EXPLORING ARTFUL POSSIBILITIES

A TRANSDISCIPLINARY RESEARCH ON CULTURE, ARTS AND SUSTAINABILITY

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Table of Contents

INTRODUCTION 5

PART 1: CULTURE(S) AND AESTHETICS OF SUSTAINABILITY 23

Culture and the arts in sustainable development: Rethinking sustainability research 25

Toward Global (Environ)Mental Change: Transformative Art and Cultures of Sustainability 39

Which wealth for which sustainability? 61

Complexity as experience: The contribution of aesthetics to cultures of sustainability 69

PART 2: THE ARTS IN RELATION TO CULTURE(S) AND AESTHETICS OF SUSTAINABILITY 78

Art and Sustainability: The search for cultures of sustainability is not an easy journey 80

The Practice of Ecological Art 88

Music and sustainability: organizational cultures towards creative resilience – A review 96

Prefiguring Sustainability: Response-Ability & Spaces of Possibility 98

PART 3: CREATIVE SUSTAINABLE CITIES 105

Extreme Climate Events as Opportunities for Radical Open Citizenship 107

Creative Cities and (Un)Sustainability: From Creative Class to Sustainable Creative Cities 119

The roles of artists in the emergence of creative sustainable cities: Theoretical clues and empirical illustrations 136

The City is our Anthropo-Scene! Art as a Verb and Urban Sustainability Transformation 138

The Emergence of Creative Sustainable Cities 145

Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations 153

IHM-agining sustainability: Urban imaginaries in spaces of possibility 155

Stadt als Möglichkeitsraum – Möglichkeitsräume in der Stadt Eine Einführung 157

Kreativ-kulturelle und künstlerische Praktiken für städtische Möglichkeitsräume 159

Perspektiven der nachhaltigen Stadtentwicklung: Übereinstimmungen, Diskordanzen und Empfehlungen 161

PART 4: TOWARDS ARTFUL SUSTAINABILITY RESEARCH 162

The transcultural and artscience: The 'Karamoja Campaign' as an attempt at transdisciplinary action research 164

Artistic research and climate science: transdisciplinary learning and spaces of possibilities 176

Artful Sustainability: Queer-convivialist life-art and the artistic turn in sustainability research 184

Proving the world more Imaginary? Four Approaches to Imagining Sustainability in Sustainability Research 208

Village Triangles: games to playfully learn about complex systems 211

Retracing my Steps: a 10-years journey to walking-based transdisciplinary research 227

Ricklingen, Bornum und Linden-Süd – Urbane Randzonen 229

Linden-Nord 231

Ein Spaziergang durch Hannover-Mitte 233

CONCLUSION 234

Introduction

My doctoral research, published at transcript Verlag under the title *Art and Sustainability: Connecting patterns for a culture of complexity* (Kagan 2011), was my first thorough research on the cultural dimension of sustainability and on the functions of the arts therein. The book proposed a theoretical synthesis on "cultures of sustainability". First describing how modernity degenerated into a "culture of unsustainability", to which the arts are contributing (in chapter one), I then searched for a fundamental rethinking of our ways of knowing and seeing the world (in chapters two, three and four), looking for specific "aesthetics of sustainability". "We must learn not to be afraid of complexity, and to re-awaken a sensibility to patterns that connect" was my resulting slogan, which to this day, I continue to abide to. With an overview of ecological art over the past 40 years (in chapter five), of contemporary art dealing with themes of ecology and sustainability in the decade 1999-2008 (in chapter six), and a discussion of art and social change (in chapter seven), this doctoral research constituted my first extensive assessment of the potential functions of art in a much-needed worldwide transformation process called "sustainability" or "sustainable development".

The work was very well received internationally (cited by 155 other publications according to Google Scholar[1]) and recognised as a pioneering work that "presents a comprehensive and sophisticated analysis of the relationship between art and sustainability in the context of complexity theory" (Milne 2012:80), "impressive in its range, succinct synthesis, and clear communication of complex concepts" (Milne 2012: 82). A Russian sociologist praised the book as "impressive in the breadth of concepts, names and theories, the depth of their study, the saturation of the empirical material. Despite the impressive volume – more than five hundred pages – it is built very logically and systematically […] This work is not run like a hundred meters. Rather, it is like a marathon, you cannot get that right the first time. However, it is worth it" (Yatsyk 2013). A US-American cultural sociologist reviewing my book in the journal *International Sociology* considered it "an important book by someone with an impressive depth of knowledge in the field and that should serve to inspire further research and debate" (Barthel-Bouchier 2012). A reviewer in the *International Journal of Cultural Policy* commented that the book was "offering a long-overdue theoretical framework that helps bring a higher degree of understanding to an inordinately scattered field" (Kaye 2013:141). In the *Oxford Art Journal*, a US-American art historian commented that "Sacha Kagan is another rare scholar who merges his interest in art and his concern for the environment in a boldly encompassing book […] Speaking from the perspective of a sociologist, Kagan nevertheless transcends disciplinary boundaries to connect sociological, philosophical, and ecological theories in order to provide an overview of environmentalist practices in contemporary art" (Boettger 2012).

Furthermore, my doctoral research (Kagan 2011), together with earlier explorations of the field where I had brought together ecological artists and art sociologists (Kagan and Kirchberg 2008), and my subsequent early-postdoctoral publications (e.g. text 2 in this manuscript), were the explicit direct inspiration for the creation of an entirely new research and education program in Brazil: The transdisciplinary research group in "arts, cultures and sustainability" initiated in 2013 by Prof. Dr. Adilson Siqueira at the federal university of São João del-Rei. Siqueira and his research team then also created a postgraduate program in "Arts, Urbanities and Sustainability" that started offering a Master (the "PIPAUS" MA) since 2016. This MA integrates urban studies, sustainability research and arts-based research. It is being taught by fourteen professors from five

[1] Available at: https://scholar.google.de/citations?user=5Ps0MeQAAAAJ&hl=en ; last accessed: January 30th 2019.

departments: Literature, Arts and Culture (DELAC: Literature, Theater and Social Communication); Architecture, Urbanism and Applied Arts (DAUAP: Architecture and Urbanism and Applied Arts-Ceramics); Natural Sciences (DCNAT: Biology); Zoology (DEZOO); and Administrative and Accounting Sciences (DECAC).

My doctoral research indeed contributed to an emerging field of research mobilising various disciplinary, interdisciplinary and transdisciplinary perspectives on the arts and culture (such as the sociology of the arts, cultural sociology, art history, art theory, philosophy) and on sustainability (such as sustainability science and other forms of sustainability research, as well as phenomenology, systems thinking, the sociology of conventions, eco-feminism, the new paradigm of qualitative complexity from Edgar Morin, and Basarab Nicolescu's approach to transdisciplinarity).

In the post-doctoral phase of my research, from 2011 onwards, and thanks to the very encouraging feedback received in response to my published PhD Thesis in the years immediately following its publication (as described above), my motivation grew to further develop an own, inter- and transdisciplinary research direction in order to both deepen the understanding of the cultural dimension of sustainability (putting my own approach on "cultures of sustainability" in relation with other approaches) and to expand my investigation of the functions of the arts in the search process of sustainability (expanding the scope of my research both geographically and in terms of the different forms of artistic expression). Furthermore, my postdoctoral research also focused on these themes in the context of urban development. In this process, I also increasingly came to discuss more explicitly the epistemological and methodological opportunities offered by artistic and arts-based approaches to research in order to challenge and overcome the limitations of sustainability research.

The texts collected in the present manuscript for a cumulative habilitation, which represent these different aspects of my postdoctoral research from 2011 to 2018, are therefore structured in four parts that respectively focus on (1) culture, (2) the arts, (3) cities and (4) artful sustainability research. The chosen structure is mainly thematic, rather than chronological, i.e. each part includes texts published across the years between 2011 and 2019.

The first part, which explores the relations between culture and sustainability, starts with a recently published text (Text 1: "Culture and the Arts in Sustainable Development: Rethinking Sustainability Research") that I contributed to a book on "cultural sustainability". That book was itself an outcome of an exchange initiated by a Professor of Theology, Torsten Meireis, and a Professor of Literature, Gabriele Rippl, both then-based at the University of Bern (Switzerland), who had taken part in the final Conference of the European COST Action "Investigating Cultural Sustainability" in Helsinki on May 6th-8th 2015 (a conference for which I was part of the scientific committee, which scientific program I contributed to create and organize, and which gathered 290 European researchers). These two professors were not fully satisfied by the depiction of "cultural sustainability" coming out of the said conference in Helsinki and of that COST network's final report (Dessein et al. 2015). My participation at the subsequent workshop organized in Bern in November 2016 by Meireis and Rippl, and my individual contributed chapter in their book, were an occasion for me to discuss the diversity of discourses that emerged

over the past decades around the question of culture's place in relation to sustainability or sustainable development. This gave me an occasion to reframe my own earlier arguments on "cultures of sustainability" in relation to other discourses, also comparing the different functions attributed to the arts within these different approaches.

The second text ("Toward Global (Environ)Mental Change: Transformative Art and Cultures of Sustainability") was published several years earlier, and was produced at the request of the Heinrich Böll Foundation headquarters in Berlin. In cooperation with several other foundations and NGOs, the Böll Foundation organized the conference "Radius of art: Creative politicization of the public sphere – Cultural potential for social transformation", at their site in Berlin on February 8th and 9th 2012, and it invited me "to write an essay as a catalyst for discussions during and beyond the conference" (as formulated by Dr. Heike Löschmann in her Preface to my text). I was also invited, as expert in this field, to co-coordinate together with Heike Löschmann the Conference Stream "arts towards cultures of sustainability" within the "Radius of Art" conference. In Löschmann's view: "From the perspective of the transformative power of art, this essay was conceived as a twin contribution, complementing the essay by the German social psychologist Harald Welzer, *Mental Infrastructures – How growth entered the world and our souls*, that was also published in [the same] series. It equally aims to derail frozen habits, social conventions and inherited "mental infrastructures"" (Löschmann 2012: 7).

The third text ("Which wealth for which sustainability?"), a much shorter text (and the only one from among my 'magazine' style articles, which I include in this manuscript)[2], was based on a paper I had presented in December 2010 at the "Open University" of the "Ready to Change" Forum in Ljubljana, hosted by the cultural center "Bunker" within the framework of the Sostenuto project: "Thinking culture as a factor of economic and social innovation." This text links the notion of cultures of sustainability, and the cultural dimension of sustainability, to the question of wealth, usually located within the economic dimension of sustainability.

The fourth text ("Complexity as experience: The contribution of aesthetics to cultures of sustainability") closing part 1, was based on a video-conferenced keynote address I gave at the conference on "The Aesthetics of Sustainability" at Curtin University (Perth, Australia) in October 2013. It was published as a book chapter in 2015 within the book *An introduction to sustainability and aesthetics: the arts and design for the environment*. The text articulates some way in which cultures of complexity are nourished by aesthetics of complexity, theoretically grounding the functions of the arts within cultures of sustainability.

The second part of this manuscript includes my publications that focused more closely on the functions of the arts in relation to sustainability. The texts focus on ecological art (texts 5 and 6), musical practices (text 7) and contemporary interdisciplinary arts in urban arts organizations (text 8).

The fifth text ("Art and Sustainability: The search for cultures of sustainability is not an easy journey") came out of several years of exchanges with artists and cultural organizations in Asia, including China (the insights from which had been kept aside thus far, and were flowing into my research publications after my PhD was over): In 2008, I was a member of the Advisory Board for the "Asia-Europe Dialogue on Arts, Culture & Climate Change" organized by the Asia Europe Foundation (ASEF) and I moderated one of the round-tables at this dialogue's international conference at the Central Academy of Fine Arts, Beijing (China), in October 2008.

[2] As it was originally published as an online magazine article, this text is the only one in the present manuscript that, exceptionally, does not make any use of "proper" literature references but only alludes to authors and works in the body of the text.

In the following year 2009, I was taking part in the "expert panel on the role of culture in the transition to an ecological age", commissioned by the Asia-Europe Foundation (ASEF) alongside COP15 (the UN Climate Conference in Copenhagen). In 2010, I was preparing and coordinating the "Sustainable Creative Cities: the role of the arts in globalized urban context" workshop at the ASEF 'Connecting Civil Societies' conference (which took place in Brussels on October 2-3 2010 as a preliminary to the ASEM Summit). In 2009 and 2010 I was also working on an international Summer School (the "International Summer School of Arts and Sciences for Sustainability in Social Transformation – ASSiST", which took place in August 2010 in Gabrovo, Bulgaria, and of which I was the founding director), which was also financially supported by ASEF (the support allowed us to invite several Asian artists and social scientists to the summer school). Besides, I organized and coordinated in June 2011 (shortly after the arrest of Ai Weiwei) the event "Can Artists Change China?" at my home university in Lüneburg as a cooperation between the Fédération Internationale des Droits de l'Homme (FIDH) and Cultura21, with the support of the Leuphana University's "Kunstraum". Through all these activities over these four years, I could engage in dialogues with artists and cultural researchers based in China, allowing me to gain some comparative insights about artistic practices dealing with ecology and sustainability in China and Europe, some of which I could share in text 5.

The sixth text ("The Practice of Ecological Art") was published in the French online art & science Journal *Plastik* published by the "Institut ACTE" in Paris, an "Art-Science" research unit, a joint-creation of the Sorbonne University and of the CNRS (Centre National de la Recherche Scientifique). Knowing about my doctoral research and subsequent research on the specific artistic movement of "ecological art" or "eco-art", the journal's publisher suggested that I contribute to a special issue on art and ecology. My contributed journal article was the occasion for me to revisit my insights on ecological art practices (both from the doctoral phase, when my focus was mostly on US-American artists, and from the post-doctoral phase in the years 2011-2013, including more recent empirical insights from Europe and Asia) in order to determine what are the main shared properties of the practice of ecological art, across and beyond the differences in approaches.

The seventh text ("Music and sustainability: organizational cultures towards creative resilience – A review") was born out of my efforts to expand my research on the arts and sustainability beyond the realms of contemporary art (which is largely interdisciplinary but remains historically rooted in visual arts and performance art), including specifically the art form of music. The text was also nourished by repeated exchanges with Prof. Dr. Volker Kirchberg over several years. Its production benefited from a preparation period whereby we first contributed to a one-day symposium on music and sustainability in July 2013 at the classical music festival in Hitzacker (Germany), and then contributed a paper (with an early draft of the published text) which I presented at the "1st ARTEM Organizational Creativity International Conference" at the ARTEM campus (a union of the Nancy Business School, Nancy Art School and Nancy Engineering School) in Nancy, France in March 2015. The article, published in late 2016 as a "review article" in the *Journal of Cleaner Production*, was to my knowledge the first explicit review of the art form of music in relation to sustainability, which was mobilising insights about music from a great variety of disciplines (including the sociology of the arts, cultural sociology, cultural studies, psychology, musicology, philosophy and anthropology) in order to make them intelligible and stress their relevance in the context of sustainability research. This transdisciplinary review article did not stay unnoticed, and is meanwhile cited by 13 other publications according to Google Scholar[3].

The eighth text ("Prefiguring Sustainability: Response-Ability & Spaces of Possibility"), written at the request of the IETM (International network for contemporary performing arts), was part of

[3] Available at: https://scholar.google.de/citations?user=5Ps0MeQAAAAJ&hl=en ; last accessed: January 31st 2019.

a publication meant to inspire the "ArtCOP21 Professional Workshop", an international gathering of cultural policy administrations (including the UNESCO and also the French Ministry of Ecology and Sustainable Development), arts organisations and individual artists, art managers and cultural producers, devising own commitments and strategies of the cultural sector to address global climate change. (I was also the General Rapporteur of this gathering, i.e. I observed its emerging direction and gave a synthetic conclusion as a speech at the end of the event at the Gaité Lyrique in Paris in December 2015, which also went into the organizers' final report, not discussed in this manuscript). The eighth text also includes some insights from the work that I did in 2014-2015 as a lecturer at the MOOC (massive open online course) "Managing the Arts: Marketing for Cultural Organizations" at the Leuphana Digital School, for the Goethe Institute (a MOOC at which I was also a member of the scientific advisory committee and of the project management team, and which obtained a "Comenius EduMedia Siegel 2015"). This text brings together the concerns of arts organizations, artists and cultural policy-makers seeking to address issues of sustainability, by discussing how urban arts organizations may mobilize contemporary interdisciplinary arts in opening up "spaces of possibility" for an urban society to explore and prefigure potentially sustainable futures. The text also constitutes, for this manuscript, an adequate transition to the third part, as it links my research on the arts and sustainability to my further research focus on cities.

The third part of this manuscript, which brings together my publications focusing on urban cultural and arts-related phenomena in their relationships to urban sustainability, is constituted of two main clusters of texts: Texts 10 to 13, published in between 2011 and 2016, show a first phase in the urban dimension of my postdoctoral research, whereby I was focusing on a critique of the "Creative City". Texts 14 to 18, published in 2018-2019, show the second phase where I focused more on the contribution of the arts to urban sustainability around the notion of "urban spaces of possibilities". All of these latter five texts stem from the "Stadt als Möglichkeitsraum" ("City as Space of Possibilities") research project (2015-2018), which I initiated and of which I was one of the four coordinators.

The third part starts with a ninth text ("Extreme Climate Events as Opportunities for Radical Open Citizenship") written in equal parts with Beatrice John, a then-doctoral student in Sustainability Sciences and colleague at an educational project at the Leuphana University Lüneburg. I include this text in part three of this manuscript because this text was the occasion for me to formulate an understanding of urban resilience that stresses the value of civil society's ability to draw from its self-organisation (drawing on historical examples of serious crises, from the Spanish Civil War to Latin America's crises of the late 20th century and to recent hurricanes in the USA). The development of self-organized and bottom-up approaches to urban sustainability is also an important characteristic of the urban cultural practices that I have been researching. As we suggest in this text, the value of self-organization may dramatically rise in importance in the future if climate change is to seriously destabilize the established formal institutions.

The tenth text ("Creative Cities and (Un)Sustainability: From Creative Class to Sustainable Creative Cities") dates back to 2011 and was my first journal-article publication dealing with the question of culture and sustainability in cities. The article (written with the assistance of Julia Hahn as second author, who was back then one of my students) also constituted my first articulation of a critique of the "Creative City" phenomenon (and especially of the "Creative Class" discourse of Richard Florida) and the emergence of a few elements for a re-definition of the creative city that would better relate to the development of cultures of sustainability.

Around the same time, I edited together with Katelijn Verstraete of ASEF, a final report (Kagan and Verstraete 2011) based on the results from the “Sustainable Creative Cities: the role of the arts in globalized urban context” workshop I had organized at the ASEF “Connecting Civil Societies” conference in Brussels in October 2010. Because that text is a “grey literature” report and a synthesis of the voices of many participants in the workshop I organized, I decided not to directly include it in the present manuscript. Nevertheless, it was the first extended publication in which I formulated a first working definition for a “sustainable creative city”, based on an earlier and shorter initial workshop concept paper, that I had authored in preparation to the workshop, with editorial reviews by several ASEF officers (Katelijn Verstraete, Anupama Sekhar, Qiu Yi Tan and Sabina Santarossa) and by Prof. Dr. Masayuki Sasaki of Osaka City University, circulated internally to workshop participants. Furthermore, the final report (Kagan and Verstraete 2011) contains several questions and critical reflections coming from the workshop participants, which inspired my further research on creative and/or sustainable cities.

This research direction was further elaborated, both theoretically and empirically (with a focus on the German city of Hamburg) in the eleventh text (“The roles of artists in the emergence of creative sustainable cities: Theoretical clues and empirical illustrations”), written in collaboration with Prof. Dr. Volker Kirchberg and published two years later in 2013. The publication of text 11 gave me the opportunity to articulate my understanding of cultures of sustainability towards urban development (drawing on concepts of resilience and serendipity) in relation to some of the discourses of critical urban sociology that Volker Kirchberg is working with, and in relation to the urban social movements involving artists in the city of Hamburg. The article was published as part of a Special Issue of the Journal *City, Culture and Society* on “The sustainable city and the arts” guest-edited by Volker Kirchberg and myself. We had made the preliminary editorial selection of articles submitted for peer review for that issue of *City, Culture and Society* from among the papers presented in the conference stream ‘‘Sustainable City and the Arts’’ at the 10th conference of the European Sociological Association (ESA) from September, 7 to 10, 2011, in Geneva, Switzerland (including a paper by myself and a paper by Volker Kirchberg, which both fed into the writing of text 11). I was also the first author of the “Guest Editorial” for that special issue (together with Volker Kirchberg as second author). I decided not to include the full guest editorial in this manuscript, but include now an extended excerpt characterizing the critical analysis I had reached and the questions I was raising by then (around 2012-2013):

“Nowadays, many official agendas propose and support kinds of artistic activities in contemporary ‘creative cities’ that raise serious concerns when considered under the perspectives of ecological, social and cultural sustainability. Reasons for this antagonism lie in the urban regimes’ often non-critical, positivist and uni-dimensional view on ‘creativity’. Too often, neo-liberally inclined public agencies limit their support of ‘creativity’ to, first, cases and objectives of ‘innovation’ as economic valorization (rarely achieved by artists), second, an instrumentalization of local artists and art movements and art institutions to form a brand of an ‘artistic creative city’, and, third, to the accelerating of gentrification processes through, e.g., temporary spatial artistic uses. None of these reasons to assist artists and their artistic production coincide with an enlarged rationale of urban sustainability. In fact, urban public policies and support for arts and culture, if they exist at all, still often tend to eschew the topic of sustainable urban development” (Kagan and Kirchberg 2013: 121). Among the questions raised in the guest editorial about an “engagement with a sustainable city” were: “How much do urban artistic initiatives and projects relate to issues of sustainability and sustainable creativity? What is a ‘sustainable creativity’? How much does sustainable urban development, formulated and implemented by artists and their facilitators, relate to creative city concepts? What are the implications of sustainability concerns into urban artistic discourses, urban artistic practices and urban cultural policies? How do artistic initiatives and projects relate to the emergence of sustainable cities and sustainable urban development?” (Ibid.).

The twelfth text ("The City is our Anthropo-Scene! Art as a Verb and Urban Sustainability Transformation") constituted an effort to transfer, reframe and reconsider the insights from this research direction in the different context of the City-State-Island of Singapore. The opportunity was given to me to conduct a short exploratory empirical research in Singapore, being allowed to freely interview two dozen artists, arts organizations and Singapore-based researchers over a period of nine days, ending with a keynote speech I gave at the "iLight symposium" of the iLight Art Festival, organized in March 2014 by Ong & Ong Architects and commissioned by Singapore's Urban Redevelopment Authority (URA). This short research stay and my keynote Speech held at the URA also resulted (besides the publication of text 12) in a short newspaper article (not included in this manuscript) in Singapore's official daily newspaper *The Straits Times* (April 10th 2014), entitled "Let artists shape a resilient city", whereby I was striving to encourage a shift in Singapore's cultural policy towards creative resilience, with more tolerance for indeterminacy. (As the supportive public response from a nominated Member of the Singaporean Parliament, as well as my newspaper article's circulation and informal echoes within Singaporean ministerial circles – as was later reported to me – demonstrated, my intervention did manage to stimulate the Singaporean public debate in the intended direction, despite the imposed shortness of the newspaper article and the minor editorial censorship it was subjected to.)

The thirteenth text ("The Emergence of Creative Sustainable Cities") resulted from a guest speech I gave at the HafenCity University of Hamburg in September 2014, as part of the Hamburg-Copenhagen City Link Congress: "Cities, culture & sustainability". The speech and the publication gave me the opportunity to share some further comparative empirical research insights stemming from several short research stays in nine cities around the world: In the years that immediately followed the empirical focus on Hamburg (as visible especially in text 11), I did several short empirical research stays in cities in Asia (Bangalore, Mumbai, Singapore as mentioned above, and Seoul), Europe (Köln, Hannover, Cluj-Napoca and Oslo) and the US (New York City). During these exploratory research stays, I interviewed artists, arts organizations, researchers and other local experts of the respective cities' cultural sector, who all were involved in one way or another with issues of ecology, sustainability and urban development. This exploratory and international empirical work allowed me to further reflect the notion of a "sustainable creative city" in its concrete cultural and artistic articulations around the world – coming to replace it with the notion of a "creative sustainable city" and also coming to re-focus my research onto the phenomenon of "urban spaces of possibility" – which would become the conceptual centerpiece of a subsequent research project (see texts 14 to 18).

The fourteenth text ("Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations") was the first common publication from several researchers at the three years (2015-2018) empirical research project in Hannover (Germany) called "Stadt als Möglichkeitsraum" (acronym "SaM", i.e. the city as a space of possibilities), of which I was one of the four main/coordinating researchers in an Inter-Faculty project consortium[4]. I had been seeking to obtain funding for a research project to research art and sustainability in the city of Hannover already since 2012, when Janika Millan, a colleague who had been part of our team from the "Radius of Art" conference at the Heinrich Böll Foundation (in the preparation of which I had authored text 2, as mentioned above) started working as a municipal officer at the city's Cultural Office and initiated projects on "arts towards cultures of sustainability" (directly inspired by the conference stream I had coordinated in Berlin and by my essay, i.e. text 2). Janika Millan also pointed me to several relevant artists and projects in the city. When the State of Lower Saxony announced its new "Science for Sustainable Development"

[4] together with and at the same level as three university professors: Prof. Dr. Volker Kirchberg from the Faculty of Cultural Research, Prof. Dr. Ute Stoltenberg from the Faculty of Sustainability, and Prof. Dr. Ursula Weisenfeld from the Faculty of Economics, all based at Leuphana University Lüneburg. Each of us led one research area, and Prof. Dr. Kirchberg was the "Speaker" of the Consortium.

research funding focusing especially on research in Lower Saxony, Prof. Dr. Volker Kirchberg and I saw the opportunity that this was offering to develop the research project I was aiming for. We found within the Leuphana University Lüneburg two strong allies with whom to develop a research proposal consortium, in the persons of Prof. Dr. Ute Stoltenberg, who had a long experience and expertise in the field of Education for Sustainable Development (and had been one of the founders of the Sustainability Faculty at the University of Lüneburg), and Prof. Dr. Ursula Weisenfeld, whose expertise in the field of institutional innovation and institutional entrepreneurship also proved to bring an invaluable perspective to the overall research project. I personally had started doing preliminary exploratory research in Hannover already in 2013 and 2014 (on my own account), and once our project was funded, we immediately started the SaM project in February 2015, which lasted until mid-2018.

I coordinated text 14, which was our first occasion to share our growing understanding of urban spaces of possibilities in the small niches of an urban society, as well as our questions and first insights regarding the relations of such spaces to wider processes of institutional innovations for sustainable urban development across a whole city.[5]

The fifteenth text ("IHM-agining sustainability: Urban imaginaries in spaces of possibility") is a contributed chapter in the *Routledge Companion to Urban Imaginaries*, which allowed me to share empirical insights from the research area I coordinated within the SaM project (namely: "creative and artistic practices for a sustainable urban development") pertaining to the specific research question of imaginations and imaginaries of sustainability. The chapter gives detailed insights on the imagination and imaginaries of a number of artists and cultural actors in one district of Hannover. It also explores how the imagination and imaginaries of sustainability at play among several grassroots organizations, initiatives and arts-related groups in Hannover, relate to their emplaced and place-making activities in the city.

Text 15 represents however only a specific perspective on my empirical research results in Hannover. The "bigger picture" is then given in the following three texts (16, 17 and 18), all taken from the final book publication from the SaM project, published in January 2019 in German language (Kagan, Kirchberg and Weisenfeld 2019). Whereas the book's general introduction and conclusion (sixteenth and eighteenth texts) provide a synthesis that relates my research area to those of my colleagues within the overall research project, my individual chapter in the book, i.e. the seventeenth text in this manuscript ("Kreativ-kulturelle und künstlerische Praktiken für städtische Möglichkeitsräume"), is the most important publication reporting my empirical research of the period 2015-2018 on urban spaces of possibilities in Hannover, the one that provides a comprehensive account of the results from my own research area within the SaM project, bringing together questions of imagination and imaginaries, social creativity (i.e. the combination of individual creativity and collective creativity), entrepreneurship in conventions, indeterminacy and serendipity, and experimentation.

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[5] Interestingly, our article was published (in a typical double-blind peer review process) in the journal *City, Culture and Society*, which is welcoming of sustainability research, after an earlier version of it had been blocked by one of its anonymous reviewers in a different journal, the *International Journal of Cultural Policy*, a journal strongly defending sectorial cultural policies and directly opposed to our transdisciplinary conception of urban sustainability. (The *International Journal of Cultural Policy* was indeed then planning a special issue on the topic, which forced upon its authors a sectorial definition of "cultural sustainability" – as sustaining the arts and cultural sector through cultural policy – which is directly at odds with the integrative conception of sustainability shared by most sustainability researchers; and a sectorial definition which our initial draft article was also explicitly rejecting.) Beyond the anecdote, this incident illustrates the politics of research publications and the fallacy of any claim of "value neutrality" in academic journals. Different journals do not only impose specific (inter- and/or trans-) disciplinary, epistemological and methodological directions, but also (even if often not explicitly) specific political and ideological discourses.

The fourth and final part of this manuscript gathers my publications that focus on the epistemological and methodological questions about transdisciplinary research that have arisen on my research journey at the crossroads of the two main fields of the arts and sustainable development, and at the crossroads of the two academic worlds of cultural research (or "Kulturwissenschaften" in German) and sustainability research (or "Nachhaltigkeitswissenschaft" in German).

Text 19 is clearly older than the following ones in part four, and reflects back on a separate research project that I had coordinated in earlier years (back in 2008-2009, separately from my doctoral research). This specific text, published in 2012 (as the written elaboration of a presentation I gave at a conference about "transcultural science" organized at Leuphana University Lüneburg by Prof. Dr. Christa Cremer-Renz and Dr. Bettina Jansen-Schulz), after the completion of my doctoral research, and long after the completion of the empirical research it relates to, revisited one specific element in that earlier research project, namely the integration of one piece of artistic research within a wider sustainability research project. I wrote this text as a reflection on this earlier practice, allowing me to more generally start to more explicitly articulate the question of how artistic research may be integrated in sustainability research.

Text 20, a contribution in the *Journal of Science Communication*, was published three years later, in 2015, in the context of a collaboration conducted between the Hamburg art school HfbK and climate scientists at a research center in Hamburg. This text (which emerged from a visit and conversations with the Hamburg-based artists and scientists) resulted from my dissatisfaction with the outcomes of such collaborations as the one I witnessed in Hamburg. Interrogating the assumed challenges of the exchange of art and climate science, this text traced a first sketch of the possibilities for more profoundly transdisciplinary research.

This first sketch, however, was still very limited, and by that time (around 2014), I perceived clearly the necessity for me to develop a more precise and detailed discourse on the question of art's contribution to sustainability research, and started working on it, over a couple of years. This was the process that led to the production of text 21, published in 2017 in the *Transdisciplinary Journal of Engineering & Science*. The journal was not chosen accidentally, as this is the journal chief-edited by Basarab Nicolescu, whose meta-theoretical approach to transdisciplinarity has the required epistemological depth and openness to enter in a fruitful dialogue with artistic and arts-based approaches to knowledge, learning and research, unlike the more widespread understanding of transdisciplinarity currently dominating sustainability research (see the following couple of pages). The twenty-first text thus investigates in detail what are the specific qualities of arts-based research as a different approach to conducting research, and relates this approach to the goals of transdisciplinary hermeneutics (as discussed by Basarab Nicolescu and by Hans Dieleman). This text also considers the epistemology of artistic and arts-based approaches from a queer perspective, i.e. a perspective informed by a queer-theoretical reflection on art.

Text 22 (accepted for publication, upcoming in 2019 in the *Austrian Journal of Sociology*) reflects a subsequent step in my research that made me reflect further, both on the importance of imagination for sustainability research itself, and on the distinct imaginations and imaginaries at play in different approaches to sustainability research. This further reflection, touching upon the sociology of knowledge, of science and of emotions, allows to better contextualize the programmatic ambitions of the previous text and more generally of an arts-based approach to transdisciplinary sustainability research. This reflexive work was directly stimulated by exchanges with Prof. Dr. Regine Herbrik, whose sharply critical views of sustainability science as practiced for example at Leuphana University Lüneburg's Sustainability Faculty were opened

to a creatively critical dialogue in a workshop (entitled "Seeming To Be To Become Reality: Sustainability – A Normative Fiction In Art, Science And Society") organized by Regine Herbrik in 2016 at Leuphana University's Interfaculty Center for Methods.

The remaining five texts provide a more specific account of arts-based methods as I used and developed them over the past years, throughout my postdoctoral research. The twenty-third text introduces a collective corporeal game I developed. My specific methodological research question for the development of this game was how to develop a performative format allowing the embodiment of qualitative complexity. This question had been initially suggested to me by Prof. Dr. Paul Shrivastava back in 2011, when he had invited me as a guest speaker at the "Midi de la Recherche" in the framework of his "Chaire Arts & Sustainable Enterprise" at the ICN Business School, Nancy (France). In the feedback round following a series of systems thinking games I had been animating at that occasion (next to my lecture), Shrivastava was asking me why I was still using the games by Dennis Meadows and Linda Booth-Sweeney, i.e. keeping to systems thinking and cybernetic models in this practice, whereas my own theoretical work was already operating at another level, involved in qualitative complexity after Edgar Morin. After a few years of maturation, I thus started (from 2016 onwards) to develop, experiment with and practice a modified game design that would allow the extension of the embodied processes to reach for an experience of qualitative complexity.

The other four texts focus on the practice of walking-based research and on walking formats as methodological tools. The first of these four texts (text 24) gives an autobiographical overview of this part of my postdoctoral research, i.e. my practice of walking and how I integrated it in my research. It was published in January 2019 in the journal *World Futures*. An earlier draft of text 24 had been prepared as a contribution to a book project (that did not get completed) coordinated by two artists-researchers of the *Footworks* research group attached to the UK-based 'Walking Artists Network' (both of which I am a member of, and in whose walking-workshops I took part at several occasions in my postdoctoral research phase). Among other things, the initiation of that book project (and of my chapter in it, which later turned into a journal article instead) lied in the conference "Where to? Steps towards the future of walking arts" organized by the same artists-researchers in 2015 at the Falmouth University. Another peculiarity of this twenty-fourth text is that it constitutes in itself an effort to include arts-based elements (and queering elements) in the very text itself, though published for an academic journal. This I did with the encouragement of the journal's editor, Dr. Alfonso Montuori. The other three texts (texts 25, 26 and 27) give concrete illustrations of walking-based research (which resulted from a variety of walking formats used as methodological research tools), which were published as short texts in the final book publication of the SaM project (Kagan, Kirchberg and Weisenfeld 2019).

My postdoctoral research from 2011 to 2018, as retraceable through the collection of texts presented in this manuscript, revealed itself as a journey allowing me to establish and deepen an approach to transdisciplinary research on questions of culture and sustainability. This warrants a few more words about how my own research trajectory relates to transdisciplinarity, and about the kind of transdisciplinarity that is involved.

In the course of my PhD research (from 2006 to 2010), my entry into transdisciplinarity came through the work on qualitative complexity that has been done by Edgar Morin from the 1970s up to the 2000's in his Opus Magnus, a series of six books entitled *la méthode*. Earlier, as a student of "Sciences Po Bordeaux" in France, I had been academically trained first in a merely multidisciplinary environment, i.e. a model of study and research where a variety of disciplines

and subdisciplines cohabitate neatly with each other, but do not really engage or relate with each other with any significant depth. My further studies in "cultural economics and cultural entrepreneurship" at a MA at the Erasmus University Rotterdam had then given me a glimpse of a more genuine academic exchange and mutual enrichment between disciplines, i.e. a practiced interdisciplinarity. In parallel, my interest in sustainability research brought me to systems thinking and different systems theories (Dennis and Donella Meadows, Gregory Bateson, Niklas Luhmann, etc.). Through this avenue, I eventually came to Morin's work (which develops a qualitative understanding of complexity reaching far beyond the limitations of systems theories) and to Basarab Nicolescu's approach to transdisciplinarity. Yet while my doctoral research was increasingly sailing towards this understanding of transdisciplinarity, which I am still further developing to this day, I of course noticed over the years that most sustainability researchers (and especially those who increasingly came to call themselves "sustainability scientists") were following a rather different discourse of transdisciplinarity, championed most articulately at the ETH in Zurich, and largely disconnected from (and sometimes even rejecting the insights from) Nicolescu's approach. It became soon clear that the two approaches were diverging in epistemological and even ontological terms. So, I realized that there were several research cultures of transdisciplinarity, and that especially those clearly distinguishable two research cultures, institutionalized respectively at the CIRET in Paris around Nicolescu, and at the ETH in Zurich around the emerging research field of Sustainability Science, were offering two distinct potential pathways to my research interest. To replace my own work (to be found in the remainder of this manuscript) in this context, I will now end this introduction with a short overview of these two research cultures.

Back in 1970 the word "transdisciplinarity" appeared in France in an exchange between Jean Piaget and Erich Jantsch, at the international workshop "Interdisciplinarity– Teaching and Research Problems in Universities," organized by the Organization for Economic Co-operation and Development (OECD). The notion was about the hope of recovering a kind of unity of knowledge and recovering from the course of a fragmentation of disciplinary knowledge. There was not so much use of the term for a while (while Edgar Morin's work on qualitative complexity was meanwhile published and starting to gain influence in southern Europe and Latin America; and Morin was also already using the term back then, but without further defining it), until it reemerged in the second half of the 1980s and the 1990's, and then grew into several parallel streams, two of which were to be institutionalized at respectively the CIRET and the ETH. These two parallel streams also followed relative divisions of language: While the former, championed by Nicolescu from the start, was especially active in the French-speaking world, in Rumania and in Spanish-speaking countries (i.e. the Iberic Peninsula and several Latin American countries), the latter grew especially in German- (and soon English-) speaking countries.

These developments were happening in parallel to growing calls for "science society partnerships" (with the goals to develop knowledge together and bring about positive social changes), while the Rio de Janeiro UN Earth Conference and its Agenda 21 were pushing forward a global sustainability agenda. The situation for researchers was an apparently paradoxical one, whereby technological developments brought contemporary challenges to sustainable human development, involving great complexity, which science was being asked to resolve, while these technological developments were partly a result of the strong specialization and fragmentation of the sciences.[6]

[6] Behind this paradox, one can argue about the logic of the hegemonic order of a "technological system" as especially Jacques Ellul did (see chapter 1 in Kagan 2011).

The problems lied not only in fragmentation but also in simplification: “Disciplinary processes emphasize the […] simplification of a research object (i.e. the perspective on this object). The problem is that complex reality resists simplification [...] In multidisciplinarity objects are still analyzed individually, or neatly separated, in a number of disciplines. With the result that the scientific treatment (and logic) of the object is without contradictions” (Kirchberg 2012). Nearly all approaches to transdisciplinarity are rooted in the realization that disciplinary (and to some extent, inter-disciplinary) science, cannot meet the challenges of unsustainable human development. Transdisciplinarity is an approach to research that is clearly oriented towards society and towards the lifeworld ('Lebenswelt').

Some common elements are shared by these different transdisciplinary approaches:

Transdisciplinarity generally recognizes uncertainty and incompleteness as an unavoidable condition that research is facing. Thus transdisciplinarity opens itself to perspectives and insights from outside the boundaries of science, and to collaborations with actors from outside the disciplinary borders of academia. In this way, transdisciplinarity always strives to involve a constant learning process that mutually affects all actors. (However, where and how far the learning process is reaching, differs depending on which transdisciplinary research culture is involved.)

The goal of transdisciplinarity is not merely to explain reality or understand the world, but also to change or even transform it. (Therefore, no claim of so-called “value neutrality” is found in transdisciplinary research. Transdisciplinary research assumes its normativity and abandons the scientific *illusio* of value neutrality.) Transdisciplinarity recognizes the insights from the sociology of science showing how science is context-dependent and influenced by cultural, political and economic contexts. Most transdisciplinary researchers have abandoned the belief in an “objective science” cleansed from subjectivity and interests. The works of Bruno Latour, Donna Haraway and others in the social and cultural sciences, but also the works of quantum physicists on the relations between observation and the actualization of reality, have all played a role in bringing about this realization. Transdisciplinarity is therefore, across its different streams and traditions or schools, a case of what Gibbons et al. (1994) characterized as “mode 2” research. “Mode 1” research (i.e. mostly disciplinary research) looks for universal principles to explain phenomena. “Mode 2” abandons that claim and instead recognizes the context-dependency of science. It does not try to reach some absolute knowledge. Another important difference between mode 1 and mode 2 research is that mode 1 research is very satisfied with using a language that is both meant to be understood by the disciplinary peers, and meant to extirpate itself from the polysemic dirt of common language and the 'Lebenswelt'. Mode 2 research language, however, is not intending to further contribute to this “atomization of consensual knowledge” (Kirchberg 2012). So mode 2 research has to deal differently with language too. Transdisciplinarity implies transgressing several disciplinary norms, to create new knowledge, and it requires relinquishing certain claims of sovereignty by individual disciplines. It thus implies for researchers to behave as poachers rather than as licensed hunters.

The difference between interdisciplinarity and transdisciplinarity is sometimes described with the image of a mosaic. Interdisciplinarity allows looking at individual relationships between individual pieces of the mosaic and getting them together. But it is with transdisciplinarity that broader views of the mosaic are attainable, allowing to interpret possible motifs in the overall mosaic. However, I do not find that image fully satisfactory, because “interdisciplinarity is built on overlapping understanding and consensus [and it] searches for coherent, compatible knowledge. […] It is possible to create a synthesis of these findings. Transdisciplinarity on the

other hand is built on the confrontation of different, even contradictory, findings. This confrontation will not necessarily end in consensus" (Kirchberg 2012).

Nicolescu's efforts to develop transdisciplinarity, with the participation of Edgar Morin and of others, took form in the late 1980's. In 1987 the CIRET (Centre International de Recherche et d'Études Transdisciplinaires) was created. A keystone congress of transdisciplinarity was held in 1994 in Arrabida, Portugal. This approach considers that "transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline. Its goal is the understanding of the present world" (Nicolescu 2002: 44). This approach strives to find back a "unity of knowledge", but a complex unity of knowledge, without falling into the all-too-easy trap of a simplifying, reductionist or holistic theory of everything.[7] At the core of this approach, Nicolescu proposes a set of transversal principles founding a shared epistemological basis for a transdisciplinary methodology (while being very open to a great diversity of methods), which can be summed up with Nicolescu's three axioms, based on the earlier work of Stéphane Lupasco[8]:
1. *Ontological Axiom*: The real is constituted of different "levels of reality" (Nicolescu 2002) or "levels of reality of the object" (Nicolescu 2014), to which correspond different "levels of perception" (Nicolescu 2002) or "levels of reality of the subject" (Nicolescu 2014).

2. *Logical axiom*: The passage from one level of reality to another level is insured by the included middle. (With this "included middle", a logic of contradiction can exist across two levels of reality while at the same time the principle of the excluded middle is maintained within a single level of reality.)

3. *Epistemological axiom*: The structure of the totality of levels of reality is a complex structure: Every level is what it is because all the other levels exist at the same time.

To access and relate to different levels of reality, we need to work with different organs or instruments of perception, which include techno-scientific instruments (such as the telescope and the Large Hadron Collider) but also intuition, emotions, symbolic thinking, aesthetics and the arts, meditation, etc. Different disciplines of the sciences and the arts relate to different instruments of perception, in order to focus on certain fragments of one level of reality. However, one needs to contrast and assemble different organs and instruments of perception, across and beyond existing disciplinary research, in order to start entering a transdisciplinary research space. Indeed, "transdisciplinarity concerns the dynamics engendered by the action of several levels of reality at once" (Nicolescu 2002: 45). The main consequence of this approach is that transdisciplinary researchers need to cultivate the knowledge of different levels of reality by resorting to a diversity of ways of knowing and types of intelligence: analytical, emotional, embodied/sensory, intuitive, symbolic, meditative, etc. Here, Nicolescu finds great value in both "the artistic creative experience" and "the religious experience", which according to him "cannot be assimilated to [single] levels of reality" and instead are capable of "crossing levels" of reality (Nicolescu 2010: 29). (Hence, this approach to transdisciplinarity recognizes a special importance of the arts to any transdisciplinary research.) A further consequence then is also that the researcher herself or himself forms in many instances a constitutive part of her or his research field. The traditional subject/object separation then often needs to be overcome.

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[7] Hence, this approach is not proposing a holistic way of thinking that would merely "oppose thinking in terms of contradictions" (as misconstrued by several colleagues in sustainability science who may have misunderstood Nicolescu's overcoming of dichotomic thinking for a rejection of contradictions).
[8] I will not take the space to explain the consequences of Nicolescu's axioms in detail here. See Nicolescu (2002, 2014)

The other approach to transdisciplinarity, developed at the ETH (i.e. the Swiss federal institute of technology), is epistemologically less challenging for academics, but also epistemologically less open to the insights from arts-based research and artistic research (as I discuss them in detail in text 21). This is why I related less systematically to that approach in my own work. But as that approach is the dominant one among sustainability researchers, it requires my attention too. Furthermore, the main strength of this approach is its practice-oriented focus on collaborations with societal actors outside of the academic worlds. Therefore, this approach also came to play a role in my empirical research (in combination with the CIRET approach) for example at the SaM project (2015-2018).

The approach was developed from the early 1990's onwards, with a keystone conference held in 2000. It counts many followers in the sustainability research departments of universities such as the Arizona State University and the Leuphana University Lüneburg (where I was employed for thirteen years). This approach has a strong focus on joint problem-solving involving the participation of non-scientists, regarding problems at the triad of science, technology and society. These problems have to be societally relevant, and the knowledge generated has to be "solution-oriented [and] transferable to societal practice" (Lang et al. 2012: 27). The kinds of problems that interest this tradition of transdisciplinarity are so-called "wicked" and "ill-defined" problems (Rittel and Webber 1973) that involve much uncertainty and complexity, also in the different ways they are perceived from different perspectives, so that disciplinary and even inter-disciplinary research cannot address them adequately.

This approach to transdisciplinarity aims at generating three kinds of knowledge: (1) systemic knowledge about the origins and development of societal problems as well as their interpretations in society; (2) a goal-oriented, normative knowledge about desirable sustainability transformations; and (3) transformation knowledge about possibilities and processes of change, tactics and strategies. The learning processes involve "reflections, transformation of attitudes, the development of personal competence and ownership, along with capacity building, institutional transformations and technology development" (Hirsch Hadorn et al. 2008: 25). The learning process involves some learning for the scientist (from other scientists and from practitioners) but much of the learning is meant for the so-called "societal stakeholders". At least until recently, only limited attention was given to a potentially epistemic, or even ontological, transformative learning on the side of the scientists.[9] No epistemic reflection comparable to Nicolescu's was developed. In many research projects across the past two decades, this approach remained still little more than a kind of "interdisciplinarity +", involving collaborative research between academics/scientists, experts from public administrations and the private sector, NGOs and civil society, beyond the traditional "interdisciplinary" collaboration limited to academic disciplines... This "interdisciplinarity +" created a complexity that affects the different phases of the research process, the roles taken by academic institutions, the dissemination and implementation of results, and the links to education.

I now turn to some of the significant differences between the two approaches (hereafter called the CIRET and the ETH approaches for ease of language; however, I do not mean to imply that I am discussing *the only* approach to transdisciplinarity present at the ETH, as the ETH is a very large institution that also hosts further approaches to transdisciplinarity, which I do not discuss here).

[9] This changed slightly in recent years, as more exchanges and crossovers between the two approaches, as well as the epistemic interests of new researchers entering this field, started to develop. Besides, some sustainability researchers also work across the two approaches, such as e.g. Hans Dieleman in Mexico and Ulli Vilsmaier in Lüneburg.

The ETH approach is interested in the knowledge residing outside scientific disciplines in terms of professional knowledge and knowledge acquired from everyday experience in specific localities. However, unlike the CIRET approach, it is not deeply interested in different ways of knowing, and still maintains a hierarchy with scientific knowledge at its top (i.e. it involves only a limited epistemic opening). This is clear in the "Zurich definition" of transdisciplinarity from the 2000 congress: "The science system is the primary knowledge system in society. Transdisciplinarity is a way of increasing its unrealized intellectual potential and, ultimately, its effectiveness" (Häberli, Grossenbacher-Mansuy and Thompson Klein 2001: 4).

Basarab Nicolescu (2010) also discussed the differences between the two approaches. In his view, the two approaches would represent different ontological understandings of reality: He interprets the ETH approach as a "phenomenological transdisciplinarity" resulting merely in a "horizontal" complexity at one level of reality, the level of analytical thinking and knowing, whereas he sees the CIRET approach as a "theoretical transdisciplinarity" resulting in a "vertical" complexity aiming to link various levels of reality and corresponding levels of perception (while also dealing with horizontal complexity, and also involving collaborations with various societal actors).

The ETH approach remains most often a practice of research that focuses on the object of research alone (and thus most often leaves intact the mainstream assumption of subject/object dualism), whereas the CIRET approach more often questions the subject-object dualism and reflexively considers the subject-object interaction.

The ETH approach has a valuable focus on "real-world problems" whereas the CIRET approach sometimes runs the risk of becoming a largely theoretical and contemplative approach to the world, paying too little attention to pressing societal issues and "external" transformation of societal condition, while it pays much attention to the "internal" transformation of the human soul.

These two transdisciplinary research cultures are met with a number of challenges, that I also came across in my own research journey.

Each of the three kinds of knowledge sought after by the ETH approach (as noted above) has to meet specific challenges: While systemic knowledge has to deal with the great uncertainties of the wicked problems it confronts, goal-oriented/normative knowledge has to deal with conflicting values and views of what constitutes the common good, and transformation knowledge has to deal with issues of politics as well as policies. More generally, both of the two approaches to transdisciplinarity I discuss here are confronted with the same question: How to best interrelate and articulate (but without reductionism) scientific and non/extra-scientific knowledge, both in the production phase and in the dissemination phase of research processes? How to work with various and sometimes conflicting worldviews and paradigms? They approach the question differently insofar as, in my understanding, the ETH approach deals with the challenge especially in terms of science-society collaboration, whereas the CIRET approach deals with the challenge as a deeply ontological and epistemological one, striving to both avert reductionism (i.e. knowledge being reduced to one level of reality through the universalist claim of one 'theory of everything') and avert fragmentation, hence seeking a qualitatively complex unity of knowledge.

