evident in the design field but also in the broader context of social and environmental activism. The critical reflection on research practices and the dynamic interplay between research intentions and the disciplinary habits of the mind as shapers of research outcomes have become more prominent.

Figure 13. A significant part of the experimental phase is made up of the various inputs and inspirational insights gained during the years of doctoral studies, and the parallel experiments carried out before and during the Elisaari project, which then guided the direction and thinking behind the design adventures in Elisaari.

Example 1

The feeds for drifting depicted in Figure 13 included meeting inspirational people and colleagues or attending compelling lectures and seminars. During the process, a few doctoral courses significantly transformed my thinking. These included a course on the intersections of design and sustainability, held at Aalto University, during which I discovered the inner dimension of the sustainability concept (see Paper 3), and the mutual learning process in connection with writing Paper 2 with researchers from other fields such as transformative learning and sustainability education, which eventually influenced the formation of the arguments and contributions of this doctoral thesis. Another transformative learning experience took place during a course called Exploring fieldwork that led me to speculative personal experiments with more-than-humans and nature. The course was jointly held in 2017 by The Royal Danish Academy of Fine Arts, The Swedish Design Faculty for Design Research and Research Education, and ResArc–The Swedish Research School in Architecture.

One of the aims of the “Exploring fieldwork” course was to elicit critical reflection on the research practices via site-based fieldwork exercises, and to explore the dynamic interplay between research intentions and the disciplinary habits of the mind as shapers of research outcomes. Thus, we were given the task of formulating an initial research question that would give structure to our fieldwork day. These initial questions were affected by our individual preconceptions and images of the site mixed with our own research interests and methodology. Due to my background in co-design, and with a promotional video of Ørestad that had been introduced to us beforehand—painting the picture of an urban, upcoming downtown, where you could live a London or New York lifestyle—my question became: What is the Ørestad Experience and how is it co-created? By co-creation I mean the co-construction of a site, how to create...
and build environments together and the experiences we all share through the movement of continuous becoming.

However, by coincidence, when our research team entered the “field”, for some reason, there were no people in sight (see Figure 14).

Figure 14. Exploring fieldwork in Ørestad, Copenhagen. By coincidence, when our research team entered the “field”, Ørestad, on an ordinary Wednesday morning, for some reason there were no people in sight. Eventually, this occurrence liberated space to ask new questions and discover what else was interesting; who else co-creates, builds, inhabits, and shares the environment? Who else co-exists there besides humans?

The fact that there were no people to interview liberated space to discover what else was interesting: What becomes of co-creation in a site where there are no people? Who are the co-creators then? Who else creates, builds, inhabits, and shares the environment in Ørestad? Thinking of the origin of the soil, the nature and the history of the place before/beyond human property rights and ownership, who else co-exists there besides humans? This experience was one of the key turning points in my fieldwork exploration, and opened up a completely new way of thinking about my own research work, research methods, participation, and the whole issue of the human-centered worldview. Through the mental calibration of letting go of the habits of the mind, and letting the site talk back, my fieldwork focus shifted to finding ways to better access the more-than-human side of Ørestad, and to better understand co-creation from a more-than-human angle.
This led to a spontaneous moment of practicing mindfulness while sitting on a bench the next day near the metro station watching a group of birds. Immersed in my observations, I did an imaginary and speculative exercise in which I wanted to try out what it would be like to become, experience and create the present moment from the perspective of a pigeon. Trying to make sense of the experience, I illustrated it and put it into words (see Figure 15):

“I follow the bird’s actions and interactions with its comrades. How it takes care of its territory through movements and gestures. How it sends off competitors from potential food discovery or from interesting companions. And how it reacts to people passing by or to other bird species around us. While observing the pigeon I begin to blend into its way of being by sensing and listening to the present moment through my observations. I’m aware of my presence as a human-being but start to switch my orientation towards the otherness, by letting go of the essence of the human mindset and by letting in, imagining, becoming that pigeon. From this orientation, through re-positioning the interpretative continuum of my subjective becoming, I start to notice how people walking by suddenly feel like potential threats, or how the women who come to sit next to me on the bench immediately start to look like possible intruders or rivals. The experience feels quite unpleasant and heavy throughout my body. My state of being is somehow different, more intense, stressful, and alert, and I want to stop.”

Excerpt from Exploring fieldwork notes 20.4.2017

Figure 15. Speculative role-taking exercise of ‘becoming a pigeon’ during fieldwork explorations in Ørestad.

Later, these experiences evolved into ideas to include speculative role-taking exercises into co-design settings in order to incorporate broader eco-systemic views and more-than-human perspectives into ongoing projects. Figure 16 illustrates such a co-design event in which design researchers observed the local
environment and studied its more-than-human others and nature. At the same time, it was also studied how to instruct the participants to take on a speculative, more-than-human role, such as a local sheep, and how the experience could then be used to imagine new, more nature-aware and broader-looking ideas for the ongoing research project.

**Figure 16.** Application and further research on imaginative and speculative role-taking exercises aiming to add more-than-human perspectives to co-design practices.

**Example 2**

Another example comes from my engagements and interests in Theory U (Scharmer 2016) and the related awareness-based methods and co-creation practices, in which one meaningful approach to studying and fostering transformation processes is to use embodied intelligence (Dutra Goncalves and Hayashi 2021) and the performative, social art form called *Social Presencing Theater*, SPT (Hayashi 2021) as a research methodology.

Such an approach to embodied intelligence as a form of mindfulness of the body—and ways of experiencing the world and the lived experience in general—was foreign to me. Like many others, I had spent the most of my waking hours in my head, forgetting I have a sensing and feeling body. Thus, it could be said that my journey into the "from head to body connection", which manifested itself to me in various ways during the research process through these experiments, was one of the most transformative insights and lessons for me not only during this doctoral thesis but also in my personal life. Figure 17 illustrates one of the later occasions of this learning journey, where I studied SPT methods at the Social Field Research Summer School 2019 in Berlin, held by the Presencing Institute.
Introduction: The unanimous call for a shift–the kind of knowing and inner wisdom that manifests itself when we listen to and sense current situations and future potentials through embodied intelligence (Dutra Goncalves and Hayashi 2021). The exercise is part of the Social Presencing Theater, SPT methods (Hayashi 2021). The picture on the left shows a learning process, in which together with the team I studied and documented my own stuck related to the current situation. This was done by using the social body of the team to make a so-called sculpture of the situation and experience. Since the stuck is never sustainable, we used our embodied knowing to sense how this sculpture we created of the current situation wanted to evolve and move towards a second sculpture manifesting an emergent future situation.

However, at first, my interest in SPT methods was in their potential to bring out new ways of knowing for collective sensing and making future potentials visible. Using these methods, a group of participants is able to connect–according to the process of the Theory U–to sources of inspiration and open will, and thereby allow something new to emerge (see Section 2 and Section 2.2.2). In particular, the applicability of the methods to the co-design context–in terms of both facilitation techniques and creative design practices in which embodied methods such as experience prototyping and enactment activities have been used for a long time (see Part 1 and Paper 3)–was a significant confluence.

As in the previous example, with the help of these experiments, I gained valuable experience and expertise in the facilitation skills required for applying these practices to co-design processes (Figure 18).

It was not until much later, when I was working on design adventures in the Elisaari project and immersed in the practical implications of care ethics as a way of fostering the sense of connectedness to nature and more-than-humans, that I really began to internalize the importance of embodiment practices and deeper embodied knowing in the process of change. Little by little, I began to notice in my everyday activities–such as gardening and my attitude towards its living eco-system, or experiencing more connectedness with others instead of separation in difficult (work) situations–how my way of being and relating had moved towards a more caring and connected internal posture. As I
Introduction: The unanimous call for a shift point out later in Part 4 and in the arguments of this doctoral thesis, in light of transformation toward eco-social sustainability, gaining such first-hand experiences of connectedness, as well as internalizing these transformative insights, is essential.

Figure 18. Further research on SPT methods as my way of trying to understand their application in a co-design context. Figures show a research team at Aalto engaged in a practice called 4-D mapping (Hayashi 2021), which is another variation of the Stuck exercise pictured in the previous figure. Similarly, the figure on the left represents a sculpture of the current situation. The participants were guided to sense the tone and quality of the dynamics and relationships embedded in their social system through embodied intelligence. The figure on the right represents a sculpture that presents the emerging future situation. The purpose of this exercise was to generate insights into the factors that influenced the participants’ perceptions and ways of thinking about their personal and shared future possibilities.