The divergence between the ETH and the CIRET research cultures expresses a tension between the urge to solve 'real world' problems (especially among sustainability researchers) and the need to fundamentally question and challenge deeply ingrained worldviews. As my own research development (unfolding in the texts of this manuscript) brought me to consider, to overcome that

divergence and achieve any meaningful articulation of the two approaches, researchers will need to consider a much more open, much more challenging realm of "solutions" than what has been effectively practiced by sustainability researchers working with "Problem Based Learning" frameworks. (My own response to limitative frameworks such as Problem Based Learning is to be found especially in the fourth part of this manuscript.)

The search process of sustainability requires that transdisciplinary researchers work on all knowable levels of reality, and do not conveniently leave out the levels that researchers are less comfortable with. However, this is exactly what happens: Much research deploying problem-based learning within the ETH approach ignores the more-than-rational levels, while some research within the CIRET approach over-emphasizes certain levels of reality and especially a certain level of perception (sometimes labelled as spiritual, religious, or transcendental) – even though Basarab Nicolescu himself regularly warned against that risk and insisted that "no level of Reality constitutes a privileged place from which one is able to understand all the other levels of Reality. [...] In other words, our approach is not hierarchical. There is no fundamental level." (Nicolescu 2010: 26). The need to find a dynamic balance of "unitas multiplex" (Morin 1977: 105) is always a difficult challenge, in both research cultures, which requires constant self-critical vigilance.

One specific difficulty for sustainability researchers in this regard has to do with their normative, ethically and politically motivated missionary attitudes: These motivations, together with the alarming science-based knowledge about extreme ecological crisis (climate change, species extinction, etc.), generate an (understandable) sense of urgency that often causes the researchers to enter into so much obsession with the (very real) urgency of the problems, that the sustainability researchers then aim to deliver solutions with a great sense of haste. In such situations, the researchers then tend to effectively discard qualitative complexity (or pay only lip service to it). Furthermore, in such situations, when the researchers do involve artists, researchers then tend to seek out for the more straightforward artistic expressions with one-dimensional messages (or to misinterpret the artistic work in a reductive way). Then, the artful inquiry and the dialogues of knowing (to which I am pointing in my publications) are not provided the required cognitive space to unfold. If such an unfortunate development were to take durable root, the young field calling itself "sustainability science" may eventually become merely one more interdisciplinary silo of academia's history. Meanwhile, among academics and independent researchers inspired by Nicolescu's work (but misunderstanding Nicolescu's characterization of the transreligious), as well as by some other approaches (e.g. researchers inspired by Ervin László's discourse, which I already critically reviewed in Kagan 2011, by Rudolf Steiner, or by Ken Wilber)[10], certain sectarian-spiritualist drifts can be observed, in the name of "more-than-rational" knowing and of an epistemic critique of science and praise for alternatives to Western/European/Global-North epistemologies and ontologies.

Yet another challenge faced by transdisciplinary research is an issue of language: Despite their stated ambition to bridge across the divides of different ways of knowing (proclaiming themselves as "mode 2 research" as noted above), transdisciplinary discourses (especially in the CIRET approach, but also in the ETH approach) tend to develop their own esoteric-sounding languages. This development is unavoidable, as the researchers need to develop a language that allows them to reach a meta-theoretical mutual understanding. However, next to the theoretical language needed to address qualitative complexity, transdisciplinary researchers also need to practice a more accessible language that continues to exemplify qualitative complexity while allowing to dialogue with communities of practice involved in concrete "real-world" problems. This challenge can also be felt in the following pages, across my own texts collected in the

[10] For example in the case of László, I criticized (in Kagan 2011) his over-emphasis of natural evolution towards order, which is related to a simplifying spiritualist discourse.

present manuscript, as I have been striving to accomplish such a balancing act across my postdoctoral publications (resulting in the use of different levels of language in different texts).

The publications collected in this manuscript demonstrate my efforts to contribute to a transdisciplinary research on culture, arts and sustainability that may meet these challenges, learning from the potentials and the pitfalls of two (CIRET and ETH) transdisciplinary research cultures.

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PART 1: Culture(s) and Aesthetics of Sustainability

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Culture and the arts in sustainable development: Rethinking sustainability research

Abstract

Over the past two decades several discourses around sustainable development and sustainability introduced a cultural component. Among the main clusters of discourses that emerged are (1) establishment of culture as a "fourth pillar of sustainability" and formulations of a "cultural sustainability", (2) identifications of "culture(s) of sustainability" and (3) articulations of a "cultural dimension" of sustainability or sustainable development. These discourses also intersected or converged with approaches relating the arts and aesthetics to theoretical and practical aspects of sustainability.

At the intersection between wider considerations of "culture and sustainability" on the one hand, and a more specific interrogation of relations between "the arts and aesthetics and sustainability" on the other hand, emerge a number of cultural-scientific (*kulturwissenschaftliche*) insights and issues. The importance of imaginaries, of imagination and of aesthetics of complexity becomes salient, as well as the interface of memories and futures. The arts, aesthetics and a culturally sensitive approach to social-scientific research then reveal the potential for a transdisciplinary advancement of sustainability research, laying the ground for an "artful sustainability" research beyond the limitations of the young neo-discipline of "sustainability science".

***Keywords**:* cultural sustainability, cultural dimension of sustainable development, culture(s) of sustainability, arts-based sustainability research, procedural sustainability

Introduction

In policy discourses concerned with sustainability/sustainable development (besides any policies specific to the "cultural sector"), such as policies for sustainable urban development, culture is considered only marginally. However, there is a growing awareness of some of the functions attributed to culture: When culture is understood as a prerequisite for social change, the functions attributed are those of value-system, mode of place-making and identity-building (Barthel-Bouchier 2012; UNESCO 2013a; Lehmann 2010). When it is seen as a motor for transformation, its functions are to enable creativity and engagement (James 2015; UN Habitat 2013; UNESCO 2013a, 2013b). When it is perceived as a social challenge, its functions relate to cultural diversity and multi-ethnicity (DifU 2011; Meuleman 2013). Further attributed functions of culture relate to "well-being", "happiness" and sustainable ways of life away from consumer culture (UNESCO 2013a; Davies 2015).

The groundwork for this growing attention to culture came from an increasing number of discourses about culture and sustainability, carried out by professional, academic and policy-related actors. In the years that followed the Brundtland Report and the 1992 Rio UN Summit, a minoritarian – albeit growing – discursive arena emerged that gave space to arguments for a greater attention to culture in sustainable development policies, discourses, practices and research. Unsurprisingly, actors from the cultural sector and cultural policy were involved in this

development, and one UN agency that supported this trend from the start was UNESCO. The UNESCO Summit on Culture and Sustainable Development in 1998 was the result of a process that lasted several years. Under the title "The Power of Culture", it proclaimed in general terms the interdependence of culture and sustainable (mainly economic) development. Over the following decades, several discourses around sustainable development and sustainability emerged that introduced a cultural component, in a variety of ways (see section as follows).[11] Furthermore, an imaginative and arts-informed approach to sustainability has also emerged, which has gathered a growing attention and bears promising potentials for the rethinking of sustainability (see second section).

Four expressions of the relation between culture and sustainability

One type of discourse that champions the integration of a cultural component into sustainability does so around the notion of culture as a "fourth pillar of sustainability". The expression was explicitly foregrounded as the title of a publication by Australian cultural policy analyst and community arts advocate Jon Hawkes in 2001 (*The Fourth Pillar of Sustainability: culture's essential role in public planning*). His four pillar model of sustainability stressed cultural vitality as an important dimension, pointing at the inherent value of cultural diversity and of a vibrant cultural life amongst human communities, necessary to quality of life (Hawkes 2001).

Hawkes' discourse is connected to the policy field of "cultural planning", which emerged in the 1980's in the US in urban and regional policy, and was further articulated in Europe from the 1990's onwards as a trans-sectoral approach to policy-making, in particular by Franco Bianchini (1993). It is also connected to "community cultural development", which is a North American term for policies supporting community arts and the cultural practices of communities under a logic of "cultural democracy" and human development (see Adams and Goldbard 2001). Both policy fields are based on a rather wide (anthropological) definition of culture as way of life and of cultural practices as rooted in the everyday lives of local communities.

The fourth pillar discourse was taken up by other protagonists, including "United Cities and Local Governments" (UCLG), an international organization federating local governments, which since the mid-2000's has been advocating (with its "Agenda 21 for Culture") for the strategic positioning of culture (and culture-related policies) as a "fourth pillar" for sustainable development in its own right, i.e. not only as an instrument for achieving goals related to the ecological/environmental, social and economic "pillars" but also as an own domain, acknowledging cultural goals for human development (UCLG 2004). Indeed, the development of a rich, historically grounded, creative and lively culture is as important to the sustainable development of human societies as a rich and evolving biosphere, an economy that meets human needs, and a society that is just and equitable for diverse social groups.

Another discursive development emerging from the late 1990's onwards – and eventually finding some common ground with the fourth pillar discourse – took the shape of discourses about "cultural sustainability", i.e. investigation/research into, and advocacy for aspects of culture that are deemed worthy of consideration from the perspective of sustainability, as well as research on the ways in which cultural processes and cultural institutions are sustaining human communities and societies, as well as landscapes and other natural-cultural ensembles. The term "cultural sustainability" is also sometimes used for investigations into "sustainable" processes and effects

[11] For an overview of the development of policy discourses on culture and sustainability over the 1990's and 2000's, see Duxbury and Jeannotte (2010).

located within "the cultural" field – which may lead back to a deleterious fragmentation and re-disciplining process, defeating the transdisciplinary ambitions of sustainability research. Meanwhile, some authors have also used the German equivalent of the expression "cultural sustainability", i.e. "kulturelle Nachhaltigkeit" (see e.g. Krainer and Trattnigg 2007), but in a way that conceptually bears more resemblance to the discourses of "culture(s) of sustainability" that I discuss later.

These sets of discourses stimulated the emergence of a research field on "cultural sustainability", hosting a diversity of themes, topics and approaches (from memory studies to speculative fiction, making links to pre-existing fields such as ecocriticism, geography and various branches of humanities and social sciences). As a result, the expression "cultural sustainability" has thus been used in varied ways over the past decade, and although no consensus emerged on one definitional framework, some international research networks have attempted to sort out the multiple understandings of cultural sustainability, such as e.g. the COST Action network "Investigating cultural sustainability" (Dessein et al. 2015).

In the meantime, while continuing to pragmatically use the term "pillar", Hawkes noted the difficulties that come with the use of such "a limiting and misleading metaphor" as that of pillars of sustainability/sustainable development, reckoning that "lens, framework, dimension or perspective offer a much clearer impression of the proposed applications of this conception" (Hawkes 2010: n.p.). A comparable direction, rejecting the sturdy symbolism of "pillars", had already been taken up in the late 1990's in Germany by several authors associated with the "integrative" definition of sustainable development, who explicitly rejected a "pillarized" discourse on sustainability and called instead for a recognition of a "cultural dimension of sustainable development" (Stoltenberg and Michelsen 1999; Holz and Muraca 2010; Holz and Stoltenberg 2011; Holz 2016). This discourse is related to the field of "Education for Sustainable Development", whereby the importance of cultural education and of a transdisciplinary, integrative approach to education, are heralded by the advocates of "the cultural dimension". According to this conception, one can never understand the integrative challenge of sustainability/sustainable development as long as one focuses solely on single dimensions taken separately from one another (be they environmental/ecological, economic, social, cultural or other dimensions). Indeed, the very question of sustainable development is one of a complex integration of different dimensions. Thus, any non-integrative conceptualization of sustainability that merely perpetuates the traditional modernist juxtaposition of sectorally conceived policies is a basic misunderstanding of the very question at hand.

In parallel to these developments, discourses also emerged that advocated and described elements, whether historical, contemporary or foreseen, of a culture/cultures of sustainability (Rowson 1997; Worts 2006; Nadarajah 2007; Brocchi 2008; Kagan 2010). Another term used by a comparable strand of discourse is "ecocultures" (Slack and Whitt 1992; Ivakhiv 1997; Böhm et al. 2014). The "culture(s) of sustainability" approach aims to identify the characteristics of cultures that are able to evolve and sustain human development in challenging environments, and especially able to learn from crises and transform themselves accordingly (Kagan 2012).

Discourses surrounding "cultures of sustainability" understand "culture" in the sense of a shared set of world views and value systems, and a shared symbolic universe. They argue that the move toward culture(s) of sustainability is comprised of several ethical and normative elements: "a fundamental shift in contemporary culture away from a hyper-consumption oriented, hyper-industrialised, hyper-modern culture and towards a culture infused with an understanding of and a respect for life in all its complexity; a culture empowering people to change their lives in order to re-invent another, more sustainable "good life" that is inclusive of human groups until now oppressed or disadvantaged" (Kagan and Kirchberg 2016: 1490).

They also identify an epistemological quality to such a cultural change, which involves developing a set of richer, more diversified and integrated skills, competences, capabilities, reflexivities and ways of knowing reality as a basis for re-inventing possible futures in an interand transdisciplinary search process (Dieleman 2008; Kagan 2011; Eernstman et al. 2012; Shrivastava 2012; Eernstman and Wals 2013). Social creativity (i.e. combining individual and collective creativity – cf. Montuori and Purser 1999), serendipity (Kagan 2012) and emergent cultures are central to the cultural change process advocated for in this discourse because “we need to learn to deal with complexity and uncertainty rather than learning a predetermined ‘sustainable’ set of values and behaviors” (Sandri 2013: 767).

Discourses on culture and sustainability have also been differentiated according to the normative frameworks guiding them. One attempt in this direction was made by Soini and Birkeland (2014) who conducted a systematic discourse analysis of peer-reviewed articles including the term “cultural sustainability” in the period 1997–2011 (i.e. focusing only on one of the key expressions I discussed earlier), and identified four divergent frameworks (conservative, neoliberal, communitarian and environmentalist). However, the discourses referred to previously do not necessarily exclude each other and often exist in hybrid forms, whereby the different expressions are often used interchangeably (also causing confusion). Common across most of the discourses on culture and sustainability is the thesis that sustainability transformation, across and beyond all its “dimensions” or “pillars”, requires wide-ranging cultural transformations (see e.g. Hawkes 2001; Brocchi 2008; Kagan 2011; Holz and Stoltenberg 2011). Furthermore, these discourses generally share the view (clearly articulated in Hawkes 2001) that sustainability goals should include the vitality of cultural and artistic expression in their definition of diversity, allowing for a rich cultural life and guarding against cultural homogenization (as could unfortunately happen under the goals of economic or ecological “efficiency”).

Culture, sustainability and the arts

All of the four directions introduced earlier (and most of the authors cited above) do involve the arts in their discussion of the relations of culture and sustainability, albeit in partly different ways and with different foci. The fourth pillar discourses usually advocate for the importance of renewed and extended support for the arts through strategically central cultural policies that would allow professional arts organizations as well as community arts initiatives to contribute to community cultural development. The cultural sustainability discourses often add a specific focus on the preservation and safeguarding of cultural heritage (also in relation to landscape preservation) and on cultural memory.

Discourses on the cultural dimension of sustainability, for their part, often stress the benefits of cultural education, including artistic, as part of an integrated approach to education for sustainable development, as well as the contributions of the arts to transversal and transdisciplinary thinking, ethical-reflection and research for sustainability. In a similar vein, the discourses advocating cultures of sustainability tend to focus on artistic research, arts-based research and artful knowing rooted in a variety of arts practices, as well as the role aesthetics plays as a form of experience (after John Dewey) and site of reflexivity (Kagan 2017). They are thereby striving toward new transdisciplinary qualities in the search for viable and desirable futures (Dieleman 2017). In this respect, some discourses on cultures of sustainability have focused their attention on a range of creative cultural practices: artistic practices rooted in the socio-ecologically transformative ambitions of “social sculpture” (initiated by Joseph Beuys and further developed by others such as Shelley Sacks at Oxford Brookes University); “ecological

art", with its complex aesthetic, cultural and research-like qualities (Kagan 2011, 2014); the cultural-ecological reflexive practice of ecocriticism in relation to literature and cinema (cf. Zapf 2016a, 2016b); and the political potential of recent "social practice" arts.

With regard to the part that I played in these discourses on the "cultural dimension" and on "cultures of sustainability", I have focused on the need to cultivate an "aesthetics of complexity" (Kagan 2011) and a culture of qualitative complexity as a core element for (inter)personal, social and civilizational developments. In my analysis, any culturally meaningful approach to sustainability should work with a "procedural" definition of sustainability (Miller 2011) where "sustainability is the emergent property of a discussion about desired futures" (Robinson in Miller 2011: 31), not a Brundtlandian "universalist" definition that aims to merely determine standards that can be agreed upon at the level of international organizations. A procedural definition recognizes and works with the unavoidable and necessary conditions of emergence, unpredictability, uncertainty and "situated knowledges" (Haraway 1988). Unlike universalist sustainability, it does not level out cultural difference but instead engages in a process of articulation, (re)interpretation and negotiation of cultural difference with respect to questions posed by global sustainability challenges (cf. Bhabha 1994). This then implies a departure from the illusion of direct control over the complex processes at play. (This analysis of mine is, however, not necessarily shared across the whole range of discourses relating culture and sustainability that I discussed earlier.)

In its procedural definition, sustainability is about re-inventing worlds, and is thus primarily a cultural project. The importance of imagination becomes salient, as well as the interface of memories and futures in the production of social imaginaries and in the constant (re)negotiation of diverse goals and priorities. Nevertheless, sustainability goals, even under a procedural definition, are not completely free-floating, nor reducible to a "culturalist" dimension. Rather they are bound to (1) consider all the dimensions of sustainable development and especially the interrelations (and contradictions) between them, and (2) acknowledge certain planetary conditions about which a wide scientific consensus exists, such as climate change and the massive extinction of species/biodiversity loss.

Consequently, I hold that the procedural definition of sustainability is best associated with complexity-based "culture(s) of sustainability". The "culture(s) of sustainability" approach offers a distinct way to deal with a crucial dilemma in the relationship between culture and sustainability, which is the relation between normative prioritization and cultures. Normative prioritization is a general question facing the diverse discourses of sustainability/sustainable development: On the one hand, the infrastructural dependence of humanity on the planetary biosphere demands a top-prioritization of the ecological dimension of sustainability, whereas the economy should be considered as a means to achieve ecological, cultural and social sustainability before considering economic ends in themselves. Hence Niko Paech's argumentation in favour of a prioritization whereby the ecological dimension is granted highest priority and the economic dimension lowest priority, i.e. the exact opposite of contemporary effective prioritization in international political practice (Paech 2006). On the other hand, this prioritization should not annul the importance of manifold normative goals and the need to strike balanced compromises between conflicting goals. As pointed out by Robert Hauser and Gerhard Banse, "if values such as life, infant mortality, nutrition, or the ability to adapt to changing environmental conditions are used as indicators of sustainability, the fictitious people living close to nature probably would not compare well with Western cultures" (Hauser and Banse 2011: 45–46).

Furthermore, the very normative value-construction of sustainability (with its principles of justice(s) and of responsibilities) is culturally determined (Hauser 2011), as are all interpretive frameworks by which we come to know reality. Therefore, in order to be able to conceptualise the mutual grounding of the ecological and cultural dimensions in one another, a meta-level must

be reached with a higher degree of complexity, where concepts no longer suffice, but “macro-concepts” (Morin 1977) come into play that allow a “dia-logic” (in Morin’s sense, not “dialogic” in Bakhtin’s sense) intellectual culture to emerge beyond the limitations of both logical positivism/critical rationalism and dialectics, and beyond the opposition of naturalism, culturalism and radical social constructivism. While there exist no “sustainable cultures” per se, as Hauser and Banse (and many others) argue, a complex, transdisciplinary (in the sense employed by Basarab Nicolescu) and uniplural culture(s) *of* sustainability is called forward that would allow both a planetary naturecultural co-piloting of the biosphere and a historically (and humanities- and social-scientifically) informed approach to cultural complexity.

The imaginative yet scientifically informed process that is called forward, one that is cultural yet recognizant of the non-human, entails a challenging and often uncomfortable search. It is a search which cannot succeed without the development of an acute sensitivity toward the manifold transdisciplinary “patterns that connect” (Kagan 2011) different dimensions of our planetary interdependencies. Training the capacity to perceive these patterns and to embrace a complex world without fear (and without the subsequent simplification that would result in ideological impasses) is what I have been pointing towards with the notion of an “aesthetics of complexity” (Kagan 2011, 2015a), which draws from John Dewey’s and Gregory Bateson’s previous works on aesthetics together with Edgar Morin’s paradigm of complexity. Deweyian aesthetics points at personal affectivity in everyday life experience and at a human being’s overall interrelationship with his/her environments. I associate it with Batesonian aesthetics as sensibility to the “pattern that connects”, i.e. a pre-ethical yet already transdisciplinary perceptivity for the linking patterns across different levels of reality, which can be further informed by insights from the arts and sciences. An aesthetics of complexity, as a co-evolving movement of the self in contact with the movements of the living world (cf. Merleau-Ponty 1969; Ingold 2011; Weber 2013), forms a basis for ethics, knowing and action through dynamic connections with a complex world that involve the body-mind through multisensorial (Pink 2015), emotional and cognitive processes in integrated ways. Complex interdependencies, tensions and interpenetrations between culture and nature are thereby perceived, involving cooperation, competition, antagonism and unity through mutual constitution rather than a simple dichotomic opposition (or a likewise simplistic, “holistic” unification of nature and culture).

From the perspective of an aesthetics of complexity, the arts and especially art as a form of enquiry and (re)search process into the qualitative nuances of the human experience of the world, bear special qualities. Arts-based approaches to enquiry/research elicit unusual ways of thinking about social and natural phenomena, through the stimulation of uncertainty, risk-taking, and confrontation beyond superficial and taken-for-granted understandings and meanings, “broadening and deepening conversations” (Savin-Baden and Wimpenny 2014: 79). An arts-based approach opens up new ways of asking questions and uncovers new questions to be asked (Leavy 2009: 12). It aims to make questions and enquiry more interesting, to “stimulate problem formulation” (Barone and Eisner 2012: 171), rather than to directly and unequivocally answer research questions and offer some “definitive” meanings, as it “revisits the world from a different direction, seeing it through fresh eyes” (Barone and Eisner 2012: 16).

Abandoning the claim to produce universal knowledge, arts-based research generates multiple perspectives on the questions it poses, which are rooted in multiple “attentions” (Mersch 2009: 37–38). Those attentions address complex and subtle interactions and they make them noticeable in the first place. This deepens our understanding of issues and makes it more (qualitatively) complex (Barone and Eisner 2012: 3). An “artful sustainability research” (Kagan 2017), integrating the qualities of artistic and arts-based research briefly evoked here, thus forms a desirable horizon for sustainability research and sustainability-oriented activism. Examples of the manifold insights and resulting innovative perspectives that can result from the involvement of the arts in the search process of sustainability already abound, for example in the works of

ecological artists over the past four decades (cf. Blanc and Ramos 2010; Kagan 2011, 2012, 2014; Weintraub 2012; Blanc and Benish 2016; Mayer Harrison and Harrison 2016; Demos 2016).

Procedural sustainability as a cultural project affects both the professional worlds of culture and the arts, and the worlds of sustainability research and advocacy/activism. It integrates arts-based enquiry into an artful sustainability research agenda while re-inventing worlds and rooting itself in an aesthetics of complexity. This results in potential opportunities and responsibilities for the professional "cultural sector" (i.e. the fields of cultural expression and arts production). Organizations working in this sector are potential bearers of "spaces of possibility" where alternatives can be imagined, experimented with, designed and directly experienced (Kagan 2016). "This is not just about professional artists (who of course can be very inspiring initiators), or about artists in social practice and communities (also playing essential roles), but it is also about sharing response-ability for more diffused artful doing and learning by local communities in spaces of challenging experience, imagination and experimentation" (Kagan 2015b: 29).

Arts organizations deal directly with meaning-making and structures of meaning, with world views and values, and with the histories and lives of cultural artefacts and intangibles (practices, traditions, non-written transmissions, etc.). Thereby, they contribute to memories and changes in the symbolic universe that we build and inhabit, as well as to place-making in the locations in which we dwell. They thus hold a share of responsibility regarding the ways in which individuals, communities and societies (do not) relate to their environments, from local to planetary scales.

Procedural sustainability as a cultural project poses a challenge to the business-as-usual of sustainability research (including the neo-discipline of sustainability science) and of sustainability advocacy, which both need to place social imaginaries at the centre of their attention and imagination at the core of their practice. Sustainability research and advocacy then need to integrate scientific and arts-based forms of research, learning and expression. Sustainability research requires a major qualitative shift in its transdisciplinary gravity point, away from its current claim to form a "sustainability science" as a kind of neo-discipline and towards the formation of an integrated research practice of artful sustainability.

Only a few of the leading researchers in this field have already realized this need and acted upon this realization. One of them is John Robinson, who was an early proponent of procedural sustainability as "a kind of discursive playing field in which [conflicting views] can be debated" and as "the emergent property of a conversation about what kind of world we collectively want to live in now and in the future" (Robinson 2004: 382). As Provost for Sustainability of the University of British Columbia, in Vancouver, Robinson launched in 2014 the interdisciplinary project "Sustainability in an Imaginary World" that developed an arts-based platform to collectively explore visions of possible futures with the hope of stimulating "deeper ontological and epistemological questions" on worlds-making, ideally "challenging ontological presuppositions" (Bendor et al. 2015: 54–55).

Another current project integrating artful sustainability is the "City as Space of Possibility" project at the Leuphana University Lüneburg (led by Volker Kirchberg, Ute Stoltenberg, Ursula Weisenfeld and myself). Our project investigates creative and innovative approaches to sustainable urban development in the city of Hanover, Germany. We look for physical, social and mental spaces where potentially sustainable futures are already taking some shape, emerging and experienced in today's urban society – involving networks or/and coalitions of various urban actors including artists and other cultural professionals and creative practitioners (and 'life-artists'), civil society and social movements, educationalists, local entrepreneurs, city-government administrators and policy-makers (Kagan et al. 2018). Other sustainability research projects incorporating an artful sustainability are being developed around the world (e.g. those by

Hans Dieleman in Mexico, Karen O'Brien in Oslo etc.). Early-career researchers pursuing this approach are starting to organize themselves (e.g. at the international Workshop-Conference "Realizing Potentials: Conversations and Experiments at the Frontier of Art-based Sustainability" held in Barcelona in November 2016).

Conclusion

Over the last two to three decades, a variety of discourses around sustainable development and sustainability have introduced and discussed culture in multiple ways. Beyond the differences, contradictions and confusions between different discourses (which I clustered in this text into four approaches: culture as a fourth pillar of sustainability, cultural sustainability, the cultural dimension of sustainability/sustainable development, and culture(s) of sustainability), certain features know a near-consensus among many (if not most) researchers: the importance of a rich and lively cultural heritage and cultural development for the vitality of human societies, and the need for wide-ranging cultural transformations in contemporary societies and polities that are excessively ruled by a narrowly conceived mainstream economic rationality. Most of these discourses also intersect by or converge with approaches relating the arts and aesthetics to theoretical and practical aspects of sustainability.

Some researchers stressed in particular the importance of social imaginaries (as pools of cultural resources), and of the human imagination (as a generative principle) as engines for potential social transformations. This direction can be engaged with through procedural sustainability, understood as a cultural project. Furthermore, to deal with the complexity of sustainability's multiple challenges, a cultural continuous-learning process rooted in an aesthetics of complexity allows an embrace of qualitative complexity, rather than a simplifying response strategy reinforcing illusions of control, as do certain discourses of the so-called "anthropocene" and certain solutionist sustainability discourses.[12] Within this process, artistic and arts-based practices of (re)search offer opportunities to both develop imaginative approaches and deepen the qualitative enquiry into complexity. Cultural-academic and artistic-discursive reflections and their critiques of social developments, including critiques of sustainability and sustainable development, may sometimes allow a more challenging and thus more diverse and deeper reflective process than do the usual academic fora of sustainability research. However, a more detailed discussion of this aspect would fall outside the space available for this text.

In this sense, the discourses and research investigating the relation between culture, the arts and sustainability/sustainable development not only constitute a valuable sub-theme for specialized researchers and for cultural practitioners interested in this intersection. They also offer a crucial opportunity for sustainability research to realize the potential of a deeper epistemological programme of transdisciplinarity, in order to help re-orient human development with more inventive, imaginative and challenging reflective approaches and practices, beyond the limitations of an engineering of sustainability-solutions into which sustainability science may otherwise trap itself.

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[12] A discussion and critique of these complexity-obscuring trends lies beyond the scope of this text.

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Toward Global (Environ)Mental Change: Transformative Art and Cultures of Sustainability

[The Preface to the original publication, authored by Heike Löschmann, then Head of the Department for International Politics at the Heinrich Böll Foundation, is not included here.]

Introduction: Toward Global (Environ)Mental Change

The global crisis of unsustainability is not only a crisis of the hardware of civilization,it is also a crisis of the software of minds. The search for a more sustainable development in the 'developed' world has, so far, been focusing too much on hardware updates, such as new technologies, economic incentives, policies and regulations, and too little on software revisions, that is *cultural transformations* affecting our ways of knowing, learning, valuing and acting together. The cultural software is, nevertheless, at least as much part of the fundamental infrastructure of a society as its material hardware.

We need a *global (environ)mental change*, that is a transformation process to affect the many relationships between our minds and their environments. There are several environments to the conscious mind, such as the subconscious, the shared culture(s) and the natural environment. They are not all just environments, but also part of our minds. This is a bit like a hologram: Each part of the hologram contains some information about the whole. Each human mind echoes elements from its environments, and is connected to them in many ways.

Global (environ)mental change will highlight *complex interdependences* and will teach us, not to be afraid of these complexities. This requires a movement away from our *culture of unsustainability* which is hindering our grasp of these interdependences(part 1).[13]

Some changes are already underway, affecting lifestyles in daily practices, as several social-cultural movements across the world are illustrating. The spread of the commons, transition towns, permaculture and right to the city movements bear some promises for a cultural transition (part 2). Certain types of artistic practices and experiences of art also bear great potentials to reconstruct the software of our minds (parts 3 and 6).

Among the cultural categories that need revision, is our modern, Western understanding of “nature”. Instead of a nature/culture dichotomy, global (environ)mental change induces us to think in terms of a dynamic NatureCulture complex (part 4). Some other dichotomies also need revision, such as markets/State and mind/body (part 2).

To help us face complex interdependences, I am suggesting that we foster our aesthetic sensibility to complexity (part 5). And to help us learn and experiment sensible ways out of our unsustainable lifestyles, I am suggesting that we foster serendipity and learn to induce profound changes in society not with spectacular actions but with subtle maturation (part 7).

[13]Many of the themes and topics which are only shortly discussed in this essay, are analyzed at more length in the book *Art and Sustainability: Connecting Patterns for a Culture of Complexity* (Kagan 2011).

PART 1: The need for a cultural transformation

I, as a West-European, am living in a so-called 'developed' country. This country is highly industrialized. It has a hyper-developed consumer culture and a high level of material wealth. However, the sort of development and material welfare that we are comfortably experiencing for example in Germany, is being criticized from many angles, as being *unsustainable.* How so?

Many authors have described at length, why our mode of 'development' is not sustainable. Be it the global ecological crisis or the unfair 'terms of exchange' between the global North and the global South, most of the available analyses have been focusing on economic, social and/or environmental dimensions of a global crisis of unsustainability. I will not be repeating those analyses once more.

Relatively less attention has been given to the cultural dimensions of unsustainability. However, with a bit of attention to the writings of various philosophers and authors from the 20th century, one can find several insightful critiques of the Western model of civilization. For example, in the German intellectual tradition, Max Horkheimer and Theodor Adorno's *Dialectic of Enlightenment* have been especially significant. More recently, the Polish sociologist Zygmunt Bauman brought up a harsh critique of contemporary individualism and consumerism: He analyzed the trade-offs of the kind of 'freedom' we're experiencing in an age of *Liquid Modernity*. But I will not be offering a history of these critical insights, either, in the following lines.

I prefer to focus on one major dimension of the contemporary culture(s) of unsustainability: the problematic character of modernity's dominant modes of knowing reality. That is to say, how we know the world around us to be the way we think it is – and how we act upon such knowledge.

Already in the 1960's and 1970's, the anthropologist, psychologist, ethologist and co-founder of cybernetics, Gregory Bateson, warned against the excesses of 'purposive consciousness'. That is, a technical-rational, narrowly purpose-oriented rationality. As a “bag of tricks”, it is 'problem-solving' oriented, and it brought many advantages to the Western world, such as fast technological developments. But it has seriously harmed our knowledge of the world: purposive consciousness sees only shortcuts. It short-circuits a complex reality, and it ignores most of the side-effects of human enterprises.

For example, the ecological consequences of economic activities were, for most of the industrial age, simply ignored. Relatively recently, as they became increasingly hard to ignore, these unpleasant side-effects were re-introduced as 'externalities' to be 'internalized' into economic models – but this is, by far, not enough. We need to learn to know reality in a way that allows us to better understand *complex interdependences*. This is why we should pay more attention to Bateson's warnings: “Purposive consciousness pulls out, from the total mind, sequences which do not have the loop structure which is characteristic of the whole systemic structure” (Bateson 1973, p. 410). In other words, purposive consciousness is quite insensible to *interdependences*.

The development of purposive consciousness has numbed the intuitive and metaphorical sources for a knowledge of the many connections between different aspects of our reality. Gregory Bateson gave an evocative name for the sort of expanded consciousness that we are lacking: He called it “the sensibility to the pattern which connects”.

According to the American phenomenologist David Abram, the numbness of a large part of human knowing-abilities, developed itself gradually over many centuries of European history, before conquering wider parts of the world with modern European colonialism. Modern societies

have suffocated a whole dimension of the human sensibility, which was and still is vibrant among some indigenous peoples: the sensibility to the intelligence of the non-human, and the capacity to bridge perceptions with the non-human. (By “non-human”, I mean the environment's complex and dynamic webs of life.) We need to re-discover this reflexive sensibility.

Purposive consciousness allows us to perceive only straight cause-effect lines. This linear causality explains reality in terms of single lines of causes and effects, while systemic causality reveals feedback loops - that is to say, cycles where effects feed back on causes in multiple ways. Linear causality cannot account for the multiple mutual relationships characterizing complex interdependences. The general trend towards simple, linear causality still remains widespread, but it has already regressed in some areas of scientific knowledge, most especially in cybernetics and ecology. A systemic culture has been emerging for several decades already, in these specific fields of science. It is championed by authors such as the American physicist Fritjof Capra, who is advocating for “ecological literacy”,but such a literacy remains insufficiently widespread across society.

Next to the atomization of knowledge brought by linear causality, another, related aspect of our culture's highly developed form of self-closing and self-deception, is the fragmentation of human understanding across disciplines, and across social sectors. The German sociologist Niklas Luhmann described this situation in most bitter details. With his adoption of the key concept of “autopoïesis” from the evolutionary theories of Humburto Maturana and Fanciso Varela, Luhmann described how modern societies are locking themselves in this direction, making it increasingly hard to change course. He described our society as one in which social “systems” (such as e.g. the economy, politics, science, art, etc.) gain more and more autonomy from each other and from the rest of the world, and increasingly develop themselves on their own terms: They adapt their environments to their own developmental programs. They are acknowledging environmental “irritations” only according to their own internally developed logic. They do not adapt themselves to their environments very well anymore. In short, the development of modern society, as described by Luhmann, is ultimately unfit for survival, from an evolutionary perspective.

We have come to forget that ecosystems are also part of our mental systems and of our social systems. A cultural transformation is, therefore, needed in the search for more sustainable models of human development.

PART 2: Signs of cultural transition

If sustainability is to be understood as a search process, then it should address all dimensions of unsustainability, including its cultural dimensions. From a cultural perspective, sustainability can be understood as the search for alternative sets of values and knowledge of the world, reforming the ways we know reality, thereby founding an understanding of “patterns that connect” the economic, social, political, cultural and ecological dimensions of reality. The cultural dimension has thus a foundational value for the whole search process of sustainability.

Culture expresses itself as much in our daily lifestyles as in specific symbolic forms of human expression such as the arts and literature. At the level of everyday lifestyle changes, a number of contemporary trends are pointing a possible cultural transition, by experimenting with possible ways out of unsustainability. Several commons-based social practices are especially interesting, from this perspective: among them are the “transition towns” and “right to the city” movements,

the life-art of “Buen Vivir” in Latin America, and practices such as urban gardening, which are expressing different, but complementary dimensions of cultural transitions toward more sustainable forms of social organization.

The “commons” are expressing another economic culture than the dominant one, with a different language and logic than the Markets/State duopoly. This allows rediscovering the value of commonly managing precious natural and cultural resources, in caring, and careful, communities. It unearths and updates some deeply buried knowledge, about collaborative forms in the management of land, of intellectual property, and of other 'commons'. It may even manage to function as a antidote to several decades of neoliberal economic policy that imposed market-logic in all areas of life: The logic of the Markets/State dualism is offering no space besides the Market's principle of individual freedom and individual choices, thereby marking a balance between self-interest and personal Bourgeois virtues, or the State's principle of an institutionalized collective order imposing just arbitration, as in the form of redistribution or of a top-down, planned economy. In such a logic, communities cannot be trusted to manage things themselves, as explained in the myth of the so-called “tragedy of the commons”. On the contrary, the commons movement is heralding and supporting bottom-up self-management by communities, reinvigorating the numbed collaborative virtues of modern individuals.

The “transition towns” movement started as a single, bottom-up initiative, a few years ago in Totness, UK. Since then it has been spreading across the UK and internationally, at a fast pace, across urban neighborhoods. This movement stimulates bottom-up citizens-based initiatives for living more sustainably, or more specifically, for living a lifestyle liberated from our addiction to oil. This goal to move away from fossil fuels, is motivated both by global climate change and by the expectation of “peak oil”. That is, fossil fuels are non-renewable resources and will not last indefinitely. Past a certain “peak oil” point, our societies will experience a harsh withdrawal phase, after many decades of addiction. The transition towns participants do not wish to wait until this deep crisis is at their own doorstep.

Each transition town has to develop its own experiments, and the overall movement does not give recipes to be applied universally. A general principle of the transition towns, and of the commons movement too, is that local communities should find their own solutions, collaboratively.

The “right to the city” movement is inspired by the writings of the French urban sociologist Henri Lefebvre. Through direct action, it is motivating and empowering the inhabitants of urban neighborhoods to exercise, in a radical way, their right to determine the fate of their own city. It especially encourages all inhabitants to take part in decisions about urban developments, resisting the powerful interests of real estate investors and city developers. The “right to the city” movement especially empowers the tenants, in urban neighborhoods. Even though these members of the community do not hold individual property rights over their place of residence, they should be able to co-determine, and to take responsibility for the place where they live.

The notion of “Buen Vivir” comes from South America. The expression is not new, but has gained in popularity in the past few years. It relates to a variety of practices and worldviews with diverse indigenous roots, which are inspiring contemporary social movements and politicians across that continent. The different contemporary discourses around the notion of “Buen Vivir”, whether more philosophical or more political, are pointing at possible alternatives to strictly materialistic notions of wealth and happiness. In doing so, they contribute to re-setting the criteria for good life, and rethinking development policies on different bases. They are asking questions which are relevant not only to their own contexts, in South America, but also to ours, in Europe.

These are some very fundamental questions: What is a good life, and what does it mean to live well, together? Which kinds of wealth would a sustainable society strive for? The question of the

“true source” of wealth is of course not exclusive to any specific culture or time period, neither South American, nor European, nor modern, but it expresses itself in a myriad of ways. And the way the question is asked, already determines which kinds of specific answers are then formulated in different societies. In Europe, the old-modern belief in a constantly growing material economic wealth as synonymous with a ‘good & desirable life’, is an integral part of our culture of unsustainability. And we'd better get inspired by other perspectives on good life, from across the world.

Another sign of a possible cultural transition is the growing popularity of practices such as urban gardening, guerrilla gardening, and urban bee keeping. Urban agriculture is not a new phenomenon, and it has been practiced time and again, during crises, wars and other difficult periods across history. Nowadays, however, these practices are finding an increasing following, even in rich urban centers in North America and Europe. This may be just a short-lived trend for some of its practitioners. But it may also have a deeper value, expressing an existential need to reconnect to their own body and to the natural environment, in a concrete and meaningful way. In any case, urban gardening potentially gives its practitioner the opportunity to (re)discover concrete, down-to-earth, opportunities for embodied learning.

In everyday professional lives, we usually over-stress the analytical left side of our brains, and neglect the sensitive intelligence from the right side of the brain. As a result of our tedious learning habits, we cannot even remember a shopping list in the supermarket. The regular practice of urban gardening may be a form of self-help, to heal this condition. “Embodied learning” means healing from the dualistic notion of body and mind, which has been prevailing in modern Europe. Embodied learning stresses that we can better know the world around us, when engaging our whole body into learning experiences.

Urban gardening is also sometimes informed by the principles of “permaculture”. Inspired by systems ecology, agroforestry and organic farming, it rethinks human agriculture and human settlements/habitat. As coined by its co-founder, Bill Mollison, permaculture aims to shape self-sustaining systems integrating human activities with their non-human counterparts, and sees itself as “a philosophy of working with, rather than against nature”.

The arts may also play a fundamental role in the cultural transformation process towards cultures of sustainability, most especially in reforming our ways of knowing and acting upon our knowledge of reality. This is for example already the case with the practices of “ecological artists”. How so? The following pages will aim to explore this question further.

PART 3: Of bananas, workers, crabs and artists

What do I see, when I see a crab or a banana in the supermarket?

We're constantly dealing with *interdependences*. This is all the more important, in an age of globalization. For example, the working conditions of banana growers in the Caribbean islands and the health of these islands' ecosystems, are related in specific ways to global trade regulations and to the consumers buying bananas across the world.

To address the global crisis of unsustainability, we need to see these interdependences between different dimensions of the crisis and to understand in which vicious cycles we're engaged. We need to derail frozen habits, social conventions and “mental infrastructures” - as coined by the German social psychologist Harald Welzer. We should allow ourselves to experiment with, and

feel the experience of alternatives. One meaningful and inspiring way to do all three (seeing, understanding, and experimenting/improvising alternatives), has been developed for the last four decades by people known as *ecological artists* (or eco-artists).

One such person, Shelley Sacks, looked closer into the interdependence between bananas, workers and consumers. She started by drying banana skins and collecting them in the early 1970's in South Africa. She was wondering about their producers and reflecting on the economic networks involved. In the 1990's, then living in the UK, she started a project entitled *Exchange Values: Images of Invisible Lives*. She purchased many bananas, dried them and stitched them together, turning them into large dark sheets. She then labeled the sheets with the "grower identification number" of the crates from which they came. She went to meet and interview the farmers who cultivated those very bananas, in the Caribbean Windward Islands. She organized meetings with people both on the consuming end in the UK (while collecting the skins and inviting people to eat the fruits) and on the producing end. In both cases, the discussions dealt with interdependences and echoed some principles of 'fair trade'. Sacks also organized such meetings alongside an art installation (exhibited in various art museums) constituted of both the sweet-smelling banana-skin sheets and the voices of their producers, talking about their rather bitter living and working conditions.

According to Shelley Sacks, the experience of her art installation has a transformative value:

"Although the consumer standing listening to the voice of the invisible producer is not, in that moment, involved in changing the status quo in any concrete way, responses suggest that the experience of absence is so tangible - of a producer whose 'skin' is stretched before us, whose voice is inside us - that it stirs one imaginatively, provoking an inward movement that we carry outwards into the world. People describe how the experience has given them a sense of their power to see things differently, and to explore ways of getting involved in shaping a better world."[14]

Good examples of ecological art link specific multi-dimensional issues – that is issues that combine ecological, social, cultural, political and economic dimensions, with each other. They investigate and bring to visibility, the relationships between humans and others (animals, plants, etc.) *here and now* on the one hand, and *then and there* on the other hand, that is in the short term and the long term, from the local to the global. They point us at some of those *interdependences* that need to be kept in sight, and they experiment, improvising openly around the issues. They do not do these things as lonely heroes, but rather, they strive to shape and share common spaces for wider communities to explore and change situations: Ecological art adopts the collaborative principle that I already evoked when discussing the commons and transition towns movements.

Another couple of such practitioners dealt not with bananas from the Caribbeans, but worked with a species of crabs from Sri Lanka, in a twelve years long process which established them as leading figures of eco-art: From 1972 to 1984, the US-American artists Helen Mayer Harrison and Newton Harrison worked on their *Lagoon Cycle*, combining an artistic inquiry with a thorough scientific work on the complexity of ecosystemic conditions necessary for sustaining the breeding cycle of these crabs, under artificial conditions in California. The Harrisons' learning cycles were turned into the text and images of the *Lagoon Cycle*, which is at once, a book, an art exhibition, and is sometimes also performed by the Harrisons.

The story of the *Lagoon Cycle* unfolds around an exchange between two main characters: the "Lagoon-Maker" proposing technological solutions for ecosystemic restoration, and the "Witness" critically assessing and questioning these proposals. They visit Sri Lanka, learning

[14]Shelley Sacks. "Exchange Values Six Years On". 2002. Available online at www.exchange-values.org

about the country and asking local fishermen about the crabs. The Lagoon-Maker is eager to import the crabs, these “hardy creatures” that are surviving even under tough conditions, back to California, and to re-create their living conditions. However, this proves to be difficult, and the Lagoon-Maker dreams on, and soon wants to develop large-scale crab-aquaculture systems which also would clean up the Salton Sea in California. Confronted by the scale of the Salton Sea ecological disaster, the Lagoon-Maker even imagines a gigantic system of canals, to flush the polluted waters into the Gulf of Mexico and the Pacific Ocean. However, the Witness alerts the Lagoon-Maker to the consequences of their dreams, and together they realize that displacing water pollution from the Salton Sea to the Pacific Ocean would be a short-sighted, foolish action.

Along their quest for understanding and control, the two main characters encounter several other difficulties, as well as very peculiar third characters, who constitute ideal-types characterizing the Sri Lankan society and culture, as well as US American / 'Western' society, the working of a market economy, and the rigid perspectives of some capitalist and Marxist discourses. Among other things, they learn to appreciate the culture-in-nature of Sri Lanka, by contrast to the culture-partly-apart-from-nature of the contemporary United States. Their learning cycles weave together the patterns of ecosystemic, socio-economic and technological complexities in both countries. Faced with global climate change, the *Lagoon Cycle* ends with a poetic vision (written in the early 1980's) of the potentially graceful withdrawal of humanity, along the shores of oceans and rivers.

Shelley Sacks' work on bananas and the Harrisons' adventures with crabs are two highlights among a growing number of exemplary cases of ecological art. Often, eco-art projects also involve concrete interventions and inventions, with local and regional ecological restoration, and community empowerment. According to a common statement written by the 'ecoartnetwork', an international network of eco-art practitioners, ecological art “embraces an ecological ethic in both its content and form/materials. Artists considered to be working within the genre’ subscribe generally to one or more of the following principles:

• Attention on the web of interrelationships in our environment—to the physical, biological, cultural, political, and historical aspects of ecological systems.
• Create works that employ natural materials, or engage with environmental forces such as wind, water, or sunlight.
• Reclaim, restore, and remediate damaged environments.
• Inform the public about ecological dynamics and the environmental problems we face.
• Re-envision ecological relationships, creatively proposing new possibilities for co-existence, sustainability, and healing.”[15]

Eco-art, in its best moments, is not only a means of awareness-raising and community mobilization: It also improves our sensibility to the complexity of the world around us.

We will indeed not manage to deal with complex interdependences, as long as we keep seeing them only through the lens of the modern dichotomies we have acquired as habits of thought. Beyond the body and mind dichotomy, lie opportunities for embodied learning. Beyond the State and markets dichotomy, lie opportunities for community empowerment with the shared management of commons. Another fundamental dichotomy which is clouding our understanding of reality, is the one between nature and culture. To move beyond this specific duality, we need to learn appreciating the value and vitality of *NatureCulture*'s complexity.

[15]Source: internal communication on the 'ecoart' network mailing-list, in preparation for eventual wikipedia entries (November 2011). See www.ecoartnetwork.org for more information about this network.

PART 4: NatureCulture: The beauty of dynamic complexity

“Nature” is that which is already there, both “out there” and “deeply within”, from a certain perspective at a certain point in time. At the dawn of life on Earth, “nature” on our planet was a physical and lifeless but already complex environment. At the dawn of humanity, “nature” was a rich biosphere, i.e. a complex ensemble of ecosystems and geo-chemical cycles.

“Culture” is most often related to the specific development of the human species, although some ethologists have identified forms of “proto-culture” especially among apes such as the Bonobo. Across the hundreds definitions of culture available today, many stress both culture as a society's set of shared values, views, and understandings, and culture as the set of practices and rules/conventions shaping ways of life in a society. Cultures materialize themselves into various physical objects and landscapes, from the 'wild' to the pastoral, and the rural to the urban. Historically, the evolution of human cultures has been co-determined by ecological contexts. But in return, cultures have also been modifying “nature”, co-determining the further evolution of the ecosystems in which human societies established themselves. Today, for human beings and many other species, nature has become tightly interconnected with a variety of human cultures.

Nature never was in a fixed state, but has known, since the beginning of our universe, before the beginning of life, a rich and surprising evolution. For example, the formation of stars allowed the generation of more complex matter than existed before then. Evolution makes improbable things come to existence.

So are human cultures on the move too, developing themselves in multiple directions, at times compatible with their environments, and at other times bringing forth their own eventual collapse.

Seen from a very wide perspective, whether in human cultures, in life on Earth, or in the whole universe, “only the improvisation remains constant” (as the Harrisons wrote in their *Lagoon Cycle*).

“Nature” is that which is already there. Today, that which is already there, is however better understood as 'NatureCulture'. It makes little sense to continue perceiving “nature” and “culture” as two clearly separate entities. We need to heal from modernity's habit of atomizing, fragmenting, reducing complexity by means of supposedly “clear” concepts and definitions. The time has come to appreciate the beauty of NatureCulture as originated in the vitality of its complexity.

But what do I mean by complexity, and what does it have to do with vitality? Complexity was magnificently studied and introduced by the French philosopher and 'transdisciplinary' researcher Edgar Morin, in his lifetime work *la méthode*. Morin introduces the possibility to think unity and diversity alongside each other, and to think about any pair of terms, with a combination of *unity*, *complementarity*, *competition* and *antagonism*: These 4 types of relationships, through their complementary tension, are altogether forming a genuinely *complex relationship*. For example, the relationships between a predator and a prey are involving of course antagonism (which leads to the predator's starvation or the annihilation of the prey), but also complementarity (preys and predator depend on each other for their species' survival), competition (with each side developing tricks to fool the other side and obtain decisive information ; and with competition among predators / among preys) and unity (taken together, predator and prey are united in forming and maintaining an ecosystem).

To understand complexity, we need to think of those 4 types of relationship together, rather than separated from each other, and we need to avoid both the simplification of reductionism, limiting us in the western modern tradition, and the simplification of holism. As Morin pointed out, “the whole is more AND less than the sum of its parts”:

- Reductionism ignores that the whole is more than the mere combination and inter-relations between the parts it is constituted from. Reductionism ignores what scientists nowadays call the “emergence” of a new level of reality. Instead, complexity means that emergence brings jumps in reality, with discontinuities in logic.

- The second simplification ignores that the whole is also less than the parts. The whole suppresses certain properties of the parts, imposing overarching rules and constraints.

Across different levels of parts and wholes, we need to learn to appreciate the contradictions between different logics, and to acknowledge the great level of ambivalence, uncertainty, and indeterminacy that we have to cope with, in our lives. This is neither easy nor comfortable, but it is necessary and vital. Since the summer 2010, ecological artist David Haley thus keeps repeating to his audiences this one sentence: “We must learn, not to be afraid of complexity!”

Why is complexity crucial to vitality? Because vitality, that is life's continuous renewal through transformations, is driven by constant improvisations, with trial-and-error cycles, and it is feeding on a diversity of alternative options. “Only improvisation remains constant” and there are no fixed recipes for evolutionary success. Therefore, vitality depends on “resilience”. Resilience refers to a system’s capacity to endure, withstand, overcome, or adapt to changes from the “outside” or from the “inside”. In other words, resilience points to the ability to survive on the long term by transforming oneself in relationship to one’s environments. Resilience necessitates the preservation of diversity, both biodiversity and cultural diversity, as a pool allowing us to learn from the unexpected.

The French scholar Michel de Certeau wrote, about the work of the Harrisons, that “art is what attention makes with nature”. However, paying attention to CultureNature's dynamic complexity is of course not reserved for ecological artists alone. The internationally acclaimed gardener Gilles Clément, for example, understands gardens, nature and life in general, as constant transformation. His work also conveys a view of nature that is neither the dominated and alien nature of modernity, nor a sublime and virgin nature that humanity would not touch. His view of nature is pointing to a great diversity of species and interactions, that includes humanity's peculiar responsibilities and seeks partnerships. More specifically, Clément's gardens reflect three key ideas articulating his understanding of CultureNature: “moving garden”, “planetary garden” and “Third Landscape”.

The “moving garden” (*jardin en mouvement*) is inspired by Clément's observations of fallow land, or formerly used land that has been neglected for some time by humans and left to the free colonization by various species of plants and insects. In it, the gardener's role is not to control these species and constrain them into geometric patterns conceptualized a priori. The gardener's role is rather to observe the evolutionary interactions between these species, learn from them, interpret them, and then intervene with the goal of fostering dynamic balances between species, and most importantly, of increasing biological diversity. Clément's motto is: “To do as much as possible *with* – as little as possible *against*”.

Such a gardener spends more time observing, less time gardening. She or he does not design a garden and then implement it, but learns while doing, in an *iterative*, or trial & error process. Dynamic rhythms matter more than fixed aesthetic forms. For example, in many of Clément's gardens, the gardener allows and accompanies the plants' displacements through the garden, and

does not try to constrain this evolution. If a plant grows in the middle of a pathway, it will not be cut. Rather, the visitors paths will change every year, adapting to the changes brought by the movements of different plants.

With the “planetary garden”, Clément considers the whole planet as a garden and ponders over the gardener's responsibilities. For example, he is opposed to a fundamentalist view of the defense of indigenous species against invasive species, based on too-rigid, static views of nature. As Edgar Morin argues, ecosystems also evolve, and as Clément argues, migrating species should be judged according to their observed behavior, not according to their origin (and the same applies to people too, by the way). On the one hand, certain invasive species threaten the biodiversity of entire ecosystems, but on the other hand, some invasive species can stimulate evolutionary transformations. It is therefore on a case-by-case basis that the gardener should carefully try to evaluate the (de-)merits of specific species, playing the role of a matchmaker between different species of plants, insects and animals. Gilles Clément explored the theme of the planetary garden especially in the “Domaine du Rayol” in the Var, on the French Mediterranean coast, on a 20 ha site, looking into ecosystems typical for the Mediteranean climate, and its variations across the world. The role of the forest fire to promote biodiversity was, also, considered.

The “Third Landscape” (by reference to the “Third Estate” in France's Ancien Régime), is the sum of all the spaces which are left to themselves: fallow lands, industrial waste sites, road sides, embankment slopes, and nature reserves. Clément points out that these landscapes are the world's biodiversity reserve, a gene pool for the planet's future. Stressing the importance of the Third Landscape, the gardener also wants to convince policy-makers to leave spaces for the undecided, the unplanned. The Third Landscape was visualized in one realization by Clément, the “île Derborence” in the midst of the “parc Matisse” in the French city of Lille: 3500m² which are elevated 7 meters above the rest of the park, inaccessible to the human visitors but at the same time very much visible and present.

With his gardens, Clément does not praise some sort of postmodern disorder, or some superficially romantic garden. Rather, he is showing the highly complex play of order and disorder, organization and disorganization and reorganization, in his moving gardens. In this, he is very much the gardener counterpart to Edgar Morin's theoretical elaborations on the complexity of life. Clément is interested in genuine spontaneous natural processes and in his chance partnerships with them, whereas many romantic gardens re-create a mere illusion of spontaneous nature, hiding themselves as human interventions.

After eco-art and moving gardens, I will turn to another exemplary domain: To see NatureCulture's dynamic complexity under yet another angle, a specific perspective on sex offers its insights. “Queer ecology”, which was born a decade ago at the crossings of queer studies and ecofeminism - itself a meeting of feminism and the environmental justice movement. Queer ecology focuses on NatureCulture's incredible sexual creativity. Indeed, sexuality in nature, whether reproductive or non-reproductive, is much more complex, polymorphic and changing than was conceived only a few decades ago, with the traditional view of a functional evolution of sexuality.

Many European and non-European societies have been historically plagued with the imposition of the belief that acceptable, natural, “god-given” sexuality is limited to heterosexual sex with the aim of reproduction. Other forms of sexuality have been repressed, over the past centuries, and condemned as “unnatural”. Still today, a number of our contemporaries, especially certain religious extremists, are convinced that all sex occurring outside a restricted heterosexual normative frame, is “against nature”. However, queer ecology works to debunk these unfounded beliefs, pointing out that nature encompasses a wide variety of sexual possibilities. A queer-

ecological look at cultural history also reminds us that in the Middle Ages, Europeans were not yet constrained by hetero-normative Christian norms, and that later European colonizers repressed the more flexible sexualities of American Indians.

As suggested by Alex Johnson, the interest of "queering ecology lies in enabling humans to imagine an infinite number of possible Natures. The living world exhibits monogamy. But it also exhibits orgies, gender transformation, and cloning. What, then, is natural? All of it. None of it. Instead of using the more-than-human world as justification for or against certain behavior and characteristics, let's use the more-than-human world as a humbling indication of the capacity and diversity of all life on Earth. Let's stop congratulating ourselves. Instead, let's give a round of applause to the delicious complexity. Let us call this complexity the queer, and let us use it as a verb. Let us queer our ecology."[16]

Furthermore, I am seeing in queer ecology an antidote to holistic ideals of consensus and organic unity that might lead towards forms of green totalitarianism. On the contrary, we should seek discourses and practices that value pluralism, contestation and tensions, compromises and regulated competition, as the political dimension of cultures of sustainability based on complex uni-plurality. Beyond the traditional liberal understanding of pluralism, the feeling of queerness in NatureCulture's vitality, is awakening us to the value of a diversity of ways of being in the world.

A queer ecology, as opposed to a straightforwardly harmonious culture of nature, can contribute to our sensibility to uni-plurality: This is an aesthetic question.

PART 5: Aesthetics: The sensibility to patterns that connect

The search process of sustainability compels us to heighten our sensibilities to the interdependences in contemporary (un)sustainable developments, and to the rich and vital complexities of NatureCulture. This is as much an aesthetic as an ethical imperative.

Gregory Bateson was defining aesthetics as "the sensibility to the pattern which connects". By this, he meant a capacity of recognition, shared not only by humans but also by other living beings: For him, the aesthetic is that which is "responsive to *the pattern which connects*". He defined the "aesthetic preference" of a mind, as being "able to recognize characteristics similar to their own in other systems they might encounter". A typically aesthetic question, would be "*How are you related to this creature? What pattern connects you to it?*"

For Bateson, a strong aesthetic sense is a heightened responsiveness to the meta-pattern uniting the living world, rather than an arrested perception, stumbling upon the 'first-order' or 'second-order' differences between elements of the living world. What this means is that relatively smaller differences should be recognized but they should not lead us away from the wider unity of the living world.

Coming back to crabs (but this time not exactly the Harrisons' crabs from Sri Lanka): Bateson once explained the "pattern which connects" to a group of art students, with the help of a dead crab on the table, asking the students to explain why that dead crab used to be a living thing. The students were supposed to find answers by just looking at it, and to do as if they had never seen a crab before. The students moved from the observation that the crab showed some symmetry

[16]Source: http://www.orionmagazine.org/index.php/articles/article/6166/

between its parts (left/right), to the observation that the symmetry was not absolute (one claw bigger than the other), to the conclusion that there existed a similar relation between parts, in the case of one crab ("both claws are made of the same parts") as well as in the crab/lobster comparison and (crab-lobster)/human comparison.

Bateson was arguing that such a sensibility is biologically rooted in our selves, at a subconscious level, but got numbed in modern societies. He was encouraging the recovery of this "responsiveness to the pattern which connects", giving us back a sense of aesthetic unity - and of ecological ethics in the same process, that contemporary humans are critically lacking.

Conscious purpose and goal-oriented, analytical 'rationality' do offer us shortcuts to what appears, at first sight, as solutions to our immediate problems. However, they do so at the cost of our wider mental capacities, simplifying our mental constructions of reality, and entrenching us in an increasingly narrowed-down and self-centered sensibility.

An art that is involved in the kind of aesthetics described by Bateson, can re-engage us into a wider-than-conscious communication, reconnecting ourselves to our embodied knowledge and to the many intuitive and subconscious sources of knowing that lie within ourselves. The aesthetic reflects a mental capacity which exceeds consciousness. For instance poetry is not distorted prose, but rather prose is poetry subjected to logic.

In a lecture held in 1970, Bateson asserted that art "is concerned with the relations *between* the levels of mental process [...] artistic skill is the combining of many levels of mind [...] to make a statement of their combination". The artist Shelley Sacks, whose work *Exchange Values* I shortly introduced above, wants her work to open an "expanded field of consciousness" for the participants in her projects. With such experiences, an opportunity is offered for participants to have "a creative experience in which [the] conscious mind plays only a small part", as Bateson argued.

A comparable ecological-aesthetic plea can be found in David Abram's book *The spell of the sensuous*. In it, Abram advocates for the re-awakening of a whole dimension of the human sensibility, which was and is still vibrant among some indigenous peoples, but is numbed in our societies: the sensibility to the intelligence of the "more-than-human" - and the capacity to bridge perceptions with the environment's complex and dynamic webs of life.

The aesthetics I'm discussing here, after Bateson and Abram, is also rooted in US-American philosopher John Dewey's understanding of aesthetics as experience, pointing at personal affectivity in everyday life and at a human being's overall interrelationship with his/her environment. Next to being personal, intimate even, and mundane, it is nevertheless also a global aesthetics, linking small forms to global forms, that is the third-order, global connections mentioned by Bateson. (In the example with the students looking at the crab on the table, the third-order connection is the (crab-lobster)/human comparison.) Such an aesthetic sense highlights the value of what establishes relationships across many different things in the world, that is all that is *trans*: transversal, trans-local, transitory, transsexual even - like in the *Rocky Horror Picture Show*, and transformative, against all forms of local chauvinism and monomaniac obsessions. This aesthetics of the trans- is not a New Age trance melting everything together and singing the praise of an uninterrupted natural harmony, that is a simplistically holistic sensitivity which would only consider complementarity and symbiosis in nature, in life, and in society. In other words, I am not advocating for a naive form of hippie revival. On the contrary, the aesthetics of sustainability I'm pointing to, is a complex sensitivity that considers as much antagonisms and competitions as complementarities and symbiosis, and transcends the contradictions so as to reveal the complementary tension of antagonism and complementarity.

Understood in this way, aesthetics of sustainability highlight the beauty of the complementarity of antagonisms, which is also crucial to democracies. This sensibility was already present in the fragments of the pre-Socratic Greek philosopher Heraclitus on aesthetics:

"That which is in opposition is in concert, and from things that differ comes the most beautiful harmony" (Heraclitus – quoted in Aristotle, Eth. Nic.).

For his part, Edgar Morin expressed this sensibility to complexity with a musical metaphor:

"The systems sensibility will be like that of the musical ear which perceives the competitions, symbioses, interferences, overlaps of themes in one same symphonic stream, where the brutal mind will only recognize one single theme surrounded by noise" (Morin 1977, pp. 140-141).

This approach to aesthetics also requires a careful, sensible and differentiated consideration of the uses and experiences of technologies:

Technology-mediated experiences generally contribute to modern humans' numbed experience of NatureCulture. Furthermore, the globally interconnected "technosystem" in which we are living today, is giving us the impression that it is becoming a total environment of means, maybe even capable of replacing our planet's natural environments, that is the ecosystems and the global biosphere. This is a dangerous illusion, which has a strong footing in many contemporary discussions on sustainability. What's more, technological aesthetics may convey the false impression of experiencing complexity. Artificial machines and other cybernetic systems designed by humans, even the most advanced, are not as complex as biological living beings and the ecosystems in which they interact. Machines, which are merely fragments of prostheses of human societies, do not generate their selves, their own beings and existence, do not learn and evolve (or so little), and are not genuinely autonomous.

In the Harrisons' *Lagoon Cycle*, a comparison is made between the buffalo and the tractor, working in the fields in Sri Lanka. Their merits and demerits are described. The tractor is apparently more "efficient" and "modern", it is "a bold invention". But it does not insert itself as well into the ecosystem as the buffalo did over time. Nor does it provide other benefits such as milk, utilizing weed as fuel, and providing fuel and fertilizer with dung. Rather, it calls forward further technologies such as chemical fertilizers, herbicides and pesticides. Nor is it self-regenerating. The Harrisons describe the buffalo as being engaged in a dialogue with the wallow, in contrast to the tractor's "technological monologue". They write that the "buffalo / finally / is more efficient / and its dialogue with the land / more lucid". The Harrisons are being here carefully, but not indiscriminately, skeptical about the charms of technologies. They conclude: "Clearly there is something about technology that does not like that which is not itself / Yet this is not a necessary condition / this unfriendliness to the land".

Even biotechnologies, with genetic engineers, and some artists manipulating the DNA of various lifeforms, offer only very reduced forms of life's complexity. Human genetic designers cannot seriously compete with millions of years of living evolution. Therefore, if such experiences take, aesthetically, as they often do nowadays, the disguise of complexity, we are dealing with fraud. There are of course some exceptions: One recent exception might be the "evolution machines" (as reported in *New Scientist* on June 27 2011): Some genetic engineers who have understood that intelligent design is far inferior to evolution, are instead now trying to make evolution work for them. They are accelerating some evolutionary processes of bacteria, in their "evolution machines", without trying to control, understand and design everything.

On the other hand, technologically mediated aesthetics can, in some cases, add something more, and valuable, to our experience of complexity. For example, the current reality of global climate change challenges us to experience the long time and the wide space of its unfolding.

Some artists, such as for example Andrea Polli, are conveying a sensible experience of climate change, thanks to visual and/or sound art installations which can compress climate data, from scales beyond immediate daily experience, and make them present to the visitors of these installations. Polli's sound compositions are converting climate data collected by scientists, translating variations in temperature into variations in loudness, pitch, length, timbre, etc.

Therefore, a careful and reflexive, critically aware, but also open-minded, attitude towards techno-aesthetics, is warranted. This means, neither a rejection of technology-based aesthetic experiences, ignoring their opportunities for new perceptual insights, nor a naive trust in such forms of aesthetic experience, threatening to nourish the delirium of the dawn of a “post-human” world.

Last but not least, this approach to aesthetics requires a healthy measure of sociological reflexivity. In order to avoid the risk of becoming a new tool for the self-serving distinction of elite social classes, aesthetics of sustainability should not be conceived as a fixed measure for some form of streamlined aesthetic progress and aesthetic excellence. Rather, it should remain strongly rooted and contextualized in communities across society, with a wide diversity of possible ways to realize an aesthetic experience of complexity.

And when it enacts itself in art, this is then not about art as a noun, reifying The One and Only Aesthetics of Sustainability, but about art as a verb.

PART 6: Art: It's a verb

Art understood as a verb, rather than as a noun, is about interactions, experiences and processes in their vitality, rather than about fixed end products, objects and achievements in their excellence and glorious intemporality. For example, the German artist Hans Haacke stressed that he is “concerned with change [as] the ideological basis of my work [...] there's absolutely nothing static [...] the status quo is an illusion, a dangerous illusion politically.”

“Art as a verb” is, however, not necessarily sustainability-literate art. Not all change-oriented movements in art can be associated to cultures of sustainability, fostering sensibilities to patterns that connect NatureCulture's dynamic complexities. For example, the belief in perpetual growth and linear progress, and the unfettered deployment of absolute individual freedom, detached from any responsibilities, are, to some extent, 'process' and 'change'-oriented values which can be found echoed in much of the art of the 20th century. However, they convey a linear, fragmented experience of reality which fuels the mainstream contemporary culture of unsustainability.

The US American artist Mierle Laderman Ukeles expressed this line of fracture between mainstream modern art and an art of sustainability, in 1969 in her manifesto of “Maintenance Art”. In it she opposed the “death instinct” of modern art as opposed to a “life instinct”. “The Death Instinct: separation; individuality; Avant-Garde par excellence; to follow one’s own path to death—do your own thing. [...] The Life Instinct: unification; the eternal return; the perpetuation and MAINTENANCE of the species; survival systems and operations; equilibrium.” To the death instinct of modern art, Ukeles further associated, in her manifesto, the notions of “Development: pure individual creation; the new; change; progress; advance; excitement; flight

or fleeing". To the life instinct, she associated the processes: "preserve the new; sustain the change; protect progress; defend and prolong the advance; renew the excitement; repeat the flight". She also proposed to link the "personal", that is her personal maintenance work in everyday life, the "general", that is maintenance in social life, from sanitation work to education and health work, and the "Earth", that is the general ecosystemic support of human life. In her manifesto, Ukeles pointed out that "Maintenance Art" is proposing a conception of dynamic balance between inter-connected processes, and opposing it to a linear conception of change and movement.

Such a kind of art-as-a-verb, offers non-linear perspectives on reality. It allows a different look at the issues we are confronted with: Non-linearity is an alternative to straight 'cause and effect' views. Linear problem-solving is the traditionally advocated methodology of planning schemes, including the local Agenda21 processes: First formulate a vision, then diagnose the problems, then develop alternatives, then seek consensus, then take decisions, and finally implement and execute. The problem with this way of working is that it is rigid, disjunctive and compartmentalizing because cutting reality in separate pieces, and then incapable of re-assembling them. It is incapable of properly incorporating most of the human ways of learning and knowing reality, into decision-making. Instead, a non-linear inquiry of reality is based on "question-based learning" (as coined by the ecological artist David Haley), that is a capacity to ask, again and again, wider questions, and thereby to reframe the problems in new ways, rather than being trapped into the path-dependency of pre-established problem-definitions. Art-as-a-verb, when it is not hampered by a linear value system of progress and growth, harbors the potential for questions-based learning. If we take this potential seriously into account, we can uncover a whole new way of doing politics. For example, the German artist Joseph Beuys tried to convey such an approach to the German Green party in the 1980's, but unfortunately, they did not take it up.

Art as a verb, when practiced and experienced intensively enough by a practitioner, participant, or recipient, has the potential to also stimulate certain experience processes with a transformational value:

- *Imagining* potential other states of reality, other configurations of individual and social life, and *enchanting* one's worldview with this envisioning of alternative futures, thanks to the stimulation of one's imagination ; the artistic process may even give an immediate experience of the imagined alternatives, giving them a feeling of strong presence in one's life ;

- *Detaching* from, and *subverting*, through the imagined alternatives, one's established a-prioris, assumptions, pre-set mental schemes and fixed routines and habits - and in this process, maybe also unearthing one's repressed intuitions and knowledge, kept buried at a subconscious level ;

- *Experimenting* with these envisioned, subversive alternatives, in a playful framework with a higher tolerance for failure, and for unconventional behavior, than is usually possible in non-art contexts ;

- *Empowering* oneself as a change-agent in society, changing one's self-image and perceived capacities to exercise influence and make a change, reducing inhibitions and healing from apathy – that is reducing fear and stress induced by the social context, and *catalyzing* personal and collective motivations and commitments for change.

These experience processes are present as potentials in art-as-a-verb, but not guaranteed to occur always, for everyone. They work best, for social transformation towards cultures of

sustainability, when they occur in combination with each other. For example, enchanting imagination, without subversion, detachment, concrete experiments and empowerment, will have only little transformational value.

Not all experiences of art-as-a-verb need to be deeply subversive. But they should be *challenging* experiences. Non-challenging experiences of “art”may be very enjoyable, but they comfort us in our values, habits and established knowledge. They are little more than entertainment. However, what is experienced as entertainment and comforting repetition to one person, may be challenging to another person. Therefore, the challenge-value of art-as-a-verb depends on the specific context and on the people involved.

Regarding the process of subversion, the German philosopher Herbert Marcuse (in his *Aesthetic Dimension*) argued that art's subversive imagination can only unfold itself as long as art retains a power of *estrangement* from the established social order. For this to remain the case, art-as-a-verb has to prevent simplifying discourses from reducing its beautifully complex ambivalences and equivocalness.

Furthermore, genuine detachment also requires a constant critically *reflexive* process, including a critical self-reflection about one's value system, one's working processes and the many possible consequences and side effects of one's actions. For example in Germany, Bertolt Brecht famously developed an approach to such a distancing/estrangement effect (*Verfremdungseffekt*) in the practice of theatre. The artist and researcher Tim Collins characterized ecological artists as as “investigate-ers” and story-tellers of “alter-tales”, “seek[ing] to identify conflicting and conflicted belief systems.”

But in this process, conscious reflection and subconscious intuitions are not to be separated and opposed to each other, condemning intuitions as unreflective. On the contrary, they should complement one another.

The playful experimentation with alternatives is comparable with the learning process of an acrobat, who learns to walk on a thin wire, with a safety net. However, the acrobat's safety net is not meant to be kept forever in place. It is removed, once the acrobat has found his or her dynamic balance. This safety net is therefore not the same thing as an eternal sandbox for a Peter Pan art-world, with its never-aging, childish, ironic and irresponsible professional artists. The experimentations elaborated by artists working toward social transformations, are not merely escapist dreams trapped in The Never Never Land. On the contrary, their work is shared in communities of practice beyond the boundaries of specific 'art worlds', and it aims to convey art's subversive imagination, into empowering capabilities across all areas of social life.

Empowerment, in communities of practice, also requires that the creative processes be shared, as *commons* rather than as gifts coming exclusively from geniuses such as talented artists or inventors. The issue of ownership matters. The artist's role should therefore be, as argued by Tim Collins, to “intervene as advocate for shared spaces and ecosystems”, “transcend[ing] primary authorship”, fostering creativity, ownership and empowerment in the community rather than appearing as sole or final author of creative impetus. For example, Helen and Newton Harrison take care in their work to be “non-possessive” and to “share authorship” so that a conversation or project they initiated, can also “develop a life of its own”. Therefore, they are encouraging “others who take ownership”. Tim Collins is also aware that the artist, however, cannot claim to be seen as a mere regular community insider, and thus should not be naively expecting this to happen by itself:

“We cannot change the fact that we arrive as both outsiders and experts. It is up to us to take the various theoretical issues of agency, representation and dialogic equity to heart and mind and to

work with care and consciousness in any resulting dialogue. We must act with full awareness of the fundamental need not to harm. We must act with the clear intent of dialogue, and we must act with a clear understanding of the relationships of power and our role in that context."[17]

A transformational practice of art-as-a-verb is neither conceiving art as useless, nor as functional. This means that the artistic practice does not try to remain useless - turning uses of art into a taboo, but also does not aim to fulfill a priori functions, that is functions determined at the outset of the process. Some functions may come in the process itself, and that's all right. This kind of process can be linked to the concept of "exaptation" from evolutionary psychology: A property that appeared for some reason develops new functions for itself and fulfills unforeseen goals. This is a process of extension of functionality, emerging from collective practices, without a pre-established design. Collective intuitions have the potential to shape exaptations which are far more innovative than any so-called "intelligent design".

Besides the four categories I described above (imagining/enchanting, detaching/subverting, experimenting, empowering/catalyzing), comparable experience processes and learning processes can of course also be described in different ways, with other categories. For example, the London-based collective PLATFORM, composed of artists, activists and researchers, identifies and describes the following seven dimensions in its work:

- *Dreaming*, that is having "visions" beyond what is usually considered possible;
- *Researching*, inter-disciplinarily and with communities, to "[d]evelop in-depth understanding" ;
- *Selecting*, that is being "pragmatic [in c]hoos[ing] whatever strategy and medium is most appropriate to the aim of the work";
- *Forming*, that is setting in motion "a process like sculpture – molding, changing, experimenting" ;
- *Feeling*, that is to "[e]ngage with audiences [...] in the most intense and moving way possible [... to m]ove beyond the rational alone [and e]ngage the soul as well as the mind" ;
- *Connecting* the local and the global, and "enabl[ing] individuals to understand their own power and ethical responsibilities" ; and
- *Looking Long*, that is "a commitment to place and people over time", with certain works that extended over as much as 15 years.

I am not trying here to herald art-as-a-verb at the exclusion of other ways of exploring and knowing reality, such as for example science-as-a-verb, carefully elaborating theoretical constructions and empirically confronting sets of hypotheses. Rather, art-as-a-verb is part of a complex knowing of reality, which also requires the insights of various scientific methods. And art-as-a-verb is, actually, already actively present, within innovative scientific practice, as well as in many professional fields other than "the arts". Some people, like the Dutch-Mexican social scientist Hans Dieleman, even prefer to move towards "artscience" rather than to continue working within art and/or science. Art, *as a verb*, should not be understood as limited to a specific sector of society labelled as "the arts". But professionals who do work in the artistic

[17]Tim Collins. "Reconsidering the Monongahela Conference." Pittsburgh, 2004. Available online at: http://moncon.greenmuseum.org/recap.htm

sector can very well be catalysts for others to become reflective practitioners, and for communities to tap into the potentials of their collective intuitions.

PART 7: Serendipity: of learning cultures and silent transformations

The English language has a beautiful word, standing for the ability to discern opportunities for learning in accidents and surprises of life, and for the sagacity of making discoveries of things which one is not looking for: S*erendipity*. This word has become popular in the second half of the 20th century, and even extremely popular in the English-speaking world in the last two decades. But it is, unfortunately, improbable that its meaning and depth has gained an equally widespread understanding. The wisdom coming from serendipity is needed, in order for us to relate to the *emergence* of the new in NatureCulture's complex dynamism, and to the chances of extensions of functionality in art's *exaptation* - as I described in the pages above.

In their experiments with the crabs from Sri Lanka and with the ecological disaster of the Salton Sea in California, over the 12 years process of the *Lagoon Cycle*, the Harrisons illustrated one case of a couple of artists combining applied scientific research and some willful planning/dreaming, with artful, serendipitous learning and, conclusively, a humble withdrawal from the illusions of technological control.

Serendipity allows us to learn from the unexpected, in our failures and in our intuitions, and to learn by trial and error - also called *iterative* learning. The occurrence of an accident is in itself not enough for someone to be serendipitous, but a specific openness and sensibility is necessary, a specific “sagacity”. The word “sagacity” refers to a wisdom that is grounded in sense perceptions, and that allows keen discernment and sound judgment. The required openness also means that one should be flexible, curious and alert enough to change one's goals and interests, along the way.

Serendipity also involves learning across different, apparently unrelated contexts, in a transversal, often metaphorical, way. This is also called *lateral thinking,* learning from unique incidents by a process of *abduction*. In all these aspects, the practice of art-as-a-verb can be helpful.

One everyday practice, which artists share with all other human beings that can also be especially helpful in this, but which the 'developed' consumer societies are only seldom performing, is walking. In consumer culture, walking is limited to shopping spaces, amusement parks and footpaths for the holidays.

Serendipity is a walker's wisdom. The fairy tale entitled *The Three Princes of Serendip*, published in Italy in 1557 (from Persian or/and Indian sources), was the inspiration for the creation of the English word serendipity by Horace Walpole in the 18th century. In this fairy tale, the three princes from the island of Serendip (which is no other than present-day Sri Lanka), gain wisdom while walking in a foreign kingdom. They are learning, while walking and attentively observing, smelling, touching their surroundings to interpret the most subtle and nearly unnoticeable signs on the road sides. They are readily discovering what they were not looking for.

Walking is not only an everyday practice characterizing the human being, but also a very rich form of *action research.* It allows embodied learning. Walking-based practices put learned things in contexts, locally and ecologically, embedded in a real geography and not only conveniently virtual. Thanks to the slower rhythm, the walker heightens his or her attention. Walking across places involves moving, exchanging, comparing. Walking is transversal because the transversal is

that which cuts across, walks across, different levels of reality, not only bridging them, but also traveling beyond them.

Walking can even become a genuinely transversal method for knowing, sensing and changing the realities of local communities. Transformation may then also occur, as the reshaping of the form of reality. Walking is sometimes a social and political practice, reshaping the realities of shared spaces and the fiction of public space, accompanying political expressions and the articulation of democracies, as with Gandhi's famous "salt march to Dandi". Walking allows both exchanges with multiple others and personal introspection for oneself. And, as an ordinary activity, low-tech rather than high-tech, it is accessible to all, and open to mixing all sorts of non elite-wisdoms from all human groups.

Furthermore, cultures of sustainability as learning, evolutionarily fit cultures, also require a sensibility to what the French philosopher and sinologist Francois Jullien called "silent transformations". These are long-time, wide-scale transformations in nature and society, that are deep and progressively, imperceptibly emerging, such as one's own aging process, love turning into mutual indifference, a revolution turning into reaction, the growth of a tree, or climate change. Because such changes are so transitional, involving a continuous process of "modification-continuation" (*bian-tong* in the *Yijing*, the ancient Chinese classic), they are not well-thought of within Western thinking, rooted in Greek philosophy's focus on identifying determined forms. Silent transformations are indeterminable, and Western philosophy can only see an end-result, a fixed form. For example, Jullien explains, Plato could not conceptualize the phenomenon of melting snow, stuck as he was in trying to define beings with delimited properties. By contrast, Chinese thought, for example in the Taoist tradition, is better able to think in fluid ways, and can teach us to better understand and deal with the silent transformations that are so important to profound changes in social life. Rather than trying to change reality heroically with big and salient actions and with abrupt events, we should rather explore the subtle propensity of situations, and induce changes by finding moments of inflections of *propensities*: In other words, moments of possible shifts of inclinations into other directions. When changes are visible, it is already too late to act on silent transformations which have been at play under the surface of perception. The serendipitous learner, the sensible gardener, will be sensible to the propensities of situations, rather than confronting facts with actions. How to act then? Jullien suggests practicing a patiently political art of inducing subtle changes, without excessively willful control and interventions which by their willfulness and strong design-desire, would ignore propensities. It is an "art of maturation" rather than modelization, based on experienced conditions rather than on idealized concepts.

For all these reasons, cultures of sustainability can be fostered thanks to the transversal practice of art-as-a-verb which is unfolding itself as a personal and social *space of indeterminacy*.

To give one last example, in very concrete terms, such spaces of indeterminacy could be physical spaces in cities which have no assigned functions from city planners but many, changing – that is transient, impermanent, informal uses. Such un-planned hybrid voids, which do not fit with the limited and linear formal rationality of urban planning , constitute some potential spaces for transformative practices. There is also a need to "de-plannify" urban planning and to allow more un- designated spaces in the city, where communities and creative practitioners can experiment more sustainable ways of life – instead of exceedingly planned creative/cultural districts. In these spaces, communities also exercise their "Right to the City".

For a transformative art to flourish, which works toward global (environ)mental change, the cultivation of serendipitous learning in spaces of indeterminacy, should be further encouraged.

Alliances with social movements experimenting with cultural transitions, such as the commons, transition towns and right to the city movements, should be encouraged, and insights shared across these different platforms and networks. Art-as-a-verb in general, and ecological art in particular, have the potential to foster a sensibility to NatureCulture's dynamic complexity. This may hopefully contribute to cultural transformations as the basis for social-ecological reforms. Reconfiguring the hardware of civilization also necessitates wide-ranging transformations in the software of minds.

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PUBLICATION 3

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Which wealth for which sustainability?

"There is no wealth but life"

John Ruskin

For centuries, the question of wealth has been discussed by European and American economists in relation to the theme of the individual "good life". Today, the issue of wealth, reconsidered under the perspectives of sustainability, is related to the question of what it means to "live well, together."

The question of the "true source" of wealth is however, neither exclusively modern, nor exclusively European, as a historical legend from Sri Lanka illustrates (reported in the *Lagoon Cycle*, a work by ecological artists Helen Mayer Harrison and Newton Harrison):

In the fifth century A.D. / when King Datusena was overthrown by his son / Kassapa / the son demanded of his father / the King / all of the royal treasures. / The king took his son to the treasury / and it was empty. He then took his son to the great tank outside the capital /the tank at Anuradhapura / and waded into it / and filled his hands with water. / Turning to his son / the King said: / This is my wealth / my treasure / and the wealth and treasure of us all. / The son / disbelieving / had his father killed.

Traditionally, in both the capitalist and former State-planned economies of Europe, "wealth" has been associated to material well-being as measured in terms of economic growth. The dogma of economic growth in the mainstream media and in economic policy is still dominant today. Often, ecological concerns, and the question of "Limits to Growth", are met with glossy stories about "green growth", "ecological modernization" and dreams of "cradle to cradle" industrial revolution. However, efficiency gains cannot forever push back the horizon, and we should not forget that the de-materialization of economic activities in the OECD countries is made possible by the displacement of industries to countries like China and India...

The controversy about growth, (which fostered alternative discourses such as voluntary simplicity, de-growth and post-growth economy), will be my entry point, but not my focal point in the following paragraphs. Rather, I am asking myself, which kind of wealth should we aim for, for which sustainability?

The story of King Datusena and his son Kassapa allows us to perceive several dimensions of "wealth". Before coming to the other dimensions, I will first discuss the dominant, "economic" dimension of "wealth", i.e. in the story, the royal treasury coveted by the young king.

First of all, why does economic growth, as traditionally measured, give us only a very narrow view of wealth?

At the current levels of wealth redistribution, economic growth worldwide does not benefit the poor, and would only alleviate poverty if it were pushed to extremely unsustainable levels. An

evaluation by the “New Economics Foundation” states that only 3% of the world's economic growth (in terms of GDP) from 1990 to 2001 benefited the poor.

Furthermore, the crude measurement of economic development with GDP (Gross Domestic Product) has been under heavy criticism for several decades now although it still is widely in use today. Not only do GDP measures say nothing about the distribution of wealth. They also say nothing about those elements of human activity and well-being for which no direct or indirect market valuation is available A country's growth, increased goods production, and expanding services have both "costs" and "benefits"--not just the "benefits" that are expressed in GDP. Economic growth can damage the health, culture, and welfare of populations and it can reduce the ability of nature to provide services to humans.

This led some economists to suggest alternatives, such as the GPI (Genuine Progress Indicator – also known as ISEW - “Index of Sustainable Economic Welfare”), which takes sustainability into account. For example, to come back to the Sri Lankan illustration of the water tank: Agricultural activity that uses rainwater and river runoff, will score a higher GPI than the same level of agricultural activity that lowers the water table by pumping irrigation water from wells. The GPI is calculated by adding up a country's expenses (GDP), but also including sectors that are usually excluded from the market economy such as housework and volunteering, and then subtracting social ills such as crime, natural resource depletion and loss of leisure time.

And unlike the GDP, the GPI data for European countries and the USA show a decline over the last 3-4 decades. Own calculations by the German ministry of environment, published in 20009, also indicate a decline of the country's wealth, when GDP is corrected with social and environmental effects.

The GPI is rejected by neo-classical economists as imposing value judgments, by contrast to the 'objectivity' of markets. However, as argued by Mathis Wackernagel (one of the creators of the “ecological footprint” concept), the market itself is also a value judgment, as it dismisses everything but financial transactions. "Valuations are arbitrary judgments and the GDP is full of them. It says many things have the value zero, such as housework and the environment" The GPI figures aren't perfect, says Wackernagel. "But we think it's better to give a rough estimate than to say these things are worth nothing."

Second question: Does economic wealth indicate people's well-being?

Some studies have claimed to show that the individual feeling of happiness in the USA has not increased significantly since the 1950's, although economic growth and individual 'purchasing power' have significantly increased. More generally, most comparative research on the feeling of happiness tends to demonstrate that, passed a certain level of material well-being, further increases in individual economic income do not clearly raise the level of happiness anymore.

I am not convinced that “happiness” is the best descriptor of an ultimate goal in life, nor that international, intercultural measures of happiness recently developed are reliable, but, still, the discussions on 'wealth and happiness' are worthy of interest.

One of my colleagues in Lüneburg, Jorge Gonzales, is cautious about comparisons of stated happiness (as indicated by surveys), but he does nevertheless claim that overall people in so-called developing countries are at least as happy as, or even happier than, people in so-called developed countries. Is this just a romantic tourist's yearning, or is there more to Gonzales' claim?

Gonzales discusses the pursuit of happiness along two poles:

- At one pole, humans strive for security, and are motivated by fear (of insecurity). The satisfaction of needs related to the pursuit of security, is a precondition for happiness, he argues, but not an attainment of happiness. As argued by some researchers, once a certain level of security has been achieved, further increases in economic wealth and satisfaction of further material needs/desires do not get us much closer to “happiness”. They may even work detrimentally to happiness, as fear and the pursuit of security turn into greed and addictive hyperconsumption, and as more growth, more material wealth, leads to more needs.
- At the other pole, humans strive for freedom, and are motivated by love, according to Gonzales. This, he argues, brings us closer to happiness. But here we may be drifting a bit into ethnocentrism. Geert Hofstede already pointed in 1984 at the cultural relativity of the quality of life concept, considering Maslow's pyramid of needs, with “self-actualization” at the top, as being typical of individualistic societies, whereas, according to Hofstede, in collectivist societies, the needs of acceptance and community outweigh the needs for freedom and individuality. Anyhow, whether we prefer Maslow's, Gonzales' or Hofstede's perspectives, the discussion here points at dimensions beyond the mere pursuit of economic security.

A number of indicators have been developed in the past two-three decades, which claim to measure and compare happiness, “quality of life” or “life satisfaction”, internationally. I cannot discuss them in details here, but they are interesting especially because their attempts at measurements, their rankings, their methodological choices, can stimulate further questions about which outcomes to look for.

Indicators of quality of life usually include not only wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time, and social belonging. The most established indicator is the Human Development Index (HDI), which combines measures of life expectancy, education, and GDP-per-capita. However, this indicator, used by the UN for its Human Development report, ignores ecological issues and non-quantitative dimensions altogether. More generally, many quality-of-life indices bear the risk of ethnocentrism, in their selection of indicators.

Measuring subjective happiness is no less problematic, as it depends on expectations, which themselves can collapse in dire situations: diminished expectations can then increase stated relative happiness, without necessarily meaning that the respondents are “living well together” to a greater extent than they did before their expectations went down. Nevertheless, several 'happiness' surveys have been developed, which I won't discuss in details now.

The word “happiness” is also used in indices which do not consist, or not only, of happiness surveys. Among the different indices, often discussed is that of “Gross National Happiness” (GNH) which has known several developments from the 1970's onwards, starting with its use in the kingdom of Bhutan. The GNH aims to combine material and spiritual dimensions of human development. Its 5 pillars are (1) human development (including health & education), (2) balanced and equitable development, (3) preservation of the natural environment, (4) preservation of culture and historical heritage, and (5) establishment of good governance.” The GNH index has been re-designed differently when applied in other countries than Bhutan. It is not an index that allows direct comparisons between countries, and some critics denounce its lack of consideration, in the case of Bhutan, for the expulsion of the Nepalese minority from the country.

In one of the late declinations of the GNH, elaborated in 2006 by Med Yones, of the International Institute of Management (Las Vegas), 7 dimensions are proposed:

1. Economic Wellness ;
2. Environmental Wellness ;
3. Physical Wellness (i.e. related to health);
4. Mental Wellness: (i.e. mental health) ;
5. Workplace Wellness: (i.e. labor conditions, e.g. unemployment, job change, workplace complaints and lawsuits);
6. Social Wellness: (i.e. social measurements such as discrimination, safety, divorce rates [note the conservative value judgment here], complaints of domestic conflicts and family lawsuits, public lawsuits, crime rates);
7. Political Wellness: (i.e. political measurements such as the quality of local democracy, individual freedom, and foreign conflicts).

Besides the GNH, another indicator has attracted some attention recently:

The "Happy Planet Index" developed by the New Economics Foundation in 2006, tends to demonstrate that truly sustainable happiness/quality of life cannot be achieved if the ecological footprint per capita of a country is too high. This index thus combines measurements of well-being and of ecological footprint (the index approximates multiplying life satisfaction and life expectancy, and dividing that by the ecological footprint). In short: The HPI measures the *environmental efficiency of supporting well-being* in a given country. Such efficiency could emerge in a country with a medium environmental impact and very high well-being (e.g. Costa Rica), but it could also emerge in a country with only mediocre well-being, but very low environmental impact (e.g. Vietnam). A country with relatively high well-being but also extremely high environmental impact, the USA, is ranked very low in the HPI (114th).

However, the HPI is criticized especially for completely ignoring issues like political freedom, human rights and labor rights.

Third question: redefining wealth?

Altogether, these different examples, in the search for alternative indicators, are moving away from the old-modern belief in a constantly growing material economic wealth as synonymous with a 'good & desirable life'. **How to better define wealth then, beyond the vicious cycle of economic wealth and economic want?**

Let's come back to King Datusena and his son Kassapa. It appears that the purely economic dimension of wealth is insufficient. Living well together, sustainably, is about reaching a minimum level of material well-being, so as to live in relative security, but this does not require an accumulation of material goods and an addictive consumer society. We are now still in the situation of Kassapa, who by killing his father, rejects his wisdom and refuses to recognize that his countrymen's wealth depends on ecosystems services, i.e. on **natural wealth**.

King Datusena, in the story, does not point at any random sort of natural resource. He points at a natural resource, rain water, which is renewable, and which is accessible thanks to a highly elaborate rainwater-harvesting system. (A system which the British colonists largely destroyed and then neglected.)

Nowadays, the idea of "ecosystems services" points at the vital services provided by nature to humans, rather than at the commodities it provides. For example, ecosystems services are clean air, clean water, fertile soils, productive oceans, pollination, pest control, regulation of local and global climates.

Quoting Janet Abramovitz, from the Worldwatch Institute: "Honeybee pollination activity is 60 to 100 times more valuable than the honey they produce. The value of wild blueberry bees is so great, with each one pollinating four to five gallons of blueberries in its life, that farmers view them as flying $50 bills.'"

Recognizing natural wealth implies that we subordinate and harmonize economic wealth to natural wealth. This means, we should not only organize the economy into markets, but integrate the economy with ecosystems. We need to incorporate insights from complex thermodynamics (as understood by Ilya Prigogine), from the geo-chemichal-biological cycles of global Earth systems; from complex balances of ecosystems. We need to consider the Earth as an open system thanks to solar energy inputs, but only relatively open, within constraints (e.g. with non-renewable resources). Some researchers have been pointing at these realities for several decades already, proposing to integrate economics into them (as did for example Nicholas Georgescu-Roegen, or René Passet, with calls for a "Bio-economics").

All of this is very different from the illusion that economic growth could be de-coupled from materiality, i.e. de-materialized.

But the nurturing context of natural wealth is not the only other dimension of wealth that the story of King Datusena and his son Kassapa evokes. Besides economic wealth, and natural wealth, the story can be related to social, cultural and spiritual wealth:

- **social wealth**, i.e. the benefits coming from living together, as communities, i.e. what is coined nowadays as "social capital". In the story, the water tank exists thanks to the collaboration of the community, and serves the community. The harvested water is not only a renewable natural resource, but is also the "commons". Unfortunately, the dominant discourse nowadays tells us an individualistic story about the "tragedy of the commons" and sings the praise of the privatization of all commons.

- **Cultural wealth**, i.e. the benefits of being in-formed and inspired, and what some people call **spiritual wealth**, i.e. the benefits of being transcended, are also implicitly present in the performance by King Datusena: Wading in the water, he immerses himself totally, body and soul, in this wealth constituted by the harvested rainwater. Wealth here is experienced, as something meaningful, enabling, and empowering.

Cultural and spiritual wealth are of course not only constituted of the recognition and experience of natural resources, but of all the cultural diversity which is weaved in and around natural wealth. The mutually reinforcing imperatives of biological diversity and cultural diversity constitute the basis for a more complete understanding of sustainable wealth, with is natural, cultural, spiritual and social, not only economic.

Such a **sustainable wealth** is not an end in itself, but an enabler, a multi-dimensional capital which builds up "capabilities" (to use Amartya Sen's terminology). And which wealth of capabilities do we need, in order to become more sustainable societies? Complexity research

tends to show that we need co-evolutionary capabilities, i.e. capabilities that allow humans to evolve together with non-humans, in the biosphere in which they are embedded. This deals with an **ecological wealth**, meaning more than just "ecosystem services" i.e. nature outside of ourselves – ecological wealth with a wide understanding of "ecology", i.e. the "Oikos Logos", the logic of our house.

We need a multidimensional wealth of capabilities, and a capital of diversities, that allow resilience and emergence. Let me explain those last two words, shortly:

- ***Resilience***: Resilience refers to a system's capacity to endure, withstand, overcome, or adapt to changes from the "outside" or from the "inside" environments. In other words, resilience points at the ability to survive on the long term by transforming oneself in relationship with one's environments Resilience is the ability to absorb disturbances, to be changed and then to re-organise and still retain a relatively stable identity. It includes the ability to learn from the disturbance.

- ***Emergence***: A concept which points at the creation of a new logic at the level of a system, whereby no analysis of the interactions between the different constituents of the system, can suffice to account for the arising of coherent and novel structures at the level of the whole system. Emergence is the engine of complex, unpredictable evolutions in nature and in societies. The logic of emergence is chaotic, bottom-up and rhizomatic (a rhizome is a polycentric/acentric network: e.g. roots of bamboo), as opposed to the constrained, top-down and hierarchic logic of human design and of modernistic development

What can artists and cultural practitioners contribute to a sustainable wealth, especially in terms of cultural wealth?

They can nourish the capital of diversity, and complement it with a capital of reflexivity and with the wealth of a sensibility to complexity. I am discussing in my current work an understanding of "aesthetics of sustainability" (in the book *Art and Sustainability: Connecting Patterns for a Culture of Complexity*, published at transcript Verlag). In a few words: Aesthetics of sustainability, as I propose to define them, have to do with developing specific sensibilities, which are:

- sensibilities to what Gregory Bateson called "the pattern that connects" i.e. the holistic connections between different realities; but also:

- sensibilities not only for holistic harmonies, but also for distinctions, conflicts, disconnections, i.e. sensibilities to manifold imbalances and injustices in nature and society;

- a sensibility for complex relations, i.e. the complex interaction of relations of unity, complementarity, competition and antagonism. This is a sensibility that does not mistake transversality for a so-called universality. This is a sensibility that avoids both the simplification of atomistic, fragmented, modern knowing, and the simplification of holistic or universalistic knowing.

Fostering, enabling and sharing such a complex sensibility may constitute an important element of reflexive capabilities allowing resilience and emergence.

This is, I believe, a valuable task for cultural practitioners today, in order to develop cultural and spiritual dimensions of sustainable wealth, i.e. in order to live well together, today and tomorrow.

PUBLICATION 4

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Author: Sacha Kagan

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Complexity as experience: The contribution of aesthetics to cultures of sustainability

Transduction

Rather than an introduction, I prefer to label the start of this text as a 'transduction'. A transduction is the action of conversion of matter, energy or a message into another form. More specifically in medicine, transduction refers to “the transfer of genetic material from one organism (as a bacterium) to another by a genetic vector and especially a bacteriophage” (www.merriam-webster.com). Transduction has more to do with transformation processes than does introduction, i.e. merely bringing something into play in a given context. My suggested transduction is to take some Deweyian aesthetics, as well as some complexity research (and some other material I will discuss below), and invite you to virally transfer them into the field of sustainability studies. Hence the title of this chapter: ‘Complexity as Experience’.