To conclude, all the literature found, and the experiments conducted during these courses were turned into research papers (Papers 1–4) and experiments in the design adventures process in Elisaari. In this context, I also consider the rejected conference papers and the co-creative conversations with the reviewers concerning both published and rejected papers a feed for drifting intentionally, thanks to which fragile ideas evolved into more mature concepts of the same idea. Sometimes, broader collective interests can also cause drifting that turns out to be a surprising but relevant concept for the process. This was the case with care ethics, which was the focus of the design research field a few years ago (among many others, the Nordes conference 2019 entitled “who cares”). There was an unexpected confluence between the care ethics, the awareness-based systems change perspective, the ontology of becoming, and the conversations on the need to shift internal postures in the context of transformative change (see Introduction and Part 2). The study of care ethics eventually led to the teaching experiment reported in Hakio et al. (2019). Similarly, care ethics significantly influenced the thinking and reflective discussions during the design adventures in Elisaari, and ultimately played a key role in the analysis and synthesis process (see Paper 4).
The drifting that occurred during the experiments phase was not about an external need to test or apply a certain literature concept, but instead a possibility to follow an internal hunch or inspiration to combine elements within the design research process and to follow where this leads. However, this also involved living with a tangled mess of unfinished thoughts and threads, and accepting a potential risk of failure in terms of not matching the needs and interests of the collaborating partners, or not being able to find suitable publication channels for my ideas.

Before we get to the third activity of the dialectic epistemic tradition of constructive design research—evaluation—and how it materialized in this doctoral thesis work, we first take a closer look at the experiment depicted in the Figure 12, namely the design adventures in Elisaari.

### 3.4 The design adventures

The next two sections briefly summarize the design research project in Elisaari (see Figure 8 again), and its data collection phases and methods. **At this point, the reader would benefit from reading Papers 4 and 3, in particular their case study descriptions, in order to get a better overall picture of the several-year research process. I also advise reading the findings and results of these papers, as they are not included in this summary.** Both papers also contain **figures and illustrations of key events and observations that are essential for the reader to understand** in order to **make sense of the discoveries and contributions presented in Part 4.** However, to avoid excessive repetition, **I have not added them to this section.**

The Elisaari project (10/2016–3/2019) was an experiment that was conducted in the context of nature tourism on a local island called Elisaari on the coastline of Helsinki. The archipelago area is partly a nature reserve and famous for its old oak grove. Elisaari is owned by the City of Helsinki, but has local custodians, an entrepreneur couple who run boating, nature tourism and accommodation services on the island. They are passionate about development grounded in ecological values and holistic thinking, initiatives for organizing social innovation projects, and enhancing collaboration among the local entrepreneur network and the community. During the summer season, the entrepreneurs hire seasonal employees to run the restaurant and cafe and to take care of the maintenance of the site. They have also employed a few apprenticeship-based workers out of season to help with construction and renovation work as well as with customer service. Otherwise, the island’s main stakeholders are nature and the non-humans that inhabit the place throughout the year.

The initial impulse for the joint development project between the entrepreneur couple and Aalto university researchers came from the couple’s interest in finding new openings for the site’s activities, and in developing their work and service culture in a caring and co-creative direction. At the beginning, two design researchers were involved in the co-design workshops, me as a doctoral candidate and a Master’s student doing her MA thesis. Later, this
became my own research project. The project consisted of two papers, Papers 3 and 4. Both describe the same design adventure in Elisaari, but from different perspectives. Paper 3 consists of five co-design workshops, with an initial research focus on embedding the service design approach in the development but also expanding the approach by exploring awareness-based co-creation practices to complement the deficiencies of service design, including a human-centered perspective and the methodic shortcomings of capturing the internal dimension of change. Paper 4 in turn describes how the co-evolution of the place was followed and mapped out after the reported co-design workshops.

In terms of answering the research questions and exploring how the co-design repertoire on transformative change can be broadened, thus expanding design knowledge on shifting internal postures, design adventures in Elisaari can be considered the main experiment of this doctoral thesis.

### 3.5 Methods and data collection

Although the focus and the questions of the research changed as the project progressed, as is typical in constructive design research, the way in which the data were collected using the co-design method was a common factor for the design adventure experiments. Choosing the data collection methods was also influenced by the purpose and nature of the design experiments and their role in the research process (Figure 19). Therefore, because the experiments articulated research interests, and as drifting occurred both in the experiments and between them (Krogh and Koskinen 2020: 59), the data collection methods also adapted to these factors. Thus, in addition to the co-design method, design adventures in Elisaari made more extensive use of exploratory fieldwork methods, such as observation and sensing the place, and self-reflective techniques and self-awareness tools. Thus, the research data also included material on the participants’ internal experiences (see Paper 4).

The data collected in this experiment continued the same themes as in the initial design adventures with the public sector, providing knowledge on the applicability of the design approach in a novel environment and for new collaboration partners, and continuing the adventurous nature and learning-by-doing attitude of the collaborations. Thus, similarly the mutual learning process became visible through the chosen methods. However, it was at this point that the phenomenological research paradigm of this doctoral thesis emerged, as the choice of data collection methods involved the inclusion of human experiences and the internal dimension. Papers 3 and 4 describe how in practice this meant paying attention to how the internal movements and experiences of the workshop participants on the one hand, and the internal movements and experiences of the entrepreneurs on the other, could be documented in different ways. These included self-awareness and co-sensing techniques and tools, which were tested in the co-design workshops and documented by taking photos, making field notes, recording videos, facilitating group reflection at the end of the workshops, and collecting the materials produced in the workshops.
In addition, during the experiment process, reflective dialogue sessions were held with one of the entrepreneurs, which were documented through audio-recordings and field notes (see the complete data collection phase of the Elisaari project in Figure 19 and Table 1).
**Table 1. Data collection methods in the Elisaari project.** To facilitate following the activities of the different phases of the project in the process diagram (Figure 19), this table uses the same color codes (source: Paper 4, table format adapted from Botero 2013).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Data Material</th>
<th>Stakeholders</th>
<th>Outcomes &amp; Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection and analysis</td>
<td>Photos, field notes, audio recordings, interview data</td>
<td>Project team, local communities, research assistants</td>
<td>Improved understanding of the local context, increased awareness among stakeholders, enhanced project sustainability</td>
</tr>
<tr>
<td>Planning and implementation</td>
<td>Workshop materials, meeting minutes</td>
<td>Project team, local communities</td>
<td>Enhanced project design, improved community engagement</td>
</tr>
<tr>
<td>Evaluation and feedback</td>
<td>Questionnaires, interviews</td>
<td>Local communities, project team</td>
<td>Continuous improvement, enhanced project outcomes</td>
</tr>
</tbody>
</table>

Note: The color codes used in the table correspond to the activities described in Figure 19.
<table>
<thead>
<tr>
<th>OUTCOMES &amp; IMPACT</th>
<th>Stakeholders</th>
<th>DATA/MATERIAL</th>
<th>METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Success</strong></td>
<td>Camp staff, parents, students, and the community.</td>
<td>Field notes, photo records, observational data.</td>
<td>Ethnographic study of camp operations and impact.</td>
</tr>
<tr>
<td><strong>Community Building</strong></td>
<td>Local community groups, partner organizations, and families.</td>
<td>Audio recordings, video recordings, and interviews.</td>
<td>Semi-structured interviews and focus groups.</td>
</tr>
<tr>
<td><strong>Personal Development</strong></td>
<td>Campers, parents, and school counselors.</td>
<td>Field notes, reflective journals.</td>
<td>Ethnographic study of the camp experience.</td>
</tr>
</tbody>
</table>

**Introduction:** The unanimous call for a shift...
As the focus of the design adventures in Elisaari shifted from co-design activities into following the co-evolution of the place and mapping the manifestation of the project intentions (described in Paper 4), the methods focused more on observation, exploring fieldwork, and the above-mentioned reflective dialogue sessions, which were documented through audio-recording, photos and field notes. In this context, however, we cannot speak of purely ethnographic fieldwork, as each reflective dialogue session also involved joint reflection, imagining potential future directions, and envisioning possible next steps on the basis of current insights and observations. Such an approach is well reflected in the James Hunt aspect of the differences between ethnography and design highlighted by Thomas Binder in the Exploring fieldwork course; “whereas an ethnographer works in detail to ensure that she has got the present just right, the designer uses the present as a provisional leaping of point for reimagining possible futures” (Hunt 2001, p. 35).

Finally, many interesting things happened on Elisaari at times when I was unable to attend, or of which I only afterwards became aware. Furthermore, some activities did not allow me, as a researcher, to be included, such as the recruitment process of seasonal employees or the sessions that included employee orientation (Paper 3). Thus, the data collected also contained secondary source materials on entrepreneur-led experiments and workshops, which were documented for the process via the experiences of the entrepreneur couple, by audio-recording the reflective dialogue sessions and viewing the occasional photos that they had taken. (Figure 19 and Table 1 also include these events and activities).

3.6 Analysis and validity

Krogh and Koskinen have highlighted that design experiments can be viewed and analyzed through different typologies, depending on whether they allow drifting in the experiments (Krogh and Koskinen 2020). As explained earlier, the nature of the constructive design research approach is that design researchers become engaged in the ongoing discussion between constructing hypotheses, conducting experiments, and evaluating activities to review the course and goals of the process. Simultaneously, they become engaged in maintaining a sense of doing something relevant and producing essential knowledge. (ibid., p.61) According to Krogh and Koskinen (2020, also Krogh et al. 2015), the way in which experiments thus generate knowledge through a cyclical and reflective analysis process can be examined by identifying a certain typology of the experiment. The typology can be, for example, an accumulative, comparative, expansive, serial, or probing method for constructing knowledge through experiments (ibid. p. 62).

If this thinking is loosely applied to the experiments of this doctoral thesis, the design adventures in Elisaari identified with both expansive and serial typologies, and also had some links to probing qualities. To be more specific, the expansive typology usually includes journeying to smaller research areas, such
as exploring the possibilities of incorporating a person’s inner dimension and change into co-design practices, and projects seeking transformative change. Serial typology also allows observation of how contextual variables evolve over the course of the study, and the variables introduced many improvements. This is visible in the way in which the data collection methods evolved over the course of the Elisaari project toward methods that enabled and supported the inclusion of self-reflection and self-awareness components into the research process and the co-design practices.

Finally, the probing typology, which is characterized by exploring opportunities and ideas as they emerge through design work, was connected to the idea of including more-than-humans and nature as the key stakeholders and co-creators of nature tourism services. As explained earlier, the idea emerged during the process, by drifting to other contexts and concepts, namely doctoral courses, and the care ethics literature. (Krogh and Koskinen 2020) In this doctoral thesis, typology thinking was used to discover the locations of the contributions offered by the research process, and to gain a broader understanding of the relevance of the knowledge generated through experiments in the entirety of the doctoral thesis.

3.6.1 Evaluation, analysis, and synthesis in the dialectic tradition

In constructive design research, analysis and synthesis are simultaneous, mutually fertilizing actions, and the transition from analysis to synthesis or vice versa is not linear (Krogh and Koskinen 2020:82). Instead, the discussion and sense-making activities continue throughout the process. In the dialectic epistemic tradition of constructive design research, sense-making is carried out via mirroring thoughts and insights with others and thereby co-creating meaning with the other people involved in the process. The local collaborators, the stakeholders, or the community decides what is valid, in contrast to research approaches in which decisions on the analysis process and its choices remain private, shrouded in the researcher’s own paths of thought (ibid.:91). In this case, the validity came from the collaborating community in Elisaari. Central to the experiments was thus the reflective dialogue with the materials, discoveries, and insights produced during the process (after Schön 1983), and a common sense-making process with local stakeholders.

For the analysis of the entire experiment, this sense-making process was central. Figure 20 illustrates the continuous evaluation activities that took place simultaneously with the experimenting phase. These included both my own private reflections and the inner dialogue with the research material, and the joint sense-making and reflective dialogue sessions with the entrepreneurs.

In this process, reflecting on the ongoing process together helped reveal and outline meaningful and relevant themes. These were the meanings and implications of different workshop experiments, but also more broadly, how the project’s intention to create and prototype a new culture manifested itself as different hints and clues in the middle of everyday life: For example, in encounters with other people and nature, in new ways of organizing recruitment processes.
Introduction: The unanimous call for a shift or job descriptions, in making a choice to trust the caring synchronicities of life and thus practicing the corresponding internal posture toward a building and renovation project, or in observing the different steps of the emergence of a like-minded community.

As shown in Figure 8, which depicts the outline of the research process (page 63), the process was cyclical. I used these emerging findings in my own sense-making round, which was followed by the next reflective dialogue round (for this see the process diagram in Table 1 and Figure 19). In this sense, through the collaborative, reflective and dialectic sense-making activities, I was able to constantly mirror my thoughts, insights, and personal experiences with the local partners’ views and experiences on the premises. These sessions also helped both parties reflect on and revise the direction of the project and envision potential desirable future directions. Thus, it was not just a matter of mastering and testing exploratory research methods, but of holistically applying my design researcher skills and repertoire, drifting alone and with the entrepreneur couple from one workshop experiment and fieldwork activity to another, and making observations and finding clues throughout the process. Thus, the assessment of the relevance and validity of these findings and insights is based on anchoring them in the target community (Krogh and Koskinen 2020) and on the local entrepreneur couple’s assessment of the relevance of the work to their aims and intentions.
3.6.2 Integrating the awareness-based approach into sense-making and analysis activities

The collaborative aspect of sense-making entailed that each workshop included a joint reflection session with the participants. Figure 21 describes one example, and sheds light on the discussions that took place in these moments of shared reflection.

![Figure 21](image)

Figure 21. One of the workshops described in Paper 3, in which participants explored the nature tourism services from the perspective of various more-than-human roles. The speculative task of role-taking was seen as becoming from the perspective of otherness. Later, the group reflected on the experience together and discussed the meaning of the experience from a broader perspective. One of the key points that arose was how such activities could be seen as actions of care. More precisely, they were seen as embodied experiences that remind people to view otherness, nature and more-than-humans through changed eyes. The participants discussed how the experience of role-taking felt like a “unifying encounter with the whole”, as it forced them to drift away from the constant mental noise and chatter of the mind, typical of human experience, and to pay attention to the experience arising from the present moment.

Since the study was explorative and followed a learning-by-doing ethos, these sessions were of central importance. My task as design researcher was to highlight the ongoing steps and the observations from the process, feeding these in as input into the sense-making sessions, while also making the steps in the process visible through images and visualizations, and cross-pollinating the discussion via concepts and theories from the corresponding literature. The sense-making sessions consisted of several sorts of exercises, such as exploring previous steps in the process by having all the participants view the collected material or generative tinkering with 3D models (Sanders 2002; Sanders and Stappers 2012) in silence (see Figure 22). The purpose of these activities was to let the materials at hand and the outcomes of the making “talk back” (Schön, 1983). In addition to meaning-making, listening to what the data had to say revealed new insights and tapped into not-yet-visible aspects of the process (for the say–do–make model and tacit knowledge, see Sanders and Stappers 2012; Polanyi 2009). The aim was, that by exploring the emergence of a co-created 3D model, those involved could find new perspectives and insights into the project’s
progress, its more profound meanings, and its directions for the future—that is, link “head, heart and hand” (Scharmer 2016; see also Orr 1992) to explore both the current stage and the potential futures through doing.

Figure 22. Sense-making sessions in which meaning was co-created by letting the materials “talk back.” These sessions featured various ways to explore earlier steps in the process but also to find not-yet-visible future potential through reflection, making, and visualizing.

Another meaningful denominator for the sense-making and reflection portions of the project was the practice of presencing, which was one way of implementing the project’s awareness-based aspect. For example, the reflective dialogue and the sense-making sessions between me and one of the entrepreneurs began with a joint tuning-in exercise, the aim of which was to align and metaphorically attune to the same frequency as the other, the surrounding environment, and the essence of the location. This involved walking in nature together (see Figure 23). Such exercises helped us consciously ground ourselves in the moment, with nature and the Earth, and ultimately in the generative essence arising from the present moment. At the same time, this tuning-in experience afforded a broader perspective, which entailed a constant reminder to listen and reflect on past and current events in light of the project’s intention, its guiding values, and the ‘greatest possible potentials’ for the area’s future.
Introduction: The unanimous call for a shift

By walking in nature together, the entrepreneur and I, the design researcher, tuned in metaphorically to a shared frequency—aligning with each other, but also with the surrounding nature and essence of the location.

From findings to insights

Joachim Halse, along with many others, argues that “there is no unidirectional way to magically make the leap from a discrete observation to an insight” (Halse et al. 2010: 148). Typically, applying a constructive design research approach generates rich, diverse, and ambiguous research material, and regardless of the chosen method of grouping, (design) researchers will always find themselves repeatedly grouping and regrouping the material (ibid.). Halse points out that to keep the sense-making valid, the researchers must always ponder whether the emerging categories correspond to the experience of reality, are relevant and true representations for the research context, and how they will affect the lives of the people of that context (ibid.: 148-149).