“Art as experience”, as proposed by John Dewey 80 years ago, characterizes aesthetics as an intense and rich relationship with the world, which we can sometimes experience in everyday life (Dewey 1934). According to Dewey, the aesthetic experience is an integrated experience manifesting connectedness and a “sense of the including whole”. Dewey's understanding of aesthetics as experience, points at personal affectivity in everyday life and at a human being's overall interrelationship with his/her environment. “Experience is the result, the sign and the reward of that interaction of organism and environment which, when it is carried to the full, is a transformation of interaction into participation and communication” (Dewey 1934, p. 22).

Echoing Dewey's expression, I suggest that we look into “complexity as experience”. Complexity as experience, I will argue here, characterises a specific type of aesthetic experience: “aesthetics of sustainability”. Here, aesthetic experience becomes a tense and complex relationship with the present world, a world characterized by the evolutionary challenge of the Anthropocene. In other words, aesthetics of sustainability confronts us with the challenge of finding prospects for the resilience of human communities, in an age where we cannot afford anymore to perceive nature and culture through simplified schemes.

Before I move further, let me shortly explain two terms, “resilience” and “Anthropocene”. Sustainability researchers often point at the importance of fostering the resilience of communities. In other words; how best to survive serious crises with a combination of adaptation and also some degree of resistance, when faced with external and internal threats. For example, in discussions on sustainable cities, several authors stress that “building resilience depends on nurturing diversity, self-organization, adaptive learning and constructive positive feedback loops between the economic, social and infrastructural aspects of a city as a complex system” (Dieleman 2013, p. 174). On a wider scale, resilience is about averting the extinction of the human species.

The Anthropocene is a new geological period, proposed by Paul Crutzen to have started with the industrial revolution (Crutzen & Stoermer 2000). In the Anthropocene, humankind has become a major geological factor deeply affecting the evolving conditions for the co-evolution of humans and many other species on planet Earth. This should not be misunderstood as meaning that humans are Gods and that the technosystem has swallowed and replaced the ecosystems, rather it means humans have always been embedded in nature's dynamic and ecological evolution. Therefore, culture is always a part of nature, rather than something apart from nature. This is no

news. However, what is increasingly true in the age of the Anthropocene is that human culture has so much affected natural processes on Earth, that culture has become a "planetary copilot" of nature. (I am borrowing the expression "planetary copilot" from Edgar Morin.)

Our present situation calls forward a perception of our complex embeddedness in "natureculture". (My use of the compound word "natureculture" navigates in between the uses of the term in ecopsychology and its uses by cultural theorists like Donna Haraway.) As I argued elsewhere: "It makes little sense to continue perceiving "nature" and "culture" as two clearly separate entities. We need to heal from modernity's habit of atomizing, fragmenting, reducing complexity by means of supposedly "clear" concepts and definitions" (Kagan 2012).

The aesthetics of sustainability

As I did in the book *Art and Sustainability* (Kagan 2011), I propose an understanding of the aesthetics of sustainability that, acknowledging previous developments in 'ecological aesthetics' and in ecofeminism (cf. e.g. Merchant 1995), roots itself in the Deweyian tradition, and brings together the insights from Gregory Bateson's perspective on aesthetics as the sensibility to "the pattern that connects", David Abram's animistic take on phenomenology, Edgar Morin's paradigm of complexity, and Basarab Nicolescu's transdisciplinarity. I will be able now to only sketch these 4 elements out very shortly. (For a more detailed exposition, please refer to chapter 4 in Kagan 2011.)

The notion of a sensibility to connectedness was central in Gregory Bateson's understanding of aesthetics. He stressed the importance of being aware of relational contexts, for our survival. To Bateson, the aesthetic is that which is responsive to "the pattern which connects" (Bateson 1979, pp. 8-10). A living mind has an "aesthetic preference" which is "able to recognize characteristics similar to [its] own in other systems [it] might encounter" (p. 118). Bateson posited a meta-pattern uniting all of life, and saw aesthetics as an important epistemological access to it, which reaches beyond the limits of purposive rationality.

According to David Abram (1996) historical societies based on phonetic alphabets, and especially modern industrial societies, have numbed and suffocated a whole dimension of human sensibility, which was and is still vibrant among some indigenous peoples; the sensibility to the intelligence of the 'more-than-human' - and the capacity to bridge perceptions with the non-human – i.e. the environment's complex and dynamic webs of life. We need to re-discover this numbed reflexive sensibility, which the arts and culture may play a role in re-awakening.

However, aesthetics of sustainability requires even more than a mere sensibility to the pattern that connects and to the more-than-human. It requires a sensibility to complexity, as discussed by Edgar Morin, who used an excellent image that I will quote now:

"Th[is] sensibility will be like that of the musician's ear which perceives the competitions, symbioses, interferences, overlapping of themes in the same symphonic flow, where the brutish mind will recognize only theme surrounded by noise" (Morin 1992, p. 139).

The aesthetics of sustainability should not be merely based on a holistic sensibility, over-emphasising the unity and integration of the biosphere or universe, replacing the disjunctive paradigm of modernity with a simplistic 'New Age' paradigm, but rather should be attentive to complexity, i.e. combining and contrasting unity, complementarity, competition, and antagonism. This implies firstly, a complex sensitivity that perceives as much antagonisms and competitions

as complementarities and symbiosis, and that transcends the contradictions so as to reveal the complementary tension of antagonism and complementarity. Secondly, a sensitivity to wholeness and order that also perceives and values disorder, disharmony, as well as uncertainty, and that respects genesic chaos.

The aesthetics of sustainability is especially open to chaos (i.e. the chaos of chaos theories, not the chaos of Lyotard's postmodernism) as a genesic source for generativity. Life's "creative evolution" emerges not from computational capacities alone, but from the ability to deal with disorder and ambiguity as genesic forces (Morin 1980). An aesthetics of sustainability, which is open to the generativity of chaos, then opens up a sensibility to emergence.

A transdisciplinary sensibility helps navigate through levels of reality and levels of perception, while keeping a certain direction and avoiding confusion and simplifications (cf. Kagan 2011, pp. 240-246). NatureCulture can work as a "macro-concept" (as proposed by Edgar Morin in *La method* (1980). A macro-concept harbours the dynamic tension, both contradictory and complementary, between relationships of unity, complementarity, competition, and antagonism (Morin 1977, 1980). Across different levels of reality, we need to learn to appreciate the contradictions between different logics, and to acknowledge the great level of ambivalence, uncertainty, and indeterminacy that we have to cope with and learn from, both in our daily lives and in sustainability problems.

Such an approach to living complexity, following Morin, points at life's continuous renewal through transformations, which is driven by constant improvisations, with trial-and-error cycles, and feeds on a diversity of alternative options. "Only improvisation remains constant" (Mayer Harrison & Harrison 1985, pp. 37, 60) and there are no fixed recipes for evolutionary success.

So we come back to resilience, or the ability to survive for the long term by transforming oneself in relationship to one's environments. Such an understanding of resilience, informed by the aesthetics of sustainability, then points us at the necessity to learn from the unexpected.

Walking as 'serendipedestrian' aesthetic practice

In the book *Art and sustainability*, I discussed, in rather abstract terms, this ability to learn from the unexpected by a having a certain openness to disturbances. I called this productive openness to disturbances, "autoecopoïesis" - as a contrast to Luhmann's autopoïesis. However, in the meanwhile I have also taken up another, easier and already available word. The ability to learn from the unexpected can also be discussed with an existing, popular word in the English language: serendipity. Serendipity stands for the ability to discern opportunities for learning in accidents and surprises of life, and for the sagacity of making discoveries of things which one is not looking for (Merton & Barber 2004, Kirchberg 2010). The wisdom coming from serendipity is needed, in order for us to relate to the emergence of the new in NatureCulture's complex dynamism (Kagan 2012).

The occurrence of an accident is in itself not enough for someone to be serendipitous, but a specific openness and sensibility is necessary, a specific sagacity. Sagacity refers to a wisdom that is grounded in sense perceptions, and that allows keen discernment and sound judgment. The required openness also means that one should be flexible, curious and alert enough to change one's goals and interests, along the way. Serendipity also involves learning across different,

apparently unrelated contexts, in a transversal, often metaphorical, way. This is also called lateral thinking, learning from unique incidents by a process of abduction.

Serendipity, as embodied learning, actualises itself in the experiential process of walking. That is why Cultura21 focused its first international summer school of arts and sciences for sustainability in social transformation, in August 2010 in Gabrovo, Bulgaria, on walking as a potentially transdisciplinary method (Kagan 2010b). And that is why I made up a derivative word, "The Serendipedestrian", at the occasion of "Sideways", a festival/long-distance-walk/conference in the summer of 2012 in Belgium.

Serendipity is a walker's wisdom. The fairy tale entitled *The Three Princes of Serendip*, published in Italy in 1557 (from Persian or Indian sources), was the inspiration for the creation of the English word serendipity by Horace Walpole in the 18th century. In this fairytale the three princes from the island of Serendip gain wisdom while walking in a foreign kingdom. They are learning, while walking and attentively observing, smelling, touching their surroundings to interpret the most subtle and nearly unnoticeable signs on the road sides. They are readily discovering what they were not looking for.

Walking-based practices put learned things in contexts, locally and ecologically, embedded in a real geography and not only conveniently virtual. Thanks to the slower rhythm, the walker heightens his or her attention. Walking across places involves moving, exchanging, comparing. Walking is transversal. The transversal is that which cuts across, walks across, different levels of reality, not only bridging them, but also travelling beyond them. Walking can even become a genuinely transversal method for knowing, sensing (in a multi-sensorial way as discussed by Tim Ingold (2008)) and sometimes eventually a basis for changing the realities of local communities. Walking is sometimes a social and political practice, reshaping the realities of shared spaces and the fiction of public space, accompanying political expressions and the articulation of democracies, as with Gandhi's famous salt march to Dandi. Walking allows both exchanges with multiple others and personal introspection for oneself. And, as an ordinary activity, low-tech rather than high-tech, it is accessible to all, and open to mixing all sorts of non elite-wisdoms from all human groups (Ingold and Lee Vergunst 2008, Kagan 2010a).

First short excursus: gardening

An embodied attention to NatureCulture's complex vitality can be practiced through certain ways of gardening. One very good example of this is the internationally acclaimed gardener Gilles Clément, who understands gardens, nature and life in general, as constant transformation. His way of gardening also conveys a view of nature that is neither the dominated and alien nature of modernity, nor a sublime and virgin nature that humanity would not touch. The aesthetic experience of nature that comes out of his approach to gardening, is pointing to a great diversity of species and interactions that includes humanity's peculiar responsibilities, and seeks partnerships.

With Clément, the gardener's role is not to control the plant species and constrain them into geometric patterns conceptualized a priori. The gardener's role is rather to observe the evolutionary interactions between species, learn from them, interpret them, and then intervene with the goals of fostering dynamic balance between species and of increasing biological diversity. This kind of gardener carefully observes, before acting. He or she allows and accompanies the plants' displacements through the garden, and does not try to constrain this

evolution. If a plant grows in the middle of a pathway, it will not be cut. Rather, the visitors paths will change every year, adapting to the changes brought by the movements of different plants (Clément and Jones 2006).

With his gardens, Clément does not praise some sort of postmodern disorder, or some superficially romantic garden. Rather, he is experiencing the highly complex play of order and disorder, organisation and disorganisation and reorganisation, in his moving gardens. In this, he is very much the gardener counterpart to Edgar Morin’s theoretical elaborations on the complexity of life.

Second short excursus: queer ecologies

Another embodied approach to experiencing the creative diversity in NatureCulture's dynamic complexity is through sexuality. Under the notion of queer ecology, or ecologies as developed by Greta Gaard and by Catriona Sandilands (eds. Mortimer-Sandilands and Erickson 2010), an interesting meeting of queer studies and ecofeminism occurred – ecofeminism being itself a meeting of feminism and the environmental justice movement.

Queer ecology focuses on NatureCulture’s incredible sexual creativity. Indeed, sexuality in nature, whether reproductive or non-reproductive, is much more complex, polymorphic and changing than is traditionally conceived of, e.g. with the view of a functional evolution of sexuality. Nature encompasses a wide variety of sexual possibilities. A queer-ecological look at cultural history also reminds us that in the Middle Ages, Europeans were not yet constrained by hetero-normative Christian norms, and that later European colonisers repressed the more flexible sexualities of Native Americans.

Vancouver-based ecological artist Caffyn Kelley argues that “homosexuals must bring a particular sensibility to the experience of nature. Abhorred as unnatural, and alternately as bestial, castigated as primitive, and described as the strange fruit of a civilization grown too distant from the earth, identifying as homosexual, queer, gay or lesbian makes one attuned to the culture of nature. Nature appears not as a timeless essence, separate from human experience” (Kelley nd). Kelley further sees many qualities in a queer experience of nature and of the self; “Queer is a way of choosing a radical openness instead of a fixed identity. A queer ecology might eschew the essentializing, anthropocentric tendencies of identity and identification (including taxonomies of species, gender, race), and allow us to instead choose complexity, fluidity and interconnection” (ibid.).

Ecological art and the search for lived cultures of sustainability

I understand the notion of cultures of sustainability as part of the eco-evolutionary challenge I described above. By eco-evolutionary, I mean evolutionary in an ecological sense, with multiple levels of evolutionary and co-evolutionary processes, seeing also whole ecosystems as dynamic (Morin 1980). The sustainability of human communities today, depends on their capacity to co-evolve with other living systems, within rapidly changing environmental conditions (of which they are the co - pilot). It requires contextually relevant capabilities to learn, both in specific places and in a planetary context. For example, the Malaysian sustainability researcher

Manickam Nadarajah proposed 8 principles for a culture of sustainability in cities, which all focus on how the 'symbolic universe' of sustainable communities is closely related to a deep, spatialised knowing of ecological contexts in their local specificities, their diversities and their inter-relationships (Nadarajah & Yamamoto 2007). In her discussion of environmentalism and cultural studies, Ursula Heise complemented such a notion of sense of place with the equally important notion of a sense of planet (or eco-cosmopolitanism (Heise 2008)).

I have gained the conviction that the practice of ecological art can play a key role in training ourselves towards such cultures of sustainability, through aesthetics of sustainability. At the very least, ecological art bears an interesting potential in that respect. A working definition of ecological art can be taken from the self-understanding of ecological artists, as formulated in a statement from the 'ecoart network'. Ecological art "embraces an ecological ethic in both its content and form/materials. Artists considered to be working within the genre subscribe generally to one or more of the following principles:

• Attention on the web of interrelationships in our environment—to the physical, biological, cultural, political, and historical aspects of ecological systems.
• Create works that employ natural materials, or engage with environmental forces such as wind, water, or sunlight.
• Reclaim, restore, and remediate damaged environments.
• Inform the public about ecological dynamics and the environmental problems we face.
• Re-envision ecological relationships, creatively proposing new possibilities for co-existence, sustainability, and healing."[18]

The remaining space in this chapter does not allow me to conduct a detailed discuss of the characteristics of ecological art, nor to bring concrete examples. What I shall do instead is to highlight seven key elements (see also Kagan 2014), often found in ecological art practices, which bear a high potential for the aesthetics of sustainability and for experimentation towards cultures of sustainability:

- Theirs are "connective" practices, cultivating empathy and responsible dealings with fellow humans and non-humans, rather than merely affirming an individual self in opposition to society (as discussed e.g. by Suzi Gablik (1991)); ecological artists are acting as interprets of interdependence (as discussed e.g. by Tim Collins (2004)).
- These practices are exploring and shaping shared spaces for people and other species.
- They are aiming to foster the non-possessive, shared authorship of a process that eventually develops a life of its own.
- They are navigating across different scales of ecological relations at the local, regional/national, bio - regional (e.g. watersheds), and continental levels.
- They are connecting the level of everyday activities, the level of critical reflexivity and systemic questioning, the level of envisioning and imagining of heterotopia, and sometimes also at a spiritual level.
- The practice of ecological art is participatory, not unlike the practice of participatory action research.

[18] Source: internal communication on the 'ecoart' network mailing-list, in preparation for eventual wikipedia entries (November 2011). See www.ecoartnetwork.org for more information about this network.

- As in the serendipitous learning process of walking, the work carried out in ecological art projects is cultivating a wisdom grounded in sense perceptions, with an iterative process of exploring and experimenting.

I am of course not claiming that all seven elements mentioned above are, or have to be, all present together across all forms of ecological art practice. My argument is rather that, when they are present (and especially when several of them are co-present), these elements foster the experience of the aesthetics of sustainability.

Transclusion

I do not like conclusions, and the false comfort given by the impression of "wrapping up" that they confer. Instead, please find here a few words for a suggested 'transclusion' of sorts (loosely borrowing the term from hypertext scholar Ted Nelson (1981)), i.e I suggest some further readings to those readers interested in pursuing the lines of reflection suggested so far.[19]

My short discussion of ecological art, above, jumped right into some key features of the practice of ecological art (discussed at more length in Kagan 2014), without having the space for illustrations with concrete cases of ecoart. I invite the readers to look into chapter 5 of *Art and Sustainability* (Kagan 2011), and into Linda Weintraub's *To Life* (Weintraub 2012), where they will find descriptions and discussions of several good examples of ecological art practices.

In my discussion of aesthetics of sustainability, I did not mention several relevant discussions of aesthetics. One of them is Beth Carruthers' discourse on "deep aesthetics" which bases itself on James Hillman's distinction between aisthesis and a state of anasithesis in which modern individualism plunged us, according to Hillman (Carruthers 2013). Furthermore, Hillman and Carruthers are not the only authors and practitioners who pointed out the importance of aesthetics in order to heal a contemporary condition of anaesthesis (e.g. in the UK, the social sculpture researcher/artist Shelley Sacks, and in Germany, the philosopher Wolfgang Welsch).

Finally, I would like to refer to one author whom I mentioned at the "Aesthetics of Sustainability" conference at Curtin University on October 3rd 2013, in the discussion time following my videoconferenced plenary contribution (on which this chapter is based). One colleague raised the question, whether sustainability research may be too-exclusively grounded in biological discourse, and too little grounded in symbolic discourse. My response to this question was that we should explore the work that has been done in the field of biosemiotics, and then bridge cultural-scientific/humanities research with a certain kind of biological discourse that shows a great openness to an aesthetic-epistemological access to the world. In this direction of thought, I invite the readers to look into the essay *Enlivenment*, by German biologist and philosopher Andreas Weber (2013).

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[19]However, this bit of text does not include any real "transclusion" in Nelson's sense, requiring mutual hyperlinking, i.e. textual hyperlinks working both ways between the two hyperlinked texts (i.e. the text including the transclusions, and the source text).

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PART 2: The Arts in Relation to Culture(s) and Aesthetics of Sustainability

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Art and Sustainability: The search for cultures of sustainability is not an easy journey

Engagements with issues of sustainability and ecology are becoming increasingly relevant and noticed across the world, including in the fields of the arts and culture. To gain a comparative China-Europe perspective on this thematic area, I consulted with a dozen Asian, European and American cultural practitioners, including Ada Wong, director of the Hong Kong Institute of Contemporary Culture, as well as several internationally renowned ecological artists.

In China, as well as in Europe, advocacy for ecology and sustainable development is more predominant among environmentalist activists than in the art worlds. In Europe, a thriving civil society (NGOs, foundations and informal networks) as well as green political parties are contributing to a rising ecological awareness. But too often, awareness of ecological issues does not convert into experimentation with more sustainable livelihoods. However, good practices are emerging, such as for example the permaculture and 'transition towns' movements in several major European cities, i.e. self organised neighbourhood initiatives aiming to transform everyday life with the goal of overcoming their 'addiction' to fossil fuels. The interest of these initiatives lies in their daily creativity and in the fact that they address lifestyle changes beyond mere 'green technology' innovations and limited energy saving measures. Transition initiatives spread out from the UK to the rest of Europe, North America, Brazil, Oceania and Japan in recent years. The situation in China bears less comparison. As Ada Wong says:

"In China, there are now more green groups and environmentalists but not that many ecological artists. SEE (Society of Entrepreneurs and Ecology) is one of the more influential groups comprising business people who care about ecological issues. Their main concern has been desertification in Inner Mongolia and they fund NGOs to do community advocacies. Friends of Nature is one of the earliest NGO green groups in China and one of its founders, architect and intellectual, Liang Cong-jie ( ), is a grandson of Liang Qi-qiao, an icon of the May 4 Movement in China."

China does not have 'transition towns' but has several top-down initiatives aiming to experiment with ecological planning in urban development (e.g. some projects in partnership with the firm Arup, and some exemplary projects developed by Turenscape). However, by comparison with Europe, ecological awareness is less developed in 'public opinion', partly because the mainstream media in China do not report accurately the seriousness of the country's ecological crises (unlike for example the WWF). As observed by Ada Wong: "The majority of Chinese people have not awakened to the fact that there are grave ecological issues that everyone as a global citizen must tackle. And indeed, 'development' (by building more property, factories, axing more trees and harming the environment) is still seen as a must for progress and economic expansion."

Focusing more specifically on artistic responses, there are again relatively few points of comparison between Europe and China.

In Europe and North America, artistic movements known as 'ecological art', 'environmental art' and 'art in nature' appeared in the 1970s. They address issues such as the inter-relatedness of ecological and social crises, relationships between culture and nature, the recovery of an ecological sensitivity numbed by modernity, and more specific topics (e.g. water pollution, ecosystem improvement, conversion of landfill sites, etc.). The 'social sculpture' movement initiated by the German artist Joseph Beuys, links social, cultural and ecological issues and

engages communities into creative experiments for alternative lifestyles (e.g. see the Social Sculpture Research Unit at Oxford Brookes University). Starting in the 1990s, some artists collectives (such as Wochenklausur in Austria) developed a practice of 'intervention art' aiming to identify and resolve specific, small- and medium-scale social and/or ecological issues autonomously, with direct interventions in society.

But so far, ecological art, social sculpture, intervention art and the like have remained relatively marginal movements in the European art landscape. However, ecological art has gained more attention in recent years, alongside a rapidly growing, albeit more superficial, interest in issues of ecology and sustainable development among both some contemporary art 'elites' and some popular artists. Most spectacular in recent years has been the surge of interest in issues related to climate change and to changing unsustainable practices in the arts and cultural industries across Europe (with concrete ideas to reduce the ecological footprint of arts organisations). Among the many initiatives in the past decade, can be mentioned:

- The UK-based Cape Farewell (a series of expeditions to the Arctic on a sail boat, gathering climate scientists and artists, hoping to inspire the invited artists to engage with climate change), Tipping Point (an 'Open Space' conference format gathering climate scientists, artists and other cultural workers, and a series of commissioned art projects about climate change) and Julie's Bicycle, as well as UK-specific online resources on ecological art such as most recently eco/art/scot/land.

- In Germany, several projects experiment with social-ecological transformations in urban as well as rural contexts, e.g. in Berlin with 'Culture is it!', initiated by Hildegard Kurt in 2005, and with 'Ueber Lebenskunst' since 2010, a framework initiated by the Haus der Kulturen der Welt. Groups such as 'slap' (social land art projects) and Cultura21 advocate for 'cultures of sustainability'.

- Based in Hungary, curators Maja and Reuben Fowkes (translocal.org) foster curatorial discourses and practices related to 'sustainable art' within the field of contemporary art across Europe. In France, the organisation COAL (coalition for art and sustainable development) follows similar aims.

- Internationally, inter- and trans-disciplinary platforms gathering scientists, artists, and diverse professionals, such as Cultura21, are networking these initiatives. Professional networks with similar aims, focusing on specific art sectors, also developed themselves, such as Imagine2020 which gathers several European theatres in a commitment to ecological issues and sustainable practices.

The interest in climate change issues in the European contemporary art scene peaked in late 2009, with several prestigious art institutions in Copenhagen and elsewhere opening exhibitions on the topic, and with Culture | Futures (a conference gathering several European cultural institutions) alongside the UN COP15 conference. However, in 2010, the level of interest dropped. Besides, many of these initiatives by major art institutions were superficial, unreflective and short-lived.

In reviewing the themes which are currently predominant in Chinese art, Ada Wong observes that ecological issues are apparently viewed as less imminent than current social and political issues:

"Some contemporary artists' works are characterised by a spirit of rebelliousness and how people face up to the impenetrable walls of authority. Others are socially engaged and incorporate political and historical references in their works. Some capture the edginess of contemporary society, how society is under assault from all quarters while others are concerned with their history being taken away and investigate the place of tradition in contemporary China. They are

preoccupied with 'speed', that the Chinese experience has happened so quickly, from a drab and colourless society in the mid-1970s to the very materialistic and 24-hour assault of light and noise we now see in Beijing and other big cities."

Despite being even more marginal than in Europe, artistic practices concerning ecology have also emerged in China. At one level, Ada Wong mentions the cultural practitioners whose works aim to raise awareness of ecological issues in the general population: "Some photographers and filmmakers can be called ecological cultural practitioners. Filmmaker Chen Lu is concerned with Kekexili ( ), a nature conservation zone in the Qinghai highlands at over 4,000 metres altitude. The touching film told the story of conservationists and village officials who died while protecting Tibetan antelopes in danger of being extinct because of illegal hunting activities (as their skins are very precious). Photographer Xi Zhi-nung ( ) from Yunnan province is one of the most well known "ecological photographers" and has won much acclaim in his use of images to foster his vision of a more ecological and environment friendly society. His photographs have been featured in *Photographing China* and the *National Geographic* and were instrumental to various campaigns to save forests and rare species of birds and monkeys. He is also a documentary filmmaker and his film on (a rare species of monkey) has caught the attention of government and in the end helped to protect the species."

Such practices also exist in Europe, where a documentary tradition exists with environmentalist concerns (its most widely popular practitioner being the French photographer Yann Arthus-Bertrand). But, for all their qualities, these practices do not fully constitute 'ecological' or 'sustainable' art, unless they address the complex relationships between different dimensions of ecological, social, cultural and political issues constituting unsustainable human development. However, in the Chinese context, "there is a fine line between acceptable advocacy (such as what Xi is doing) and overstepping into sensitive issues" – which can unfortunately lead to personal consequences for the artists. Artistic engagement with sustainability is thus especially difficult to practise in China, but a few examples can be mentioned: Several Chinese artists worked in ecological art projects in the past two decades, e.g. in exchanges with the US American ecological artist Betsy Damon, starting with the project The Living Water Garden (1995–1998) for the city of Chengdu in the Sichuan province of China (cleaning some of the water from the Fu and Nan rivers and educating visitors about issues of water treatment). An interdisciplinary collaboration with Chinese experts (including hydrologists and a microbiologist), this park includes constructed wetlands with different water-purifying plants and flow forms. The first phase of Betsy Damon's work, before the realization of this park, consisted of a "pilgrimage to the headwaters of the river, in Tibet" and, back in Chengdu, in a performance (Washing Silk, where she rinsed white silk in the Fu-nan River, and the silk went brown-grey with the pollution).

Linked to Damon's project, further artistic works were realized by about 25 artists in Chengdu in 1995 and 30 artists in Lhasa in 1996. Damon continues to work in China and elsewhere on the Keepers of the Waters project, which involves art, science and community involvement around water sources. Further projects in China include the Wenyu River planning project, the Olympic Forest Park project and the TongZhou ecological park in Beijing. In Chengdu, Damon is supporting with CURA, the Chengdu Urban Rivers Association, the Model Village Project, conducted by Tian Jun and Duncan Cheung. They work with the villagers (in An Long village, Pi County) to create proper waste streams, restore rivers, protect the watershed and improve the standard of living by producing organic food. Among the Chinese artists who worked with Betsy Damon in Chengdu were Song Dong, Dai Guangyu, Wang Lian, Yin Xiuzhen, He Qichao, Ci Ren La Na and Ang Sang. In her 1995 performance Washing River in Chengdu, Yin Xiuzhen "had 10 cubic meters of polluted river water frozen into ice. These ice blocks were placed at the riverbank and then she asked passers-by to clean these blocks of ice until they turned into water." (Berghuis 2006, p. 253)

In Lhasa in 1996, the 'water preservationists' art events organised by the American artist Norman Bates and the Chinese scholar Zhu Xiaofeng constituted "one of the first large scale international performance art movements" in China, and "was designed to show artists' commitment to the environment, nature, life and spirit by means of performance art, installation art and other media." (ibid., p. 256) Among the participating artists were Liu Chengying, Zhang Xin, Zhang Shengquan, Zhang Lei, Ruan Haiying and also some invited artists from Switzerland. At that event, Song Dong performed Water, using a large seal with the character for water, and repeatedly stamping it onto the water surface of the lake in Lhasa. This and other performances by Song Dong (including since January 1st 1995 his "writing diary with water" – whereby he writes his daily diary on a stone with water, leaving no traces) evoke a Taoist poetic sensibility to the human relationship with nature. At the event in Lhasa, Li Xijiang performed Antibiotic: Injection into (Qinghai- Xizang) – literally pouring antibiotics into polluted water, wearing a hospital uniform. Other ecological art works dealing with water were produced at an event in Beijing in 2003: 'Water 0.03%' performed in Houhai, with works by Wang Peng, Nianchao Shang, Zhao Liang, Rania Ho, Wang Wei, and Zhang Hui.

Zhang Wei, a curator based in Guangzhou, director of Vitamin Creative Space since 2002, developed a project in collaboration with a community and a property developer, to save a mountain from the extraction industry. In a 2006 UK-based publication (ed. Andrews 2006), Hu Fang of Vitamin Creative Space interviewed artists and authors such as Feng Yuan, Zheng Guogu (initiator of the Empire Time land art project since 2004 near the city of Yangjiang) and Jiang Jun, offering critical perspectives on the unsustainability of Chinese land reforms, from Mao's rural land reforms to contemporary urbanisation and its superficial, image-driven architectural plans. Other Chinese artists make incursions into specific issues of (un-)sustainability, such as Wang Jianwei with the video Living Elsewhere (1999–2000 – addressing urbanisation and migrations) and the installation Spectacle (2005 – referring to consumerism and pollution).

A sensibility to the complexities of human-nature relationships implies a creative openness to disturbances, an "autoecopoïetic sensibility" as I argue elsewhere (cf. Kagan 2011).[20]

This also involves exploring human inner nature, as e.g. in Chen Lingyang's works (e.g. Twelve Flower Months in 1999–2000, Periodical Fairy in 2002) where she echoes the ecological cycles in the autopoïetic cycles of her own body.

In Hong Kong, in the past year, "several artists joined a movement against the wiping out of Choi Yuen village (a small farming village) in order to build a hi-speed rail link between mainland China and Hong Kong. The village was later used as the venue for site specific art installations, photographic works and marathon concerts and rallies, and many artists, especially younger ones, were core members of the movement. Artists, planners and architects are now helping villagers to build a new eco village and organic farm with proper treatment of rain water. They recently attended lectures on permaculture, and are also advocating slow food and a 'slow experience'."

Also in Hong Kong, Ada Wong has organised the annual MaD (make a difference) forum since 2010: "MaD is a platform for young people in Asia to create personal, social and environmental changes. It believes in young people to lead change and bring about positive, social and environmental impact with their energy and passion. The theme of ecology and sustainability is very important at the annual MaD forum (comprising talks, workshops and chat rooms) held in January each year. There are events throughout the year to ensure that young people do not sit back on their dreams but follow up with action. 'Change in Action' is an ongoing initiative

[20] An autoecopoïetic system is creatively open, and sensitive, to environmental disturbances, whereas a merely autopoïetic system can only be disturbed by already recognised environmental irritations. Autoecopoïesis allows 'emergence', in other words, the unexpected.

(under MaD) which provides seed money to teams of 4-5 young people. These projects could be social or environmental and should bring about small but positive impact. I have hired a young team of artists, art historians and administrators to oversee the various MaD projects and they are inspired by Joseph Beuys, using social sculpture to promote ecological awareness."

Ada Wong and her colleagues are organising further exemplary initiatives which cannot be considered in detail here. In particular, the HKICC School of Creativity, where questions of sustainability are integrated in the curriculum, and which could be an example for others to follow in China and Europe.

As well as arts education, another area which can only be mentioned briefly is landscape architecture and garden design, where exemplary ecological projects are developed both in Europe (e.g. the gardens of Gilles Clément) and China (e.g. the projects by Kongjian Yu of Turenscape, such as the Shenyang Architectural University Campus, integrating agricultural and urban landscapes).

In the past few years, several China-Europe exchanges have addressed issues linking sustainability/ecology and the arts and culture:

- In the UK in 2004, Alan Boldon invited Zhang Wei to the Desire Lines conference (Dartington College of Arts), and later brought together several UK art institutions to organise a visit by British artists and architects to the Pearl River Delta, meeting their Chinese hosts around the theme of alternative urban models.

- In October 2008, the Asia-Europe Foundation organised the Asia-Europe Dialogue on Arts, Culture and Climate Change in Beijing, which included a residency by Insa Winkler and Oleg Koefoed at the Central Academy of Fine Arts (working with students of the Experimental Art Department) and an international conference.

- Further exchange examples include residencies by the English ecological artist David Haley at several art universities in the north and south of China.

In general, my analysis is that a culture of sustainability must base itself on a culture of complexity, i.e. opening itself to ecological and cultural complexities, in order to nourish perspectives of resilience for human societies. The ecological artist David Haley insists that "we must learn, not to be afraid of complexity". I think that this requires the development of an aesthetic sensibility to complexity. This is linked to balancing plurality and unity, conflicts and compromises, and to valuing diversity. Valuing diversity is relevant, not only at the biological and ecological levels, but also at the level of cultural diversity, and at the social and political levels.

However, fostering such a sensibility is very difficult. That difficulty has different characteristics in Europe and in China. In Europe, the practice of pluralism and "polyarchy"[21] (cf. Kagan 2011, chapter 7) is helpful. However, the disjunctive tradition of European modernity (reducing the properties of wholes to the properties of their constituting parts, fragmenting our knowledge of reality), and the holistic simplification of some 'green' discourses (over-emphasizing the ecological harmony of wholes, ignoring the important roles of conflicts and tensions among the parts) constitute risks.

In China, the Taoist tradition and knowledge of practices such as traditional Chinese medicine constitute potential bases for aesthetics of complexity. However, the political climate remains

[21] A polyarchy is a regime of authority that allows various non-hierarchical political configurations. The term is borrowed from Robert Dahl.

insufficiently appreciative of diversity because, instead of recognising harmony in diversity (as in the Taoist or Heraclitean traditions), the ruling system tries to impose harmony through establishing a uniform consensus in society. Besides, in both Europe and China, a naive belief in green technologies, mistaking complicated cybernetics for the deeper complexity of ecologies, is impoverishing our search for sustainable futures.

The search for cultures of sustainability is not an easy journey, but it is a fascinating one. We can learn from some of the examples mentioned in the present article. Building upon these examples, further transformations are required in the fields of arts and culture, as well as in culture at large.

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The Practice of Ecological Art

Abstract

The genre of "ecological art", as originally conceived in the 1990's on the basis of practices that emerged from the late 1960's onwards, covers a variety of artistic practices which are nonetheless united, as social-ecological modes of engagement, by shared principles and characteristics such as: connectivity, reconstruction, ecological ethical responsibility, stewardship of inter-relationships and of commons, non-linear (re)generativity, navigation and dynamic balancing across multiple scales, and varying degrees of exploration of the fabric of life's complexity.

Keywords: ecological art, aesthetics of complexity, practice, commons, ecological ethics

"We believe that in a well-functioning system, cultural diversity and biodiversity exist in a state of mutual interaction – the former self-conscious and able to intend and transform, and the latter the pattern of self-organization from which we all spring and to which we all return, and which ultimately determines the possible" (Helen Mayer Harrison and Newton Harrison, 2004).[22]

Over the past decade, as the global crisis of unsustainable development has become increasingly difficult to ignore (with the combined effects of climate change, massive extinction of species, etc.), the interest for ecological issues and related themes has been rising in the art worlds. In this context, the labels "ecological art" and "eco-art" (or "ecoart") have gained increased attention in recent years, and are being used loosely by a variety of practitioners and commentators, sometimes even interchangeably with expressions such as "environmental art", "land art" and "art in nature".

However, the emergence and original usage of the term "ecological art" refers to a more clearly defined set of artistic practices: The name "ecological art" appeared in the 1990's, to qualify artistic practices that emerged from the late 1960's onwards. Focusing on ecological art in this more specific, original usage, and considering it as a set of social-ecological practices, I will consider some of its salient characteristics.[23]

The "ecoartnetwork", an invitational network and mailing-list (started in 1999) which is gathering more than a hundred practitioners and friends of ecological art, among whom are several key figures in this movement or genre, issued a statement that circulated on the ecoartnetwork mailing-list in 2011, as an attempt at self-definition:

Ecological art "embraces an ecological ethic in both its content and form/materials. Artists considered to be working within the genre' subscribe generally to one or more of the following principles:

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[22]Available at: http://moncon.greenmuseum.org/papers/harrison1.html

[23]However, I will neither engage in a thorough art historical inquiry, nor list all available definitions of the term. For an overview of definitions of "ecological art" and a presentation of selected artists and curators working within this genre since the late 1960's, see: Sacha Kagan, *Art and Sustainability: Connecting Patterns for a Culture of Complexity*, Bielefeld: Transcript Verlag, 2011 (2nd ed. 2013), pp. 269-343. For a wider selection of artists, see also: Linda Weintraub, *To Life! Eco Art in Pursuit of a Sustainable Planet*, University of California Press, 2012.

• Attention on the web of interrelationships in our environment—to the physical, biological, cultural, political, and historical aspects of ecological systems.
• Create works that employ natural materials, or engage with environmental forces such as wind, water, or sunlight.
• Reclaim, restore, and remediate damaged environments.
• Inform the public about ecological dynamics and the environmental problems we face.
• Re-envision ecological relationships, creatively proposing new possibilities for co-existence, sustainability, and healing."[24]

Some of the general features of ecological art practices were already described by a few art historians and artists/researchers over the past two decades. Especially, the art historian Suzi Gablik, back in 1991,[25] highlighted three important characteristic of this emerging movement that would come to be known as ecological art:

1. These are "connective" practices, cultivating empathy and responsible dealings with fellow humans and non-humans, rather than merely affirming an individual self in opposition to society. One early work that epitomized this attitude is *Touch Sanitation* (1979-1980) by Mierle Laderman Ukeles.[26] In this sense, the practice of ecological artists is often explicitly inspired by, and referring to ecofeminist philosophy (e.g. Carolyn Merchant), which from the 1980's onwards, allowed ecological artists to overcome the rigid dualisms of nature vs. culture, developed world vs. underdeveloped, man vs. woman, reason vs. emotion, etc.[27] Such a connective quality in artistic practices, which tends to reach beyond superficially connective "relational aesthetics" à-la Bourriaud, has also received renewed attention in the past decade, for example in Grant Kester's writings on "collaborative, participatory and socially engaged practices" in art.[28]

2. These are practices which aim to be "reconstructive" of sustainable ways of living, and not only "deconstructive" of modern social systems (as discussed by Gablik in the context of postmodern discourses of the 1980's and early 1990's). Their reconstructive quality also implies that these practices are generally aiming to be transformative rather than representative (as Rasheed Araeen lately pointed out about the Land Art of the 1960's and 1970's)[29], and that ecological art is neither useless (in the sense of art for art's sake), nor functional (in the sense of fulfilling already defined functions).

3. These are artistic practices which subject themselves to ethical responsibilities toward communities (understood as both human and non-human communities of life). In *The Reenchantment of Art*, Gablik contrasted these practices to e.g. the individually confrontational and self-hero-ifying practice of Richard Serra in the production of his

[24]Source: internal communication on the ecoartnetwork mailing-list, in preparation for eventual wikipedia entries (November 2011). See www.ecoartnetwork.org for more information about this network and a list of its members.
[25]Suzi Gablik, *The Reenchantment of Art*, London: Thames and Hudson, 1991.
[26]See also the Manifesto of "Maintenance Art" which Ukeles wrote in 1969.
[27]More recently, the merging of ecofeminism and queer studies, into "queer ecologies", started to attract the attention of some practitioners of ecological art. This further development in ecofeminism was initiated in the late 1990's, by: Greta Gaard, "Toward a Queer Ecofeminism", *Hypatia*, 12 (1), 1997.
[28]Grant Kester, "Collaborative Practices in Environmental Art", in: Crawford (Ed.), *Artistic Bedfellows: Histories, Theories, and Conversations in Collaborative Art Practices*, Lanham: University Press of America, 2008. See also: Grant Kester, *The One and the Many: Contemporary Collaborative Art in a Global Context*, Durham: Duke University Press, 2011.
[29]Araeen unfortunately ignored the decades of practice (and the already practiced qualities) of ecological art, in his recent 'discovery' of "ecoaesthetics": Rasheed Araeen, "Ecoaesthetics: A Manifesto for the Twenty-First Century", *Third Text: Critical perspectives on contemporary art & culture*, 23 (5), 2009, pp. 679-684.

Tilted Arc (1981) and in the subsequent controversy that ended with the work's removal (1989).

Another important feature of the practices of ecological artists, as stressed in 2004 by Tim Collins, is the shaping of shared spaces for people and other species and the advocacy for such shared spaces (such as commons and ecosystems). This implies common care and "stewardship through inter-relationship".[30] One example of such a practice is the "trans-species art" of Lynne Hull, whose clients include multiple species, human beings being just one of them. Hull's works include restorations of wildlife habitats, co-conceived with local human communities and tried & tested for suitability by non-human clients.

Because of this orientation, the practice of ecological art avoids focusing mostly on the gifts of talented individuals, but aims rather to foster the non-possessive, shared authorship of a process that eventually "develops a life of its own" (as coined by Helen and Newton Harrison). The work carried out by the Harrisons, from the 1970's to this day, also constitutes a exemplary practice in this respect. For them, the real client is the land itself, and creativity is understood as a shared flow, meshing individual and collective processes. Such understandings of creativity among ecological artists coincide with the values of the "Creative Commons" movement and more generally with the rediscovery of the collective human management of Commons as beneficial to bio- and cultural diversities.[31]

Back in 1969 in her manifesto of "Maintenance Art", Mierle Laderman Ukeles suggested another, related quality: Artists adhering to Maintenance Art, and I would argue, ecological artists, are striving for a regenerative (non-linear) quality (rather than a merely generative, linear quality, as was the case in modern art). This fundamental insight has been declined in various forms (and with a variety of reformulations) since then among ecological artists.

Complementing these characterizations of ecological art, I suggest adding the following elements:

The practice of ecological art is often navigating across different scales, such as:

- Different scales of ecological relations at the local, regional/national, bioregional (e.g. watersheds), continental, and global levels: The work of the Harrisons, from the *Lagoon Cycle* (from 1972 to 1984) to *The Force Majeure* (since 2008), is exemplary in this matter, as it spans, e.g. in *The Force Majeure*, from the level of one single mountain, through the level of bioregions, to the level of e.g. the entire European peninsula and the global biosphere. Here, the work of ecological artists prefigured the concerns for a combination of "sense of place" and "sense of planet" that gained attention more recently in the literary field of ecocriticism.[32]

- Balancing, at multiple scales, the ego-... & the eco-.... perspectives: While some ecological artists are (I think, mistakenly) only aiming for an "eco-centrism" - which is partly understandable, as a move away from a long tradition of anthropocentrism in mainstream western culture, some artists are more attentive to the productive tension, and

[30] Tim Collins, "Reconsidering the Monongahela Conference", 2004 – available at http://moncon.greenmuseum.org/recap.htm

[31] See: Collectif (avec Jack Kloppenburg, Birgit Müller, Guy Kastler), *La propriété intellectuelle contre la biodiversité? Géopolitique de la diversité biologique*, Genève: Cetim, 2011. See also: Silke Helfrich and Heinrich Böll Stiftung (Eds.), *Commons: Für eine neue Politik jenseits von Markt und Staat*, Bielefeld, Transcript Verlag, 2012.

[32] For the discussion in the field of ecocriticism, with a plea for "eco-cosmopolitanism", see: Ursula K. Heise, *Sense of Place and Sense of Planet: The environmental imagination of the global*, New York: Oxford University Press, 2008.

complex interdependence, between ego-centrism and eco-centrism, and do not try to negate or erase the dimensions of ego-centrism and autopoïesis (self (re)production/creation/making) in the development of all lifeforms.[33] One exemplary practice of this careful attention unfolded itself with Shelley Sack's notion of "I-sense / ich-Sinn" as developed through her social sculptures, such as the "Earth Forum" as part of the "University of the Trees".[34] Balancing the ego-... and the eco-... involves balancing individuals & communities, as well as different scales of communities, and human & non-human communities.

- Connecting the level of everyday activities (and the creative "practice of everyday life" à-la De Certeau); the level of critical reflexivity and systemic questioning – with, among some eco-artists, explicit references to (and thorough study of) scientific insights from systems theories, ecology and complexity research (e.g. in the writings of the Harrisons, Aviva Rahmani and more recently Alyce Santoro); the level of envisioning and imagining of heterotopia (rather than planned solutions and utopia); and in some cases also a level that might be alternatively considered as shamanistic, animistic or spiritual.[35]

I also argued at length elsewhere that ecologically meaningful artistic practices are practices that are genuinely exploring the fabric of life's complexity (and engaging into what I characterized as "aesthetics of complexity").[36] The following elements contribute to this engagement:

- As already mentioned above, eco-art practitioners are interpreters of interdependence (and not fiercely independent modern heroes). They value regeneration in life and highlight systemic effects. They act as co-operators of life's creativity rather than solely creative individuals. The Harrisons coined the expression "conversational drift" to refer to the processes that can be allowed to emerge thereby. For example, such a conversational drift facilitated the re-appropriation of Helen and Newton Harrison's *Green Heart Vision* (1994-1995) by Dutch policy-makers (since 1999 at the Dutch Ministry of Agriculture, Environment and Forestry), working towards the implementation of a biodiversity ring/corridor around the so-called "green heart" of Holland's Randstad.[37]

- They typically do not draw neat and clear lines between "nature" and "culture", overcoming simplifying dichotomies. But they also do not confuse living ecosystems with non-living cybernetics (as tend to do some other artists working on or with technology).[38] This is an important aspect for aesthetics of complexity: to avoid collapsing reality into

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[33]See also Kagan 2011 (op. cit.), pp. 350-351 in 2nd edition (2013). In this line, I also developed the concept of "autoecopoïesis": See Kagan 2011, pp. 214-215. On the new understandings of life grounding these approaches, see also: Andreas Weber, *Enlivement: Towards a fundamental shift in the concepts of nature, culture and politics*, Berlin: Heinrich Böll Stiftung, 2013.

[34]See http://www.universityofthetrees.org/ ; see also: Sacha Kagan, Marco Kusumawijaya, Heike Löschmann and Rana Öztürk, "Report - radius of art: Thematic Window - Art toward Cultures of Sustainability", Berlin: Heinrich Böll Stiftung, 2012 - available at http://www.boell.de/educulture/education-culture-thematic-window-art-toward-cultures-of-sustainability-14219.html

[35]Practices, philosophies and self-understandings are varied around this level. While Joseph Beuys or Suzi Gablik (1991, op. cit.) turn to "shamanistic" rituals, David Abram advocates for an "animistic" phenomenology (David Abram, *The Spell of the Sensuous*, New York: Random House, 1996), and Dominique Mazeaud speaks of "the spiritual in art" (Dominique Mazeaud, "Concerning The Spiritual in Art in Our Time?", 2010, available at http://dominiquemazeaud.blogspot.de/2010/02/concerning-spiritual-in-art-in-our-time.html).

[36]Kagan 2011 (op. cit.). My understanding of complexity is based on the transdisciplinary tradition initiated by Edgar Morin.

[37]See http://theharrisonstudio.net/?page_id=534

[38]Kagan 2011 (op. cit.). See also: Sacha Kagan, *Toward Global (Environ)Mental Change: Transformative Art and Cultures of Sustainability*. Berlin: Heinrich Böll Stiftung, 2012.

uni-dimensional thinking or into rigid dialectics (working instead in a way that coincides with the “dialogique” advocated by Edgar Morin).

- They are inter- and transdisciplinary practitioners, both when working by themselves, and when working (as is often the case) in teams with other professionals from a variety of backgrounds as well as with local communities. One concrete, applied example is Patricia Johanson's infrastructural projects in cities around the world.[39]

- They are often practicing a participatory research & art, comparable to what is known in the social sciences as Participatory Action Research. In this manner, they are encouraging others to take ownership while maintaining self-critically “a clear understanding of the relationships of power and our role in that context”.[40]

- They value and practice embodied learning/knowing, cultivating a wisdom grounded in sense perceptions (inspired by phenomenology), aiming for a deep, spatialized knowing of ecological contexts in their local specificities, their diversities and their inter-relations.

- They work with an iterative process of exploring and experimenting (which is more attune to living complexity than a more linear research design and working process would be), remaining “open to all possibilities” in a way that “can question and redefine anything at any step” (Lynne Hull). One example of this serendipitous learning is David Haley's practice of “question-based learning”, e.g. in his *Walks on the Wild Side* (since 2004, in Manchester).

- Their practice includes a necessary “embedded ecological critique”, as was e.g. personified in the character of the “Witness” in the *Lagoon Cycle* (in contrast to the hubris of some more problematic artists interested in ecological issues such as Peter Fend, whose ambitious work is however often unencumbered by any precaution principle).

- Their art elaborates complex critical relationships to techno-science (as exemplified, once again in the *Lagoon Cycle*, by the self-reflexivity on experiments and by the comparison of the buffalo's ecosystemic and economic relationships vs. the tractor's technosystemic limitations). In this regard, they differentiate themselves from the largely hypo-critical relations to technologies of some other artists (such as Eduardo Kac regarding genetic engineering, and Victoria Vesna regarding nanotechnologies). This does not mean that ecological artists necessarily adopt a neo-luddite radicalism: The discourses and practices cover a spectrum from an almost neo-luddite rejection of modern technologies to a careful exploration of “post-human” themes.