The awareness-based action research approach of mixing third-person (external observations), second-person (deep listening and dialogue), and first-person data (one’s own experiences) (Scharmer 2019; Scharmer and Kaufer 2015) was utilized to enable exploration of the topics from different perspectives and experiential angles. In this study, this meant collecting all the clues, findings and evidence—in the form of pictures, highlights from transcribed workshop
documents, social media posts, and other publications (external observations), visualizations and highlights from transcribed reflective dialogues (deep listening and dialogue), and excerpts from personal notebook texts and research diaries (one’s own experiences)—as a collage on the wall for viewing and letting the collected material talk back. This meant that the material was reviewed and regrouped each time new insights arose as the joint sense-making sessions and reflective discussions progressed. The themes emerging from the grouping of the material were multifaceted and miscellaneous: They varied from more practice-oriented perspectives, such as exploring tuning-in and self-awareness techniques or rethinking employee recruitment, to capturing experiences and reflecting on the diverse meanings of, for example, the nature connection, social entrepreneurship, and community-building volunteer groups. (See Figure 24).

Figure 24. Mixing third-person, second-person, and first-person data generated rich, diverse, and ambiguous research material, from which a collage was made on the wall for analysis and grouping (left) and visualization cycles (right and below).

Such grouping and categorizing activities are not purely intellectual ways of analyzing data in a systematic way. They call for “attention to the practitioners’ own creative being in the situation” and a “full-bodied, environmentally and socially dependent processes expressed in actions and words” (Halse et al. 2010: 148).

Thus, knowledge was produced through a mutual learning process, in which the relevance and meaning of the ongoing events and experiments surfaced through later reflection on them. My role as a design researcher was not only as the organizer, planner and facilitator of the co-design workshops, but also as the mentor in the later stages of the process. One of the entrepreneurs saw the opportunity to have a frequent reflective dialogue session as a place to pause
and gain a broader perspective, in which my role as a design researcher, in her words, was that of a “crystallizer”. This meant that during the reflective dialogue and sense-making sessions, she had the opportunity on the one hand to take a step back and become aware of the larger picture in prototyping the new culture, and on the other hand to reflect on both her personal visions and intentions, and the intentions and visions of nature tourism and developing their activities.

The relevance and validity was evaluated at regular intervals until the manifestations of the new culture and the intentions of the project began to be visible in the last joint reflective dialogue session. This was a natural point at which to end the research process, although it is clear that local activities and missions to prototype an alternative culture founded on awareness-based co-creation and care constantly takes new forms and shapes. As Krogh and Koskinen state, “if the design has its origins in a co-design process, issues like replicability become secondary concerns” (2020: 91). Instead, what is meaningful is “matters of curating conversation around emerging designs rather than matters of method or protocol. The outcome is a design that is robust and fitted to a particular community” (ibid.). In the case of this research process, “design” refers to the insights and findings that emerged during the prototyping of an alternative new culture (Papers 3 and 4). In line with these observations, the evaluation of the relevance of this doctoral thesis and the knowledge it carries through different possible contributions remains to be seen in the joint dialogue with the design research field and the other potential audiences.

3.6.3 Addressing my personal involvement

Finally, I wish to address the topic of my personal involvement and influence on the production of the knowledge on the validity of the research. As the research process presented above shows, I was actively involved in the experiments and evaluation phases, in line with the constructivist worldview and phenomenological research paradigm of this doctoral thesis (see Figure 7 again). Thus, I did not even try to separate my own experiences of searching for neutrality, which in itself is impossible (see the “Underlying research paradigm” section above). Thus, emphasizing the social constructivist view, the way I myself constructed knowledge from the research material (alone or with others) was always shaped and filtered through my own cultural programming, mental models and worldviews. Similarly, Juha Varto argues that even though many methods known in scientific research for dealing with qualitatively inseparable units such as humans seem to be suitable methods for researching human experiences, due to the uniqueness of human experiences, this suitability is a delusion (Varto 1992, p.5). In line with Varto’s views, Scharmer (2016) argues that in order to gain knowledge of social realities and human experiences, the research approach needs to have a suitable repertoire of methods to access these realities. Design researchers Xue and Desmet (2019) repeat that researchers always use themselves as the measuring instrument to investigate the subjective phenomenon under study. Thus, what is crucial is the researchers’ ability to be a sensitive measuring instrument, and their capability to report and
communicate the experiences of the phenomenon (ibid., p. 58). This is why I adopted an approach founded on awareness-based action research (Scharmer and Kaufer 2015) in my analysis, which emphasizes mixing first-person data (one's own experiences), second-person data (co-creation and dialogue), and third-person data (external observations) (see also Smeenk 2019 for mixed perspectives). Thus, in this doctoral thesis, validity can be seen as a mixture of a) my personal take on what is meaningful, interesting and a possible contribution to the design research field, and b) the target community's response to my views while mirroring them with their take on what is meaningful, interesting and a possible contribution to their activities and thinking. This is in line with the dialectic epistemic tradition of constructive design research methodology. The contributions of this doctoral thesis to different contexts, and their relevance and potential novelty value, are discussed in next Part 4.
4. PART: Discoveries

Part 4 summarizes the conclusions and contributions of this doctoral thesis, which can be considered discoveries from a long, experimental adventure. These discoveries are presented as a collection of the different components and contributions that emerged from the various discussions, literature reviews and research findings presented in the previous chapters and the four papers of this thesis. At this point, the reader would benefit from also reading Papers 1 and 2 (in addition to the previously reviewed Papers 3 and 4). The presented discoveries provide insights into and a broader understanding of what kind of knowledge–practical and theoretical–is needed for turning inwards in transformative co-design. First, I introduce the components that were identified as relevant for facilitating and practicing internal shift work as part of the transformation aims of co-design processes. Next, I present the four main contributions, after which I address the limitations and future directions of the research. Finally, I end my reflections on these experimental adventures with my concluding thoughts.

4.1 Components for internal shift work in transformative co-design

This section summarizes the components that were identified as relevant for facilitating and practicing internal shift work as part of the transformation aims in co-design processes. In accordance with the scope and context of this doctoral thesis, these components are connected to capacity-building aims that seek to create favorable conditions for participants to experiment with and embrace new ways of being and becoming with themselves, others and the world.

Some of the components show how suitable and potential ingredients for internal shift work already exist in creative and empathic design practices, in which, for example, practices of visualizing, generative making, and embodied and speculative sensing and prototyping exercises promote turning inwards, self-awareness and reflection (see Papers 1–4). Other components are more unfamiliar practices in co-design settings, such as guided moments of mindfulness, presencing, and journaling to promote experiencing connectedness, becoming aware, and letting go of stories and mental limitations that do not serve us (see Papers 1, 3 and 4). What all these components have in common is that they entail group exercises that have already been carried out...
in various collaborative contexts such as education, training, and development environments. This makes them well suited to the co-design context. An important part of self-reflection and self-awareness is the group, which provides a natural support and mirror for examining one’s own actions and thoughts—as seen in Paper 2, transformative learning is a relational process of becoming with others. In other words, we need interaction with others for the insights that lead to transformative learning, because it is often easier to see and hear oneself through others. Thus, components that include individual exercises such as guided moments of mindfulness or guided journaling exercises support both individual and collective transformation journeys in co-design processes through collective making, experiencing, sharing, and reflection.

Another crucial aspect is how these components remind us of the often-forgotten side of transformation. Alongside the future-oriented, innovative goals that co-design processes often have, these components emphasize the ability to pause, stay with, and face the messy, uncertain, and uncomfortable side of the processes, and to dive deeper to co-sense and bring to the surface underlying emotions, social dynamics, and institutionalized structures. Openness and willingness to change have been identified as key factors in many design contexts, and these qualities and components must arise freely from the individuals themselves, from within. However, in this doctoral thesis, empathic co-design techniques and tools, for example, (along with more reflective forms of empathy and guided self-awareness practices) were identified throughout the research process as practices of design that focus on fostering the broadening and changing of perspectives through personal and embodied experiences and encounters. This was emphasized at all stages of the research process. Thus, these exercises have been designated as components that can support an individual’s own efforts to open up to a shifted state, in which they are able to embrace the meta-level view, and look at things beyond their personal beliefs, perspectives, and worldview.

The proposed components can be used to explore and make visible the underlying social dynamics and mental models of the co-design projects and contexts. With the right facilitation they can also lead us to pause and ask fundamental questions such as “who is my self?” and “what is my work?” (after Scharmer 2016). In this context however, new questions arise about what kind of capacity-building designers need, as both educators and students, so that the themes of transformative change and the related internal shift work can be included in design education (and in other fields of education). Paper 2 opens up this question slightly, and provides a few examples, as does Part 2. In regard to capacity-building and eco-social sustainability, Scharmer’s questions connect our personal, highest future visions and hopes to broader, collective, emerging visions, motivations, and directions, which may exceed the timeframe of a given course or project and thus remain alive and evolve in people and groups. These questions become deeper inspirations, influences and unifying forces that gather people who experience the same vocation and thus provide deep motivation for action. In the context of eco-social transformation, such inner insights and callings are significant, because they formulate the grounding and
motivation for work that starts from people’s inner ownership, and thus from care. Sometimes, such callings can lead to joint activities that aim to transcend the market-driven status quo and paradigm, and start from different ontological points, such as in the design adventure experiments, presented in this doctoral thesis.

Table 2 summarizes the components and the related conceptual and ontological grounding for internal shift work in transformative co-design. Next, I address each of these elements in more detail.

**Conceptual and ontological grounding**

The form follows consciousness concept (see Part 2 and Paper 4) views internal and external change as interconnected. What all parties involved in the transformative co-design process (including designers) need to understand is their own agency and thus responsibility as the co-creators (and potentially implementors) of future outcomes. This includes acknowledging their role as an interconnected being in local and global ecosystems. By underlying influence, I mean the hidden and tacit inner conditions that animate actions and have been extensively discussed earlier in this doctoral thesis. Thus, practicing internal shift work in transformative co-design processes involves internalizing the idea that the inner conditions of individuals in a social system, also called source conditions (see Figure 5 again), determine the quality and tone of people’s interactions, and thereby give rise to and co-shape how the visible outcomes and practical results of the system, or in this case transformative co-design project, unfold (Scharmer 2018:16; Scharmer 2016: 94; Scharmer & Pomeroy 2019).

From the perspective of transformation toward eco-social sustainability, scale is irrelevant in this context. Although the original concept was created with extensive civilization renewal, and paradigmatic, societal, and structural systems change in mind (Theory U, Scharmer 2016), the same conceptual basis also applies to local and situated transformation aims. Such a perspective brings the abstract and theoretical conception of eco-social transformation toward sustainability closer to everyday life and practice, where “transformation may be made up of several subtle, yet profound, individual changes” (Bentz et al. 2022: 10). The ideas presented in Paper 4 about creating a prototype of a possible future culture and thus experimenting with alternative ways of becoming with the world, describe exactly this kind of small, local, individual, and mutual learning process, which eventually, with the help of the next evolution of the prototype, builds the capacity for ecological and social sustainability on a larger scale.

In this context, it is also important to reflect on the ontological potential of the present moment. Drawing from Part 2’s discussions on the ontology of becoming and from Paper 4, the ontological view to transformative change in this doctoral thesis refers to an understanding that the opportunity to shift the qualities of our inner conditions, and to reinvent the ways in which we relate to and become with, lies in every moment in the ever-present now. This means that every encounter with ourselves, with others, and with the world, is a choice.
# Turning inwards for change

Components for *internal shift work* in transformative co-design

<table>
<thead>
<tr>
<th>Conceptual &amp; Ontological Grounding</th>
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<tbody>
<tr>
<td><strong>Form follows consciousness.</strong></td>
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<tr>
<td>Every moment is a choice.</td>
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<tr>
<td>Understanding, that every moment is an ontological opportunity to choose one’s own tone and quality of becoming with the world.</td>
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<tr>
<th>Co-design as an enabling creative practice.</th>
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<tbody>
<tr>
<td>Building a safe atmosphere of trust and transparency.</td>
</tr>
<tr>
<td>Supportive, intimate and non-judgemental space, that fosters sensitizing to other ways of knowing, and where one dares to be vulnerable with others.</td>
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<th>Creating Favorable Conditions</th>
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<tr>
<th>COMPONENTS &amp; CAPACITY BUILDING AIMS</th>
<th>FACILITATION TECHNIQUES &amp; TOOLS</th>
<th>CORRESPONDING PAPER</th>
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<tbody>
<tr>
<td><strong>Openness &amp; willingness</strong> to learn about oneself, and to learn from and with others.</td>
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</table>
Cultivating self-awareness; Seeing, sensing and making visible tacit and hidden assumptions, beliefs, values and mental models. |
Openness and willingness to embrace and develop new roles and practices. |
Guided moments of mindfulness. |
Guided reflection exercises. |
Guided journaling exercises. |
| **Learning to let go** of old, unserving beliefs, stories, mental limitations, identities and intentions. |
Learning to let go of the need to be in control. |
Building capacity to trust and attuning to the supportive flow and nature of the process. |
Prepares conditions for openness to receive, and be part of the world in its continual becoming. |
Guided moments of mindfulness to become attuned and present for oneself and others. |
Personal reflection and learning diary. |
PAPER #1 | PAPER #3 | PAPER #4 |

| **Learning to stay-with** and face the uncomfortable side of transformation journeys: courage to deal with the unpleasant feelings, emotions, pain and trauma surfacing in change processes. |
Learning to stay-with and in one’s own center in hard situations. |
| Reflective journaling, visualization and improvisational exercises as a way of working with the body, emotions and intuition. |
PAPER #2 | PAPER #4 |

<table>
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<tr>
<th><strong>Experiencing connectedness</strong></th>
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<tbody>
<tr>
<td>Learning to experience connectedness and attunement with oneself, with others, and with Earth.</td>
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</table>
Learning to embrace and internalize ecological selves. |
Learning to become a being of care in its broadest definitions. |
Guided moments of mindfulness. |
Speculative, creative and imaginative enactment and embodied-knowing practices for exploring and experiencing ecological selves. |
Guided reflection exercises. |
PAPER #1 | PAPER #4 | PAPER #3 |

<table>
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<th><strong>Shifting between different levels of attention</strong></th>
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<tbody>
<tr>
<td>Building capacity to move between different levels of attention in action. Building capacity to shift and move between different ways of knowing.</td>
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</table>
Learning the capacity to become aware and choose: Through which "lens of care" one experiences and perceives the world - do I see difference and separation, or sameness and unity? |
Experimenting with lenses of care through guided moments of mindfulness, journaling and reflection. |
Personal reflection and learning diary. |
PAPER #4 | PAPER #3 |

Table 2. Components for internal shift work in transformative co-design.
This was discovered by one of the entrepreneurs via her encounters with clients and marginalized young people, which also revealed the difficult side of practicing this choice. In addition, the ontological potential of the present moment was highlighted in the entanglements of care ethics and alignment practices, where it was stated that this choice also applies to our ways of relating to more-than-human others and nature. “When considering new ways of becoming with the world or acting from an evolved inner posture, building the capacity to identify these moments of internal choice is central” (Paper 4:78).

Creating favorable conditions

Integrating internal shift work with co-design settings requires enabling, favorable conditions. This brings us to the topic of co-design as an enabling creative practice, incorporating appropriate structures, practices, and elements that support the facilitation of both individual and collective transformation journeys through mutual learning. Paper 2 elaborates on this. Grocott (2022) sees how such learning leading to transformation emerges over time as the participants slide back and forth between their own personal experiences and worlds and the worlds of others. Senge and colleagues support these observations by highlighting how individual and collective transformation goes hand in hand with “a living system for learning”, in which “all those involved with it individually and together, will be continually enhancing and expanding their awareness and capabilities” (Senge et al. 2012: 7).

However, through practical examples (e.g., Grocott et al. 2019; Grocott and McEntee 2019) we know that achieving such a living system and state of mutual learning requires building a safe atmosphere of trust and transparency. Design research has multiple examples of setting the stage for designerly collaboration that resonate with these observations. An example is Kirsikka Vaajakallio’s (2012) remarks on organizing design games, in which she emphasizes creating a specific environment and atmosphere, a magic circle, in which participants are helped to “leave the everyday behind”, and immerse themselves in creativity, playfulness and imagination. In addition to becoming sensitized to other ways of knowing as described above, here, enabling favorable conditions also refer to paying attention to intimate and non-judgemental settings, in which one dares to be vulnerable with others (Grocott et al. 2019; du Plessis 2015). Paper 4 presents common everyday moments in which mundane and informal encounters, such as a shared meal or coffee, fostered the experience of openness and genuineness, which in turn nurtured a local culture of care. This could be one way to foster safe, intimate conditions. Another example is to adopt Circle work, also mentioned in Paper 4, as a collective practice. Circle work is a well-known facilitation practice for building a non-judgmental, trusting atmosphere in which everyone is seen, everyone’s voice is heard, and which is based on deep listening to others (see e.g., Scharmer 2016: 151–155 and 175–179).