I am not claiming that the elements I suggested here, especially regarding ecological artists' explorations of the fabric of life's complexity, are present in all the practices of all artists who are labeled (or regard themselves) as ecological artists, even within the 'circle of recognition' of the above-mentioned “ecoartnetwork”.[41] Rather, I am pointing at these elements as signs of certain

[39]Caffyn Kelley, *Art and Survival: Patricia Johanson's environmental projects*, Salt Spring Island: Islands Institute, 2006.
[40]Collins 2004 (op. cit.).
[41]I am using here the expression “circle of recognition” in art-sociological terms, as Hans Abbing and myself did over the past decade. In short: Compared to an “art world”, a “circle of recognition” is both smaller and potentially more open to inter- and transdisciplinary hybridizations than an art world ; it can be variably in- and exclusive.

qualities in these practices which, under the normative perspective of sustainability studies, can be considered as contributive to aesthetics of complexity and cultures of sustainability.[42]

Furthermore, even though they share some relatively common characteristics, as I suggested above, the practices of ecological artists are diverse, and differentiate among themselves in multiple ways:

While certain works of ecological art consist in direct interventions in natural habitats and/or on human infrastructures (with "ecoventions" as discussed by Amy Lipton, Sue Spaid and Patricia Watts), others prefer an approach that may be less directly interventionist at the material level while focusing on expanding human consciousness (as do some practitioners of social sculpture). Besides, direct intervention can also mean altering the perception and understanding of a site, without physically modifying it too much, as the example of the *Nine Mile Run* project by Tim Collins, Reiko Goto, Bob Bingham and John Stephen in Pittsburgh showed.

Some practitioners (such as e.g. John Jordan and Isabelle Frémeaux, with the Laboratory of Insurrectionary Imagination) engage in politically radical activism/artivism with subversive political agendas, which they merge with ecological practices (such as permaculture in the case of Frémeaux and Jordan), while others prefer to engage with a large cross-section of society, including more conservative political forces.

Some ecological art projects can be closely associated to local, national or international policy, infrastructure, public service or industry entities, while others focus exclusively on local communities, and can engage in community mobilization and empowerment to varying degrees.

When they engage with communities, ecological artists may initiate either "shallow" or "deep dialogues" (as labeled by Collins), i.e. short or long-term project engagements with specific contexts.

Some ecological artists impose on themselves more stringent direct environmental responsibilities than others (e.g. by judging more closely the work in terms of its ecological restorative benefits or balancing its other/indirect merits vs. the generated ecofootprint/environmental impact).

Some practices are characterized by a professional engagement in applied natural sciences (as e.g. Brandon Ballengée's work) while others focus for example on phenomenological experience. Some practitioners (such as for example the collective "foam" in Brussels)[43] engage more than others in explorations of new technologies and socio-techno-scientific systems, that may be relatively less critical but may also be experimentally more open-minded.

Ecological art is gaining both relevance and urgency as a social-ecological practice, as the global crisis of unsustainability continues to aggravate itself. Some commentators have announced recently that ecoart is reaching a "critical mass".[44]

However, and to varying degrees depending on the above-mentioned differentiations, the practice of ecological art brings with it a number of difficulties and challenges in the relationships of its practitioners to the art world of contemporary art. I will not explore these difficulties in further details now, although a thorough art-sociological analysis of the changing tensions between the

[42]On cultures of sustainability, see Kagan 2011, 2012 (op. cit.), and Sacha Kagan, "Cultures of Sustainability and the aesthetics of the pattern that connects", *Futures: The journal of policy, planning and futures studies*, 42 (10), 2010.
[43]See http://fo.am/
[44]Weintraub 2012, op. cit., p. xiv.

practice of ecological art and the established institutions and conventions of contemporary art, would be warranted, to better accompany and support the shift towards cultures of sustainability.

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Last but not least, many thanks to two anonymous reviewers and the editorial team at the Journal *Plastik*.

[**References**: This academic journal's format did not allow a final list of references at the end of this article. Please find all full references within the footnotes of this text]

PUBLICATION 7

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Title: Music and sustainability: organizational cultures towards creative resilience – A review

Authors: Sacha Kagan and Volker Kirchberg

Share of Authorship of Sacha Kagan (see documentation in the appendices): **80%**

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Music and sustainability: organizational cultures towards creative resilience – A review

Abstract

While the potential of creativity and of the arts for societal transformation towards sustainability has gained attention over recent years, a specific focus on music is lacking in sustainability science. What are the specific potentials of music, and why should we care? Collective *musical practice* enhances group cohesion, and musical improvisation trains social creativity, both of which are important resources for organizational resilience. Turning to the *experience of* music on the individual level, cultures of sustainability can be fostered through a musical aesthetics of complexity that opens up to the ambiguities, ambivalences, contradictions and creatively chaotic dimensions of a transformation towards sustainability. However, music is a "double-edged sword" and its emotional power can be deployed instead to strengthen prejudice, simplify worldviews, and restrain creativity. This paper offers the first broad transdisciplinary review of research at the intersection of music and sustainability. It exposes the mechanisms operating at this intersection and highlights key areas where the social experience and practice of music can contribute to the cultural dimension of sustainability in communities, organizations and society.

Keywords: Music, Cultures of sustainability, Aesthetics of complexity, Creativity, Qualitative complexity, Organizations

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PUBLICATION 8

Original Publication Type: Book Chapter

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Author: Sacha Kagan

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Prefiguring Sustainability: Response-Ability & Spaces of Possibility

We must stop thinking and working in silos – and in terms of so-called "pillars" of sustainability (whether the environmental, economic, social or cultural "pillar"), reproducing the failed mental models that brought us where we are. In the following lines, I suggest an engagement for arts organisations that is not merely about sustainability awareness-raising (with a narrow focus on the environmental as a separate concern), nor just about environmental management at the arts-organisations, however urgent and useful such approaches are. Sustainability is about re-inventing worlds; it is a cultural project. Cultural (and arts) organisations are bearers of "spaces of possibilities" towards sustainable futures. This is not just about professional artists (who of course can be very inspiring initiators), or about artists in social practice and communities (also playing essential roles), but it is also about sharing response-ability for more diffused artful doing and learning by local communities in spaces of challenging experience, imagination and experimentation.

Arts Organisations and sustainability as an integrated multi-dimensional search process

Arts organisations (like any human organisations) work in complex and rapidly changing environments – or rather than "environments", we should rather say: in unfolding "worlds" co-evolving with the organisation. These worlds are multi-dimensional: physical, ecological, social, economic, political, historical and cultural. Worlds are made of dynamic encounters of things, people, other living beings, places and times... Many of these are related to each other in specific, multiple ways – even though it is a lazy and dangerous simplification to just claim that 'everything is related to everything else'.

Sustainability is a normative search process which aims to address these worlds as a whole – not seeing them as a collection of separate domains (with the very unfortunate image of "pillars" of sustainability)[45], but seeing the personal, the social, economic, political, cultural and ecological realities as different levels, dimensions of worlds (or inter-related ecologies as Felix Guattari famously suggested)[46]. Sustainability is not a fixed normative picture, like a fixed model or template. Because reality is complex, changing and contextual, sustainability too is a constantly changing horizon, a search process that constantly needs to be revised and critically reviewed. Sustainability as a search process seeks no universal, but transversal properties which allow translocal exchanges and translations, thanks to inter- and transcultural learning.

This is not to say that the dimensions are only instrumental to each other. The 4 or 5 dimensions of sustainability each hold intrinsic value and point to specific goals: The **ecological** dimension is foundational for everything else, and points us to the existence-value (and not only use-value) of many forms of life than constitute ecosystems around us and often together with us, whether in cities, in rural areas or in more-or-less wild areas. The **social** dimension points to the imperative of justice, for all groups in a society, which means developing a dynamic awareness to the

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[45] Joost Dessein, Katriina Soini, Graham Fairclough, and Lummina Horlings (Eds.), 'Culture in, for and as Sustainable Development. Conclusions from the COST Action IS1007 Investigating Cultural Sustainability' { http://www.culturalsustainability.eu/conclusions.pdf }, University of Jyväskylä, 2015.
[46] Felix Guattari. 'Les trois écologies', Galilée, 1989.

situations of any marginalized groups and to the dynamics of injustice. The **cultural** dimension points to the value of culture, i.e. the vitality of cultural and artistic expressions in their diversity, allowing a rich cultural life, guarding against cultural homogenisation, and linking a living cultural heritage to cultural change. The **economic** dimension seeks economic viability, not only of the arts organisation itself, but also of other organisations and agents with which the organisation is related. The economic dimension of sustainability points to the question of desirable and sufficient wealth and well-being, which often can be achieved through diverse forms of mixed economies ([1] market, [2] public ; [3] gift ; and [4] an economy of the commons (through shared community stewardship of available common resources). The personal dimension points to individual self-development and fulfillment.

Arts organisations therefore need to gain an integrated understanding of these contexts for their work, and then they need to especially develop:
- sound practices of environmental management;
- practices that open up to all layers of society, including marginalised minorities and seeking social justice;
- enlivenment of the cultural dimension (see the following paragraph);
- personal fulfillment of employees, volunteers, partners and audiences;
- and practices that are economically viable for oneself and for others (also questioning the typical economic self-exploitation of the creative sector).

As cultural organisations, arts organisations deal, more explicitly than other organisations, with the structures of meanings that we find and that we shape in the world around us: the worldviews that we hold, the values that we cherish and that we practice, and things that are speaking back to us. Arts organisations contribute to the changes in the symbolic universe that we build and inhabit, and which is full of sensory realities, sights and sounds, smells and tastes, sensations and movements. Engaging with culture, as an arts organisation, means playing an important role in society, contributing to shape the systems of meanings in that society. This does have long-term impacts. Arts organisations thus have a special responsibility towards the cultural dimension of sustainability – in the sense of "**cultural sustainability**".

Cultures are also a fundamental key in the search process of sustainability, when looking at all dimensions of sustainability together, in an integrated way – in the sense of "**cultures of sustainability**". There will not be a shift of civilisation towards sustainability without a fundamental shift in contemporary culture, towards an aesthetically grounded understanding and respect for life in all its human and other-than-human complexity.

This means, for the arts organisation, to enrich the symbolic universe which is attached to the local realities – a kind of "enlightened localism"(as discussed by Manickam Nadarajah)[47]... and to enrich the symbolic universe which is attached to global realities, at the level of the whole planet – a kind of planetary consciousness of humanity as a species (as discussed by Edgar Morin)[48]. It also implies not only the development of certain ethical values (beyond a simplistic green moralism), but also the enrichment and diversification of our skills, competences and ways of knowing reality.

Constituencies and response-ability

[47] Manickam Nadarajah, Ann Tomoko Yamamoto (Eds.),'Urban crisis: Culture and the sustainability of cities', Tokyo: United Nations University Press, 2007.
[48] Edgar Morin, 'L'an I de l'ère écologique', Paris: Tallandier, 2007. See also: Edgar Morin, 'La méthode', Paris: Seuil, 2008.

Sustainability is a normative search process, questioning society, not just looking at the world around and describing it with a detached gaze. It requires that the arts organisations develop a “response-ability”, an ability to respond to issues of unsustainability. This means first of all, an ability to respond to the multiple constituencies inhabiting the immediate environment as well as the rest of the world.

To be able to respond to constituencies and the issues they face, arts organisations first have to recognise all their constituencies and to acknowledge them. We can visualize such constituencies along three axes of space, time and otherness:
- One axis goes from the local level to the planetary level...
- A second axis goes from the long dead to the not-yet-born...
- A third axis goes from the human to the many others (that is, non-humans).

Some arts organisations may still fail to engage all of the local human constituencies: for example, among the inhabitants of a city, many non-visitors may be considered a “lost cause” by certain arts organisations. Sustainability requires to seriously engage with the diversity of local communities rather than stick to the niche audiences who do walk into the theatre. For example, the multicultural appeal of arts organisations is often still lacking (in some cases even despite genuinely emerging efforts).

The response-abilities of arts organisations are not, however, limited to engaging with immediate situations. They are relating to historical heritage as well as to future generations. Furthermore, sustainability also calls attention to our community with non-humans. For example, the local ecosystem of the river that flows through a city, demands to be attended to, not only in very concrete terms (with art managers implementing good practice in environmental management), but also in symbolic terms (e.g. the symbolic relationships of the city to its river and to the river's ecosystem).

The constituencies also include humans and non-humans that are far away from the local environment of an arts organization. Whether for geopolitical reasons – if we think of the Syrian refugees, who in Europe were long felt as 'far away' by many… until the reality-check came closer to home, revealing the un-reflected selfishness of many Europeans; or if we think of LGBTQI people who are persecuted in Uganda, Russia and too many other countries -,or for global ecological reasons – when we refer to climate change and the many communities affected worldwide -, any art organisation needs to address the issues related to our global interconnections, and planetary responsibilities as one fast-growing species on this planet.

If arts organisations aim to seriously relate to these diverse constituencies (as some are already doing), and to have cultural impacts, they need to further develop their approaches and formats to enhance their response-ability to this world. This includes, for an arts administrator/manager, to think beyond existing “performance indicators” and develop new ones. This requires creativity and a qualitative turn, looking beyond the existing, mostly quantitative, indicators about revenues, attendance numbers, etc. **Arts organisations need to develop qualitative performance indicators that address the multiple dimensions of sustainability**, and that can give a meaningful feedback about the effectiveness and the limits of the work done so far. One attempt to develop such a tool emerged in Canada: Douglas Worts and his colleagues developed a few years ago a set of qualitative performance indicators for self-assessment by museums, called the “Critical Assessment Framework”[49], which focuses especially on the levels of individuals (visitors and non-visitors), communities (locally) and the museum (the staff and volunteers at the

[49] Douglas Worts, Measuring Museum Meaning: A Critical Assessment Framework, The Journal of Museum Education, Vol. 31, No. 1, 2006, pp. 41-49. {http://www.jstor.org/stable/40283905}

own organisation). As Douglas Worts himself argued meanwhile, such an evaluation framework would need further expansion, to also include relations with other organisations, as well as the ecology and society of whole regions and the entire planet.

Grounding spaces of possibility in artistic inquiry

Thanks to artistic openness to the new and to continuous learning, arts organisations have a great potential to become, not only learning organisations (i.e. organisations that are continuously learning and evolving, developing themselves), but also open learning spaces for others.

This potential needs to be tapped into. Sustainable development requires transversal, creative ideas and approaches to new problems facing society. This is where artists come to the forefront. A growing number of artists are dealing with issues of social, economic, political, intercultural and/or ecological natures (as I discussed in the book *Art and Sustainability*)[50], which all can shed new lights on questions of sustainable development. The role of the arts organisation, in this process, is to accompany, support and foster such artistic inquiries. It is to provide the space of free play that the artists need in order to be able to share their inquiries with others. But it is also to challenge and stimulate artists to further develop and realize their perspectives in relation to the locality where the art organisation is placed.

As many arts organizations are well-aware of, artists can bring perspectives that help develop critical reflexivity in society (when they are not content with playing within the sandbox of the art worlds):

- They can make us become aware of routines, social conventions, habits and other aspects of our lives, of which we are barely aware (or fully unaware). They can defreeze them and invite us to try out alternatives.

- They can shape new aesthetic experiences that open up our perception to the intricate complexity of our environment, while making it accessible. They can shape symbols and reshape the symbolic values of any aspect of everyday life. This symbolic work is very important for cultural change.

- They can help us engage in new situations with an experimental attitude that is open to sensorial and intuitive knowledge, as well as to lateral thinking (thinking in metaphors instead of thinking in a narrowly deductive way), and thinking by doing instead of first thinking and then doing.[51] All these qualities of “artful doing” are not reserved to artists alone. They can become contagious.

Through sharing these different reflexive perspectives, the artists may be able to provoke detachment from lazy thinking, enchantment to envision alternative realities, and empowerment to experiment with change. These qualities of artistic inquiry, and the creative processes they awaken, should be at the core of the arts organisation as an open learning space.

[50] Sacha Kagan, ‘Art and Sustainability: Connecting patterns for a culture of complexity’, Bielefeld: Transcript Verlag, 2011.

[51] Hans Dieleman, Transdisciplinary Artful Doing in Spaces of Experimentation and Imagination, Transdisciplinary Journal of Engineering and Science, Vol. 3, 2012, pp. 44-57.

To be able to unfold these potentials for change, artists need open frames that allow for unplanned experiments and stimulate critical learning. The art manager's role is thus to open up these frames, allowing and fostering these artistic reflexivities and letting them flow through the arts organisation. The arts professionals can also connect together the different challenging perspectives offered by different artists.

However, the constitution of *spaces of possibility* for sustainable development requires that arts organisations move beyond their own habitual spaces (both physically, socially and metaphorically). To reach out to people who are not part of cultural elites or of activist networks, these spaces have to be located in institutionally still undetermined spaces, where creative experiments and the everyday life of local inhabitants may come together, functioning as emergent open commons. This calls forward artistic and cultural interventions across the urban fabric, beyond the spatial-temporal and conventional frameworks habitually associated to existing cultural organisations and art worlds.

In *Spaces of possibility*, the qualities of artistic inquiry that I shortly listed above are embedded in local (often urban) initiatives, embedded in neighborhoods and aiming to transform everyday life while addressing urban development and politics, rather than performed as single art projects. They are strategically deployed for the realisation of an archipelago of heterotopian spaces – where we can concretely experiment potential futures without waiting for others to do it for us. One example of such an archipelago is in the city of Hamburg (Germany), the "Right to the City" network [http://www.rechtaufstadt.net/] (including the Gängeviertel [http://das-gaengeviertel.info/], Keimzelle [http://keimzelle.rindermarkthalle.de/], KEBAP [http://kulturenergiebunker.blogspot.de/], Planbude [http://planbude.de/] and other spaces and initiatives).

Spaces of possibility are actively networked with each other and with wider movements working towards emancipatory and ecological goals (such as discussed for example in the *Convivialist Manifesto*)[52]. These spaces offer civil society the opportunity to activate change-agency and empowerment by operationalising "prefigurative politics": the immediate practical experimentation with desired future forms of social life, without waiting for (necessary) transformed larger political and economic structures to allow the wider dissemination of such social innovations. Spaces of possibilities are "spaces of imagination and experimentation", as coined by Hans Dieleman.

[52] Manifeste Convivialiste: declaration d'interdépendance, Lormont: Le bord de l'eau, 2013. {English translation online at: http://www.gcr21.org/publications/global-dialogues/2198-0403-gd-3/}

The 'Tag des guten Lebens' in Cologne, is not only a yearly car-free-Sunday festival with 100 000 visitors, but a space of possibility where thousands of residents in many streets develop own creative re-appropriations of urban space (picture: Marén Wirths on Flickr).

Art organisations can contribute to grounding spaces of possibility in artistic inquiry, by opening up spaces of challenging experience, imagination and experimentation: sustainability is a radical search process; it requires highly challenging (rather than comfortable) aesthetic experiences, while at the same time such experiences should remain accessible to different participants. The same artistic proposal will be more or less challenging, depending on the background of each participant. How to avoid merely providing comfortable aesthetic satisfaction that maintains people in a state of uncritical anaesthesia (or offers pseudo-challenges to blasé high-culture elites)? Spaces of possibility are no places for anaesthesia and political self-satisfaction.

Spaces of possibility unfold in thinking by doing: This is as if the artist, or other initiator, is inviting people to take a ride on a bike, although they have not learned yet to ride a bike. The art organisation needs to develop safe places where participants can feel enough trust to 'take a ride' in a situation that is new and uncertain, and allow themselves to experience surprise, puzzlement and confusion, and still be open to learn something new out of it.

What I also mean concretely by experimentation is that art organisations can also offer some hands-on activities that invite people to experiment with doing things differently. It can be a workshop, a market, a big living room or playroom set up in the middle of the street, or many other things... It should invite people to bring together their heads, their hearts and their hands. Invite people to a place where they can test out things, like acrobats walking on a rope with a safety net below them.

Imagination is important because spaces of possibility are about exploring multiple alternative realities and alternative futures. The goal is not to close down people's imaginations so that they "get it", so that they get the one correct image or interpretation. Arts organisations are no churches for a gospel of sustainability. The goal is to invite people to engage with situations and with their imaginations, without settling down too soon.

This is about developing safe and trust-inspiring places that invite their visitors to a participation with consequences, not just some token or superficial participation. These places need to foster a social creativity – a creativity that is no longer just the privilege of individual artists on stage; a creativity that flows as a good conversation between friends. Participants need to be stimulated to think and act differently, even if it feels silly. Creating that type of creative climate is also a real challenge for the arts organization.

Finally, shaping spaces of possibility, as arts organisations, is like weaving a spider web, not alone but together with many other spiders from outside the cultural sector- joining existing urban and regional inter-sectoral networks (such as "Transition" [https://www.transitionnetwork.org/] or "Right to the City" networks in different cities) and helping build new ones. Such networks involve a great diversity of aspects and dimensions of economy, society, ecology, culture and local everyday life. Sustainability implies moving away from thinking and acting within specific professional fields. The work of such networks is to engage each other into shared public discourses and to build a democratic space together, to continue experimenting and connecting different experiences. There can and should be tensions within such networks. It is actually deleterious to expect or enforce permanent consensus. A

balance between collaboration and antagonism is much more sane, as long as the conversations and web-spinning continue (in an “agonistic” democratic space as argued by Chantal Mouffe)[53].

Engaging with the search process of sustainability, arts organisations are challenged to relate both to 'cultural sustainability' and to 'cultures of sustainability'. Their potential contribution to the multiple dimensions of sustainable development implies more than mere environmental awareness raising and the necessary greening of creative processes. **Arts organisations have a role to play in the wider diffusion of artful, aesthetically challenging and playfully experimental practices and spaces in local communities** (based in artistic inquiry, but reaching beyond single arts projects), contributing to the development of spaces of possibility, as prefigurative politics for sustainability transformation.[54]

[**References**: This publication’s format did not allow a final list of references at the end of this text. Please find all full references within the footnotes of this text]

[53] Chantal Mouffe, ‘Agonistics. Thinking the world politically’, London: Verso, 2013.
[54] The notion of “sustainability transformation”, which has gained some popularity in the field of Sustainability Science, points to radical innovation towards sustainability, i.e. a more disruptive change than what was discussed in earlier sustainability discourses.

PART 3: Creative Sustainable Cities

PUBLICATION 9

Original Publication Type: Article

Title: Extreme Climate Events as Opportunities for Radical Open Citizenship

Authors: Beatrice John and Sacha Kagan

Share of Authorship of Sacha Kagan (see documentation in the appendices): **50%**

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Extreme Climate Events as Opportunities for Radical Open Citizenship

Abstract

Droughts, floods and other natural catastrophes related to climate change belong to a class of global risks that have downstream effects on the economy and productivity of settlements, social cohesion and administrational institutions. This represents growing challenges for adaptation strategies and disaster management. In order to increase the overall resilience of socio-ecological systems, civil society will be compelled to draw from its self-organisation rather than relying on increasingly unstable established structures. Based on the exploration of 20th century concepts such as "horizontalidad" and "right to the city", this article explores characteristics of resilience that offer possible responses for civil society.

Introduction

Many Europeans vividly remember the images from the severe 2013 flooding that destroyed large amounts of property and goods in Austria, Switzerland, Germany, Hungary, Poland and other central European countries. Such natural disasters are on the rise due to climate change and are becoming costlier. In 2012, global losses from these kinds of events totalled €120 billion, of which about 40% were actually insured losses (MunichRE 2013a, 2013b). Urban areas in affected regions generally suffer most heavily from losses and fatalities, as they are trading and innovation hubs, contributing about 75% of the global gdp.

These topics are one example of how the effects of climate change are felt across varying temporal and spatial scales, ranging from local communities to institutions in the global financial system. Given the rising number of extreme weather and climate events (Intergovernmental Panel on Climate Change 2013), policy and societal coping strategies are increasingly challenged (Coumou & Rahmstorf 2012). Coping with and adapting to changing environments and new challenges has become part of the transformation towards sustainability (wbgu 2011). As a result, it is necessary to develop solutions that address the roots of unsustainable production and consumption as well as practices that reduce greenhouse gas emissions (Weisz & Steinberger 2010) in order to empower entire urban areas and regions and to develop their overall resilience.

High levels of uncertainty about future developments related to climate change call for flexibility and adaptive capacity. Lengthy top-down processes require more responsive, communicative and iterative decision-making structures; this means that bottom-up processes from civil society are particularly important. Civil society therefore needs to develop the tools to implement adaptation tactics and response strategies considering the possible destabilisations of economic and political institutions in response to extreme weather events. This leads to the conclusion that sustainability is not a straightforward reform programme, but a radical search process that requires exploring different and so far untested paths (Morin 2011). As such, studying historical patterns of major socioeconomic changes can teach us crucial lessons about sustainable development (deVries 2013). In other words, a look back on past societal transformations provides insights into societies' capacities to manage events of crisis, such as extreme drought or flooding, economic meltdown, pandemics and famine (Costanza et al. 2007). In this context, niche and "utopian" practices such as intentional communities (Andreas & Wagner 2012) can operate in the long run

as important transformative elements within the whole dynamic of change (Fischer-Kowalski & Rotmans 2009; Jamison 2012).

This article explores such movements from the 20th century as well as resulting changes in order to better understand how civil society could be empowered to tackle extreme climate events, thereby increasing societal resilience and contributing to a sustainability transformation. It uses the framework of resilience thinking to explore examples and potentials at the level of civil society's responses to extreme climate events that address consequences and foster solution options. In this way, it introduces resilience thinking and puts into this context past experiences that hold learning opportunities for EU civil society to deal with the extreme weather events resulting from climate change.

Climate change through the lens of resilience thinking

The multidimensionality of global development trends and their manifestation in social-ecological systems (ses), such as the urban system, requires a radical rethinking of current development patterns to successfully navigate towards sustainability. To shift systems onto this desirable pathway, it is critical to consider the dynamics and complexity of introduced solutions and their resilience (Westley et al. 2011; Ernstson et al. 2010). Resilience refers to the capacity to absorb disturbances and withstand stress – such as climate change- related events – and eventually rebound (Holling 1973; Folke 2006). Actors deal with constantly changing conditions and contribute to the system's adaptive capacity: they utilise knowledge, learn, adjust their responses and thus increase systemic resilience. In the long run, when a system faces declining resilience, even small shocks can break down existing structures of economic, social and natural capital. During the following phases of development, entrepreneurial social actors experiment with transferring successful practices into innovative models and exploit niches for dissemination (Folke et al. 2010; Walker & Salt 2006). These concepts of resilience thinking provide a lens to observe climate change, but also to mobilise understanding towards changed development patterns.

Climate change can critically hinder a society's capacity to develop on a sustainable pathway. Conversely, a sustainable transformation can reduce vulnerability to climate change while enhancing resilience and adaptive capacity (ipcc 2012). Climate change dynamically impacts local and regional economies, consequently disturbing global markets far beyond the short-term costs of reconstruction, and pushing the societal burden onto future generations (Hallegatte, Hourcade & Dumas 2007). Adaptation[55] actions are undertaken under conditions of uncertainty regarding effectiveness or even unintended adverse effects. The complex urban environment in which actors and socioeconomic processes interact with the natural and built environment requires careful consideration to spot effective leverage points.

Reviews show that enhancing urban resilience as one form of adaptation to climate change is approached from different angles, such as (i) urban hazards and disaster risk reduction and (ii) ecological, economic and institutional/governance perspectives (Leichenko 2011). Resilience strategies are embedded in a variety of different types of institutional modes and mechanisms that

[55] Adaptation here is defined as "changes in social-ecological systems in response to actual and expected impacts of climate change in the context of interacting non-climatic changes. Adaptation strategies and actions can range from short-term coping to longer-term, deeper transformations, aim to meet more than climate change goals alone, and may or may not succeed in moderating harm or exploiting beneficial opportunities" (Moser & Ekstrom 2010: 22026).

mainstream collective adaptation strategies under policies and plans. In high- income countries, strategies primarily use a top-down approach with communication across agencies (Wamsler, Brink & Rivera 2013). For example, projects such as climate-adapt, Climate Friendly Cities and the European Climate Change Adaptation Strategy (eea 2012) by the European Environment Agency emphasise a multi-level governance approach that coordinates adaptation and implementation across scales down to local urban administrations. Studies from Ireland and Cumbria (Adger et al. 2012), Norway and New Zealand (Brien, Bronwyn & Berkes 2009) highlight evolving social contracts relating to new conditions under climate change. Social contracts legitimate arrangements between civil society and the state and entail obligations and constraints for all parties (Brien et al. 2009). Evolving contracts deal with new ways of ensuring citizens' welfare and aim to address the interconnected risks that arise from climate change, i.e. threatened predominant social and economic structures as well as increased intergenerational vulnerability. These examples illustrate how the field of renegotiations for resilience-informed social contracts is progressing gradually.

Both the Global North and South will experience limits and barriers to climate change adaptation. Climate change itself will manifest as a series of smaller and bigger extreme events that continuously shape and change social-ecological systems (ipcc 2013). Some extreme climate events may exceed a particular threshold or tipping point[56] and cause regime shifts, accelerated transformations with fundamental challenges for the social fabric and established institutional and political processes (Folke et al. 2010; Walker & Salt 2006). Adaptation strategies to these new regimes and surrounding conditions are still necessary, yet possibilities are difficult to assess due to uncertainty. Limiting factors to adaptation are mostly framed around physical and natural borders, technological limits and economic limits. Yet, the socially constructed character of limits to adaptation unravels even further when looking at issues such as values and relationships that underlie actions (Adger et al. 2008). Consequently, these social constructions are a leverage point when weighing the potential of resilience characteristics in order to design climate change adaptation strategies. Thus, to enhance resilience, the following four characteristics are considered significant:

- *Response diversity:* Folke (2010) labels this a "portfolio of responses" that acknowledges the dynamics and networks of a system (152). The diversity is built through the links between the processes across sectors. The focus on top-down institutional organisation and adaptation in planning for urban areas lacks, especially in the Global North, the variety of these required combined responses from both ends. This feature gains importance in the event of regime shifts when solution options are consolidated under new conditions (Brien et al. 2009).

- *Types of knowledge and flexibility*: The reorganisation of knowledge, the learning patterns and innovative capacity are vital for finding and changing to new trajectories. Innovative capacity depends on a local availability of knowledge e.g. in urban areas (Ernstson et al. 2010). Flexible solution options promote learning and break the destructive patterns that contributed to anthropogenic climate change (Brien et al. 2009).

- *Self-organisation:* A fundamental capacity of adaptive systems is their potential to self-organise. In urban systems, self-organising capabilities lie with actors who actively shape, as well as continuously respond to surrounding networks. In models of multilevel

[56] The terms "tipping point" and "threshold" describe limits that, if crossed, cause major changes for the system and its characteristics, for example damage of biodiversity and loss of resources (Walker & Salt 2006). The most prominent threshold/tipping point in this public debate is the reduction of carbon emission in order to stay below the 2°C goal.

governance, state-assumed responsibility to organise and regulate practices could hinder the emergence of self-organisation (Brien et al. 2009; Tompkins & Adger 2004).

- *Redundancy:* Loose resources in the system leave opportunities for redundancy. In contrast, high efficiency leads to low system resilience. This idea applied to planning with highly optimised infrastructure and streamlined policies illustrates the lack of open resources in a system. Costs related to the requirement of redundancy are a trade-off between causing higher vulnerabilities or causing equity issues in the future (Wamsler et al. 2013).

The key characteristics of resilience thinking broaden the discussion on adaptation strategies to climate change. Potentials for novelty and renewal lie in the ways societies are organised and in the links between societal processes and institutional arrangements, even when thresholds are crossed. Utilising these potentials would promote sustainable, locally adequate and resilience-enhancing socio-technological innovations (Smith, Fressoli & Thomas 2014).

Self-organization and sideways towards resilience

Frequent and extreme climate events caused by climate change will sooner or later throw societies into major crises of levels yet unknown. Recent extreme weather events, and societal responses to them, can offer us only limited perspectives into possible future challenges. We thus need to look elsewhere in our histories, particularly into such crises that shook institutions and revealed the inherent resilience capabilities of societies and citizens in extreme situations, which allows us to ask the following question:

How will urban civil societies in the various areas affected by climate change be able to seek resilience in the advent of severe destabilisation of political and economic institutional structures? In other words, how do urban communities (re)gain the ability to face growing challenges, even when safety nets from the state and the market are failing?

Under crisis conditions, politics-as-usual can even worsen the situation of some local communities, as illustrated by the accelerated dismantling of public social housing in post-Katrina New Orleans (Flaherty 2010).[57] As described above, future community resilience will require something different from the efficient and planned top-down solutions we are accustomed to in EU countries. It will thrive on a diversity of redundant, innovative, bottom-up, locally knowledgeable, self-organised and learning groups. Fortunately, examples of such movements and groups exist that may serve as a template for sustainability transition.

Recently, after government agencies and ngos largely failed to assist the victims of Superstorm Sandy in the USA, which hit New York on October 29th 2012, a self-organised effort took the reins of the relief operations on the ground. An offshoot of the “Occupy” Movement, “Occupy Sandy”, organised a relief effort to assist the hurricane’s victims. Created as a partnership with local community organisations, it focused on mutual aid in affected communities, and eventually shifted from immediate relief to long-term rebuilding for more robust, sustainable neighbourhoods. This movement raised “more than $1.5 million [and self-reportedly over 50,000

[57] Hurricane Katrina only accelerated a privatisation trend carried out from the 1980s onwards with a perversion of multi-level governance in the form of an “alliance of a neoliberal government, nonprofits, community activists, and powerful real estate interests”, according to John Arena (2012), contributing to a growing environmental and social injustice. See also Johnson 2011.

volunteers, and] became one of the most widely praised groups working on the storm recovery" (Nir 2013); yet it struggled to keep the characteristics of flexibility, self-organisation and responsiveness alive (Feuer 2012; Nir 2013; Shepard 2013; West 2013). The emergence of Occupy Sandy may represent a precursor to a more radical active citizenship catalysed by climate change. Similarly, Germany, in 2013, saw an increase in self-organised relief efforts, initiated by Facebook users, following the flooding of Dresden and Passau, among other areas (Kinzelmann 2013; Deutscher Bürgerpreis 2013). To understand this emerging phenomenon, however, and to transfer it to varying shapes and scales of future challenges, we need to look beyond cases of climate events and examine the precursors of Occupy Sandy.

Historical examples of severe crises (if not directly climate change related) have shown that context-specific forms of self-organisation allow creative and self-reliant tactics of adaptation and mutual aid, enhancing community resilience. The Global North may soon need to learn from experiences from the Global South, as Occupy has already started doing (Sitrin 2012). One such experience, which inspired later movements such as Occupy, emerged in Argentina in the weeks and years following the country's economic collapse in December 2001. The movement known as "horizontalidad" (horizontalism) aimed to shape "directly democratic spaces". It started with mass protests that brought on the resignation of the government. Horizontalism bypasses political parties, representative political processes and the State system altogether. Instead, it experiments and develops self-organisation through non-hierarchical networks of self-determined groups to meet local community needs (Sitrin 2006; 2007). Horizontalist practice sees equality as an ever-incomplete work-in-progress, whereby "everyone who participates has to take responsibility for continuously limiting power inequalities as they arise between participants" (Maeckelbergh 2013: 78).

Argentinian horizontalism has already influenced more recent experimental self-organised forms (in areas such as food, legal support and medical care) in social movements in the Global North, such as the "Indignados" movement in Spain and "Occupy" across the United States and Europe. These new movements are characterised by open learning processes that allow a radically innovative development of new types of knowledge and flexibility – a key feature of resilience. Sitrin (2007), borrowing from Wini Breines, talks of "prefigurative politics", whereby the performed practice prefigures and embodies the desired society. They open up spaces of possibility for the empowerment and self-fulfilment of citizens in their individual lives – i.e. the personal dimension of sustainability (Seghezzo 2009). According to Sitrin (2007), using argumentation dating back to Immanuel Wallerstein and Charles Tilly, Argentina's economic meltdown provided "a spark that help[ed] begin the process of shifting ways of seeing and being" (47), i.e. a "shift in people's individual and collective imaginations " (44) away from Argentinian clientelist democracy, and it initiated a redefinition of personal involvement and responsibilities. Most remarkably, these new movements "do not organize on the principle of ends and means given the importance of adaptability of process which enables the movements to change their objectives" (Sitrin 2007: 49). In this, they develop qualities of serendipity that contribute to more resilient responsiveness (Kagan 2012: 36-38).

The Global North knows no comparably wide-scale developments of self-organisation. However, smaller-scale examples abound, which appear to be growing faster over the past few years and are engaged in the search for sustainability. Probably the fastest-growing contemporary European example is the Transition Towns network, gathering local initiatives working towards self-made solutions to live sustainably in a post-oil reality (Hopkins 2008; 2011). Started in the town of Totnes, UK in 2008, the network had reached 1,000 initiatives by 2012. Transition Towns offer a good example of prefigurative politics. They do not shun communications with public administrators and elected politicians, but keep them at a distance and do not condition their own self-organised initiatives on public support. Other, often smaller-scale examples include intentional communities such as ecovillages (Andreas & Wagner 2012; Frémeaux & Jordan

2011), urban initiatives gathered under the "Right to the City" approach – e.g. in Hamburg (Kirchberg & Kagan 2013) – and initiatives sharing a pledge to sustain and (re)develop the "Commons" (Bollier & Helfrich 2012; Müller 2011).

An older example is the perhaps most widespread and radical network of sociopolitical and economic self-organisation, which emerged in yet another extreme crisis situation: the Spanish civil war (1936-1939). In Barcelona, surrounding Catalonia and parts of Aragon, the top-down Republican institutions practically vanished, leaving local groups to organise all aspects of social, economic and political organisation – as well as early fighting against Francoist military units (Dolgoff 1974; Orwell 1938). This process, which ran from July 1936 until mid- to late 1937, was not spontaneous, but rooted in several decades of activism, experimentation and attempted revolutions initiated by the Spanish anarchist movements such as cnt and fai. These experiments were forcefully terminated through the Stalinist-influenced central government (from mid-1937) and soon after through the Francoist political regime (from 1939 onwards). However, at their peak, in year one of the civil war, they reached a historically unprecedented scale of societal, political and economic self-organisation that covered entire regions. These movements established institutions, such as local exchange systems and currencies for a re-regionalised economy, with a federalised network of 300 local currencies, thus including all four features of resilience: self-organisation, diversity and redundancy of currencies, and a "utopian practice" (Jamison 2012) opening up a bottom-up, alternative economic knowledge. This case also reminds us that efforts at a radical self-organisation in times of severe crisis are likely to be annulled or pushed back if re-established or newly configured top-down political regimes proceed to undermine them.[58]

One tricky but important question is what kind of political culture, or micro-level "polity conventions", are fostered in different cases of self-organisation practices. How are different positions, perspectives, interests and worldviews from different participants dealt with? How is opposition overcome or maintained? Several of the self-organised social movements discussed above reportedly resort to consensus-based forms of deliberation. However, some authors have stressed the potential risks associated with consensus mechanisms, potentially causing self-censorship, peer pressure and in extreme cases, a form of "soft totalitarianism" implicitly imposed on potentially dissenting minorities. These authors stress instead the qualities of compromise-based deliberation, to develop forms of democracy that keep open the spaces of contestation (Kagan 2011: 439–444). Horizontalism as practiced by Occupy "involves incorporating conflict into the decision-making process ... leav[ing] room for multiple solutions and courses of action" (Maeckelbergh 2013: 79). If this observation is valid for the whole movement then the participatory modes of horizontalism allow a promising form of self-organised "polyarchic polity conventions" (Kagan 2011) to emerge.

Characteristics necessary for resilience are lacking to varying degrees under the largely top-down political regimes of highly technocratic multi-level governance in the Global North. As Occupy Sandy suggests, self-organisation may be already simmering, if not yet boiling, among the citizenry affected by early climate change. However, the examples above suggest that, in the Global South and to a lesser extent in the Global North, these resilience-enhancing characteristics are being developed in diverse forms of self-organisation under crisis conditions.

These practices develop a diversity of self-organised adaptive responses to crises, which do not emerge spontaneously but are inspired by both small-scale experiments and alternative types of knowledge: horizontalism gathered insights from the 20th century movements and theories such as anarchism and social ecology's libertarian municipalism. Horizontalism also reflected

[58] This risk is of course highest when a representative democracy in crisis degenerates into a totalitarian political regime. It is however also very present, and often experienced, within representative democracies.

critically upon earlier experiences from Argentina and took inspiration from other Latin American movements (such as the Mexican Zapatistas in mostly rural and indigenous Chiapas from the mid-1990s onwards, active in the self-organisation of e.g. alternative food, education and health systems). The year of anarchist self-organisation in the Spanish civil war was nourished by prior decades of libertarian self-education and social-experiential movements across these regions. The Transition Towns movement highlights the importance of alternative knowledge, as it builds upon insights from permaculture, "peak oil", resilience and psychological research on addictions (Hopkins 2008; 2011).

Resilience requires a diversity of responses to crises. Therefore, in the coming age of climate change, with its largely unknown and probably regionally differentiated challenges, self-organisation should not take one single political form – it should have many faces. Even the co-existence of several such forms may be expected and desirable, increasing the resilience feature of redundancy.

All these movements use network organisations, rather than staying isolated and scattered or relying on hierarchical structures. This encourages both a diversity and partial redundancy which "allow[s] for people to collectively coordinate multiple and divergent courses of action and produce multiple solutions to a problem" (Maeckelbergh 2013: 78), and a synergy between different areas of alternative organisation, "placing them in a larger dynamic of transition" (Rumpala 2013: 17). As Rumpala suggests, further networking of these initiatives would be a prerequisite to sustainability transition.

Conclusion

Facing barriers and limits to climate change adaptation, resilience thinking offers a perspective to understand phases before and after crossing thresholds. With global changes threatening especially urban areas, civil society is compelled to (re)gain the ability to address growing challenges and to pro-actively find new ways to increase resilience for settlements. Through the lens of resilience thinking, this article explored the potential of existing approaches at the level of civil society, drawing upon a variety of severe crises and emergent self-reliant bottom-up responses.

To increase resilience, four features are considered to play a major role in strategies for climate change adaptation: (i) response diversity, (ii) types of knowledge and flexibility, (iii) self-organisation and (iv) redundancy. The varying manifestations, operationalisations and declinations of these features, as described in the examples above, carry learning opportunities for social transformation. Self-organisation is the strongest of the features seen in the discussed examples, often stimulating development of the three other features. Self-organisation is not only a basic characteristic of the networks of living systems, allowing them to reach high degrees of resilience, but also an opportunity to change and improve the capabilities of an open society. Predominant institutional cultures influence the extent to which citizens are able to activate their inherent ability to self-organise.

These examples highlighted some of the conditions under which self-organisation can thrive or wither, such as the contexts of crisis situations, civil society's resort to radical or pragmatic agendas, the modalities of participatory processes, the degree of networking and integration of social movements and the influence of an evolving institutional context. Political institutions have to choose whether they will passively witness (or even resist) these emerging developments,

or whether they will proactively support new forms of open citizenship. The further maturation of these kinds of movements requires opening up spaces of experimentation, where learning opportunities empower EU citizens, already ahead of a regime shift. A more active approach to fostering informal learning processes would empower citizens to transfer these competences – from mere awareness to lived praxis, and from single neighbourhoods to regions – crossing administrative and other borders. Only approaches that reach across spatial scales really deploy the potential for innovative solutions and precipitate transformation towards sustainability.

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Creative Cities and (Un)Sustainability: From Creative Class to Sustainable Creative Cities

Abstract

The city today is increasingly conceptualized using terms such as creative cities or creative class and stressing the importance of culture. The effects this development can have on cities and neighbourhoods has been criticised within the wider field of sociology. We explore this critique and place it in the context of the analysis of a culture of unsustainability in order to identify how the concept of creative cities may breed unsustainability. The two cities of Hamburg and Toronto are looked at, considering their implementation of the ideas behind the creative city concept as well as the critical responses from the cultural sector. We then introduce a re-conceptualization of creative cities based on an understanding of the role of the artist in cultures of sustainability. Rethinking creativity and pointing at open dialogue and Richard Sennett‟s notion of the craftsman, we suggest one possible way toward sustainable creative cities.

Keywords: Sustainability, creative cities, cultural diversity, artistic engagement, Hamburg, Toronto

Creative cities and unsustainability

Creative cities

The current understanding of the city is one dominated by terms such as creative city (Landry 2000) and creative class (Florida 2002) which stress the importance of culture and the arts in the urban context. Cultural aspects of city life and artists have become important factors for urban policy, public officials, and businesses. In a global competition of cities, culture, entertainment, consumption, and urban amenities play an important role in enhancing locations (Clark 2004). This shows a change in thinking about the urban space and what drives development in a city. Florida, prevalently used by urban planners and city officials, stresses the importance of place, its characteristics, and how this relates to economic growth. The presence and concentration of artists, scientists, musicians, bohemians, and even gays, is linked to the city‟s economic development in that these groups foster creativity, which is seen as the new economic value. The creative climate of a city or an urban district is essential because it attracts the creative class (or not). Florida (2002) develops different instruments for measuring this, such as a "creativity index" (p. 235), "3 Ts" (p. 292), and "gay index" (p. 255). Further, Landry (2000) gives his readers urban planning objectives and a "range of approaches and methods to „think creatively‟, to „plan creatively‟, and to „act creatively‟" (p. xv). The creative potential of a city is essential for the city‟s survival and prosperity, especially given the global competition for attractiveness and human resources. Certain planning tools for enabling a creative, open environment, such as a mixture of bottom-up and top-down methods, or the removing of obstacles to creativity such as bureaucracies, are mentioned (Landry & Bianchini 1995, p. 56).

Within the creative city concept, the role of art and culture, among other amenities, is to enhance what Florida describes as "quality of place" (p. 232). Art and culture contribute to the general

atmosphere of a city or a district, its street life, diversity, and other aspects. This, all together, helps build what Florida refers to as "a world class people climate" (p. 293), which then enables cities to label themselves as creative places and position themselves within the global competition for human resources.

Critique of the creative city

The focus here is on the wider field of sociology and its critique of the ideas behind the creative city concept.[59] This will help increase understanding of the effects the concept can have on a city and its residents. As Porter & Shaw (2009) state: "Egged on by celebrity academics such as Richard Florida ..., governments and markets are implementing formulaic urban regeneration strategies ..., there is an urgent need to critically assess the nature, impact and meaning of this phenomenon" (p. 1). The effects identified by sociological critiques (i.e., gentrification, segregation, exclusion, displacement) can be related to unsustainable aspects within the creative city concept. By recognizing these consequences and the structures behind them, possible approaches for sustainability within the concept can be introduced, salvaging art and culture‟s role for sustainability.

In the creative city model, culture is used to increase value, be it symbolically through images or materialized. In this context, Zukin (1990) refers to "real cultural capital," meaning spatially linked cultural capital, which becomes a reason for real investments (p. 38). As Bernt & Holm (2005) state, the cultural capital (of artists) becomes objectified and transfers onto certain places; this, in turn, makes access to it easier, as it can be consumed by anyone who enters this space. Ley (2003) examines gentrification processes and how the high level of cultural capital of artists increases the symbolic value of an area and leads to „followers‟ (other professionals with high levels of cultural, but also economic, capital) coming into a neighbourhood. He uses Bourdieu‟s notions of cultural and economic capital and finds that both of these concepts help to explain gentrification. The artists‟ high level of cultural capital can "turn junk into art" (Ley 2003, p. 2541), whereas the property markets of inner cities turn art (or the presence of artists) into a commodity, raising land prices by using artists‟ "critical aesthetic disposition on the streets of old neighbourhoods" as a key tool for gentrification (Ley 2003, p. 2542).

Bourdieu (1999) also describes the "club effect"[60] as a process that excludes according to economic, cultural, and also social capital. Select spaces acquire social and symbolic capital based upon "people and things which are different from the vast majority and have in common ... the fact that they exclude everyone who does not present all the desired attributes ..." (p. 129). This "club effect" shows that consequences like segregation and symbolic violence can result from a policy that "favors the construction of homogeneous groups on a spatial basis" (p. 129) This can be connected to the creative city concept, in which arts and culture function as enablers for a creative urban milieu, in turn enhancing the city economically and often resulting in gentrification. Artists or „creatives‟ play an important role here and can be seen as pioneers of gentrification, as they give their cultural capital to a certain district or space. As Bernt & Holm (2005) describe, gentrified spaces become more and more general, losing the specific characteristics that enabled their cultural distinctiveness.

Further, the concepts behind New Urban Sociology and Urban Political Economy can help explain developments brought about through the implementation of the creative city concept and

[59] There are wide discussions on Florida and many texts that critically examine his concepts and their effects: see, for example, Peck (2005) and Hoyman & Faricy (2009).
[60] The notion of club effect has a source within economics, where it is referred to as club goods (see Buchanan 1965).

what it means for culture. Kirchberg (1998a) uses this approach and focuses on urban development and the embedded importance of culture. Urban Political Economy, which defines urban development as a result of the struggles between the exchange value and the practical value of urban space, sees segregation and the spatial allocation of social groups as a result of the privatization of public spaces which have been symbolically acquired (Kirchberg 1998a). According to Urban Political Economy, city development is a result of the power struggle between the "growth machine" (Molotch 1976) and residents. Within this, culture is often used by the "growth machine" to upgrade a district, but also by residents to identify with their surroundings. Culture, used as a method to increase value, can additionally exclude through symbolic barriers. This grants access to only a partial public made up mostly of consumers, as these benefit the economy of symbols (Kirchberg 1998b, p. 86). Other, non-target groups are left out of these spaces, which ultimately leads to a „closed" city. For example, in "Naked City: The Death and Life of Authentic Urban Places," Zukin (2009), referring to Jane Jacobs, writes about the re-building of public spaces in New York City and what consequences this has for certain groups: "These forces of redevelopment have smoothed the uneven layers of grit and glamour, swept away tracks of contentious history, cast doubt on the idea that poor people have a right to live and work here too – all that made the city authentic" (p. xi).

The assessments made by the Urban Political Economy approach can be applied to the creative city concept in that the concept relies on culture, art, and „creatives" to enhance a city"s economic development. The consequences and results of the instrumental use of culture mentioned above are also part of the creative city concept in that it is used to create the quality of a place. If cities rely on attracting the creative class as a strategy for economic growth, the result can be a struggle over space and identity of a city. This is not only the case within the city"s region , but also on the global stage, where cities compete over „creative" human resources because, as Florida (2008) notes, there is a clustering force of talent, which results in the success of a few "superstar cities" (p. 129. He describes a "spiky world" (p. 17) in which "those trapped in the valleys are looking directly up at the peaks, the growing disparities in wealth, opportunity, and lifestyle staring them right in the face." (p. 38). Bourdieu"s (1999) description of "site effects" shows that the position of individuals in social space results in their location in spatial space, "with the inhabited (or appropriated) space functioning as a sort of spontaneous symbolization of social space" (p. 124). He shows the sociological dimension of what Florida describes and refers to "the construction of homogeneous groups on a spatial basis" (Bourdieu 1999, p. 129), which can also be a consequence of the competitiveness within the creative city concept. If the peaks continuously attract „creatives" and as a result exclude other groups, they themselves will eventually become more and more homogenous. This can be seen as a contradictory tension within the creative city concept, and as a self-fulfilling prophecy, the more „creatives" a city attracts, the more it becomes full of this rather homogenous group, resulting, for example, in gentrification.

Creative cities: Hamburg, Germany and Toronto, Canada

Although there are numerous examples of cities that have applied Florida"s ideas the focus here is on an overview of two specific cases. The present situations in Hamburg, Germany, and Toronto, Canada, offer a closer look at the relationship between the creative city concept and city residents. These two cities were chosen because they are exemplary for the implementation of the ideas behind Florida"s creative class and because, in both cities there has been resistance against the direction the cities are taking.

Hamburg"s mission statement, "Metropole Hamburg – Wachsende Stadt"[61] (Metropolis Hamburg – Growing City), shows how the city is trying to position itself globally by, for instance, building cultural landmarks such as the Elbphilharmonie[62] or Hafen City[63]. In Toronto, redevelopment and reinvestment in the downtown area "are supported by an array of policy documents that bring together the rhetoric of urban renaissance ... with the concept of Richard Florida"s „creative class"" (Lehrer 2009, p. 147), which aim to move the city towards creative industries, arts, and architecture. As Lehrer describes, results have been gentrification and a high concentration of artists especially in the area of Queen Street West. Out of this situation came the formation of a group of residents named Active 18, which started negotiating with the city and developers and became involved in the planning processes of their neighbourhood. Even though there were only small gains on the side of the resistance group, such as the fact that developers had to face a public debate, Lehrer hopes "[that] for the benefit of good planning ... Toronto"s urban renaissance strategies will continuously meet resistance" (p. 156).

In addition, the fact that Florida himself lives and works in Toronto has effects on the city. A Toronto-based collective called „Creative Class Struggle" specifically challenges the ideas of Florida, their adoption in urban policy, and his presence in the city. Additionally, their website mentions the current situation in Hamburg under the title: „Activists in Hamburg Resist Creative Class Policies" (Creative Class Struggle, n.d.). They refer to the Gängeviertel, a downtown area in Hamburg made up largely of heritage buildings. The buildings were sold by the City of Hamburg to an investor group in 2008, which intended to tear most of them down in order to build high-end offices and residential towers. In the summer of 2009, these buildings were occupied by artists, musicians, and activists who opposed Florida"s ideas in their manifesto "Not in Our Name," which was published by several German newspapers. It opens with: "A spectre has been haunting Europe since US economist Richard Florida predicted that the future belongs to cities in which the „creative class" feels at home."[64] They feel instrumentalized by Hamburg because it uses Florida"s concepts as a „recipe" for developing the city, trying to turn it into an ideal place for the creative class. Instead, as the manifesto states, the city is becoming increasingly segregated and gentrified. They also mourn the decline in arts funding over many years, while at the same time artists are used by the city to enhance certain districts. For them the city is not a brand, it is a community, which is why they claim their right to the city and include all residents of Hamburg. Somewhat surprisingly, in the fall of 2009 the city government decided to buy back the Gängeviertel and grant the squatters time to find a concept for its future use.[65] It seems the City has realized that having these artists – these members of the creative class – in a downtown location is in its own interest. The developments in Hamburg and Toronto can be put in the broader context of a critique of the culture of unsustainability in order to connect characteristics of unsustainability to those of the creative city concept.

The culture of unsustainability and creative cities

Though the term sustainability has many definitions and understandings, the working definition here will be: "[a] concept that speaks to the reconciliation of social justice, ecological integrity, and the well being of all living systems on the planet. The goal is to create an ecologically and

[61] www.hamburg.de/standort-hamburg/324630/standortpolitik.html
[62] www.elbphilharmonie.de/home.en
[63] http://en.hafencity.com (Europe"s largest inner city urban development project along Hamburg's Port, aimed at attracting new high income residents)
[64] A full English version can be found here: www.signandsight.com/features/1961.html
[65] For an overview of developments in the Gängeviertel see: www.spiegel.de/international/germany/0,1518,670600,00.html. See also the website of the initiative in German: http://das-gaengeviertel.info/hauptmenue/home.html

socially just world within the means of nature without compromising future generations" (Moore 2005, p. 78).[66] This definition will allow a normative assessment and review of developments in cities and the creative city concept.

A general critique of characteristics of our society, which are also a part of the creative city concept, can be connected to the notion of unsustainability. This points to the importance of cultural change in order to achieve more sustainability. In "Angst and Unsustainability in Postmodern Times," Kirchberg (2008) connects characteristics of modernity with the sustainability discourse. He specifically looks at Bauman (2007) and Sennett (1999 and 2006) and their critiques of contemporary society in order to find possible explanations as to why its characteristics are unsustainable.[67] The exploitation of human resources and their waste is an important critical factor for Bauman and Sennett. This can be connected to the sustainability discourse as it shows "parallels [to] a wasteful and unsustainable lifestyle" (Kirchberg 2008, p. 94). Bauman mentions angst as the main factor behind present individual and social behaviour. For him, our time is based on a "ground on which our life prospects are ... admittedly shaky – as are our jobs and the companies that offer them, our partners and networks of friends ... and the self-esteem and self-confidence that come with it" (Bauman 2007, quoted in Kirchberg 2008, p. 98). What Bauman describes can be related to the creative class and their lifestyles.

Sennett's critique of the flexibility required by global capitalism and the "corrosion of character" that results can also be seen in the sustainability context: "Character as such a sustainable trait, is now lost ... in an economy that is solely focused on (unsustainable) short-term yields and short-term satisfaction" (Kirchberg 2008, p. 95). In the context of (creative) cities, the corrosion of character described by Sennett also has effects on the local level of urban neighbourhoods, as their role as a place of building and maintaining identity erodes and they cease to be sustainable communities. Regarding the concept of creative class, the flexibility described is a characteristic of this group, a requirement, but also voluntary to a certain degree. As Kirchberg notes, "sustainable positions in the labor environment are replaced by „projects" [and] temporary assignments" (p. 95).[68] The argument can be made that the characteristics of the creative class, such as an individualistic active lifestyle (Florida 2002, p. 231) and flexibility, can also be labelled as unsustainable. Even though the creative class seems to prefer unique, distinctive places, the results of creative city policies are often very different, as described previously. These consequences are unsustainable in the sense that they do not focus on local situations and therefore can cause a "corrosion of neighbourhoods" or the loss of residents' identification with the city itself.

If the creative class is the role model for the urban citizen and cities are shaped accordingly, then their (unsustainable) characteristics can have effects on the urban environment. The „spiky world" Florida describes is an extremely unsustainable condition. In an article from The Toronto Star, Whyte (2009) describes the effects of Florida"s presence in Toronto and sheds light on what kinds of „other" people are needed to ensure the lifestyle of the creative class. As a participant in a public forum remarks, "Richard Florida"s exotic city, his creative city, depends on ghost people, working behind the scenes. Immigrants, people of colour. You want to know what his version of creative is? He"s the relocation agent for the global bourgeoisie. And the rest of us

[66] See also Kagan (2008a). On the development of the concept of sustainability and its differentiations from „sustainable development', see Robinson (2004).
[67] Even though Sennett and Baumann do not explicitly use the terms sustainability or unsustainability.
[68] Boltanski & Chiapello (2005) have studied this extensively. Following Weber they identify a new spirit of capitalism and describe its current form. It shows in the project-based cité which integrates the artistic critique of the 1960s, which, for example, condemned the loss of authenticity and creativity through capitalism. This new cité incorporates the critique into its own justification system and builds its new characteristics around it. Working techniques developed and experimented with in the arts were transferred to this new cite, disarming both the artistic and social critique.

don‟t matter" (quoted in Whyte 2009). This statement illustrates what Sennett and Bauman describe and what Kirchberg brings into a sustainability context: the "wastefulness of the current use of human resources" (Kirchberg 2008, p. 94), described as a characteristic of modernity, and how the focus on the mobility of „creatives‟ within this system increases unsustainability, on a global and local level.

In a further step, Kirchberg looks at the role of the arts within this unsustainable situation. For him, artists have the ability to influence future developments in society by, for example enabling new ways of thinking that associate the cognitive and experiential.[69] The sociology of the arts can examine the issue of sustainability and what the arts are or are not doing to promote it and encourage participation in sustainability issues.

In the context of the creative city concept, the emphasis on arts and culture can be helpful for achieving more sustainability. As Kirchberg notes, given the importance of the cultural dimension to sustainability and the key role arts and culture play in social change, a closer look at the culture(s) of sustainability and the role of artists will contribute to a better understanding of what this can mean for the sustainability of cities.

Cultures of sustainability and the role of the artist

Duxbury, Gillette & Pepper (2007) highlight the importance of culture for sustainable community development in urban contexts, pointing at the relevance of the search-process of sustainability not only at global or national, but also at the local level. They advocate for culture‟s "potential to transform communities and individuals in positive and meaningful ways over the long term," and refer to Jon Hawkes‟ four-pillar model of sustainability (Hawkes 2001) which includes cultural vitality as a major dimension of sustainability. They also discuss sustainability‟s "ethical underpinnings" as grounded in "a holistic and creative process" and requiring cultural diversity and self-determination (i.e., allowing "the community to define sustainability from its own values and perspective").

The cultural dimension of sustainability implies the inclusion of culture in the discussion of local sustainable development and of sustainable communities based on an understanding of the contribution that culture (in the form of „cultural expressions‟ of a community, cultural activities, and the arts) makes „to social capital and cultural capital. It also implies an understanding of „culture(s) of sustainability‟ as set(s) of norms and values, social conventions, and institutions informing the transition to more sustainable practices. At a more abstract level, the question of culture(s) of sustainability also touches upon transformations in worldviews and paradigmatic bases for the knowledge of the world around oneself, that is, epistemological issues.

Not all human cultures are sustainable per se.[70] The culture(s) of sustainability is/are uniplural, keeping a complementary tension between the imperative of cultural diversity and a shared basis of understandings allowing the exploration of forms of human organization that maintain mutually beneficial relations between social systems and ecosystems. In the context of globalization, which provides opportunities for „Earth Citizenship‟ as much as risks of self-annihilation, the culture of sustainability can be understood as the international and translocal

[69] See Dieleman & Huisingh (2006).
[70] In history, several forms of human civilizations have self-destroyed, offering numerous examples of unsustainable cultures: see Diamond (2004) and, for a critical, more complex account, McAnany & Yoffee (2009).

commons of a necessary literacy, which is both an ecological literacy and a literacy of complexity.[71]

Cultural diversity, like biodiversity, is indispensable to the resilience of the human species on Earth: Resilience refers to the capacity to adapt to sudden change (whether exogenous or endogenous), which is by definition unpredictable. Sustainable systems can only exist as long as diversity is preserved, so that the shocks of the unexpected may give way to the responses of resourceful social and ecological systems. Therefore, the preservation and advancement of diversity (both biodiversity and cultural diversity) toward an optimal level (that is, not maximum, infinite diversity, but enough diversity to allow resilience) is a fundamental normative target for sustainability.

The literacy of sustainability, which at a general level can be considered as a common culture, departs from the currently dominant culture of globalization based on the literacy of modernity. The latter, acquired from Descartes and Bacon and fully blossoming in the scientific disciplines of the nineteenth century and in the techno-science of the twentieth century, is based on disjunctive thinking, simplification by reductionism, and atomization of knowledge and experience. It has allowed the economic and technological developments of the past century, but it has also engendered the global crisis of unsustainability by developing an advanced form of cultivated autism in modern societies" and modern individuals' relationships with their environments.[72]

In contrast, an ecological literacy – or eco-literacy as coined by Fritjof Capra (1996, 2002) – encompasses the development of an understanding and sensibility for:

- the link between resilience and diversity (both cultural and biodiversity, and their inter-relations);
- the dynamic balance at work in nature and society (meaning that ecosystems and societies be perceived as flexible, ever-fluctuating networks) and its relative vulnerabilities; and
- the creativity and open interdependence of webs of life (based on an understanding of emergence as the source of creativity and evolution).[73]

A literacy of complexity constitutes a further step toward sustainability. Sustainability cannot be based merely on a holistic sensibility, overemphasizing the unity and integration of the biosphere and harmony in human societies, and replacing the simplistic paradigm of modernity with a simplistic „New Age" paradigm. Rather, it should be attentive to complexity, that is, combining and contrasting unity, complementarity, competition, and antagonism. In Edgar Morin"s words: "The systems sensibility will be like that of the musical ear which perceives the competitions, symbioses, interferences, overlaps of themes in one same symphonic stream, where the brutal mind will only recognize one single theme surrounded by noise" (Morin 1977, pp. 140-141).[74]

An ecological literacy of complexity also requires a sensibility to the intelligence of the non-human (and a capacity to bridge perceptions with the non-human), a domain in which indigenous cultures can teach us a lot (Abram 1996).

[71] This glocal (global-local) challenge was expressed by Edgar Morin across his works (e.g., Morin 2006, 2007).
[72] Authors from diverse horizons have analyzed this crisis: see Ellul (1977), Morin (1977), Luhmann (1986), Abram (1996), Bourg (1997), and Brocchi (2008).
[73] A short introduction on eco-literacy, resilience, and related concepts can be found in Kagan (2009).
[74] Page numbers are based on the 1981 reprint edition.

Such (a) culture(s) of sustainability can be nurtured by an aesthetics of sustainability, based on Gregory Bateson‟s understanding of aesthetics as the "sensibility to the pattern which connects" (Bateson 1979; Kagan, 2010a). This sensibility has been at the core of the development of numerous ecological-artistic practices over the past 40 years. As noted by Duxbury, Gillette & Pepper (2007), eco-arts have widely influenced current "thinking about the role of culture in sustainability."

An ecological literacy of complexity will also be a literacy of ambiguity. Complex relations require, not a linear logic, but a complex dia-logic: "dia-logic signifies the symbiotic unity of two logics, which, all at the same time, feed each other, compete with each other, parasite each other, oppose each other and fight each other to death" (Morin 1977, p. 80). In this context, artistic reflexivity can bring especially relevant contributions to the constitution of cultures of sustainability. In action research-oriented collaborations between science and civil society, the arts can co-develop the dia-logic which will allow us to think about complexity.

The arts offer a social arena where, under certain circumstances, multiple forms of reflexivity can be developed, facilitating detachment from routines and conventions, subversive imagination, and community empowerment (Dieleman 2008). Furthermore, in the search process for uniplural culture(s) of sustainability, artists and other cultural agents working in interdisciplinary collaborations may play key roles as change agents, fostering intercultural cross-pollination between different social networks and different urban contexts (Kagan 2008b).

Toward sustainable creative cities

Hamburg: Why did the City listen?

The circumstances in Hamburg are insightful in the context of this article because they show effects and reactions within a city that has largely accepted Florida's ideas. The current developments could also be understood as extremely unsustainable ones. As the critique by the resistance group in Hamburg describes, the scarce funding for art and culture (outside of major projects such as the Elbphilharmonie or Hafen City) has forced positioning of neighbourhoods as colourful and eclectic to support marketing strategies that are used to create the brand Hamburg (Not in Our Name 2009). Nevertheless, it is also important to acknowledge the different reactions the City of Hamburg had towards the squatters.[75] Even though the squatter‟s manifesto criticizes the City's policies and its adoption of Florida's ideas quite directly, the argument could also be made that only through the lens of the creative city concept did the city even acknowledge the group in the first place. The fact that the City of Hamburg decided to buy back the Gängeviertel and give the squatters an opportunity to come up with a concept for its use shows this policy change. In a recent interview, Kirchberg notes his surprise regarding Hamburg‟s decision. Referring to Landry, he sees the City's current support of the developments in the Gängeviertel as a "paradigmatic change" in which the city views this "problem" as an opportunity (Kirchberg 2010).

In a video interview on the Gängeviertel, Florida highlights the equity and work that artists put into buildings or neighbourhoods.[76] For him they should be given an ownership state reflecting

[75] These different reactions might also have to do with the fact that the activists in the Gängeviertel are not „typical‟ squatters. Well-known and established artists are part of the group, giving it a higher level of legitimacy and integrity.

[76] Florida‟s interview is no longer online, but was previously available on the ZDF.de website: http://aspekte.zdf.de.

the value that they bring to a place. This would allow artists and „creatives" to act as investors, enabling them to sell if they choose to (and move on to a different neighbourhood) or stay. Here Hamburg has the chance to create a dialogue of principles, based around the idea that art is vital to economic growth and therefore has to be protected and nurtured. Florida suggests this could become a model and be applied around the world. The question here is whether there really is a "paradigmatic change" as Kirchberg suggests or whether the City, following Florida, continues only to see artists as part of the real estate system, in which their value shows in the ownership of buildings. Although Florida (2009) wants cities to "treat your artists right," the question remains whether the concept of viewing their work and efforts solely in economic terms really takes into account what the artists themselves are criticizing and what they bring to neighbourhoods and cities.

Nevertheless, the argument could also be made that by Florida's concept stressing the importance of „creatives" and artists for a city, they were regarded as legitimate actors with valid demands. Kirchberg (2010) advocates that Hamburg should refrain from interfering too much and allow a system of self-management in the Gängeviertel, which is in fact the kind of creative cluster that is continuously referred to in the creative city concept.

This example shows a possible way that sustainability issues, such as the demand for socially more just cities, can be integrated into the creative city concept.[77] Of course, Florida's ideas are still highly problematic, especially from a sustainability point of view, but they do help draw attention to the importance of arts, culture, and creativity for urban policy. The aim would be to modify the creative city concept by using its most important aspects (arts, culture, "creatives", creativity) and further integrating them with sustainability issues.[78] With this in mind, a first step would be to reconsider the notion of creativity in this context.

Rethinking creativity

As mentioned earlier, in eco-literacy the process of emergence is understood as the source of creativity and evolution: A culture of sustainability implies an expanded understanding of creativity as a property of all evolutionary networks of life, linked to the notion of emergence, and not only as a human attribute. Emergence is a very complex concept: It points at the creation of a new logic at the level of a system, whereby no analysis of the interactions between the different constituents of the system can suffice to account for the arising of coherent and novel structures at the level of the whole system. Emergence "has been recognized as the dynamic origin of development, learning and evolution" (Capra 2002, p. 14).[79] From there, the concept of creativity can be understood as a basic biological phenomenon: "Creativity – the generation of new forms – is a key property of all living systems" (p. 14).[80] Life is constantly creative: "And since emergence is an integral part of the dynamics of open systems, we reach the important

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[77] The initiative „Komm in die Gänge" also developed a concept for the further use of the Gängeviertel, which included other sustainability aspects such as public spaces not requiring consumption and an emphasis on an ethnic and cultural mix within the living spaces. The preservation of historical buildings goes against the city's emphasis on economic growth and a continuously expanding city. Restoring the old buildings helps maintain a sense of identity for residents.
[78] The concept does include sustainability issues, especially regarding environmental aspects such as clean air, bike paths, or overall climate as reasons why people are drawn to places (Florida 2002), but the aim is to broaden the regard for sustainability based on the definition used above.
[79] Page numbers are from the Anchor Books edition (2004) of Capra (2002).
[80] While describing the evolution of life on Earth, Fritjof Capra (2002) even claimed that the "planetary network of bacteria has been the main source of evolutionary creativity" (p. 29), thereby relativizing our tendency to consider humans always as the most, or only, creative species on Earth.

conclusion that open systems develop and evolve. Life constantly reaches out into novelty" (p. 14).

At the level of human communities, creativity as emergence relates to the unplanned, undirected, non-designed creation and experimentation of new social forms. If social organizations and communities are understood as living, learning beings, it is at the level of informal "communities of practice" (Wenger 1998) and social networks that new cultures can emerge. It is at the level of the informal networks and cultural scenes of a city that the openness to disturbance, and therefore the potential for emergence, is the richest – not at the level of formal organizations and planned developments. "Facilitating emergence includes creating that openness – a learning culture in which continual questioning is encouraged and innovation is rewarded" (Capra 2002, p. 123). Therefore, an emergence-friendly „creative city" policy should only give guiding principles, provide open-ended impulses, and establish spaces where informal social processes are facilitated, and should avoid any deterministic design.

Keywords for sustainable creative cities

Unlike the traditional modernist notions of individual creativity and of autonomous art, which are supporting Richard Florida's „spiky world" view, the alternative understanding of creativity that we suggest follows an ecological paradigm more compatible with the search process of sustainability (and based on complexity theories). Such an understanding of creativity also echoes earlier appeals for a more collaborative, connective, social-ecological self-definition in the art worlds (e.g., Gablik 1991) and it offers an effective leverage point to re-conceptualize creative cities within the agenda of sustainable cities.

Sustainable creative cities will require that local contexts and neighbourhoods, and all local communities (i.e., both humans and other living species), be respected as equal partners of artists and other „creatives". On one hand, the search for sustainability imposes certain limits to the autonomy of artists and „creatives", who can no longer be considered as fully irresponsible and individualistic agents allowing their cultural capital to ground processes of gentrification (just as the economy can no longer be allowed indefinite and inconsiderate growth). On the other hand, the search for sustainability also requires an evolutionary openness to the emergence of ways of life, which are both locally sustainable and informed by the global dimension of sustainability. In this respect, creativity is also an imperative for sustainability, and artists and other „creatives" should be given the necessary opportunities and degree of autonomy so as to foster creative local developments. Therefore, the kind of autonomy that is required is less the modernist autonomy of art for art's sake, and more the dialogical autonomy of trans-local interdisciplinary teams engaged for the self-management of local communities. David Bohm (2004) described dialogue as a basis for social intelligence and creativity. He understood dialogue as a genuine connectivity in conversations/social interactions, based on a caring openness to the other (and acknowledgment of one's own limits and fragility), as opposed to the mere contest of wills of the discussion (whereby each discussant tries to „convince", that is, to impose forcefully upon others, one's truth, one's will, and/or one's individual creativity). Thanks to its openness, Bohm's dialogue defines an inter- subjective space of shared experience where creativity can emerge.

If understood as emergent, creativity is not a process that arises necessarily in designated „creative" individuals according to their talent, human capital, or cultural capital, but it can also arise in the minds of „ordinary" members of local communities under certain circumstances. Artists and other „creatives" should thus be understood as the facilitators, openers, and catalysts of creative processes, rather than their owners, authors, or sole originators. Furthermore, creativity is not the only quality that should be stressed in sustainable creative cities, but it should

be complemented by other qualities that contribute to the dialogical value of communities of practice, such as craftsmanship, as described by Richard Sennett.

For Sennett (2008), craftsmanship, the wish to do work well for its own sake, is an inclusive category as it is based not on talent, but on motivation and ability. This makes it possible for "nearly anyone [to] become a good craftsman" (p. 268).[81] In addition, this means that the shared capacity to work offers a common ground for encountering others. As Sennett states, "the craft of making physical things provides insight into the techniques of experience that can shape our dealings with others" (p. 289). For him there is a connection between the material challenges the craftsman encounters and the skills required for human relationships.[82] Related to social dialogue within communities, the notion of craftsmanship can encourage connections between all members built upon joint experiences and possibly help overcome social divisions. Further, Sennett ties art and craft together based on the expressive implications behind all practices. Built around these qualities and effects of craftsmanship, artists, „creatives", and „ordinary" members of communities are able to interplay on a sufficiently levelled playing field, which is an essential quality behind a sustainable creative city.[83]

Some existing art-based projects are moving towards such practices, with the artists as catalysts for a dialogical relationship within creative communities. For example, in Hamburg in 2007, the team Migrantas (composed of an artist, a graphic designer, a sociologist, an urban planner, and a journalist) started the project "Bundesmigrantinnen – Images of Migration in Germany's Urban Space."[84] They organized workshops with migrant women from different backgrounds, exchanging experiences and expressing them in simple drawings (made by the women), which were then translated into pictograms (by the team) (see Figure 1). The drawings and pictograms were exhibited together in art spaces, and the pictograms were also turned into large-scale posters shown in urban public space. In Wilhemsburg (a multicultural city district of Hamburg along the river Elbe), the 2008 project "Culture|Nature" highlighted existing exemplary local initiatives and linked them with inspiring international artists. For example, the residents" association Interkultureller Garten e.V. and the ecological artist Susan Leibovitz Steinman worked together on "gardening art" in public urban spaces and held "kitchen table diplomacy" meetings (Haarmann & Lemke 2009). In cities across the world, exemplary projects are fostering the creative collaborations of art and social- ecological communities – for example, David Haley"s "Wild Wild Walks" in Manchester (U.K.) whereby teams of residents, artists, experts, and policymakers walk together to (re)discover biodiversity in urban spaces.[85]

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[81] The notion of craftsmanship also achieves a sense of self-worth and supports values that encourage a strong togetherness. This goes against the „corrosion of character" that Sennett (2008) describes. In a craftsman approach, "people are anchored in tangible reality, and they can take pride in their work" (Sennett 2008, p. 21). This approach, additionally, can create sustainability within an individual'ss character.

[82] Sennett only refers to human relationships, but the non-human world would have to be added here.

[83] A further aspect of craftsmanship emphasizes the importance of asking ethical questions throughout the entire work process, not only at the end. Based on pragmatism, which stresses the link between means and ends, Sennett (2008) looks at the different "stages and sequences of the work process, [in order to indicate] when the craftsman can pause in the work and reflect on what he or she is doing" (p. 296). This aspect can help integrate sustainability issues into work processes, giving a normative framework and pointing to possible consequences of one's doing.

[84] See the team"s website: www.migrantas.org

[85] We are not aware of such ecological-social projects in Toronto. For further information on walking-based art projects, see http://assist2010.ning.com

Figure 1. Pictogram poster developed by the project “Bundesmigrantinnen – Images of Migration in Germany´s Urban Space”

In this article we have only been able to briefly touch on some dimensions towards an understanding of sustainable creative cities. We explored how contemporary critiques of the concepts of creative city and creative class, when placed in the context of the analysis of a culture of unsustainability, helps to highlight how the concept of creative cities may breed unsustainability. Using the cities of Hamburg and Toronto as examples, we proposed a re-conceptualization of creative cities based on an understanding of the role of the artist in cultures of sustainability. Richard Sennett’s notion of the craftsman provides one pathway in this re-thinking process towards sustainable creative cities. Further key issues should be explored such as the question of how to become “skilled practitioners of interdependence” (see Kelley 2008, pp. 73-76) and necessary policy changes, such as rethinking Local Agenda 21 (see Kagan & Sasaki 2010; Kagan 2010b).

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The roles of artists in the emergence of creative sustainable cities: Theoretical clues and empirical illustrations

Abstract

This article consolidates critical urban sociology with the understanding of cultural sustainability towards urban development. Whereas the latter demands a ‘culture of complexity’ based on self-organized creativity as stipulation for a sustainable creative city, the former provides theories for analyzing unsustainable creative cities. By combining paradigms from critical urban sociology and cultural sustainability this article lays ground for understanding urban social movements by artists. On the one hand these movements resist unsustainable urban development; on the other hand they strive for opportunities that allow urban communities becoming creative sustainable neighborhoods. Lefebvre’s ‘Right to the City’ concept, Molotch’s ‘growth machine’ thesis, and Smith’s elaboration of ‘gentrification’ are particularly suited to explain the unsustainable urban development of ‘creative cities’. The contrasting term of ‘cultural sustainability’ combines ideas of ‘sustainable creativity’ with concepts of resilience and serendipity; here, urban development is not limited to mono-causal economic objectives. The theoretical considerations are illustrated by three case studies in Hamburg, Germany, a city with a neo-liberal, i.e., unsustainable, urban development strategy. The cases demonstrate ranges of crossovers of artistic, social and political objectives. They represent degrees of resilience against an unsustainable urban political economy with an unsustainable grasp on creativity. They also represent degrees of adaptation towards urban cultures of creative sustainability with needs of limiting growth, fostering social solidarity and shaping realms of creative possibilities.

Keywords: Creative cities, Sustainable cities, Unsustainable urban development, Urban social movements, Artists, Hamburg

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The City is our Anthropo-Scene! Art as a Verb and Urban Sustainability Transformation

The *i Light* festival in 2014 aimed, with light art in the public spaces of Marina Bay, to highlight the importance of sustainability for all Singaporeans. The organizers convened a symposium exploring these issues. The present article is stemming from my keynote address at that symposium.

The question of sustainability, for the city-nation of Singapore, is not just a matter of saving some energy here and there. How to characterize such a peculiar animal as the concept of sustainability in only a few words? Let me give it a try: Sustainability is a normative, but also multi-dimensional, search-process. It is a process of transformation without end, not a fixed end-state or a being, because any image of a perfect, stable and harmonious system is a dangerous illusion. It is an uncertain and unclear search-process, because clear ideas and plans and modernist development lines are not fit for long-term evolution.

As I just wrote, sustainability is necessarily multi-dimensional. The most widespread depiction of sustainability describes 3 pillars of sustainability: economic, environmental and social. But many scholars have, in the past 2 decades, criticized the limitations and misconceptions of that approach (see Kagan 2011, Burford et al. 2013, Soini and Birkeland 2014). The first issue, the main misconception, is to think of “pillars” or discrete “sustainabilities”, as if sustainability could be compartmentalized so that one could achieve “economic sustainability” on its own or “environmental sustainability” on its own. But in long-term perspective, to say things plainly, that is nonsense. Even the very idea of understanding each so-called “pillar” of sustainability on its own, in separation from the others, is a harmful misconception. The second issue, the main limit, is that a major fourth dimension is missing: the cultural dimension.

Thus, a better depiction of sustainability understands it as an integrative concept with 4 dimensions:

– the economic dimension, whereby long-term wealth (understood in a more than merely materialistic sense) is sought out, rather than mere economic growth and individualistic materialistic desires which in the long term are inherently unsustainable;

– the social dimension, whereby social justice, and equity for the whole diversity of social groups across contemporary and future societies, as well as the empowerment of the less powerful parts of a society, are sought out;

– the environmental or ecological dimension, whereby natural constraints are recognized, permanence rather than short-term goals determine the usage of natural resources, and the long-term co-evolution of the human species with other species and ecosystems on the planet is sought out;

– and the cultural dimension, whereby cultural vitality is sought out, with elements such as creativity as well as cultural diversity, a rich living, evolving cultural heritage, and a deeply pluralist world of meanings continuously regenerated in the arts and humanities.

Furthermore, each of the 4 dimensions plays an integrative role for the other three. Especially, the cultural dimension plays an integrative role because culture works at three levels that affect how we deal with the other three dimensions: fundamental worldviews (i.e. understandings of what

reality is and how it works), systems of values and beliefs, and sets of practices, behaviors and lifestyles.

A complementary way to depict sustainability was proposed by the Argentinian researcher Lucas Seghezzo (2009): He proposed to define sustainability as a five-dimensional construct, with:

- the 3 dimensions of space, whereby not a geometric "space" but a meaningful "place" is understood, where a place-based, place-sensitive, locally wise human development is sought out;
- the 4th dimension of time whereby permanence is sought out and long-term thinking as well as imaginative perspectives into the future, are preferred to short-term interests with the naive assumption that the future will look like a continuation of present development;
- the 5th dimension of the individual human being whereby personal fulfillment is sought after with a depth of human experience rather than a superficial happiness like the zombie materialistic happiness of the consumer.

More specifically, in the urban context, urban "cultures of sustainability" call forward certain qualities. Malaysian researcher Manickam Nadarajah (Nadarajah and Yamamoto 2007) characterized these qualities in an urban "culture of sustainability"as a specific symbolic universe that stresses wholeness & circularity in nature-culture relations and their mediations in the urban metabolism, as well as a dematerialized value system, and a culture of participatory democracy, diversity, and 'localism' (where regional development & resource-use is preferred to global markets, and where indigenous knowledge is safeguarded). Furthermore, cultures of sustainability require a literacy of living complexity (cf. Kagan 2011, 2012). Complex ecosystems and social systems do not behave like machines, not even like complicated cybernetic systems, and complexity-reducing approaches invariably lead to ecological crises, the most pressing coming crisis being climate change. A culture of complexity is required for us to search more sustainable development options.

In the coming decades and centuries, a primary challenge to the very survival of our societies will be climate change. Climate change brings together the different dimensions of our global unsustainable development. And whether we look at "mitigation" of, or at "adaptation" to climate change, not only the policymakers are concerned, but also all other community-levels and individuals, who will need to take more ownership of these issues if modern societies want to have any chance of surviving into the next couple of hundred years.

By "mitigation", one means the urgently required efforts to reduce future climate change with less wasteful, more ecologically wise human actions. The urban consumerist lifestyles that we have grown accustomed to, and which provides a blissfully comfortable irresponsibility in the upper and middle class of rich countries such as Singapore, is clearly unsustainable and worsening the scales of climate change to come.

By "adaptation", one means being being prepared to face serious threats at multiple levels, in the coming years, decades and century, which will seriously challenge most of the social, economic, political and environmental structures that we too often take for granted. To name only a few examples: With melting ice caps, the global trade routes will eventually bypass Singapore. Later on, with the growing scarcity of multiple natural resources, the age of cheap international transportations and commerce will probably come to an end. With increasingly frequent climate extremes (well beyond the recently experienced drought in Singapore), and later on with rising sea levels, the environmental conditions will become much more challenging for Singapore, if not eventually threatening the very existence of the island. With multiple destabilizing factors in

many regions of the globe, the international context will also enter into unstable unknown territories. In short, Singaporeans of the future will face great uncertainties, risks and instabilities.

In that future context, old recipes will falter. Adapting to climate change raises the question of Singapore's “resilience”. Sustainability requires resilience, i.e. the capacity to evolve through serious crises. That will become very relevant in the coming decades, when the trusted approaches that granted wealth and stability to the country will be severely tested. The concept of “resilience” comes from the scientific study of how natural and social systems, in the past, have managed (or not) to survive by evolving in the face of changing contexts. The species, ecosystems and societies that have proved able to survive extreme crises, and to evolve through these crises, share three characteristics:

The first characteristic is “redundancy”: having multiple pathways to doing similar things. (For example, if I take a food metaphor: Our bodied have multiple ways to tell us to eat, i.e. not only the symptoms of hypoglycemia). Redundancy is severely reduced by efficiency. Efficiently organized societies will generally have less redundancy, thereby threatening their resilience. (To keep the food metaphor: If our bodies were super-efficient machines, and hypoglycemia was then our single, efficient way to get motivated to eat food, human beings would be a non-viable species.)

The second characteristics is diversity: having diverse options available, for example having multiple ways to see the world and express ourselves, as well as multiple ways to learn from experience and transmit knowledge. Cultural diversity as well as biological diversity should be preserved and even increased. The third characteristic is “self-organization”: the communities, neighborhoods, groups of people constituting the city need to gain the capacity to self-organize and self-determine their responses to crises. This goes against the expectation to always receive assistance and direction from a top-down helping hand, but it also goes against the naive expectation that some natural market laws would spontaneously solve our problems.

Urban resilience requires the realization of these characteristics through the city's fabric (Dieleman 2013, John and Kagan 2014). Singapore has a rich cultural diversity, but in terms of redundancy and self-organization, much room for progress lies ahead. One promising way for cities to develop these qualities of resilience is through art. Not through the promotion of commercial art or art for art's sake, but through the involvement of artists and other unconventional creative people in the process of urban development, to help both un-plan our cities and plan them differently, in more participatory and more creative ways. By “art”, I do not mean the pleasing/entertaining production & consumption of objects labeled as “art”, but the sharing of experiences and processes that challenge the participants, creatively. This is “art as a verb” rather than art as a noun. Such experiential processes can have different degrees of transformational potentials for those partaking, involving imagining & enchanting, detaching & subverting, experimenting, and empowering (Kagan 2012).

The i *Light* festival in 2014 at Marina Bay did manage to raise the attention of many Singaporeans, and brought them together through some artworks with interactive qualities (as the *i Light* symposium made clear). This is a good start, but more can be achieved with artistic means. Artists and urban experts should work together, shaping spaces where the creative and experimental spirit of the city's inhabitants is stimulated. Artists in contemporary (post-)modern societies can bring especially fruitful approaches and methods to such processes (as discussed in Kagan 2011, 2012, 2014), if they are allowed the mental, social and physical space to do so.

Arts-based experiences can also help us develop a culture of complexity by stimulating our sensibility to complexity. In some of my earlier writings, I have stressed the importance of aesthetics of complexity as aesthetics of multiple layers and dimensions, of ambiguity, of

ambivalence, of perceiving "yes and no" rather than "yes or no", in short, a kind of Yin-Yang aesthetics. This implies a respect for, and understanding of chaos, and a heightened attention to creative emergence from chaos. Self-organization, a central characteristic of resilience, is an emergent process bringing order from chaos (and not order against chaos). Experiencing "art as a verb", i.e. being challenged creatively, also involves multiple forms of reflexivity: about the social conventions we take for granted, unfreezing habits (hermeneutic reflexivity); about fundamental meanings and beings we rarely examine because they are at the base of our worldviews (ontological reflexivity); about the relationships of form and meaning (aesthetic reflexivity); and also critical reflexivities at many levels from the political to the ecological levels of critique.

Thanks to art and other creative, hand-on activities, contemporary city-dwellers should be allowed to freely re-imagine possible futures and experiment with more sustainable ways of life. Creative "spaces of possibility" are needed, which are not commercial, countering the cancerous growth of commercial centers in the city. These also cannot be spaces which are government-controlled and pre-designated, because such procedures kill creativity, self-organization and imagination. These have to be "un-designated" spaces where artists are allowed to foster spontaneous creative processes and ownership of these processes by the different social and cultural communities of Singapore.

These few hints at a creative sustainable city should not be mistaken for the fundamentally unsustainable development fostered by mainstream creative city policies advocated by e.g. Richard Florida. (For more details on the difference between these two approaches, see Kagan and Hahn 2011, and the whole September 2013 issue of the journal *City, Culture and Society.*)

In Germany, where I am living and working since 2005, the two cities of Hamburg and Hanover show different ways in which such "spaces of possibility" are opening up: In Hanover, artists are encouraged to pursue their autonomous contributions to a "resilient city" together with the local communities, whereas in Hamburg, they are being pushed to market themselves as business entrepreneurs for a short-sighted "creative city".

In Hamburg, through the "Right to the City" network (uniting many activists and artists from over 100 local groups), a bottom-up alternative to the neoliberal and unsustainable "creative city" policy of the city government emerged. The city's policy-makers are still promoting mainly a spectacularized and commercial creative city development, in the footsteps of Richard Florida's recipe for unsustainability, but many artists refuse to be co-opted into that strategy.

In Hanover, the city government is more pro-active in seeking resilience, and is collaborating more closely with activists and artists (such as young squatters and the "Transition Towns" network), supporting sustainability-seeking bottom-up processes in neighborhoods. Emerging "spaces of possibility" then take a less oppositional character than in Hamburg.

One case in Hamburg is especially interesting: On August 22nd 2009, 150 artists, architects and marketing-experts illegally occupied a group of buildings known as the "Gängeviertel" (the last remainder from a historic workers' quarter). It started not as an ordinary "squatting" but as an art exhibition. The occupiers did not merely protest the plans of the city government and the investor: They put up an elaborate alternative plan and marketed it to the media as a cultural center, workspace and social housing solution improving a central neighborhood dominated by commercial and expensive housing buildings (Twickel 2010).

For the first time in decades the city government, which normally evacuates occupied buildings by force within 24 hours, listened to the proposal. Seduced by the artists, they even bought back the buildings from the investor and gave the occupiers a year to finalize their concept. The

occupiers further developed the site into a lively alternative cultural center through multiple series of events and self-organized activities. After a couple of years of tough negotiations with the city government, an agreement was found. Rehabilitation work started in late 2013. The historical buildings have been saved and social housing preserved. A cooperative manages the buildings as a self-organized community, fulfilling the occupiers' plans rather than the city's usual scenarios, and the inhabitants re-invent their everyday life, realizing ecologically and socially mindful lifestyles (Gängeviertel 2012, Kirchberg and Kagan 2013).

It seems to me, from my short stay in Singapore, that realizing the potential of urban resilience will be a great challenge for the island, but not an impossible one. I saw several creative seeds which would need to be encouraged to grow, for example in the new "maker-spaces" where young people build objects and grow food themselves, or in the civil society, cultural and artistic developments around the many values being re-discovered in the historical site of "Bukit Brown": People rediscovered the values of cultural heritage and biodiversity (that city life made them forget). Such sites can become exactly these kinds of undesignated spaces of experimentation and imagination that we need, if we allow them to unfold.

At the *i Light* Symposium, I suggested a name for such sites: "Anthropo-Scenes". The "Anthropocene" is a new geological age describing the unprecedented extent to which humans are affecting the planet's biosphere. The Anthropocene is a condition in which we have become co-pilots of nature on planet Earth. This brings immense responsibilities, which many people (including many artists as well as decision-makers and professions around the world) have not yet realized. In this context, cities (where the majority of human population will live in this century) become the crucibles, scenes and stages for eventual survival or collapse. By anthropo-scenes, I thus mean sceneries, landscapes and stages where the complexity of human development and human responsibilities come to the foreground, and where, rather than following rigid paths, creativity can be stimulated, on the way to a more resilient city...

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The Emergence of Creative Sustainable Cities

Are the discourses and practices connected to the creative city, sustainable city, and to urban resilience bound to reinforce neoliberal urban development? Or can they instead point toward the emergence of a radical open citizenship through the emergence and eventual scaling-up of networks of spaces of possibilities? In the following pages, I have gathered some thoughts on the latter scenario.

Creative Sustainable Cities

The unsustainability of policies for creative cities as advocated by Richard Florida's "Creative Class" discourse has already been discussed by many researchers and professionals in cultural and social fields over the past years. I too have been involved in such critical discourse, always retaining space for the consideration of alternatives as related to the concepts of "sustainability" and "resilience" in urban contexts (Kagan and Hahn 2011, Kirchberg and Kagan 2013). I wish to expand upon this facet of the topic by discussing alternative models that are being sought after and experimented with by artists and other creative cultural agents engaged with issues of sustainability in urban development. I will be looking at approaches to the relations between city, culture, and sustainability that are diverging from the neoliberal "creative city" model by working toward the emergence of what might hopefully become a "creative sustainable city".

In 2010, I organized a workshop in Brussels in collaboration with Masayuki Sasaki (Osaka City University). We were invited by the Asia Europe Foundation (ASEF) as part of the 4th "Connecting Civil Societies" Conference by ASEF in preparation for the 8th ASEM Summit (Asia Europe Meeting). Thanks to the gathering of artists, social scientists and cultural professionals engaged in the search process of sustainability in cities, this workshop allowed for an in-depth exploration and formulation of key desired features regarding the question "What is a sustainable creative city?". We summarized our responses as follows: "A Sustainable Creative City should embrace participatory, bottom-up, intergenerational approaches where 'trial and error' (i.e. iterative) experiments are fostered. In such a city, long-term developments and processes are regarded as important, rather than products. The whole city is mobilizing creative potential to 're-invent' the 'logic of the house' or 'oikos logos'. Viewed as living organisms, sustainable creative cities build on their capacities and resources to create tangible and intangible values for the present and the future. Bio-cultural diversity should be a basis for urban resilience" (Kagan and Verstraete 2011, n.p.).

Given that we are operating on a symbolic level where different hegemonic and counter-hegemonic discourses make their claims (Laclau and Mouffe 1985), the exact formulations of expressions play an important role, also regarding the order of words and associated emotional weights. This is why I prefer to speak of "creative sustainable cities" rather than of "sustainable creative cities": the aim is not to merely bring superficial ecological, social, and cultural updates to the neoliberal program of the "creative city" (by adding the adjective "sustainable" in front of it), but rather to contribute and add to the social-ecological discourses on "sustainable cities", by stressing some functions, properties and priorities related to culture and the arts (by bringing the adjective "creative" to the front of the phrase).

Urban Resilience

The concept of resilience has risen in popularity over recent years; even starting to overshadow the concept of sustainability in many circles. As a consequence, the term of resilience itself is experiencing increasing re-articulation by hegemonic forces for the justification of neoliberal programs. Recently, a British comedian reportedly argued that "People don't need to be resilient, they just need to stop being fucking oppressed". This gut reaction begs for two elements of response: first of all, the meaning of resilience should be carefully considered—and I will try to contribute a few elements in this direction in the following paragraphs; secondly, I want to stress that the semantic and political struggle over concepts, once they rise to attention, is an unavoidable and normal aspect of the political realm. Words in political use necessarily receive different discursive and emotional valuation through communicative processes that are (notwithstanding Habermassian fairy tales of communicative action) bound to push and pull meanings in different and sometimes irreconcilable directions. This is true of "resilience" as much as it is true of "sustainability" or "creativity". Rather than taking a perpetual flight, I concur with Mouffe's agonistics as a plea for us to engage in (counter-)hegemonic claims, acknowledging political processes and one's own footing in their healthily-muddy waters (Mouffe 2013). In passing, a third element of response is still due, regarding the "fucking oppressed": Mouffian agonistics also reminds us that the idea of a supposedly communist society, free of all forms of antagonism and hence finally free of all elements of oppression, entails a dangerously totalitarian concept of consensual, pacified society. It is an idea that, when put into practice, entails deeply oppressive consequences.

Therefore, in the search for "creative sustainable cities", let's "get on with" resilience as well. Resilience is about the capacity of evolving through serious crises. It is neither merely resistance, nor mere adaptation. It integrates some elements of both, resistance and adaptation, without losing sight of the ethical goals of sustainability—as they were set in the "Manifeste Convivialiste" (Les Convivialistes 2013). Within sustainability science, and among climate change researchers, resilience is assumed to become a more and more relevant approach over the next few decades when the trusted approaches that fueled urban development will be severely tested (John and Kagan 2014).

The concept of "resilience" comes from the scientific study of the ways in which natural and social systems, have (or have not) managed to survive in the past by evolving in the face of changing contexts.[86] Three characteristics are shared by the species, ecosystems and societies that have proved able to survive and evolve through extreme crises. The first characteristic of resilience is "redundancy", which means being able to take multiple approaches for arriving at the same goal. To use a food metaphor, the body has numerous ways other than the symptoms of hypoglycemia for instructing itself to eat. Redundancy is severely reduced by efficiency. Efficiently organized societies will generally have less redundancy, thereby threatening their resilience. If the human body was a super-efficient machine, and hypoglycemia was the only way to motivate the body to consume food, human beings would be a non-viable species. In the arena of urban concerns, one potential threat to redundancy in cities lies in the obsession with efficiency associated with the development of "smart cities". The second characteristic of resilience is diversity, which means having diverse options available; such as a variety of ways of seeing the world and expressing oneself, as well as multiple ways of learning from experience and transmitting knowledge. Both cultural diversity and biological diversity should be preserved and, where possible, even increased. Following the thoughts of authors investigating resilience

[86]Beware: I am not using the term "evolution" in the neo-Darwinian, sociobiological sense. Much rather, in Tim Ingold's sense.

(discussed in John and Kagan 2014), I need to stress that paramount to resilient urbanity are diverse modes of learning that result from diverse modes of knowing the reality around us. This implies provincializing logico-deductive thinking as only one of several emotional learning modes (and not as hierarchically superior to emotional, experiential and embodied ways of learning). In short, if we seriously dig into the "diversity" characteristic of resilience, we soon enter a deeper discussion about epistemic issues and transdisciplinarity beyond the scope of the issue treated in this essay. The third characteristic of resilience is "self-organization": the communities, neighborhoods, and groups of people constituting the city need to gain the capacity of self-organization and self-determination of their responses to crises. This contradicts not only the common expectation of always being passed down assistance and direction from a helping hand at the top, but also goes against the naive expectation that "natural" market laws would spontaneously solve any and all problems without some form of collective management.

Urban resilience requires the realization of these three sets of characteristics throughout the different layers of the city's fabric. One possible way for cities to develop these qualities of resilience, which I am looking into in my current research, is through art (i.e., art in a wide sense, including all sorts of creative cultural practices, and inheriting the discourses of Allan Kaprow, Joseph Beuys, Helen and Newton Harrison, Wochenklausur, Isabelle Frémeaux and John Jordan, and several others). My hypothesis is not that urban resilience will be enhanced through just any form of artistic production. Rather, I mean specific forms of artistic practice that bring artists (and other creative practitioners not explicitly labeled as "artists") together with other urban subjects in processes of urban development to help them collaboratively "un-plan" our cities, make urban questions more interesting, queer our conceptions of urban development, and "plan" cities in more participatory, creative, and emergence-friendly ways while becoming less "control-freaky".

Resilience, as I understand it, is a creative process. But the resilient city is not the usual money-making "creative city". The kind of creativity it needs is not that "Kreativitätsdispositiv" (creativity dispositive) that Andreas Reckwitz criticized in his critique of creativity (Reckwitz 2012), but rather that other kind of creativity that Reckwitz sketchily (and timidly?) pointed at, at the very end of his work: a creativity that grows from and fuels everyday life. It is a creativity for which the activists at Gängeviertel and among the "Recht auf Stadt" ("Right to the City") network in Hamburg have given a name: "Möglichkeitsräume" ("Spaces of Possibility"). These "Spaces of Possibility" have also been called other things: for example, Hans Dieleman in Mexico calls them "Spaces of Imagination and Experimentation" (Dieleman 2012). These are indeed spaces where imagination, experimentation, and—I would add, not just any experience, but more critically, challenging experiences, open up futures-oriented questions and perspectives. And these are training grounds for experimental developments that may contribute to urban resilience. These are also spaces (both physical, geographic spaces as well as spaces in our minds) where social conventions are reflected, unfrozen, and challenged, and where imaginative and experimental practices unfold thanks to lessened conventional constraints (see also Kagan 2012).