The following (non-exhaustive) list of five components is a summary of the key insights from this research journey that can be applied to multiple environments and contexts.
Component 1. Openness and willingness

The ability and willingness to be open, sensitive and receptive to multiple perspectives—to learn about oneself, and to learn from and with others is a key starting point for any transformation process. Thus, openness and willingness to embrace and develop new roles and practices is a component that makes abstract concepts such as transformation towards eco-social sustainability more concrete and brings them closer to new everyday activities and ways of being and doing things together. Such an internal posture includes:

- Genuine interest in understanding the self and fellow individuals.
- Adopting the ways of an external observer and scanning one’s own state of being—what do I carry and bring with me?
- It is based on cultivating self-awareness as a way of becoming aware of one’s own inner conditions.
- Critically observing and making visible the tacit and hidden assumptions, beliefs and values embedded in mental models and worldviews—How have I been “designed” and conditioned by culture and society?

Component 2. Learning to let go

Learning to let go prepares our inner conditions for discovering the present moment, the place of inner knowing, and the non-judgmental connection to self. Consequently, it also forms an inner connection with the source conditions for attuning to one’s highest future possibilities. It is common practice in awareness-based transformation frameworks and can mean many things, but the most important thing is to identify the need for the practice and to pay attention to it at the different turns of the collaborative process. In the light of transformation towards eco-social sustainability, the points below invite the adoption and internalization of new kinds of ontologies and a more pluralistic worldview:

- Learning to let go of old beliefs, stories, mental limitations, identities, and intentions that do not serve us.
- Learning to also let go of the need to be in control, building trust in other people, the emergence of synchronicities, and attuning to the supportive flow and nature of the process. Such a process involves perceiving and trusting the universe as a source of deeper knowing and a life-supporting, benevolent and caring force.
- Learning to let go also prepares inner conditions for the openness to receive and be part of the world in its continual becoming.
**Component 3. Learning to stay-with**

This is arguably the most challenging of all the proposed components, as it always takes courage to embrace and implement it—courage to face one’s own inner shadow sides, as well as the shadow sides of collaboration. Exercises that promote making the invisible and hidden visible through embodied and creative collaborative activities, such as embodied intelligence practices, can offer access to these experiences. Discussion on the inner dimension of sustainability revealed the need to learn the ability to stay-with the uncomfortable side of transformation journeys. Traditionally however, such expertise has not been part of designers’ co-design repertoires, nor has it been taught in design education (except for the few examples mentioned in Part 2 and Paper 2). Learning to stay-with focuses on:

- Building courage to face and deal with the unpleasant feelings, emotions, pain, anxiety, and trauma that surface in change processes.
- Building the capacity to learn to stay-with and in one’s own center and to become aware of the source conditions that animate one’s actions, for example, in difficult social encounters, or in challenging situations in transformation processes, when trust begins to run out.

**Component 4. Experiencing connectedness**

Learning to embrace and internalize our so-called ecological selves is essential for transformation toward eco-social sustainability. In practice this means, for example:

- Learning to experience connectedness and attunement with oneself, with others, and with the Earth.
- Experiencing connectedness with more-than-human others and nature.
- Learning to build inner conditions and postures that support embracing and developing new roles and practices—becoming a being of care in its broadest definition.

**Component 5. Shifting between different levels of attention**

Learning to become aware and make conscious choices in everyday situations, encounters, and environments requires activating the conceptual and ontological grounding of the components presented above. It includes awareness of the lens through which one experiences and perceives the world: For example, when I enter a social space, or nature, do I see difference and separation, or sameness and unity? Thus, shifting between different levels of attention involves:

- Building the capacity to move between different levels of attention in action.
• Building the capacity to shift and move between different ways of knowing.
• Learning to move between different levels of attention as an imaginative and speculative exercise helps us alienate ourselves from the current ways of being in the world, and from transcending paradigms. Further, moving between different levels of attention helps make visible the human-made social constructions and the hard reality, which is not used to being questioned. In the co-design research context this could be called disruptive action (after Vink et al. 2017).

Finally, as a companion to the above components and to Table 2, I would like to suggest an (ever-evolving) list of check-in questions that I have found useful in my own research work and process. They bridge the themes and methods identified in the components and in Table 2 with practical, everyday situations, experiences, feelings, and reflections that may arise as people engage in internal shift work. The questions apply to individuals and groups alike.
Check-in questions for both individuals and groups to support internal shift work:

What do I notice about myself as a co-creator of the situation?
How open am I to collaboration and learning from others?
How can we learn collectively as a group from each other?
How willing am I to broaden my own perspectives?

What happens in us when we try something new?
Are we ready for a change? Is there room for something new?
Do we have time to try something new, or do we go with what is familiar and safe?
Are we able to manifest and embody new practices in existing structures?
How do we create and maintain new practices together in our daily lives?

What do I notice in myself, and what do I notice in my community when we face uncertainty?
Am I willing to face and stay-with unpleasant feelings or challenging experiences? What happens in me when I do so?
How as a group are we able to face and make visible the "uncomfortable", the shadows?
What kind of collective ability to "work through the uncomfortable" in a constructive, forward-looking, and co-creative way do we have?

How are our interactions going?
How do we listen to each other?
Is the way in which we are and work together psychologically safe?
Are we able to see connections rather than separateness?
Are we able to see the bigger picture beyond individual benefits and paths?
What do we need to become aware of together?

How does trust manifest itself in me?
How does the need for control manifest itself in me?
Where does the power lie in this situation?
How does it feel to be left out?
Are giving and receiving in balance?

Where in the body do you feel the experience of uncertainty?
Where do you feel fear?
And where do you feel joy?
How does the body feel during flow?
How does co-creation feel?
4.2 Contributions

In the following, I present the main contributions of this doctoral thesis in four categories, at the same time answering the research questions, which are presented below as a reminder:

**Research Question (RQ) 1.** How can co-design be involved in and contribute to transformative change processes that address the inner dimension of transformation?

**Research Question (RQ) 2.** By what means can experiences of internal shifts be facilitated, fostered, and potentially co-created in transformative co-design processes?

**Research Question (RQ) 3.** What can co-design learn and embrace from other fields such as awareness-based approaches and practices that recognize the connection between internal and external change in their ways of supporting transformation processes?

**Contribution 1: Techniques and tools for facilitating the shifting of internal postures**

The first contribution provides insights into which means can facilitate, foster, and potentially co-create experiences of internal shifts. In this context, Section 4.1 above provides a summary of the components that were discovered through insights from the literature and field research, and via personal experiences. The previous section also suggests corresponding practical exercises and techniques for these components, which also support turning inwards in transformative design by fostering internal shift work (see Table 2 again). In this sense, this contribution addresses the first and second research questions (RQ1 and 2).

What this contribution emphasizes is that for co-design to be transformative in the light of eco-social sustainability, it needs to be involved with practices that support shifting internal postures. This requires discussions, guidelines, and practices for fostering turning inwards. Firstly, the practices should emphasize the role of embodied experiences which can easily be underestimated in rationally tuned social environments and problem-solving. Embodied experiences have been found to hold the potential to reveal and question key assumptions, mental models, and worldviews through designerly practices that stimulate reflectivity. Secondly, the process should acknowledge both the inner posture and capability to stay-with, and the ability to let go. This involves, on the one hand, learning to face the uncomfortable side of transformation journeys and building the capacity to deal with the unpleasant feelings, emotions, pain, and trauma that surface in change processes; and on the other hand, releasing and letting go of old beliefs, stories, mental limitations, identities and intentions.
that do not serves us. And finally, it involves helping participants take an internal posture of openness and willingness, including a genuine interest in understanding fellow individuals and becoming sensitive and respectful toward them while also being able to change one’s own perspectives and thus learn from others in joint engagements.

This contribution also addresses reflective empathy as a potential practice for promoting the above-mentioned component of openness and willingness. Thus, by taking a more critical stance toward empathy through exploring its shortcomings, this proposal also broadens the practical and conceptual discussion on empathy in empathic design research and builds on the emerging themes that focus on an individual’s inner dimension as a practice of becoming aware of oneself through others (cf. for example the double-sided mirror perspective of Garduño García 2017).