Radical Open Citizenship

What are the political consequences of looking at climate change from the perspective of the need for resilience? Droughts, floods, and other natural catastrophes related to climate change will, sooner or later, have tremendous impact on the economy and productivity of settlements, on social cohesion, on political institutions and other institutions. An increasing instability of established structures can be expected (including State structures as well as global markets). In

simple words: if we do not want to end up with tragic situations and new forms of totalitarian regimes, the so-called "civil society" must become prepared and immediately begin enhancing the resilience of human communities. Especially in the so-called Global North, we need to re-learn, through practice, qualities of self-organization. We can look at inspiration from the Global South: for example, Argentinian Horizontalidad, which was a great inspiration for the Occupy movement. These two movements are characterized by open learning processes that allow a radically innovative development of new types of knowledge and flexibility—a key feature of resilience.

However, this does not mean that in preparing for such eventualities, resilience thinking is necessarily a strategy that (1) reinforces the neoliberal agenda of a withdrawal from the welfare state and/or (2) partakes in the politically toothless strategy of "Exodus" from institutional politics, which according to Chantal Mouffe (2013) would be a historical mistake advocated by Hardt & Negri and practiced by the Occupy movement. I want here to stress again that resilience points to the value of redundancy, and redundancy should also concern the different mechanisms of the unfolding of political and urban processes of development. In simpler words, enhancing self-organization should not preclude further critical engagement with institutions of urban policy-making. Besides, in the nearer future, the city-government of Hamburg is probably not going to collapse or radically change overnight. The activists at Gängeviertel in Hamburg realized this long ago and do not follow an either/or dichotomous type of thinking in this matter. They pursue self-organization, concertations, negotiation and critical dialogue with the city government.

Now, and pragmatically, in a city like Hamburg, when aiming to foster the emergence, development and eventual scaling-up of "Spaces of Possibility", one crucial question is: how to organize these spaces as commons, given each city's specific political, administrative, economic situation? This is a question that has been raised by many activists and cultural actors during meetings I have held with them over the past few years: not only in Germany (where the debate on the commons is especially visible and supported by institutional agents such as the Heinrich Böll Foundation), but also in other countries facing a diversity of specific challenges in e.g., Latin-American or Asian cities.[87] Here, I am thankful to be able to follow the practices and reflections of the Hamburg practitioners (from the Gängeviertel and more widely from the Hamburg "Right to the City" network). For example, as is now well-known thanks to the works of Elinor Ostrom and those following her (e.g., Silke Helfrich in Germany), the commons imply the existence of non-market sets of economic relationships that puts emphasis upon sharing, gifting, caring, and collective managing, which have to find ways to co-exist with other forms of economic logic (such as market logic and the logic of state financing). In concrete terms, urban social-cultural centers such as the Centro Sociale and Gängeviertel's Fabrique in Hamburg should not, for example, be asked to pay rent to the city for their usage of their respective buildings. It is an especially complex issue of finding a working balance between this imperative (and the important alternative culture it fosters) and the dissonant logic of City Hall and of other urban actors, as is being faced by the Gängeviertel at this very moment. Hence, managing the commons requires bold new ways of collaborating with diverse stakeholders, including the city government, in order to find such balance within an agonistic dialogue, rather than being limited by the predictable outcomes of antagonistic confrontation.

[87] I noticed (during my empirical explorations in Asian cities such as Bangalore, Seoul or Singapore) that some artists and activists from these cities place a locally-specific stress on the exploration of the "commons" (and use a discourse referring to commons, i.e., not only to "public space").

Movements, Networks and Creative Spaces

Above, I mentioned the movements Horizontalidad ("horizontalism") and Occupy. There are several more movements that should be considered and critically discussed, but going into detail is unfortunately beyond the scope of this text. Among the relevant movements and networks are Transition Towns, groupings related to notions of Buen Vivir, "degrowth", intercultural gardens, and of course the "Right to the City" network which is strong in Hamburg but also in some other cities around the world. Recently, a large group of French-speaking intellectuals proposed some common traits uniting all these movements, in a text called the "Manifeste Convivialiste" (Les Convivialistes 2013). All these movements use networked organizations, rather than remaining isolated and scattered or relying on hierarchical structures. This encourages both diversity and partial redundancy which "allow[s] for people to collectively coordinate multiple and divergent courses of action and produce multiple solutions to a problem" (Maeckelbergh 2013: 78). Furthermore, it catalyzes a synergy between different areas of alternative organization, "placing them in a larger dynamic of transition" (Rumpala 2013: 17). As Rumpala (2013) suggests, further networking of these initiatives would be a prerequisite to a wider transition to sustainability. Other than this networking, I should also stress the importance of creative dimensions in spaces of challenging imagination and experimentation. As an art sociologist, I am biased towards paying attention to these aspects as I am especially interested in the different roles and forms of agencies that a diversity of artists (and more generally, of creative practitioners from a variety of professions and personal backgrounds) bring into the creation and development of such spaces. My attention is also focused on the relations of these creative agents to urban social movements and to urban policy developments.

The latter is the focus of my current empirical research, which is in an early stage. Therefore, I will not present any "conclusions" here, but merely sketch a few preliminary considerations on initiatives I am following in different cities around the world. The following is therefore no more than a collection of hunches, guesswork and initial observations based on fragmentary early impressions from the field, gathered from 2014 onward—in other words, no conclusive statements:

In Oslo (Norway), I took part in the official founding of CAN (Concerned Artists Norway). I visited Oslo twice, each time for several weeks and interviewed a diversity of artists, researchers and others.[88] In Cluj-Napoca (Rumania) I heard from different actors from arts organizations as well as social scientists about diverse initiatives in the city that included the protest movement against "Rosia Montana", which culminated in 2013. In Singapore I learned from the artists-duo "Post-Museum" about their artistic research documenting current developments at the site of "Bukit Brown", and from several other artists and organizations about their relationships to urban developments on the island-city-state.[89] These three cases appear to show, albeit in different ways and within different contexts, the emergence of creative initiatives that develop spaces for active civic engagement; by and large in the form of creative variations of protest cultures. These forms of creative initiatives entail a strong dimension of protest, are helpful, and probably indispensable in their respective contexts. They probably are also building the foundation for further developments. However, my first impression is that they may not be fully realizing the potential of "Spaces of Possibility" as discussed above.

[88]I want to thank CAN, PNEK and the individual artists who generously hosted me at their places in Oslo, for their support, and thank PNEK and The Telemark University College for covering my travel costs to Norway.
[89]I thank the URA (Urban Redevelopment Authority) and Ong & Ong Architects, for their invitation to Singapore, generously supporting me to stay a few days longer for an exploratory research on my own, besides their invitation to take part at a symposium and art festival.

In New York City, I visited several ecological artists, including for example the "Waterwash ABC" project site (in the South Bronx), initiated by the artist Lillian Ball (with several partnering organizations and individuals, e.g., the South Bronx NGO "Rock the Boat").[90] This project combined ecological site remediation, educational and intercultural social practice, and elements of participatory urban development. My students and I also interviewed Wendy Brawer at the headquarters for the "Green Maps" organization in Manhattan, which supports various grassroots green initiatives in NYC and other cities around the world.

In Cologne (Germany), the German Cultura21 network is supporting a local event, the "Tag des guten Lebens" ("Day of the Good Life"), which is carried out by a local coalition of over a hundred organizations known as the "Agora Köln". The event is a cultural format for a "car-free Sunday", in which newfound urban spaces are used not only for sustainability initiatives to introduce themselves to each other and the public, but also for local communities, individuals, and neighborhood groups and activities to connect, share, have fun, and creatively re-appropriate the cultural commons of the streets and other outdoor spaces without cars disturbing them[91]. In its first iteration in 2013, the event saw the participation of over 100,000 persons (according to the police). In Hannover (Germany) several artists and cultural initiatives are actively developing sustainability-related projects.[92] For example, the "Kultur des Wandels" ("KdW—Culture of Change") festival, a yearly event, takes over a public square for several days in order to bring together sustainability initiatives and cultural actors from the city into a situation where the public space, the private space, and the commons are staged to joyfully mingle, can interact with one another, and where networking is facilitated. I need not describe the details by which the Gängeviertel in Hamburg (founded in 2009) implemented the strategic roles of "art" and "design" in the early phase of the occupation (directed towards media and policy-makers). The Gängeviertel initiators sought an embedded role for art in the further development of their place as part of experimenting with resilient urban lifestyles, alternative economic systems, etc.

I see several qualities present in the cross-section of these examples. Predominantly in the German cases mentioned above (and to some extent in the networking of different initiatives in New York City), I see the emergence of diverse forms of "Spaces of Possibility" that go beyond mere protest movements, awareness raising, or individual project-based initiatives, and are aiming to inspire experiments of transformations in the everyday lives of urban subjects. Despite the limitations and challenges faced by these initiatives, this is where I find the most promising grounds for hope in the emergence of "Creative Sustainable Cities".

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[90] I wholeheartedly thank the ecological artist, and transdisciplinary researcher Aviva Rahmani, for not only hosting me over that whole period of time, but also for taking me to relevant events in NYC and organizing and hosting a gathering with leading ecological artists, and engaging me in in-depth research exchanges on practices and discourses of ecological artists. The present short text does not allow me (yet) to do justice to the many insights I (and my students) gained from meeting New York-based ecological artists during that couple of weeks.
[91] See www.tagdesgutenlebens.de
[92] My research activity in Hannover is part of the research project "City as Space of Possibility" at the Leuphana University, from 2015 to 2018, supported by "Niedersächsisches Vorab" funding for "science for sustainable development" from the State of Lower Saxony. See www.leuphana.de/sam

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PUBLICATION 14

Original Publication Type: Article

Title: Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations

Authors: Sacha Kagan, Antoniya Hauerwaas, Verena Holz and Patricia Wedler

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Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations

Abstract

This article contributes to an exploration of the relations between culture and policies for sustainable development in cities. It discusses the potentials to advance a cultural approach to sustainable urban development by enabling urban "spaces of possibility", relating them to institutional (social, cultural, and political) innovations. Based on empirical research in the two cities of Hamburg and Hanover, the article examines the relations between four selected cases of cultural actors/initiatives and the differing policies of the two cities, pointing at the seized or missed opportunities for innovative forms of transversal partnerships through a culturally sensitive urban policy.

Keywords: cultural dimension of sustainable urban development; spaces of possibility; institutional innovation

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PUBLICATION 15

Original Publication Type: Book Chapter

Title: IHM-agining sustainability: Urban imaginaries in spaces of possibility

Author: Sacha Kagan

Book title: The Routledge Companion to Urban Imaginaries

Book editors: Christoph Lindner and Miriam Meissner

Publisher: Routledge, London

Year: 2018

Pagination in original publication: 76-89

IHM-agining sustainability: Urban imaginaries in spaces of possibility

Abstract

Urban “spaces of possibility” for sustainable urban development are constituted to a significant extent by the spaces opened up for imaginative processes, enriching urban imaginaries with potentially radical imagination and pointing towards possibilities for urban transformation. Spaces of possibility are both spaces of imagination and spaces of experimentation, and the integration of imaginative and experimental experiential processes enhances their relevance for potential urban transformations. This chapter focuses on the relationships between (physical, social, and mental) spaces fostering sustainability-related imagination and the unfolding imaginaries of sustainability in such spaces. It is based on the empirical investigation of the development of imagination and imaginaries across five grassroots initiatives/projects/networks in the city of Hanover, Germany (in the Linden district, alongside the Ihme River). The empirical research insights reveal how these imaginaries are both emplaced and place-making, how they facilitate cooperation in urban society through balancing dialogical and dialectic communication processes, and how experimentation and imagination are mutually constitutive in such spaces. These insights strongly suggest that urban imaginaries, when researched in relation to urban spaces of possibility and to (changes in) social institutions, should become a central concern in research into sustainable urban development.

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PUBLICATION 16

Original Publication Type: Book Chapter (Book Introduction)

Title: Stadt als Möglichkeitsraum – Möglichkeitsräume in der Stadt: Eine Einführung

Authors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

Share of Authorship of Sacha Kagan (see documentation in the appendices): **40%**

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

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Stadt als Möglichkeitsraum – Möglichkeitsräume in der Stadt Eine Einführung

Eine interdisziplinäre Gruppe von Forscher*innen der Leuphana Universität Lüneburg hat sich in den Jahren 2015 bis 2018 zusammengefunden, um zu untersuchen, welche Beiträge kulturell, künstlerisch, sozial oder alternativ wirtschaftend engagierte Akteur*innen zu einer nachhaltigen Stadtentwicklung leisten, welche Hinweise, Ansatzpunkte und Möglichkeiten in einer Stadt als Möglichkeitsraum existieren, die eine nachhaltige Entwicklung befördern, und wie die spezifischen Gegebenheiten einer Stadt, die ›fabric of a city‹ (McFarlane und Rutherford 2008) oder die ›Eigenlogik einer Stadt‹ (Berking und Löw 2008), Möglichkeitsräume befördern. Möglichkeitsräume bezeichnen physische, soziale und mentale Räume, in denen schon jetzt und durch imaginative, kreativ-experimentelle und gestalterische Prozesse mögliche nachhaltige Entwicklungen der Zukunft angelegt sind. In diesem Kapitel stellen wir Fragen, die sich auf das Forschungsprojekt als Ganzes beziehen: Warum ist eine nachhaltige Stadtentwicklung wichtig? Warum sind wir deshalb an *Möglichkeitsräumen* interessiert? Wie lassen sich umfassende *Transformationen* hin zu einer nachhaltigen Stadt veranlassen? Warum haben wir *Hannover* als Fallstudie ausgewählt? Wer sind die *Akteur*innen* einer nachhaltigen Stadtentwicklung in Hannover und was bedeutet *nachhaltige Stadtentwicklung* für sie? Nicht zuletzt gibt die vorliegende Einführung zudem einen Ausblick auf die folgenden Kapitel dieses Buchs.

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PUBLICATION 17

Original Publication Type: Book Chapter

Title: Kreativ-kulturelle und künstlerische Praktiken für städtische Möglichkeitsräume

Authors: Sacha Kagan

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

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Year: 2019

Pagination in original publication: 175-234

Kreativ-kulturelle und künstlerische Praktiken für städtische Möglichkeitsräume

Einleitung

Dieses Kapitel thematisiert grundlegend die Erforschung kreativ-kultureller und künstlerischer Praktiken für die Gestaltung städtischer Möglichkeitsräume. Diese werden sowohl als materialisierte, physisch feststellbare Orte der sozialen und kulturellen Erneuerung, als auch im mentalen Sinne verstanden, d. h. als Räume für Experimente, Vermittlung und Kommunikation nachhaltiger Lebensweisen und ebensolcher Werte.

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PUBLICATION 18

Original Publication Type: Book Chapter (Book Conclusion)

Title: Perspektiven der nachhaltigen Stadtentwicklung: Übereinstimmungen, Diskordanzen und Empfehlungen

Authors: Volker Kirchberg and Sacha Kagan

Share of Authorship of Sacha Kagan (see documentation in the appendices): **40%**

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

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Perspektiven der nachhaltigen Stadtentwicklung: Übereinstimmungen, Diskordanzen und Empfehlungen

In diesem Band haben wir uns gemeinsam aus unterschiedlichen disziplinären Perspektiven mit der nachhaltigen Stadtentwicklung befasst und dazu künstlerisch-kreative und sozial-ökonomische Projekte und Initiativen, aber auch größere Einrichtungen zum Beispiel der Stadtverwaltung erforscht. Dabei wurde deutlich, dass sich hier eine Vielzahl von Akteur*innen einer nachhaltigen Stadtentwicklung zu diversen Themen bei Heranziehung heterogener Wertorientierungen unter unterschiedlichsten Rahmenbedingungen in der Gegenwart und für die Zukunft zuwenden. Die Spannweite der Aktivitäten reicht von der Abkehr eines wachstumsorientierten Wirtschaftens über die Schaffung und Verfestigung von Netzwerken und Kooperationen, der Stärkung von Partizipation und Bürgerbeteiligung, der Vermittlung von Werten und ethischen Handlungsweisen bis hin zur Realisierung ökologischer, sozialer, kultureller und alternativ-ökonomischer Zielvorstellungen. Hannover erweist sich als ein Ort mit einer sehr aktiven und vielfältigen Projektlandschaft mit der Forderung nach und der Realisierung von urbaner Nachhaltigkeit.

DOI: https://doi.org/10.14361/9783839445853-020

PART 4: Towards Artful Sustainability Research

PUBLICATION 19

Original Publication Type: Book Chapter

Title: The transcultural and artscience: The 'Karamoja Campaign' as an attempt at transdisciplinary action research

Authors: Sacha Kagan

Book title: Von der Internationalisierung der Hochschule zur transkulturellen Wissenschaft

Book editors: Christa Cremer-Renz and Bettina Jansen-Schulz

Publisher: NOMOS-Verlag, Baden-Baden

Year: 2012

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The transcultural and artscience: The 'Karamoja Campaign' as an attempt at transdisciplinary action research

Abstract

What could a “transcultural science” look like? I will explore this question through a discussion of an inter- and transdisciplinary project that I coordinated at the Leuphana University Lüneburg in 2008 and 2009: the so-called “Karamoja campaign” - dealing with issues of unsustainable development in a semi-pastoral region of East Africa. I will especially focus on the artistic dimension of that project, under the light of theoretical considerations on 'cultures of sustainability'. The main argument to be unfolded in the following pages is that, to become transcultural, transdisciplinary research may benefit greatly from viewing itself as “artscience” and from untiringly seeking transversal pathways – *des chemins de traverse*.

1. A definitional basis: from inter- to trans-disciplinarity, from inter- to trans-culturality

1.1 Transdisciplinarity and transculturality

It may be helpful to consider the definitions of two terms recently growing in popularity, the “transdisciplinary” and the “transcultural,” alongside each other, as did Basarab Nicolescu in his *Manifesto of Transdisciplinarity* (Nicolescu 2002).

Nicolescu proposes the following definitions, to discriminate between multi-, inter- and transdisciplinarity: “Multidisciplinarity concerns studying a research topic not in just one discipline but in several at the same time [...] Any topic in question will ultimately be enriched by incorporating the perspectives of several disciplines” (Nicolescu 2002: 42-43). Interdisciplinarity “concerns the transfer of methods from one discipline to another” (ibid: 43). It allows epistemological transfers between disciplines but it also contributes to the “disciplinary big bang” i.e. to the contemporary explosion of disciplines, which poses a challenge that only transdisciplinarity may address: For Nicolescu, “transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline” (ibid: 44).

Transdisciplinary research requires a complex integration of knowledge, both beyond the universalist and yet fragmented claims of science under Modernity, and beyond the postmodern deconstruction of relativism and social constructivism. In transdisciplinary research, “several levels of perception” encounter “several levels of reality.” For a researcher, and more widely for any “reflective practitioner” (Schön 1983), this does not only mean that any single method, and any single discipline, are insufficiently covering the complexity of reality: It means also that any single cultural background, and any single mode of knowing reality, are limited to perceiving only a few of the multiple possible levels of reality.

This is where Nicolescu introduces the transcultural: Transdisciplinarity involves the emergence of a transcultural communication. Nicolescu values multi- and intercultural exchanges across the world, but also points at their limitations: “The multicultural helps us discover the face of our own culture in the mirror of another culture [but] the multicultural and the intercultural by themselves do not assume the kind of communication between all cultures that presupposes a

universal language founded on shared values, but they certainly constitute important steps toward the act of transcultural communication. The transcultural designates the opening of all cultures to that which crosses through them and transcends them" (Nicolescu 2002: 104). Nicolescu defines the transcultural as an experience across and beyond cultures. "Each culture is the actualization of a potentiality of the human being, in a specific place on Earth and at a specific moment in history. Different places on Earth and different moments in history actualize different potentialities of the human being, that is, different cultures. It is the open totality of the human being that constitutes the 'place without place' of that which crosses and transcends cultures" (ibid: 105). The transcultural is in no way aiming to realize the unification of all cultures on one plane, just like the transdisciplinary is not leveling multiple levels of reality under the pan-optical view of one level of perception. Along the spirit of transdisciplinarity, transculturality "both enables the dialogue between all cultures and prevents their homogenization" (ibid: 108).Transcultural vision allows not a uniform unity but an "open" unity of knowledge. "In effect, the complex plurality of cultures and the open unity of the transcultural coexist in the transdisciplinary vision. The transcultural is the spearhead of transdisciplinary culture. Different cultures are the different facets of the human being. The multicultural allows the interpretation of one culture by another culture, the intercultural permits the fertilization of one culture by another, and the transcultural assures the translation of one culture into various other cultures, by deciphering meaning that links them, while simultaneously going beyond them" (ibid: 107). However, the transcultural (because it is "going beyond them") is maybe not exactly about 'translating' cultures but more about transiting and traversing them, as Koefoed's definition suggests more sharply.

1.2 The transcultural as extra-cultural

Approaching the term from a different theoretical background than Nicolescu (cf. Koefoed 2008), Oleg Koefoed understands transculturality as "that which operates within the cultural, yet due to its form and substance goes beyond the cultural itself; offering the players in the cultural spheres a field or form in which to step out of their specific culturality and into a suspension of this. In other words, this definition differs from the one suggested by Ortiz in 1940 [...] whereby 'transculturation' marks the introduction of foreign (cultural) elements in another culture and the transformation of the latter through the work of the former. So my definition differs by focusing on the extra-cultural, rather than the extra-mono-cultural" (Koefoed/Kagan/Dieleman 2011). Koefoed's discussion can be interpreted as pointing at the difference between the mere bridge of the inter- (cultural/disciplinary) and the suspended 'path without a path' of the trans- (cultural/disciplinary).

In Koefoed's own elaborate terminology, the transcultural is about "sustensions": suspended tensions between "virtualities", i.e. the imaginary, with possibilities and impossibilities, and "actualities", i.e. what emerges as the 'actual' real world (cf. Koefoed 2008). From this perspective, he suggests that "sustensive eventalities may be said to depend upon the presence of sustainable transculturalities. Dependant, in other words, on the role played in any event by the combinations of elements that emerge or are brought into the event, from the virtuality of the event itself" (Koefoed/Kagan/Dieleman 2011).

1.3 Transversals

Leaving the abstract terminology of the philosopher Oleg Koefoed, I may dare to ask: What is this "transcultural" that manages to go "beyond" the cultural, to come from "beneath" the cultural and yet be continually bathed in the cultural? Although no definitive answer to this question is

possible, I want to advance a few possibilities: The transcultural may be nourished by different transversal streams that co-constitute humanity together with the cultural level:

- social structural transversals (partly specific to our species, and partly shared with other animal species);
- cognitive transversals (some specific to the homo sapiens species, and some shared with certain other species);
- biological transversals (some related to complex multicellular auto(eco)poïetic processes, some related to the interplay between proteins, genes and sometimes viruses);
- and to some extent, physical transversals (structuring the physical world and, a fortiori, human beings).

These few 'transversals' as I just called them, can be compared and contrasted to the modernist notion of 'universals' (which is still to be found for example in the field of evolutionary psychology). Both terms are grasping at a relatively similar reality, but they are not interchangeable. Turning away from 'universals' and preferring to look for 'transversals' marks a commitment to complexity, i.e. to the complex interrelations between different emerging logics beneath and beyond the cultural level, yet forming, together with the cultural level, the open unity of the human condition. (By 'complex interrelations' I mean, after Morin (1977), the combining and contrasting of unitary, complementary, competitive, and antagonist relationships.) Furthermore, the terminology of "universality" unduly carries the old modernist assumption that certain universals may be 'true always and everywhere', while transversals have both a limited validity (e.g. one species, and/or activated only under specific conditions), and a contextual relevance (i.e. they emerge as realities, and come to make sense, in specific cultural contexts). Transversals are more relational, and less essential, than universals.

1.4 A sensibility to complexity

The challenges of transdisciplinarity, of transculturality and of considering several levels of reality through several levels of perception, may be met, if the researcher/practitioner cultivates a certain sensibility to complexity, which I proposed to define as "aesthetics of sustainability" and as a "sensibility to patterns that connect" fostering "cultures of sustainability" (cf. Kagan 2010a, Kagan 2011). Such a sensibility requires not only an integration of multiple perceptive skills brought by a diversity of scientific, humanistic, artistic, and professional (i.e. crafts-like) disciplines, but also more generally, an integration (yet no uniforming) of two modes of knowing that Edgar Morin (1986) discussed as the uni-duality of *Logos* and *Mythos*: On the one hand, Logos covers the domain of what Gregory Bateson called "conscious purpose" (cf. Bateson 1973: 414), echoing Max Weber's "Zweck-Rationalität" and involving means-ends calculations, narrow-efficient shortcuts, classical logic, clear and distinct ideas, and abstract concepts. On the other hand, Mythos covers a wider, partly subconscious domain involving the senses, polysemic intuitions, the symbolic, unclear connective notions, and concrete contexts.

In terms of research and educational practice, the challenge of this uni-duality has been already explored and discussed with various resourceful approaches, such as systems thinking, experiential learning, embodied cognition, action research, 'Gestaltungskompetenz', complexity theories, dia-logics, fuzzy logics, and others (e.g. in art, the 'social plastic' of Joseph Beuys), the discussion of which lies beyond the limited scope of the current article. I will therefore limit myself now to the discussion of one single project, with a special focus on its integration of scientific and artistic work, illustrating concretely how a transversal practice of an "artscience" may foster a sensibility to complexity.

I borrow the notion of 'artscience' from Hans Dieleman, who himself took it up from David Edwards (2008).[93] With that term, Dieleman points at ways of moving beyond the limitations of disciplinary methods in the scientific world, by integrating art and science (cf. Dieleman 2007). His discussion of "artscience" and of what he calls "artful doing and artful knowing" contribute to a definition of transdisciplinarity (while his article shows some skepticism vs. the keyword 'transdisciplinarity' as used in academic institutions).

2. Inter- and transdisciplinary research at the Karamoja campaign

2.1 The Karamoja Campaign

In the years 2008 and 2009, I coordinated together with David Knaute (of the French NGO ACTED), an awareness-raising campaign across Europe about the situation of the Karamoja region. The campaign included a one year-long research process involving five European universities and several African and European organizations, with numerous events, among which four international conferences and a research panel at the first world conference of humanitarian studies (WCHS), two artistic interventions, a documentary film and a final book publication (see www.karamoja.eu).

Karamoja is a semi-arid region of Northeast Uganda, bordering Kenya and Sudan. The region counts probably around a million inhabitants, among which are semi-pastoralist Karimojong and Pokot tribes, with cattle herds and goats. While their traditional, semi-nomadic way of life is jeopardized, both tribes have also been involved in increasingly deadly armed cattle-raids. Karamoja is a region in crisis for now more than 30 years, plagued by small arms (AK-47), demographic explosion, climate change, border conflicts and difficult development issues raising the issue of an unsustainable development course pursued by the different actors involved in the region (cf. Eds. Knaute/Kagan 2009).

The research process at the 'Karamoja campaign' aimed to uncover the complex issues of the region's unsustainable development, in their multiple dimensions (ecological, historical, cultural, economic and political). In order to reach an inter- and transdisciplinary level of analysis, we followed principles of systems thinking and used the "syndrome approach" as an analytical tool.

2.2 The Syndrome Approach as an exploratory tool

"If one only treats the local and partial symptoms one at a time, looking at one domain at a time, one will not manage to go very far in terms of proper and effective long-term solutions for more sustainable developments of societies," argued the promoters of the syndrome approach (Lüdecke/Petschel-Held/Schnellhuber 2004). In a complex world, issues of (un-)sustainable development can only be understood when the interactive dynamics of changing ecological, economic, social and cultural contexts are understood together. This is why the Karamoja campaign had to be integrative as well as inter- and transdisciplinary, and had to base itself on systems thinking approaches.

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93 In the meanwhile, the term has been taken up by several others. My goal here is however not to make a recension of different recent uses and interpretations of the term.

Systems thinking asserts that the only way to fully understand why a problem occurs and persists is to understand the interacting parts in relation to the whole 'system' they belong to, and to further explore complex interactions between different systems.[94]

The Syndrome Approach (Syndromansatz) was developed from 1993 onwards by the German Advisory Council on Global Change (WBGU) and further developed afterwards by the Potsdam Institute of Climate Research (PIK). It identifies functional patterns (or "clinical pictures") of interaction between humans and nature and describes key processes driving spirals of unsustainable development. To achieve this aim, a syndrome analysis brings together the knowledge about the environment, population, economy, social organization, technologies and cultures shaping a typical pattern of unsustainable development in a certain region. Sixteen different types of syndrome have been identified by the WBGU.

However, none of the syndromes described by the WBGU and PIK do sufficiently take into account the specific issues at the interface between sedentary agricultural societies and pastoralist nomadic societies. We thus developed a specific "Karamoja Syndrome" highlighting, among its key dimensions, the role of the loss of pastoral mobility in destabilizing the region's complex ecological, socio-economic and cultural balance (cf. Kagan/Pedersen/Ollech 2009).

2.3 Of (semi-)nomads, sedentary cultures and borders

It is not an accident that the specificity of nomadic cultures was ignored in the original syndrome research (e.g. in the Sahel Syndrome). It is also not surprising that the now-classical discourse of the "tragedy of the commons" based itself in a misconceived condemnation of the land management of commons by nomadic people, misrepresenting the value of dynamic, mobile communal land management and favouring the ideological imposition of sedentary, privatized-capitalist land ownership (for a deconstruction of Hardin's "tragedy of the commons" as a Trojan horse of classical economics, see Knighton 2009).

Metaphorically speaking, the fencing-off of territory, in the sake of good-old modernist management, expresses a fear of the transgressive deed of the transversal path. This is the famously narrow-minded view of Robert Frost's neighbor with his "good fences make good neighbors" discourse in *Mending Wall*. Concretely speaking, sedentary cultures often put up fences and borders against the transhumance paths of nomadic and semi-nomadic, pastoralist cultures.

Inside Europe, the long-distance transhumance of e.g. sheep herders is hindered and neglected, and its practice has dramatically declined. However, without transhumance, the resilience of Europe's biodiversity to the threats of climate change is reduced: Nomadic pastoralism over long distances, facilitates zoochory, i.e. the dispersal of seeds by animals across long distances. Zoochory is indispensable to the adaptation of numerous plant species in times of climate change, allowing them to migrate (cf. Beckmann/Garzon Heydt 2009).

In the case of Karamoja, the erection of international borders and of internal borders between regions inside Uganda, as well as the encroachment of common grazing land by sedentary agriculture, destabilizes the sustainability of pastoralist land management. These phenomena are combined with others such as the institution of "nature protection" areas by the government, and the worsening of armed conflicts hindering mobility. The loss of dry season pastures and the loss of pastoral mobility that follow, are causing overgrazing by the pastoralists. The pastoralists are

94 The space of this article does not allow me to further introduce systems thinking and complexity theories. On their relevance in the context of arts and culture, cf. Kagan 2011.

then accused of causing a "tragedy of the commons". However, the crisis is caused by the disruption of a complex and dynamic multi-year cycle of grazing across the land, which was previously in place.

This issue led the students doing the research at the Karamoja campaign, to interrogate the notion of borders, as a transversal issue affecting African as well as European pastoralists, and beyond pastoralists, an issue touching upon several aspects of Modernity's unsustainable development. This issue was one among several that were explored by the students, but, unlike some of the other issues addressed, borders and mobility became the central focus of one of the artistic interventions conducted at the Karamoja campaign: *Caution Border.*

3. A trans-situ art installation: *Caution Border*

3.1 *Caution Border*

The art installation/intervention *Caution Border* was the results of a cooperation between, on the one hand the students in my Karamoja seminar at Leuphana University Lüneburg, and on the other hand the students in the Karamoja team at the CCC (Critical Curatorial and Cybermedia) research-based postgraduate study programme at Geneva University of Art and Design, tutored by Sylvain Froidevaux.[95]

Before the conception of Caution Border, the CCC team contributed to the international Karamoja Conference in Lüneburg (24-25 October 2008) both with a visual investigation of unmarked borders between Switzerland and France, and with a paper presentation on cattle rustling, black markets and 'subversive sociability' in African postcolonial context (cf. Froidevaux 2009). Alongside and in the days preceding and following the conference in Lüneburg, the students from the universities of Lüneburg, Geneva, Bordeaux, Groningen and Prague, met international experts as well as guests speakers from Karamoja, and they discussed and brought together their perspectives gained in months of research on Karamoja. From the international and interdisciplinary context of these conference days, emerged within a few weeks the concept of a specific art intervention/installation to be implemented in and around some of the European Commission's buildings in Brussels, on January 23rd 2009:

The installation *Caution Border* consisted of barriers placed in busy areas in order to complicate people's movement through them. This included:

- customised yellow caution tape with the text "This is not a natural border";
- so-called "wet signs", also yellow, on which the text "caution wet floor" was replaced by "caution border";
- yellow flyers (distributed to passers-by), which were printed with the pictogram reproduced on the wet signs, showing a man attempting to cross a border, and the text "this is not a natural border".

On the back of the flyer were written three questions: "Do you have problems at the border? Do borders protect you? Are borders natural?" These questions relate directly to some issues raised

95 Nominatively, the students involved in *Caution Border* were, in Geneva: Kasia Boron, Giulia Cilla, Gael Lugaz, Urduja Manaoag and Eva May: in Lüneburg: Ines Gödecken, Margaretha Kühneweg and Jenny Wehrstedt. The project also benefited greatly from the research, logistical and managerial support by David Knaute, from ACTED, Paris.

in relation to the situation of pastoralist people in Karamoja. But they are also transversal questions, that the passers-by could, and did relate to other instances where borders point at specific issues.

As expressed by the CCC team:

"The aim of the intervention was to stimulate a reflection on borders by confronting the public with a concrete experience of them. Wet signs are a familiar sight in corridors, but when they warn us of a border instead of a wet floor, something seems to be wrong. As the public physically negotiates these obstacles, an environment is created where the spectator may question his or her notions of borders. The obstacle-installation also included a caution tape warning us that this border is not natural. But what is a natural border anyway? The thought of a border being build up in a corridor, and then called natural is absurd. And by stating this, the group was aiming at making the public consider how natural any kind of border actually is (Political borders? Colonial? Social? Cultural? Etc.)" (Froidevaux et al., in Eds. Knaute/Kagan 2009: 508).

During the two days in Brussels, the wet signs, caution tape and postcards were also used for public interventions downtown, at the Saint-Hubert Galleries, and cutting across the Grand-Place. The work was also invited at the “Burning Ice Festival” at KAAI Studio Brussels, where *Caution Border* was installed in the exhibition rooms as well as making an impromptu appearance on the main stage during one performance.

3.2 Trans-situ art

In the months following the Brussels event, I re-enacted the *Caution Border* installation/intervention at different locations across Europe, allowing a site-adaptive relevance to emerge each time:

- At the World Humanitarian Studies Conference, at the University of Groningen (Netherlands) in February 2009, the installation evoked the situation in Karamoja as well as other borders-related issues in the field of development.
- At the students-organized conference "Lebenswert - Die Konferenz zur Nachhaltigkeit”, at the Leuphana University Lüneburg, in March 2009 , the installation was re-enacted and discussed by a group of students who had not been taking part in the Karamoja campaign directly.
- Placed at the main entrance of the Anthropology Museum in Brno (Czech Republic) at the occasion of the 'Native and Indigenous Film Fest' in May 2009, the installation was embedded into discussions on the rights of indigenous peoples and their violations by national governments.
- Alongside COP15 (the UN's Climate Change Summit) in Copenhagen in December 2009, I installed Caution Border, with the support of a few friends, at several locations: At the entrance of the central train station in Copenhagen, partly blocking the entrance for about half an hour; and for a couple of days in two Copenhagen neighborhoods (Mozart square and Norrebrohallen) which were relatively unaffected/ left aside by all the other COP15-related events (whether the official conference, cultural events or civil society actions). In this context, the installation raised strong concerns about the situation of future climate refugees, both among passers-by at the central train station and on Mozart square (at the station: official delegates at COP15, including a delegate from Uganda who was passing

by; on Mozart square: people from the neighborhood, including some with immigration backgrounds and a specific sensibility to the topic).

- The installation was also re-enacted in small scale for the conference "from the internationalisation of higher education to transcultural science" at Leuphana University Lüneburg in September 2010, allowing an exchange with conference participants during the World Café session. This exchange was the stimulus for the writing of the present article.

While the tradition of "In Situ" in art points at the importance of the local context for the relevance of an artistic intervention, here I propose the notion of "trans-situ" art, to point at the relevance of mobile, transferable "kits" types of installations which can bring transversal issues across different contexts, neither imposing a universalist or limitatively subjective artistic discourse, nor limiting itself to a single local context, but stimulating transversal and trans-local reflexive exchanges between participants.

At the EU Commission, Caution Border was for example placed at the main entrance lobby of the EU's External Cooperation DG, right in front of a standing European flag. In this specific micro-local context, the installation reminded the passers-by of the EU's own contradictions, with the yellow tape in front of the flag symbolizing 'fortress Europe'. A few hours later, installed in the public spaces of Brussels, *Caution Border* could also evoke to some people, the burning Flemish/Wallon situation and the threat of an implosion of Belgium caused by mounting intolerance and xenophobia especially in Flanders. The very same night at KAAI, the installation then evoked the borderlessness of the climate change process and the borderfullness of our incapacity to deal with it. In all of these cases, the installation, when it was capturing some attention, did raise relevant questions about different aspects of our unsustainable development path. And it did so in a transversal, transcultural way: relevant in its contextualized relations to specific cultures and intercultural situations, suggesting 'transversals' rather than 'universals'.

3.3 Traversing: walking across

Of course, such an art installation/intervention is only one among many possible forms of artscience action-research. Another especially insightful starting-point, for the Karamoja campaign and beyond it, could have been: walking.

Specifically to Karamoja, walking is the way in which the pastoralists enact and update their knowledge of the region's ecology, and adapt their dynamic land management to an evolving context. For them, like for other indigenous groups, walking is an attentive practice, at the heart of a learning-process about the land, as well as it is a necessity for survival.

More generally, walking is not only an everyday practice characterizing the human being (as a transversal, common to all humanity), but also a very rich form of "action research", i.e. of knowing by doing: Walking allows embodied learning, i.e. not only the abstract, disembodied learning of the classroom and the schoolbook. Walking-based practices put things learned in contexts, locally and ecologically, embedded in a real geography and not only conveniently virtual. Thanks to the slower rhythm, the walker heightens his or her attention. Walking across places involves moving, exchanging, comparing, and constitutes a potentially transversal, transdisciplinary practice.

Walking is also sometimes a social and political practice, reshaping the realities of shared spaces and the fiction of public space, accompanying political expressions and the articulation of democracies, as Gandhi's famous "Salt march to Dandi" illustrated (cf. Kagan 2010b). Walking

allows both exchanges with multiple others and personal introspection for oneself. Finally, walking is an ordinary activity, low-tech rather than high-tech, accessible to all, and open to non elite-wisdoms from all human groups.

This is why the theme of walking was selected for the first edition of the International Summer School of Arts and Sciences for Sustainability in Social Transformation (ASSiST) which I directed, in Gabrovo, Bulgaria, on August 21-27 2010. That school, aiming to explore transdisciplinary methodologies, included 7 days of workshops (mostly based on walking practices), semi-open space sessions and other activities, which I do not have the space to discuss here (but interested readers can visit the ASSiST website at http://assist2010.ning.com and read Kagan2010c).

Farewell

The beauty and richness of transversals comes from the beauty and richness of the complexity that they unveil. As argued by the ecological artist David Haley, “we must learn not to be afraid of complexity.” Only then will we be able to reach the transcultural. I will thus close this text with a short poem by David, embracing complexity:

It is the real world

„A real world situation“

This is disjuncture

We must learn not to be afraid of complexity

(Haley 2010).

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Artistic research and climate science: transdisciplinary learning and spaces of possibilities

Abstract

Taking a wider view, departing from the specific case of the Hamburg exchange between artists and climate scientists, this comment envisages some radical potential for the collaboration of artists and climate scientists: moving beyond the traditional boundaries of social systems, artistic research and climate science may engage in a shared transdisciplinary learning process. They may communicate with the rest of society by engaging with others to develop 'spaces of possibilities', thus nurturing the creative resilience of communities.

My comment aims to critically reframe some of the discourses and interpretations that emerged from the exchange between Hamburg climate researchers and their visiting artist researchers, as far as I could witness them at the final event organised in late 2014 at the University of Fine Arts (HFBK). I will base my arguments on the following premises:

1. Art worlds, although they have been largely constrained in the modern era by a self-oriented, autopoïetic logic (as analysed in different ways by Pierre Bourdieu regarding the art "field", Howard Becker regarding "art worlds", and Niklas Luhmann regarding art as a "social system"), are however not doomed to follow a path-dependency complying with this logic [Kagan, 2011].
2. 'Wicked problems' such as climate change require more than merely interdisciplinary research maintaining an *illusio* of value-neutral knowledge — they require transdisciplinary practice, with explicitly undertaken elements of ethical and aesthetic reflexivity [Kagan, 2014a]

My discourse situates itself in the complexity theory of Edgar Morin and the epistemology of transdisciplinarity of Basarab Nicolescu. Rather than with boundaries between autopoïetic social systems, enclosed from the inside in a Luhmannian fashion, it engages with generative borders across autoecopoïetic complex ecologies [Kagan, 2011]. This perspective will serve as my premise, i.e. I will not expose it in much further details here.

To suggest this alternative framing, I will generally discuss spaces of possibilities opened up by the meeting of artistic research and climate science rather than directly address the specific artistic research and exchanges that occurred in Hamburg over the course of 2014.

Inter- and transdisciplinarity in science and in art

Artists (as well as other creative cultural practitioners) can engage with climate change in multiple ways. Thanks to the multiple forms of reflexivity that they develop [Dieleman, 2008, p. 108–146], artists can engage with issues by bringing together all or some of the following

elements: a critical analysis; a questioning perspective that does not rush for direct straightforward solutions to problems; an exploration of potentially unconventional perspectives; an appeal to imaginative possibilities and especially subversive imagination; a hands-on approach to experimentation which is not limited to linear logico-deductive processes and instead explores the potentials of metaphorical, associative and abductive patterns of thought; a heightened and dedicated attention to sensory, aesthetic and phe- nomenological dimensions of learning; and a capacity to overcome the misleading separation of subject and object as well as the myth of value-free discourse. Armed with these potential qualities, artists are therefore not served well when invited to "art meets science" exchanges, if their roles are pre-set as those of mere illustrators, disseminators, communicators or propagandists of an already fixed body of knowledge. From what I could glean from the Hamburg project, this first pitfall was successfully avoided, thanks (among other things) to the (epistemological) openness expressed by several of the researchers and artists involved.

Artful inquiry holds the chance to participate in a larger project of transdisciplinarity, an expanded rationality that integrates different learning processes and different ways of knowing affecting different "levels of reality". At this point, a clarification of terms (following Nicolescu's definitions) is necessary, to counter the widespread confusion in the use of the terms multi- inter- and transdisciplinarity, across universities and art schools.

– *Multidisciplinarity* highlights common areas by juxtaposing the perspectives offered by different disciplines. This leaves the disciplinary work of researchers and artists (and their epistemologies) largely unaffected.

– *Interdisciplinarity* involves practices where, thanks to inspiring exchanges, researchers from one discipline borrow and adapt methods and metaphors inspired from other disciplines, within a wider shared social system (e.g. science). This is the case in academia, but is also the case, in parallel, in art worlds where "interdisciplinarity" also functions as a descriptor for practices crossing artistic disciplines. Interdisciplinarity brings many changes in the work of researchers or artists, and is practiced widely nowadays. This practice may "irritate" (in a Luhmannian sense, i.e. disturb according to an inner selectivity) the own discipline.

– *Transdisciplinarity* (TD) is an extra dimension of research and action, whereby different modes of knowing, from outside of science (or outside of art), are engaged with, on eye level. This is a wholly different kind of research practice, which complements disciplinary and interdisciplinary research and offers a wider integrative framework.

TD is not a unified practice, and several 'philosophies' of transdisciplinarity are currently competing, or even sometimes ignoring each other, generating diverse "transdisciplinary research cultures" [Kagan, 2014a]. For some, TD is mainly about researching with practitioners (as part of the constitution of a new field of "sustainability science"), and constitutes largely a mild form of participatory action-research (PAR) where the sustainability scientists retain relatively more hold on ethical and normative goals than does a typical PAR-researcher (even though its advocates would not describe their approach in this way). For others, TD is some kind of vague extension of the humanities, or of the typically German notion of "Kulturwissenschaften" (sciences of culture), through its many "turns", with some strong elements from authors such as Foucault and Deleuze (and more generally a poststructuralist flair).

Numerous other approaches to TD exist, which I will not, here and now, attempt to mention exhaustively. I will rather focus on what interests me in the context of artistic research and climate science: TD as it was advocated originally from the 1980s onwards in France, especially by quantum physicist Basarab Nicolescu and sociologist and philosopher Edgar Morin; TD as a unity in complexity of knowledge, integrating different ways of knowing, without simplifying

them into one meta-discipline. This TD both rejects a unitary "theory of everything" and welcomes a complex unity of knowledge.

Disciplinary scientific theories and discourses are generally incapable of holding, within themselves, ambivalences, self-contradictions and ambiguities. In the philosophy of science, one speaks about a "logic of non-contradiction" which traditionally animates disciplinary scientific discourses. (Even the Frankfurt School dialectics did not really escape this logic, although Adorno came close to that goal in some of his considerations on the logic of dialectics [Adorno, 1976].) This logic is even considered as a fundamental axiom of western philosophy (with a few exceptions such as Heraclitus, Nicholas of Cusa, and in the 20th Century Stéphane Lupasco) and therefore has exerted a structuring influence on most modern scientific discourses [Nicolescu, 2002; Nicolescu, 2014]. This shuts them out from living complexity.

A transdisciplinary approach (after Morin and Nicolescu), however, requires approaches to qualitative complexity (some of which I will further discuss below) and to generalized complexity One general approach to complexity is Nicolescu's, who posits the existence of different levels of reality, and of "included thirds" across these levels, allowing the development of discourses that allow a 'logic of contradiction' across levels of reality (while maintaining the logic of non-contradiction within levels of reality) — for example across the two levels of quantum physics and macrophysical reality [Nicolescu, 2002; Nicolescu, 2014].

This radical project of transdisciplinarity, although it constitutes a marginal and vulnerable movement within academia, often vigorously rejected by disciplinary habits, is slowly gaining ground. In parallel, within contemporary art worlds, a diversity of groups and networks are working with expanded definitions of art (following the re-definitions of art proposed by Allan Kaprow, Joseph Beuys, interventionist collectives such as Wochenklausur and most recently the Laboratory of Insurrectionary Imagination, among others). Over recent decades, a growing number of artists have learned to work in interdisciplinary teams (beyond merely arts and creative industries-related disciplines), and a small but increasing number of practitioners are emerging whose pluri- and cross-disciplinary trainings (in the arts, natural sciences, social sciences and/or humanities) allow them to reach out for new hybrid forms of research, learning and exchange. For some of these researchers, the very question of pinning down the process, so as to label it as either art or science or activism, has become an obsolete concern.

Mutual learning goals, across climate science and artistic research

Which mutual gains should artists and climate scientists expect, from inter- and transdisciplinary collaborations? Mutual residencies, of artists in research centres, and of scientists in art centres, allow an exploration of mutual interests and reaching for some degree of interdisciplinarity. But what about going further and deeper? What would either side gain from a sustained mutual engagement in longer-term inter- and transdisciplinary collaborations? (I am discussing these gains below, merely in hypothetical and generalised terms, because I did not conduct any empirical study to test any of these in the specific case of the Hamburg project in 2014.)

Some of these gains would accrue to the climate scientists (across the natural science and social science dimensions of climate research): the scientists could learn from, and then integrate in their own inter- and transdisciplinary levels of research, artistic knowing as a productive way to deal with qualitative complexity. By qualitative complexity, I especially mean, after Morin, a complexity involving the meta-stable and dynamic relation between relations of competition,

complementarity, antagonism and unity, to which the arts can offer a specific aesthetic access. Morin used the metaphor of "musical ear" which can "perceive the competitions, symbioses, interferences, overlaps of themes in one same symphonic stream, where the brutal mind will only recognize one single theme surrounded by noise" [Morin, 2008].

Furthering Morin's metaphor, I explored how artists may develop "aesthetics of complexity" [Kagan, 2011]. Artistic learning and knowing bears the quality to keep open the ambiguities, ambivalences, contradictions and creatively chaotic dimensions of reality, rather than levelling them into a coherent logical system or even a dialectic system. Besides, artistic doing is an integrated process with a high degree of iterative loops, with telescoping and intuitive, serendipitous and transversal processes of thinking in and through action. These are helpful for both imaginative and experimental work at the science-society nexus (e.g. for the so-called "Reallabor" (laboratory of reality) experiments that are much discussed in German sustainability science nowadays).

Artistic research, as a form of 'Kulturwissenschaft' investigating the symbolic dimensions of our ways of perceiving and interpreting the world, is then both useful for the science-society nexus and for the self-reflexive epistemological awareness of scientists about the subconscious, symbolic, and cultural backgrounds of their own work. Artistic intervention in society, as it is practiced by some artists (see e.g. ecological art as discussed below, social sculpture, and intervention art), is potentially developing an "entrepreneurship in conventions" [Kagan, 2008; Kagan, 2011], i.e. a strategic set of cultural disruptions and invitations affecting change in social conventions regulating beliefs and behaviour at the micro and meso-social levels. These kinds of practices develop qualities which are severely lacking in many heavy-handed interventionist attempts by scientists in society.

Some relevant characteristics of artistic practice, of potential interest to climate scientists, are among those listed by the Chicago-based artist Frances Whitehead in a one-page brief, which she entitled "What do artists know?": "Artists compose *and* perform, initiate *and* carry-thru, design *and* execute. This creates a relatively tight feedback loop in their process [. . .] artists are trained to initiate, re-direct the brief, and consider their intentionality. [They develop an a]cute cognizance of individual responsibility for the meanings, ramifications and consequences of their work [as well as an u]nderstanding of the language of cultural values and how they are embodied and represented [. . . And m]any are skilled in pattern and system recognition" [Whitehead, 2006].