Table 2 above shows a collection of potential exercises that are partially familiar in the field of co-design, such as empathic, reflective, and embodied exercises, which are often part of the make–tell–enact cycle (see Part 1). Thus, their facilitation as part of the co-design process is also part of the co-design field’s repertoire. The table also includes suggestions for tools and techniques such as guided mindfulness, reflection, journaling, or body awareness moments, which require a new kind of personal and professional knowledge and expertise of the facilitator, which is not traditionally taught in design schools. Therefore, the ideas can be adopted and adapted from fields such as awareness-based systems change, in which such exercises teach participants to transform their perception, self, will, and actions (Jaworski et al. 2004). They have thus become familiar practices for supporting individual and collective journeys of transformation over several decades (see e.g., Scharmer 2016, Takanen 2013, Gonçalves and Hayashi 2021; Jaworski 2011, Senge et al. 2004; Senge 1990). In this sense, this contribution also addresses the third research question (RQ3).

However, even though many creative and established design practices and approaches contain suitable and potential ingredients for internal shift work, and are already utilized, nurturing reflectivity and making visible the underlying inner structures and conditions of social systems (see e.g., Vink et al. 2017; du Plessis 2015; Grocott 2020; Dolejšová at al. 2021), more strategic and focused modification and application of these practices is needed to promote transformative change. In other words, their potential is underutilized (see Light at al. 2019).

**Contribution 2: Cross-cutting theoretical and conceptual knowledge on the inner dimension of transformation**

By no means do I claim that the theoretical and conceptual ideas presented in this doctoral thesis are something of which co-design audiences have never heard. On the contrary, the literature discussed here has been referred to in multiple contexts and design fields, except perhaps the more recent form follows consciousness concept, which was presented in one of the awareness-based
systems change community’s own research platforms, the Social Field Research Summer School in 2019 (Scharmer and Pomeroy 2019). However, this concept conceptualizes and applies ideas that are familiar to the design researchers from the well-established social constructivist ideas of Berger and Luckmann (1966).

What I propose as a contribution to the theoretical and conceptual discussions on the inner dimension of transformation in the co-design context is that the theoretical lenses presented in Part 2 bring together the fragmented discussions on abstract concepts and practical contributions in a new way. Especially the way in which the theoretical lenses highlight the interconnectedness of internal and external change, and the role that people’s inner conditions play in the desires to shift paradigms and make radical transformations by shaping socially constructed and institutionalized mental models and worldviews. Hence my argument is (along with those of many others such as du Plessis 2015; O’Brien 2018; Scharmer 2016; Meadows 2008), that without considering these not-so-obvious, invisible layers of transformation—which have been recognized as the deep leverage points of systems change (Meadows 1999, 2008)—the collective leap toward eco-socially sustainable and flourishing futures is difficult to concretize and make a reality. Further, in terms of practical issues, it might be equally difficult to create favorable conditions and apply creative practices for transformative co-design if one is not familiar with the essence and nature of the deep, inner layers of transformative change.

In this context, I propose following many great thinkers’ advice on building the capacity to stay-with the trouble (Haraway 2016) and explore the situated and subjective experience of the present moment as an ever-present ontological opportunity to reinvent oneself. As Akama puts it (2012), being human is to constantly shift and transform, and consciously paying attention to how we are part of the continual becoming of the world (Akama 2018) in our daily lives, encounters, and choices, is one of the cornerstones of the awareness-based practice. As the presented literature emphasizes, we only use our personal perceptions and subjective experiences of the complexity of the situation to navigate our pathway through messy, systemic issues (Buchanan 2019). Thus, inspired by Akama’s examples (2012; 2018), I suggest also exploring the topic, in addition to the literature, on a personal level. Hence, the importance of gaining personal, first-hand experiences cannot be emphasized enough.

Another theoretical contribution related to acknowledging the significance of the present moment in relation to future aspirations is the way in which care ethics are treated as a framework for understanding different ways of becoming with in practical terms (Part 2 and Paper 4). The three lenses of care presented contextualize the literature findings in everyday situations and experiences, and suggest that the movement between different levels of attention in those moments can be seen as parallel and alternative perceptions of the experience of becoming with (Paper 4).

These thoughts reveal how this contribution provides answers to all three research questions (RQ1, RQ2, and RQ3).
**Contribution 3:** Unraveling the mysticism surrounding the topic of awareness-based approaches

The third contribution relates to my dialogue with the design research community during the doctoral thesis process. It consisted of various comments that I received from colleagues, conference audiences, professors, and anonymous reviewers, as I presented my evolving thoughts and concurrent findings on acknowledging and including the topic of the inner dimension in co-design practices.

For a long time, the dialogue focused on various methodical expansions, such as studying awareness-based co-creation methods and mindfulness exercises (presented in Part 2). These issues of mindfulness and the related experiences were often considered too mystical in these conversations. The comments were, of course, due to my own inability to explain and concretize my own ideas clearly enough. However, the theme of unraveling the mysticism surrounding abstract concepts is still on the agenda today, although the discussion no longer revolves solely around the methods and practical aspects of facilitating awareness-based experiments.

In this context, one relevant contribution this doctoral thesis makes is that it demonstrates how abstract concepts become concrete through practical examples. Such examples can be found in Papers 1, 3 and 4. In Paper 4, the abstract lenses of care as well the conceptual ideas of moving between different levels of attention in relation to these lenses are based on the local everyday experiences and events in Elisaari (Paper 4, see also the design adventure in Part 3). In relation to the call to shift toward new internal postures of becoming with, these events and experiences are also linked to the perceptions of what becoming with might be in practice. For example, how consciously exercising an internal posture that recognizes the qualities of interconnectedness in a challenging customer encounter affects how the situation progresses and is resolved. Or how the internal posture of becoming with, together with a worldview that sees all life as relational and intertwined, enables alternative ways of encountering nature or carrying out plant protection in the garden. These everyday experiences and events also illustrated the challenge of mental models, for example, in the context of recruitment processes and the related internal beliefs about seasonal work. Later, the way in which these new internal postures affected customer services was revealed (Paper 3). In addition, the mystical concept of synchronicity was explored in relation to care in its most “supporting and omnipresent” form by following how the renovation project of a local school began and was completed from an internal posture of trust, which in turn was based on a worldview and belief that all the necessary financial resources, building materials, and suitable renovators would materialize when they were needed (Paper 4).

All the above-mentioned examples also contribute to unraveling the mysticism surrounding more theoretical and philosophical ideas, such as the interconnectedness of internal and external change, or the ideas presented in the form following consciousness concept. These insights may be relevant to the
co-design audience for addressing the inner dimension and conditions in co-design processes. Or they may serve as an example of what practicing internal postures of becoming with might look like. This contribution provides answers to the third research question (RQ3).

Contribution 4: Extending the repertoire of the dialectic epistemic tradition of constructive design research

This last contribution relates to the methodological choices and perspective of this doctoral thesis. Although as a methodology, constructive design research has already reached some maturity by being explored in various doctoral theses (reviewed in, e.g., Krogh and Koskinen 2020, also Stappers and Giaggardi 2018; Brandt and Binder 2007) and literature reflections, the four epistemic traditions are relatively recent (see Krogh et al 2015). In their examples, many of the discussions highlight a perspective of design research that evolves around designing artifacts or practical solutions. However, researchers with a more abstract and intangible focus on the co-design process and the facilitation of local stakeholders, interaction and collaborative imagining of alternative futures and solutions may find it more challenging to identify with.

This is also the case in the dialogic epistemic tradition based on the dialogue between the design researcher and the target community (e.g., Dindler 2010; Judice, A. 2014; Judice, M. 2014). This doctoral thesis took a slightly different approach by adding a joint sense-making process with local partners to the discussions on the dialogic epistemic tradition, and thus produced knowledge and reflected together at different stages of the design experiment. The mutual learning that takes place through the exploratory and participatory activities of co-designing, prototyping ideas, joint sense-making, and reflective dialogues contributes to the repertoire of the dialectic epistemic tradition, in which the reflective conversation with the research materials has often mainly been an internal process, within the design researcher.

The observations of the reflective and dialogical process do not contribute directly to the original research questions, but follow Krogh and Koskinen’s ideas on drifting (2020:v). However, they do indirectly contribute to the first research question (RQ1) by providing a perspective on constructive design research and its implications for mutual learning, and the shared processes of meaning- and sense-making, and the surfacing insights. These same observations also contribute indirectly to the second research question (RQ2) on how design researchers should be able to embody themselves in an inner posture of becoming with, in terms of letting go of the expert mindset and the need to be in control. Becoming open and willing to learn from others is also meaningful to designers, which is a relevant internal posture to adopt for all in transformative co-design processes.
4.3 Limitations and future directions

This doctoral thesis study has several limitations, in terms of both content and the circumstances in which it was conducted. First of all, I am aware of my own limitations as a citizen of a Nordic welfare state. Although my work focused on issues of eco-social sustainability, capacity-building toward new ways of being and experiencing connectedness with all living beings, and the exploration of ways to support and cultivate internal shift work—which I see as a task for all of humanity—I can only perceive what is meaningful through my own subjective, inner condition; personal history; and cultural conditioning. This also applies to the literature I read, as it inevitably lacks the voices of Global South and non-Western thinkers.

Secondly, the design experiments had limitations in terms of their participants, and whose voice we were trying to hear. Some of the workshops focused so heavily on the inclusion of more-than-human beings that no attention was paid to the diversity of the human participants.

On the other hand, factors such as nordicness can also be seen as a resource when it comes to care ethics and working with more-than-humans and the Earth. Eco-social sustainability issues are topical for us as we live in a land of forests and thousands of lakes, where the nature connection is culturally considered self-evident. And yet, working with care ethics during this research process made my whole being experience this connectedness even more deeply, and I have started to recognize the presence of the ecological self within me.

A third limitation concerns scale. The design adventure, presented in Part 3 and Papers 3 and 4, were small-scale experiments, and therefore more examples and research are needed. A follow up could be a strategically framed study involving larger groups of participants and capturing and following their experiences and transformation journeys. On the other hand, as Manzini (2015) has observed, small-scale experiments have their own potential when they are seen as grass-roots level experiments and prototypes of possible futures, which present us with new narratives for alternative ways of organizing our lives and societies. Each of these small-scale prototypes contribute to the broader social learning process (Manzini 2015: 204), in which society on the whole can be seen as a laboratory and place for social experiments (ibid.: 161–162). I trust that this is also the case with this doctoral thesis, and that subsequent projects can build on the findings and insights from this prototype. Thus, I hope that this doctoral thesis engages diverse audiences interested in eco-social transformation toward sustainability and well-being for all. This includes researchers, educators, and practitioners working in the areas of, for example, design research, design education, sustainability education, sustainability science, transformative learning, care ethics, awareness-based systems change, and community action research.

Finally, I wish to address the lack of transformative learning literature in this doctoral thesis. Retrospectively, it is easy to see how my research interest in shifting internal postures and engaging in internal shift work overlaps with, for example, the recent contributions to design for transformative learning (Grocott
et al. 2019; Grocott 2022). As this is an area I only learned about from my co-authors during our joint process of preparing Paper 2, I do not feel sufficiently competent to add this to my professional repertoire until I have a deeper personal understanding of the concepts and practices. However, it will be the focus of future research, as transformative learning has interesting connections to, for example, John Dirkx’s views of learning as soul work or inner work (Dirkx et al. 2006). Another potential avenue for future research that overlaps with the conversations on care, eco-social sustainability, and new ways of relating and collaborating, is the emerging Inner Development Goals initiative (n.n.), which addresses transformational skills in the context of sustainable futures and focuses on the inner shifts and human growth that needs to happen in order to collectively reach the UN’s Sustainable Development Goals.

However, here too, I am aware of the initiative’s western origins. In truth, the primary target group of this initiative, and of this whole doctoral thesis, is mainly the western public, which is marinated and educated in market-driven social constructions and paradigms.

4.4 Concluding thoughts

The diverse threads and streams above ultimately crystallize into conclusions, in which everyday encounters and human-sized paths in systemic change, and internal shift work for embracing new internal postures play a key role in the aims to transform toward eco-social sustainability.

Turning inwards for change in the transformative co-design context can be seen as a way of interacting and collaborating by paying significant attention to the qualities and tone of encounters and collaboration. It is also a way of becoming aware of one’s own role and influencing how these interactions and encounters and their outcomes unfold. In this sense, internal shift work is deliberate, concrete, and guided work, in which sensitivity and awareness go hand in hand. Such an approach builds on and extends the perspectives of empathic design research on transcending self-centered aspirations and experiences, and on becoming open and attuned to oneself and each other (Mattelmäki et al. 2014; Lee et al. 2020; see also Aaltola 2014; Aaltola and Keto 2017).

Internal shift work builds the capacity to become aware of personal, but also institutional and cultural mental models, and local and global social constructions that are human made and guide and influence action. These may concern how we treat otherness and difference, such as natural elements and animals, how we react to differing opinions and views in development work, how we organize recruitment processes and seasonal work, how we perceive care, how we perceive trust, or how we perceive our abilities to receive care in the ubiquitous life-sustaining web of which we are a part.

Engaging in internal shift work also prepares us for broader alignment practices and moving between different ontologies and levels of attention. These practices respect different ways of knowing and making knowledge (see
Dolejšová et al. 2021; Houston and Light 2022; Light et al. 2019). In regards to the visions and prototypes of the future, and solutions that aim for the transcending market-driven status quo and paradigm, becoming aware of the underlying inner conditions of collectives and individuals is crucial for accessing such an imaginative state and level of awareness-based co-creation that transcends them. This also includes self-awareness, which leads participants to identify and explore both the social constructions of their social realities and the possibilities of the ever-present ontological potentials. In other words, recognizing the opportunity to rebuild and reinvent oneself is an ever-present choice in every encounter and interaction.

These may sound very philosophical and abstract ideas if one does not have personal experiences of such alignment and connectedness practices. However, as Grocott emphasizes, the identification and transformation of the inner condition is connected to people’s abilities to explore and imagine something not-yet-known, as the underlying mental models, beliefs, attitudes, and habitual patterns influence how openly or restrictively people are generally able to imagine potential future worlds (Grocott 2022: 213). This makes the awareness-based perspectives on making change, on co-creating together, and on envisioning thriving futures concrete. It requires holistic, social, and embodied participation, becoming aware, changing through exploring and experimenting, and being able to challenge restrictive internal conditions on a daily basis (cf. Yoko Akama’s take on mundane mindfulness practices, 2012).

At this point, I am aware that the ideas presented above may sound naive and out of touch with reality. I am writing this at a time when Europe, together with the rest of the world, is in intense political turmoil. One can sense how the collective energy has shifted toward building defensive lines instead of thinking about common flourishing futures on planet Earth, and toward demanding justice instead of paying attention to pluralistic worlds in which many perspectives are given space and understood. In this context, I cannot help but think that eco-social sustainability is also an internal posture in which one is at peace with oneself and others—meaning an evolved internal posture that aims for a higher civilization.

In this sense, my arguments for recognizing ontological potentials as the opportunity to rebuild and reinvent oneself as an ever-present choice, are on one hand a provocation, and on the other hand, a very simple thought. The conversation on “individual transformation is restricted by systems and structures that resist change” (Grocott 2020: 244) is ongoing, and I am well aware that these discussions place the pressure of systemic (sustainability) transformations on individuals’ shoulders (e.g., O’Brien 2018). Donella Meadows states, “there’s nothing physical or expensive or even slow in the process of paradigm change. In a single individual it can happen in a millisecond. All it takes is a click in the mind, a falling of scales from the eyes, a new way of seeing. Whole societies are another matter—they resist challenges to their paradigms harder than they resist anything else.” (Meadows 2008: 163–164)

Following Meadows’ thoughts, transformation toward eco-social sustainability can thus be, in its simplest sense, a choice and opportunity to align with the
source conditions of care, and to accordingly rebuild and reinvent oneself in every encounter, interaction and collaborative imagination activity. That is, internal shift work that one person can do, even when the surrounding society does not affirm such source conditions. Thus, this doctoral thesis is not meant for abstract daydreaming, or temporary visits to the worlds of the ecological self; it is directed toward the mundane work of internal shift work of us all.


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This doctoral thesis examines how co-design as an enabling creative practice can contribute to the transformation toward eco-social sustainability. It is written at a time when globally, the pressure and need to transform toward more sustainable, just, and equal societies and ways of co-existing calls for, unanimously, a shift.

The focus of the research was on the inner dimensions and conditions of transformation and sustainability. Transformative co-design refers here to a process that takes into account the effects of these internal conditions on the formation of external responses. The main arguments draw attention to the ever-present, ontological possibility of making an internal shift a conscious choice, and thus to a more strategic and focused application of the creative design practices to promote transformative change. In terms of transformation toward eco-social sustainability, the work highlights, how transformative co-design can contribute to shifting inner conditions, as it helps participants adopt new, more caring and aligned internal postures that arise from the broader experiences of relating and connectedness with oneself, others and the world.

Based on the findings the work presents a collection of components and corresponding techniques and tools, by means of which self-reflective and awareness-based internal shift work can be facilitated as part of co-design.