The contributions from artistic research are thus especially helpful to climate research, when integrated in inter- and transdisciplinary research, to both (1) paradigmatically move away from the cybernetic illusion of control and instead embrace chaos and complexity; and (2) to better deal, as transdisciplinary sustainability scientists, with non-knowing, with wicked problems, and with the imperative of building up resilience in society, in the face of increasingly frequent extreme climatic events.

But now, what can artists gain from this exchange, apart from the satisfaction of helping others? The artists have the opportunity to learn from natural and social scientists different methods and perspectives gained from specific systematic procedures, and then integrate them into their own inter- and transdisciplinary levels of research: these include insights forming an ecological literacy, e.g. regarding the existence of real limits in the Earth System, as well as the connections and complex dynamic relations between different systems. Such literacy is of interest to any artist aiming to work on ecological issues. They also include sociological and social-psychological literacy: this can be helpful for example in art projects with participatory character, or insightful for any artist who is neither content with staying in an ivory tower removed from audiences and other addressees, nor content with believing in curatorial discourses about the ways in which

different people experience and interpret their encounters with works of art. The artists may also gain an understanding of some of the different contemporary scientific approaches to dealing with complexity (as in the case of "complex adaptive systems" for example). They may also learn, with enough time and efforts, specific systematic processes of self-reflection, criticism, validation/falsification of their own research which is a common currency of most scientific work.

To sum up, this learning process will give the artists further insights supporting them in developing their own versions of aesthetics of complexity. One especially relevant example, when looking at the possibilities of artistic research in its encounter with the civilisational issue of climate change, is the redefinition of artistic practice which emerged in the 1970s and more recently gained strength among an international, self-selected artistic circle of recognition (counting over a hundred members), named the 'ecoart network' (founded in 1999, whereby 'ecoart' stands for 'ecological art') [Ecoartnetwork]. Ecoart network artists self-define their work as [Ecoartnetwork]: "work[ing] across disciplines and within communities to:

- Focus attention on the web of interrelationships in our environment — to the physical, biological, cultural, political, and historical aspects of ecological systems;
- Create artworks that employ natural materials, or engage with environmental forces such as wind, water, or sunlight;
- Reclaim, restore, and remediate damaged environments;
- Inform the public about ecological dynamics and the environmental problems we face;
- Re-envision ecological relationships, creatively proposing new possibilities for co-existence, sustainability, and healing."

Looking at the projects conducted over the past four decades by artists both in and outside this specific group, such as Helen and Newton Harrison, Mierle Laderman Ukeles, Patricia Johanson, Lynne Hull, Aviva Rahmani, David Haley, Tim Collins and Reiko Goto, Mel Chin, Lillian Ball, Frances Whitehead or Brandon Ballengée (to name only a few among the better-known artists), I characterised the practice of ecological art as a potentially transdisciplinary practice with salient characteristics [Kagan, 2014b]:

- As already noted early on by art historian and critic Suzi Gablik [1991], these are connective practices (nurturing connective aesthetics) rather than artistic practices entrenched in oppositional approaches, and these are practices that beyond deconstructive criticality within the boundaries of art worlds (as is common in much contemporary art) also engage in reconstructive experimentation at the borders of art and life, or even at the heart of everyday life.
- Their practitioners subject themselves to specific ethical responsibilities with regards to human and non-human communities, especially regarding the concrete effects of their practices.
- They strive to shape shared spaces for people and other species, or at least advocate for such spaces known as "commons"; and strive as well to share creativity as a cultural commons. Rather than playing the traditional role of the artist as a hero of independence, they invent for themselves new roles as interpreters of interdependence.
- Ideally, they navigate across, and connect together, different scales of space, time and systems, from ego- to eco-systems. In doing so, they explore the fabric of life's complexity, in its ecological and social ramifications.

Such a redefinition of artistic practice, which brings together with artistic qualities, the qualities of transdisciplinary research and of activism, also brings a challenge to art criticism. It highlights the need for an ecological critique in art, which neither indulges in simplistic nature-loving

platitudes, nor in self-indulgent art-world oriented discourses. It also implies the need for ecological, political and sociological literacy in art criticism, which are most often still non-existent in that field, resulting in the imposition of largely inadequate aesthetic quality criteria because art critics do not properly understand several dimensions of the work they are evaluating.

Shaping spaces of possibilities

A shared concern of many climate scientists and artists is how to communicate with the rest of society. The combined potential of a transdisciplinary collaboration of artists and scientists, as discussed here, should be translated into the development of "spaces of possibilities" as spaces of challenging experience, imagination and experimentation [Dieleman, 2012; Kagan, 2012]. In order to engage non-academics and people who are not part of the cultural elites already visiting art institutions, these spaces should not be established within strongholds of universities, institutional art spaces or activist headquarters. They should instead be located in institutionally still undetermined spaces, where creative experiments and the everyday life of local inhabitants may come together, functioning as emergent open commons. One example of such a space in Hamburg in recent years is the 'Gängeviertel' [Kirchberg and Kagan, 2013]. In spaces of possibilities, local communities who are neither scientists nor artists or activists, are given the opportunity to engage, together with activists, artists and academics, in creative, experiential and serendipitous ways, with questions relating climate change to the everyday and to their own experience, shaping not just individual but also shared desires for potential futures.

Sustainable development requires a build-up of resilience, and resilience, under unpredictable conditions related to climate change, will require great levels of creativity, both at individual and at collective levels. The goal of spaces of possibilities is not to cultivate the creativity of a "creative class" as human capital for the current economic development of the city [Kagan and Hahn, 2011]. It is to develop the creative potential of local communities for resilience, developing diverse, redundant and self-organised response-abilities. In the probable scenarios of severe climate change and failure of mitigation strategies, civil society would be compelled to draw from its self-organisation rather than relying on increasingly unstable established structures. The maturation of preparedness for community resilience towards such scenarios "requires opening up spaces of experimentation, where learning opportunities empower [. . .] citizens, already ahead of a regime shift" [John and Kagan, 2014, p. 71]. My question to the artists and climate scientists I met in Hamburg in late 2014 at the closure of their exchange project, was thus, how do they intend to proceed further into transdisciplinary mutual learning processes, and will they aim to contribute to the emergence of needed spaces of possibilities?

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Artful Sustainability: Queer-convivialist life-art and the artistic turn in sustainability research

Abstract

Artistic and arts-based research, and artful learning more generally, hold specific qualities that can contribute to the development of transdisciplinary hermeneutics. This article reviews these qualities and advocates for an artistic turn in sustainability research, as well as for a turn to a queer-convivialist life-art, enhancing the transdisciplinary experience of qualitative complexity. The article points at early signs of this turn, both in the discourse of 'convivialism' and in sustainability research & education, noticing a trend that hopefully may take up in pace and grow in scale in the coming years, allowing sustainability research to more deeply integrate arts-based research and thereby more fully realize its potential for transdisciplinarity.

Keywords: Artful learning, arts-based research, convivialism, sustainability science, transdisciplinary hermeneutics.

Introduction

Over a time-span of about 20 years, alongside the rise of “sustainable development” in public discourses and of sustainability-oriented approaches in society and in the academic world, a growing number of voices have advocated, and started to practice, a variety of forms of discourses, practice and research that highlighted and exemplified the importance of artistic (e.g. [1, 2, 3, 4, 5, 6, 7, 8, 9]), aesthetic (e.g. [10, 5, 11]) and creative (e.g. [12, 13, 14, 15, 16]) approaches, and/or more generally of cultural approaches (e.g. [17, 18, 19, 20, 21]) to sustainability-oriented action and research.

The time has now come for an *artistic turn* in both sustainability science and sustainability activism: *Artful Sustainability* is called forward, in order to realize sustainability research's potential to develop itself in terms of "transdisciplinary hermeneutics" [22].

My aim in the following pages is not to engage in a systematic review of these precedents (and the references mentioned above are only a small sample of a much wider body of literature). Rather, I aim to take up and reflect on one argument made by several authors, which amounts to advocating for nothing less than an artistic turn for sustainability research (in and beyond academic institutions) and for sustainability activism. To do so, I will focus on two elements:

First, regarding global activism, I will carry out a reading of the Convivialist Manifesto (a text which I see as a significant milestone for a sustainability-oriented civil society) in which I will be stressing an artful interpretation of its message and highlighting the manifesto's orientation to qualitative complexity.

Second, regarding sustainability research, I will focus on the potentials of arts-based research, with the aim to encourage the further development of arts-based sustainability science as part of a wider transdisciplinary movement of artful sustainability-oriented research.

1 –Promises of Convivialism and of Sustainability Science

Many civil organizations and social movements across the planet, are aiming to address the compounding contemporary threats to human civilization and working towards a more sustainable human development. A common outline for the shared features of these efforts was drawn a few years ago by the *Manifeste Convivialiste* [23], a text co-authored by several influential French-speaking left-, green- and center-left-oriented intellectuals. The Convivialist Manifesto highlighted some fundamental commonalities, shared concerns, values and approaches across a diversity of movements, and suggested several sensible orientations. I will thus engage into a commentary of this manifesto in the next section, as an opportunity to discuss the need for a queer-convivialist life-art and for an experience of complexity, as part of the transformative search process of sustainability.

Meanwhile in academia, in several European and North-American universities, a young (trans-)discipline emerged, which over the past decade became increasingly visible under the name of "Sustainability Science". This movement within academia also aims to address the compounding threats and to work for sustainable development. This still relatively-new field and form of research already developed several innovative features that bear a potential for social transformation, with a focus on solutions-oriented knowledge and action, rooted in an epistemology that does not shun from a normative self-understanding and developing an action-oriented research agenda. Sustainability Science borrows several participative and empowering features from the long tradition of participatory action-research (PAR; see e.g. Reason and Bradbury [24]), though not always clearly acknowledging it or imprecisely aiming to differentiate itself from it – and having a comparatively more fixed normative agenda rooted in the analysis of global problems of unsustainable development (whereby the researcher acquires a more 'missionary' role than usually does a PAR researcher who typically sees her- or himself as 'behind'/following social movements rather than at the helm). Sustainability Science also developed a focus on educative qualities, with many of its members aiming to build "competences for sustainability", most especially systems thinking, anticipatory, normative, interpersonal and strategic competences [25].

However, its roots in natural sciences, quantitative social sciences and systems modelling on the one hand, and its solutions-orientation spurred by a strong sense of urgency (justified by the current planetary situation) on the other hand, both bring limitations to the transformative potential of Sustainability Science. A small number of researchers involved in this field have, in recent years, started to argue, not only that "sustainability is the emergent property of a discussion about desired futures" (John Robinson in [26] p. 31), but also "that maybe the challenge of sustainability isn't to prove the world more real — rubbing people's noses in the parts per million and the hectares — but to prove the world more imaginary" (Robinson paraphrasing David Maggs, in [27]). For them, sustainability must thus ground itself beyond its traditional scientific foundation, including subjective dimensions and granting essential roles to interpretive social sciences and humanities [28]. The limitations of sustainability science can and should be addressed by an 'artistic turn' towards an artful form of sustainability research.

Addressing compounding threats such as climate change, is a challenge to work wisely with intricate combinations of knowing and non-knowing, relative certainties and uncertainties, diverse capabilities and incapabilities, hard limits and open possibilities. It is a challenge to think creatively yet humbly, containing hubris and countering the unfortunate tendency to run for quick

fixes – which Gregory Bateson deplored as a society's tendency to go for the short-cuts, instead of painstakingly identifying *deeper* leverage points (as Donella Meadows called them).

As research on climate change (and as the failure to mitigate climate change until now), shows, we need to get prepared for crises of probable much greater extent than what we have experienced so far. We will then need to get ready to develop human creative response at levels, scales and speeds probably unknown until now.

2 – The need for a queer-convivialist life-art and for an experience of complexity

As the Convivialist Manifesto made clear, the challenge of sustainability for the times to come, is not about preserving and sustaining a "good life" of the same type as what affluent societies have been enjoying for a few decades. The implications of superficial understandings of good life and sustainability, may stabilize the status quo for a few more decades to come, for some parts of the world. But in the long run for everyone (and for some sooner than for others), they will only worsen our lack of resilience.

Instead of preserving good life, the search for sustainability should be interpreted as inviting us to experiment with other lives, to open up to futures-oriented questions, and to queer these other, potential (good?) lives, taking resilience as a moving horizon.

From a sustainability-oriented perspective, resilience points at the ability to survive and live well on the long term by transforming oneself in relationship with one's environments. It implies an ability to learn from, and absorb disturbances, i.e. to be changed and re-organise, to some extent, while still keeping important elements of a "same identity" (for want of a better term), or rather, keeping an ethical societal direction such as e.g. the one sketched out in the Convivialist Manifesto around principles of interdependency and care. Resilience works here as a capacity to evolve (or rather in Edgar Morin's sense, to co-evolve and eco-evolve) through serious crises. It is not just resistance, and it is not just adaptation, but involves some elements of both resistance and adaptation, without losing sight of ethical goals for sustainability. Building up the capacity for resilience will become very relevant in the coming decades, when the trusted approaches that fuelled the development of modern societies will be severely tested. Under growing instability and uncertainties, resilience will also bring better responses than any single all-encompassing strategic blueprint for transformation to sustainability. Some of my colleagues even dropped the term "sustainability", to talk about this. For example, the many space and time scales involved in this civilizational challenge brought the ecological artist David Haley to talk of a search for "capable futures" instead of "sustainability" [29].

The understanding of resilience that I am stressing here, points at the necessity to learn from the unexpected, i.e. serendipitous learning. As I argued elsewhere [6], serendipity is not merely a meeting of an open-minded perception with unexpected events, but also implies sagacity: a wisdom that is grounded in sense perceptions, and that allows keen discernment and sound judgment. The required openness also means that one should be flexible, curious and alert enough to change one's goals and interests, along the way (i.e. developing an agility when faced with options for change). Sagacity brings together sensorial perception, experiential learning over time (and over a lifetime), and acting in wisdom.

Serendipity and sagacity allow not merely an accumulation of capabilities and of knowledge, as a stock of fixed items that would pile up over time. Rather, the accumulated experience actualizes itself in light of constantly changing factors. More important even than experience as the acquired stock of knowledge, is experience as the training of the capacity to perceive and interpret the world in complex ways, i.e. a phenomenological and hermeneutic learning process. This learning process requires artful qualities; else the experiential process may become a numbing, anaesthetizing one [30] that over time reinforces path-dependencies and tunnel visions rather than develop one's sagacity and serendipitous qualities.

When I look at the characteristics of resilient systems, what I see is the expression of life's inherent creativity. My contention is that, while sustainability requires both a build-up of resilience and an openness to transformative change (i.e. often radical change, going to the roots of issues and seeking deep leverage), building up the qualities of resilience in human societies calls forward a cultivation of multiple creative responses and capabilities – a radical embracing of Joseph Beuys' s provocation: “Everyone [be(come)/return to be[com]ing] an artist”.

Furthermore, the compounding threats discussed by sustainability researchers (and summed up in the Convivialist Manifesto), do not permit just any arbitrary form of creative development of human societies. They require a kind of cultural development that is especially sensible to qualitative complexity. My understanding of “complexity” is following Edgar Morin's, in his 6-volumes oeuvre, *la méthode* [31].[96] Although difficult to sum up in very few words, Morin's complexity can be approached by considering his notion of “macro-concepts”: A macro-concept harbors the dynamic tension, both contradictory and complementary, between relationships of unity, complementarity, competition, and antagonism. Across different levels of systems, we need to learn to appreciate both the contradictions between, and dynamic balancing of, different logics, and to acknowledge the great level of ambivalence, uncertainty, and indeterminacy that all living beings have to cope with on this planet. Morin appealed, metaphorically, to our “musical ears”, which allow us to “perceive the competitions, symbioses, interferences, overlaps of themes in one same symphonic stream, where the brutal mind will only recognize one single theme surrounded by noise” (Morin [31]).

One major quality of the Convivialist Manifesto lies precisely there: In its basic sensibility to qualitative complexity. Especially, the manifesto gives us some hints that “convivial” is not equated with 'consensus-ist conformist' political correctness, and should not drift into that direction. However, the manifesto, in its encounter with a wide readership, walks on a thin hermeneutic line: If misread in a way that is insensible to complexity, this manifesto will fall into the trap of a new form of narrow green/leftist moralism.

In order to consolidate this quality that I see in the manifesto, and to help prevent the misreading I just mentioned, I will now focus my next argument on stressing … The Importance of Being Earnest! ... Not quite. (Sustainability Science is earnest enough already.) I will focus the remainder of this section on the importance of developing an aesthetics of complexity – as a foundation stone for a practice nourishing itself in the Convivialist Manifesto and bringing an artful quality to Sustainability Science.

One area in which the manifesto expresses very well its sensibility to complexity is in stressing the balance of cooperation and antagonism (“coopérer et s'opposer”, [23] pp. 12, 25-26, 27). This insight echoes Edgar Morin's understanding of complexity and philosophy of “unitas multiplex” (where any living relationship needs to be experienced through the 4 overlapping and de-re-connecting lenses of competition-cooperation-antagonism-unity). It also echoes Chantal Mouffe's

[96] For a more thorough introduction to Morin's complexity in English language, see chapter 3 in my book *Art and Sustainability* [5].

work on the importance of antagonistic relationships (and her plea for “agonistic” politics) as important dimensions of democratic practice, warning against a reduction of politics to mere consensus-based processes.

This is indeed the core meaning of the manifesto's call “to cooperate and oppose” (with) each other. This means, to both turn away from the exclusive focus on market competition which is dominant (and dwarfing cooperation) in contemporary societies, but also to prevent the very high risk of a consensus-ideology that would invariably end up into a “soft totalitarianism” (to borrow a provocative expression that I first heard – associated to a critique of consensus and the media in late 20th century democracies – in the mouth of political scientist Slobodan Milacic). Instead of a rigid dogma of consensus, convivialism needs (a) “uniplural” (Morin) culture(s) of complexity.

The Convivialist Manifesto thereby does a better job at striking a dynamic balance between cooperation and opposition, than Mouffe's own writings that privilege agonism over consensus (e.g. [32]). The need to strike such a balance is also at the core of Richard Sennett [33]'s analysis, which demonstrated how, over the history of modern Europe, different approaches to social and political participation and cooperation have been caught in a tension between 'dialectic' and 'dialogic' tendencies: In a dialectic process (in a Hegelian sense), tensions between opposing views are resolved through compromises or argumentative resolution/synthesis. In a dialogic process (in a Bakhtinian sense), different views co-exist and respect each other's difference, whereby oppositions remain open and unresolved. The challenge of a qualitatively complex approach is not to privilege dialogic over dialectic processes as some proponents of 'mindfulness' may argue (or vice versa, as some proponents of agonistics may argue), but to find a dynamic balancing and negotiating process whereby both tendencies are involved with shifting dominance.

The challenge is to develop, in very concrete situations and contexts, a fine art of balancing competition, cooperation, antagonism and unity. This is indeed, not just a set of recipes with tested-and-tried techniques. It means resorting both to the consensus-fostering approach of nonviolent communication, and to the critical, deconstructive and dissensual artivistic approach advocated by Mouffe [32]. And it means resorting to the latter of course not merely towards others, e.g. some hegemonic evil forces 'out there', but also self-reflexively, as individuals, as societies and as species. It requires qualities of ambiguity, ambivalence and the “musical ear” praised by Morin, i.e. it craves for artistic competences fostering the aesthetic experience of complexity. In short, the convivialist “coopérer et s'opposer” is less a science (in the narrow sense of the term) than it is an “art de vivre ensemble” ([23] p. 14): an art of living together.

This art is of course not a propagandistic, agit-prop kind of art. It is rather a continuous learning and research process with queer and discordian accents. It requires both the deconstructive and dissensual qualities found in the work of some contemporary artists, but also the reconstructive and reconnective qualities of ecological artists as I discussed them in the book *Art and Sustainability* after Suzi Gablik [5]. One example of public art attempting an interesting balancing act of these qualities, is the piece that Hans Haacke did for the Bundestag in Berlin: *Der Bevölkerung* (2000 - ongoing), a collection of soils from all German Länder (federated states), which Haacke asked Members of Parliament to contribute (New MPs were asked to bring new soil, and some soil is removed when a MP’s term expires). Haacke wrote in his statement for this piece: “In an extremely controlled building, the ecosystem of imported seeds in the Parliament’s courtyard constitutes an enclave of unpredictable and free development. It is an unregulated place, exempt from the demands of planning everything. It is dedicated TO THE POPULATION”.

But why do I advocate for this necessary art to have “queer and discordian accents”? I will turn my earnest eye to the discordians later. First come the queer:

The function of a queering artistic process is not to bring certainties, to win over your audience to your critical message, to necessarily 'make them understand' something that you already identified and thought up for yourself. It is not a Brechtian process of distanciation, elevating you into the (cold winds of) an intellectual enlightenment, and shutting down the ambiguities. The function of a queering artistic process is, on the contrary, to foster uncertainties that stimulate de-normalizing and de-naturalizing aesthetic experiences and thought & embodiment processes. It is a process of distanciation and of 'freaky desires' - to paraphrase the parlance of artist and “freaky theorist” Renate Lorenz [34], keeping you in a (warm flux of) intellectual, emotional and corporeal confusion, keeping ambiguities and ambivalences thriving for a longer moment. From such an experience can arise more interesting queerings of 'good' lives, taking us to other desires, elsewhere than within the path dependencies of affluent consumerism.

We also require a queer vigilance, to balance the “relocalisation and reterritorialization” ([23] pp. 36, 38) and the “entre soi suffisamment solide” - i.e. strong enough between-ourselves/self-segregation ([23] p. 38) proposed by the Convivialist Manifesto, with a constant reflexive work of de-normalization and de-territorialization of identities, without which the genesic potential of chaos (as discussed by Morin) would be choked off. The trick is to avoid an exaggerated parochialism and maintain the quality of what Ursula Heise [35] called an 'eco-cosmopolitanism'. We must clear out any potential confusion or misunderstanding: The Convivialist Manifesto should not be confused with some kind of communitarianism: The manifesto clearly founds itself in principles of “commune humanité […] commune socialité [et] individuation” ([23] p. 26), i.e. Morin's three levels of human identity as individual-society-species, not reducing these to only one level. The further risk to avoid here, I would add, is ending up with an identitarian trinity of speciesm, communitarianism and individualism. Here the 'queering apart' (or 'freaking out') of these tendencies is of utmost importance. More generally, a vigilant and chronic process of queering is necessary to ward off a rigidified moralism within any convivialist-identified and/or sustainability-oriented movement.

For example, from a queer-ecological perspective, the manifesto's negative take on the notion of “démesure” ([23] pp. 29, 35), i.e. excess, needs to be handled carefully, because excesses, inefficiencies of redundancies, and irrational exuberances, are important qualities of all living systems, without which no resilience could be achieved. A wholly “measured” convivialist order, forbidding “démesure”, would be as foolish an enterprise as the techno-dream of efficient smart cities. The manifesto's moral warning shot hits its target more relevantly, I would contend, when it warns against “illimitation” ([23] p. 35) and “hubris” ([23] p. 29), rather than when it rejects excess.

The manifesto's second chapter proposes “four (plus one) basic questions” ([23] pp. 17ff) as “a shared “doctrinal” minimum that can fuel, sustain and legitimize an array of simultaneous answers applicable across the globe.” These are the moral, political, ecological, economic (and spiritual) questions.

These 4+1 questions form a meaningful set (although the “+1” spiritual question is largely left up in the air, without much discussion), but they fail to point out explicitly that any relevant moral question should be grounded in aesthetics – not in the Kantian sense but in the Deweyan sense of “aesthetics as experience” and in the Ingoldian sense of human experience – as the experience that is aliveness: a continuous movement constituting perception, as the pre-ethical basis to any moral questions we may raise:

Tim Ingold considers that, at the foundation of any knowledge or ethical system that is to work in practice, is the need for intuition, i.e. a “sentient ecology” (after David Anderson), a “knowledge […] based in feeling, consisting in the skills, sensitivities and orientations that have developed through long experience of conducting one's life in a particular environment. […] These skills

[…] provide the necessary grounding for any systems of science or ethics that would treat the environment as an *object* of its concern. The sentient ecology is thus both pre-objective and pre-ethical" ([36] p. 25 in the 2011 re-edition).

The manifesto therefore fails to notice ... The Importance of Being Earnest?! Still not. (Actually, the manifesto, not unlike the discourses of sustainability scientists, is earnest enough already.) Or is it missing Sense and Sensibility? Not exactly either... But let not my course of thoughts derail just yet:

The manifesto fails to notice the importance of developing senses, sensitivities and sensibilities to our environments, as multiple and interrelated modes of corporeal learning and embodied knowing, opening us up to our complex enmeshment with environments, waking us from 'anaesthesia' as coined by Wolfgang Welsch in his *Ästhetisches Denken* [30] and the associated psychic numbing. These aesthetics, i.e. these "organs of perception" (as developed by Shelley Sacks and Hildegard Kurt in their artistic work and discussed in their writings [37]), will then open up the field of perceptions-experience-knowing into enhanced qualities of questions, regarding the moral question (as well as the political, ecological and economic questions) raised by the convivialist manifesto.

To be fair: some of of the points in the manifesto tangentially approach this insight, i.e. recognizing humans as "êtres de désir" ([23] p. 18) – beings driven by desire, and recognizing the importance of the "mobilisation des affects et des passions" ([23] p. 36) – mobilization of affects and passions... We need to mobilize aesthetic sensitivities to living complexity, with a convivialist-discordian eroticism.

This also means that, besides their tactical and strategic functions for mobilization and protests, "shame" and "indignation" alone ([23] p. 35), make up a poor, narrow and limited toolbox for cultural and social movements. Here, the manifesto's appeal to "affects and passions" ([23] p. 36) is highly relevant, but it also needs to be further qualified. We need to stress and articulate artistic tactics of reflexivity that are futures- and ethics- oriented, while at the same retaining qualities of ambivalence and very importantly, tactics of humor... Only with an extended toolbox, not restrained by a constricted moralism, can the bottom-bottom (i.e. horizontal) "creativity" shortly invoked in the manifesto ([23] p.36), start unfolding itself, and stimulate qualities of resilience.

After Hans Dieleman [38], I consider that resilience requires the flourishing of spaces where imagination, experimentation and challenging experiences open up futures-oriented questions and perspectives. These are both mental and physical spaces of conviviality, agonistic confrontation and other, confusing, and individually as well as socially creative, shared experiences. These are spaces where social conventions are reflected, unfrozen and challenged [5], and where imaginative and experimental practices unfold [39].

Researchers and activists alike need to engage more fully into a comparative translocal exploration of such spaces, of the functions of arts-based activities and processes therein, and of the roles of artists and other creative individuals and groups, in such spaces of possibility (see [40] for an empirical analysis on the characteristics of urban spaces of possibility).

We may also explore local places as "Cthulhu-scenes" (after Donna Haraway's inspiring neologism and visions of the *Cthulhucene* as a response to the capitalism-uncritical concept of the Anthropocene [41]) - i.e. cities, suburbs, villages and other human settlements, both as naturecultural sceneries and as stages where diverse agents and 'actants' (in Latourian-speak), humans and also more-than-humans, engage (on different levels) with the multiple scales and dimensions of the search process of sustainability.

A convivialist life-art should ground itself in aliveness as the experience of complexity. It should be a creative, reflexive, critical and above all, a humorous activity. The convivialist manifesto should not be received as a stern treatise for sworn-in revolutionaries, but as an open and fundamentally democratic invitation. Seen artistically, this should be an invitation to re-invent through practice, the art of living together. An art of interdependence, of humility and also of a seriously healthy reflexive humor (as the discordians practiced it already several decades ago).

In the words of a famous systems thinker: “There is yet one leverage point that is even higher than changing a paradigm. That is to keep oneself unattached in the arena of paradigms, to stay flexible, to realize that NO paradigm is “true,” that every one, including the one that sweetly shapes your own worldview, is a tremendously limited understanding of an immense and amazing universe that is far beyond human comprehension. It is to “get” at a gut level the paradigm that there are paradigms, and to see that that itself is a paradigm, and to regard that whole realization as devastatingly funny. It is to let go into Not Knowing, into what the Buddhists call enlightenment” (Meadows [42] p. 19).

The one discourse I encountered, so far, that came closest to what Donella Meadows described here, is the discordians' half-serious, half-absurdist worship of chaos. But I did not really introduce the discordians yet. I kept it for the end of this section on the need for a queer-convivialist life-art and for an experience of complexity. So let me shortly (and exceptionally, else I will lose my earnest academic credentials in the eyes of some “greyfaces”) defer to the (convivialist) authority of Wikipedia:

“Discordianism is a religion and subsequent philosophy based on the veneration or worship of the Roman Discordia, equivalent of Eris, the Greek goddess of chaos, or archetypes or ideals associated with her. It was founded after the 1965 publication of its (first) holy book, the Principia Discordia […] The religion has been likened to Zen, based on similarities with absurdist interpretations of the Rinzai school, as well as Taoist philosophy. Discordianism is centered on the idea that both order and disorder are illusions imposed on the universe [...] There is some division as to whether it should be regarded as a parody religion, and if so to what degree. Discordians use subversive humor to spread their philosophy and to prevent their beliefs from becoming dogmatic. It is difficult to estimate the number of Discordians because they are not required to hold Discordianism as their only belief system, and because there is an encouragement to form schisms and cabals” [43].

A few pinches of discordianism might bring some welcome seasoning to the appetizing table of convivialism. Alas, this very article is largely falling short in terms of humorous form – despite my couple of earnest attempts, clouded with declarations of utmost importance. And my earnest efforts are not over, as I now proceed to discuss what potentials lie especially in arts-based research, which could help reform sustainability research in the direction of an artful experience of complexity.

3 – The potential of arts-based research

The potential of integrating the arts and sciences in research is especially promising in terms of 'transdisciplinary hermeneutics' [22] whereby a symbiosis between different ways of knowing the world may be developed. This understanding of transdisciplinary, based in the writings of Basarab Nicolescu [44, 45, 46], Edgar Morin [31] and rooted in the epistemological writings of Stephane Lupasco [47], is not opposed to disciplinary research, but rather to what I propose to

label as a "cisdisciplinary" attitude to research. A cisdisciplinary knowing would be one that mistakes the situated and partly valid knowledge and learning made possible by any given discipline, with a complete and self-sufficient access to knowledge of the world. I am borrowing the prefix "cis-" from the term "cisgender" that refers to people who have "a gender identity or perform a gender role society considers appropriate for one's sex" ([48] p. 789).

Cisdisciplinarity is an approach to disciplinary knowledge that mistakes a given discipline for an access to a complete knowledge of the world in one of its dimensions, ignoring that a discipline can merely contribute a fragmentary and situated knowledge on one dimension of reality. A cisdisciplinary way of researching is one that is satisfied with only the partial and fragmentary learning allowed by a single discipline, and construes it as a complete and autonomous, self-sufficient explanation of reality. It demands from its followers to perform a 'scientific' role that cisdisciplinary gatekeepers consider appropriate for one's discipline. Whereas the pursuit of procedural autonomy by disciplinary researchers in order to carry out research programs is an often necessary and productive practice in science, its extension into the pursuit of an ontological autonomy of disciplinary knowing, and the often-resulting epistemological and methodological sectarianism of cisdisciplinary researchers, are among the greatest harms to knowing-of-the-world that cisdisciplinary attitudes bring.

Cisdisciplinary attitudes are marked by epistemological, methodological and science-political conformism. They facilitate prejudice and discrimination against ways of knowing that lie outside an established canon of respectable disciplines (which includes especially the arts and spirituality; for some cisdisciplinarians it also includes certain academic fields of studies such as gender studies or specific non-scientific disciplines such as psychoanalysis). Therefore, cisdisciplinary attitudes either oppose inter- and transdisciplinary ways of knowing, or work towards limiting inter- and transdisciplinary research to forms of collaboration between "science and society" that still maintain a strong hierarchy between the legitimate scientific knowing and the illusory 'knowing' of so-called common sense.

The “breadth and depth of knowing we associate with the full scope of human understanding” ([49] p. 82) is not sufficiently tapped into, when cisdisciplinary attitudes dominate the practice of modern science. As I articulated in the preceding pages, qualitative complexity (as theorized by Edgar Morin) is required.

Already in 1983, Donald Schön argued that professionals and experts across disciplines have been experiencing, again and again, a "mismatch of traditional patterns of practice and knowledge to features of the practice situation – complexity, uncertainty, instability, uniqueness, and value conflict – of whose importance they are becoming increasingly aware” ([50] p. 18).

One of the most promising features of arts-based and artful approaches to research, reaching outside of artistic professions, is to contribute to an epistemological development beyond the limitations of cis-disciplinarity, contributing to transdisciplinary hermeneutics.

Arts-based research affects our very ideas on the nature of knowledge and understanding. It introduces considerations and elements, which have been often kept out from the breadth of a researcher’s access to the world.

In contrast to artistic research, largely originated in art schools and art studios, arts-based research brings these new approaches and insights directly to the heart of social sciences (and sustainability science) departments where researchers take the risk to work with these approaches.

Arts-based research involves the “systematic use of artistic process, the actual making of artistic expressions in all of the different forms of arts, as a primary way of understanding and examining experience” ([51] p. 29). It encompasses “a set of methodological tools used by qualitative researchers across the disciplines during all phases of social research, including data collection, analysis, interpretation, and representation” ([52] p. 1). It constitutes “an effort to explore the potentialities of an approach […] that is rooted in aesthetic considerations and that, when it is at its best, culminates in the creation of something close to a work of art” ([53] p. 1).

What characterizes research as artful or arts-based is not merely the use of specific items or elements labelled as arts (whether dance, theatre, painting, media art of other old and new formats) but rather the search for and attainment of specifically “arous[ing or] evocative” ([53] p. 41), and reflexively stimulating [54] aesthetic qualities.

Arts-based research endeavours to elicit unusual ways of thinking about social and natural phenomena, through the stimulation of uncertainty, risk-taking, and confrontation beyond superficial and taken-for-granted understandings and meanings, “broadening and deepening conversations” ([55] p. 79). It seeks new ways of asking questions and uncovers new questions to be asked ([52] p. 12). It aims to make questions and inquiry more interesting, to “stimulate problem formulation” ([53] p. 171), rather than to directly and unequivocally answer its research questions and offer some ‘final’ meanings, as it “revisits the world from a different direction, seeing it through fresh eyes” ([53] p. 16).

In his educational and research practice, David Haley calls it "question-based learning": With this approach, one sees the world as an expanding, meaningful inquiry, rather than as solution-led, problem-based approaches that demand closure. ‘Embodied questions’ offer diverse, creative ways of learning ecologically, as opposed to engineered or managed linear forms of teaching that exacerbate ‘wicked problems’, because they lack appreciation of complex contextuality.

Question-based learning, according to Haley, potentially offers dialogic processes, compared with dialectic, polarised ways of confronting the world and those (human and other than humans) who inhabit it. *Nevertheless*, as I already discussed above, the challenge of qualitative complexity is to find a dynamic balance between dialogic and dialectic processes. Therefore, arts-based research (and transdisciplinary research more generally) should not merely privilege dialogics over dialectics and shun away from insightful confrontations.

In their questioning journey, artful approaches to research “prompt us to deconstruct assumptions” ([55] p. 143). The open space of inquiry in arts-based research is especially valuable as a corrective complement to mainstream research approaches, because it is not obsessed with a solutionist urge for the provision of answers (unlike much of sustainability science).

Abandoning the claim to produce universal knowledge, arts-based research generates multiple perspectives on its research questions, rooted in multiple “attentions” ([56] pp. 37-38). Those attentions address complex and subtle interactions and they make them noticeable in the first place. This deepens our understanding of issues and makes it more (qualitatively) complex ([53] p. 3). The involvement of manifold perspectives changes the way researchers and their audiences experience situations and objects ([57] p. 128), which can stimulate innovative thinking [58].

In his work on *arts practice as research*, Graeme Sullivan highlights key characteristics of arts-based research ([49] pp. XIII ff.):

- It draws a creative tension between complexity and simplicity – this relates to a key challenge for sustainability research: addressing the immense qualitative complexity of global sustainability transformation while tracing new intervention approaches that allow participative processes beyond small circles of already highly involved agents. The apparent self-contradictory double-goal of maintaining and even cherishing qualitative complexity ("we must learn, not to be afraid of complexity", as argued by ecological artist David Haley [59]), *and* of finding simplicity and elaborating simple forms, is one challenge that artists and arts-based practitioners are long acquainted with: "not oversimplifying complex issues, and […] finding ways to be challenging whilst not being off-putting" ([55] p. 76).

- It places much focus onto venturing into and exploring the unknown, allowing the emergence of new knowledge, and taking a fluid approach to knowledge-generation. "Arts practice as research opens up new perspectives that are created in the space between what is known and what is not. Traditional research builds on the known to explore the unknown. Art research creates new possibilities from what we do not know to challenge what we do know" ([49] p. 244). Unlike the proverbial scientist searching for his keys in the night, not near where he may have dropped them but near the nearest lamp post, artists and arts-based practitioners are often willing and even motivated to explore into the darkness (and even sometimes into the murky and uncomfortable depths of the *Heart of Darkness* of human soul and society [60]), helped by a creative searching, learning and shaping (Gestaltung) process that allows ambiguity and ambivalence.

- It converts a process of search and analysis into the telling of a story – not unlike scientific research, but with much more awareness of the subjective authorship at stake in the process of telling a story.

Knowledge generation in artistic process is nourished by "imaginative investigations" ([49] p. XII) that articulate constellations of possible meanings, allowing a large freedom of 'lateral', associative thinking around lived experience. Especially the analysis and interpretation of data in arts-based research should be "systematic and rigorous but also inventive so as to reveal the rich complexity of the imaginative intellect" ([61] p. 20).

This imagination is not purely speculative. The empirical ground of an arts-based research process is to be found in sensory perceptions and in a reflexive relationship to one's perception of the world, which bears great similarities with the phenomenology of perception (hence many artists' sustained interest in Maurice Merleau-Ponty's *Phenomenology of Perception* [62]). This implies a heightened awareness of the multiple levels and processes of interpretation at play in perception and further cognitive and inter-subjective communicative processes. Artists and arts-based practitioners are often especially sensible to the framings of and influences on perceptions and interpretations by personal biographies, cultural frames and social constructions of reality (even though some sociologists like to believe in their privilege or monopoly over social reflexivity). They are also sensible to the influence of immediate contexts and importance of the situations where perceptions and interpretations take form. They thus recognize interpretation as a dynamic and interactive process ([49] pp. 15 ff.). This high self-reflexive awareness that arts-based approaches bring the researcher, are a powerful way to address the challenge of re-uniting the Subject and Object, overcoming their undue separation in modern science. In the arts-based research process, both the observer and the observed are considered "as legitimate sources of knowledge in any inquiry" but are also to be held under continuous critical scrutiny ([49] p. 52). The "convenient fiction" of objectivity ([49] p. 38) is then replaced by an intersubjective process of assessment and valuation of the potential artistic expressions ([49] pp. 39 ff.). Here, arts-based approaches can be brought together with hermeneutic methods.

For arts-based research, the dialogue with audiences of artistic expressions gains higher importance than in some traditional formats of artistic production and consumption: This dialogue assigns meanings and includes multiple perspectives, further enriching the research process. The researcher is also part of this dialogue and must include her or his own emotions too ([52] pp. 18 ff.).

Artistic practice bears the capacity to both question+reflect+critique the construction of knowledge, and to allow the emergence of new understanding (cf. [49] p. 96). The insights gained thereby sheds light on that which "might otherwise be beyond words", as argued by both Barone and Eisner, and Savin-Baden and Wimpenny ([55] p. 76), thanks to "expanding the various descriptive, explanatory and immersive systems of knowledge that frame individual and community awareness" ([49] p. 97).

Arts-based research aims to generate a broader knowledge-range, involving especially tacit knowledge, e.g. as knowledge experientially generated in-action ([50] p. 49) – revealing, beyond denotative words, that we are "knowing more than we can say" ([50] p. 51). Produced artworks are "a site where knowledge is created" ([49] p. 71), and so are artistic processes [63], as these works and processes embody tacit knowledge (see also [64]).

Arts-based research also involves contextual knowledge ([49] p. 71) through reflection about the cultural and biographical conditions of the artistic inquiry, a.k.a. situated knowledge as discussed below with Donna Haraway. At this juncture, some arts-based researchers point at an issue, "whether knowledge is found in the art object of whether it is made in the mind of the viewer" ([49] p. 83). Here, I would argue against a reduction of knowing to either of these two alternatives, instead following Tim Ingold's views on perception and knowing as a meshwork of movements where both the subject and the others (labelled by Ingold not as 'objects' but as 'things') actively encounter each other, affecting each other's lines of movement: "an issuing along with things in the very processes of their generation; not the trans-port (carrying across) of completed being, but the pro-duction (bringing forth) of perpetual becoming. ... To be sentient ... is to open up to a world, to yield to its embrace, and to resonate in one's inner being to its illuminations and reverberations. Bathed in light, submerged in sound and rapt in feeling, the sentient body, at once both perceiver and producer, traces the paths of the world's becoming in the very course of contributing to its ongoing renewal" ([65] p. 12).

Furthermore, artful knowing involves specific qualities in experiential learning: The quality of sensory-based perceptions and learning can be sharpened, deepened, and differentiated through the training of aesthetic observation and exploration, allowing more distinctive experience (cf. [66] p. 115). Next to this, the otherwise tacit and subconscious processes by which ideas and terms are associated to images in the mind, come closer to the surface and can be subjected to interference and change thanks to arts-based practices (cf. [67] p. 211).

All these qualities can sharpen a sensibility to qualitative complexity (see also Kagan [5] on the need for 'aesthetics of complexity' in the context of transdisciplinary sustainability research).

In arts-based research, the choice of specific methods-mixes is usually guided by the research questions, not by the disciplines ([55] p. 46) – it is "inquiry-based" rather than discipline-based, as is the case in any truly transdisciplinary research project (Cf. [68]). Therefore, the research incorporates findings and methods from other research approaches, with a fluid and pragmatic take on epistemology, e.g. not necessarily ignoring research rooted in positivism; it tolerates epistemological pluralism, again allowing another dimension of complexity (cf. [49] pp. 100 ff.). It also brings many own methods originating from a variety of artistic practices, largely untapped

by other research approaches, such as e.g. ethnodrama and performance ethnography where dramatic forms allow to merge research and representation ([55] p. 55), dance where the researcher and participants' bodies are the vessels of a corporeal searching, experiential learning and embodied knowing, and the "tool through which meaning is created" ([52] p. 183), or poetry, storytelling and other creative written narratives that stimulate wider interpretative processes than usual denotative language with relatively more prescriptive meanings ([52] p. 259; [49] p. 205; [55] p. 129).

Arts-based research projects do include stages that bear resemblance to traditional scientific research processes: data collection, analysis, interpretation and representation ([52] p. 12). The process often does not neatly proceed linearly from one stage to the next, but rather usually proceeds both in iterative cycles and with parallel, simultaneous and/or hybrid processes and stages ([55] p. 63). Sullivan even rejects the qualification of "iterative" for artful processes, as he differentiates their "cyclical, emergent and discovery oriented" characteristics, from the "linear, iterative and confirmatory" characteristics of processes typically found e.g. in quantitative social research ([49] p. 192). Interpretation and representation are often enmeshed with each other, as already hinted at above, and there are "more overlaps between data collection and data interpretation than in other forms of qualitative inquiry" ([55] p. 46). This also involves "iterative relationships between the issue, the context, the researcher and the participants" ([55] p. 28).

Patrica Leavy replaces arts-based research in the context of qualitative social science, recalling the epistemological shifts already brought about by qualitative research: "Qualitative researchers do not simply gather and write; they compose, orchestrate, and weave" ([52] p. 11). In this tradition, the active, meaning-making, interpretative role of the scientist was recognized, as the social sciences experienced successive 'linguistic' and other cultural 'turns' ([49] p. 18). For example, the ethnographic tradition of Clifford Geertz's "Thick Description" [69] already stressed the creative and imaginative (and sociologically speaking, the fictional) qualities of the research process.

Leavy thus considers arts-based research as "a new breed of qualitative methods" for social sciences, able to approach topics which involve existential conceptual dimensions such as love, death, power, memory, fear, loss, desire, hope and suffering. These dimensions constitute "some of the most fundamental aspects of human experience" ([52] pp. 3 ff.) and should be also highly relevant to researchers engaged for sustainability, as they matter greatly in relation to attitudes, motivations, desires, dispositions to believe, and dispositions to act, at the individual and community levels.

Furthermore, not only to investigate, but also to communicate research findings around these aspects of human experience, artistic and arts-based forms of expression can be especially "emotionally and politically evocative, captivating, aesthetically powerful, and moving" ([52] p. 12). Leavy insists on the potential power of the arts to communicate the emotional aspects of social life ([52] p. 13). This is one argument that scientists are prompt to acknowledge and focus on when thinking about the use of the arts in research, though too often in a narrowly instrumentalist and impoverished way – as the other qualities and the epistemological challenge of arts-based research (as they are sketched out in the text) are ignored. Two critical remarks are warranted, regarding Leavy's claim:

- On the one hand, as the sociology of the arts has demonstrated in much details for several decades – from the works of Pierre Bourdieu and Richard Peterson to those of Bernard Lahire and many others, different art genres, forms and styles reach only specific sections of a society, according to cultural capital and other determinants of aesthetic consumption patterns (see e.g. Lahire [70]). No art-form is therefore having a universal outreach to an entire society.

- On the other hand, the arts are not merely good communicators of emotional dimensions of reality, but offer also especially media to develop emotional intelligence and gain a probably deeper experiential knowing of these dimensions (whether directly or vicariously with works of fiction; see e.g. Weik von Mossner [71, 72]).

Given that there exists as of today, no "consensus about what should count as quality" across the great variety of existing arts-related research approaches ([55] p. 52), and that each arts-based research project needs to find its own relevant set of quality-criteria, an in-depth discussion of the issue is beyond the scope of this text. However, some potentially helpful suggestions are made by Barone and Eisner, with a set of 6 general criteria that can be considered, together with wider concerns of ethics and aesthetics: incisiveness (revealing the core of an issue), concision (that allows a previously unknown perspective to be perceived), coherence (between the parts and the whole of the inquiry), generativity (enabling to see phenomena beyond single cases, and to potentially act upon them), social significance (thematic relevance and importance for social change), evocation (reaching understanding beyond logico-deductive explanations) and illumination (deeper insights on a single topic) ([53] pp. 148-154). Regarding possible ethical criteria across different forms of arts-related research, Savin-Baden and Wimpenny ([55] pp. 86 ff.) suggest to look into matters of ownership, reflexivity, negotiated meaning, transparency, plausibility, honesties, integrity, verisimilitude, criticality, stance, authenticity and peer evaluation.

Overall, arts-based research not only brings new methodical elements that allow an enriched interdisciplinary research work, especially for qualitative social sciences. It also requires that the researchers learn and develop new sets of competences and skills that help scientists research the complex unity of the world beneath, between and beyond disciplines, as advocated by Basarab Nicolescu [44], contributing to the development of transdisciplinarity. Indeed, artful approaches to research aim not merely at explaining phenomena, but at gaining an understanding of phenomena ([49] p. 96), exploring subjects in more existential human depth than usually done in scientific research.

Arts-based research (and other forms of arts-related research) share an epistemological ground with Donna Haraway's epistemology of "situated knowledges" and of an "embodied objectivity" [73] i.e. an epistemology where knowing grounds its validity in its situatedness and partiality, rather than in the claim to reach universality by speaking from nowhere (or from an imagined "control tower", as already deconstructed and denounced by Morin [74]). Haraway insists on the differences and multiplicity of local knowledges ([73] p. 579). Arts-based research encourages this multiplicity, where other methods tend to restrain it. Arts-based research invites individual, personal, subjective perspectives and experience (of the researched, the researcher and the audience) as legitimate and central dimensions. On the one hand, subject and object are not split but united in vision, as advocated for by Haraway ([73] pp. 581 ff.). On the other hand, Haraway also calls forward a recognition of our "split and contradictory self", i.e of a multidimensional subjectivity: "The knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched together imperfectly, and therefore able to join with another, to see together without claiming to be another" ([73] p. 586). Arts-based approaches, which unfold and allow ambiguity, polysemy and/or ambivalence, are an ideal vehicle to bring about this recognition. Leavy echoes Haraway very closely (without citing her) when she writes that "arts-based practices produce partial, situated and contextual truths" ([52] pp. 15-16 ; see also [56] pp. 37-38).

However, recognizing one's partial position is not sufficient, a critical self-reflexivity is required, as advocated by Haraway as well as by arts-based researchers (e.g. [55] pp. 45, 48). As argued by Haraway, positioning is required, and thus arts-based researchers have to reflect on their position in the creation of knowledge, throughout the research process, including a reflection of political and epistemic contexts. In doing so, artful approaches allow an expanded reflexivity that is not only logico-deductive but is "more than rational" ([75] p. 109) in its integration of hermeneutic, aesthetic, ontological and professional reflexivities – i.e. of reflexivity through the deconstruction of meaning-routines, the re-articulation of perceptions and forming (Gestaltung), the revisiting of being and existence, and an experiential knowing-in-doing (cf. [75]; see also [50]). Furthermore, artistic reflexivity takes on a specific quality insofar as "a healthy scepticism and ironic posture" is often found and expected too ([55] p. 33), as attitudes that keep reflexivity in a state of near-constant sharpness. Another requirement that Haraway stresses, in the feminist epistemological tradition, is the recognition of the research objects' activity (vs. research objects considered as inert and/or passive). As discussed above, arts-based research fulfil this requirement too (as does any proper transdisciplinary research), in its attention to the multiple perspectives of the researched, researcher and audiences.

The resulting, redefined 'objectivity' according to Haraway is rooted not in a claim of neutral distance but in "contestation, deconstruction, passionate construction, webbed connections and hope for transformation of systems of knowledge and ways of seeing" ([73] p. 584). Here, Haraway suggested a bold endeavour and agenda with even clearer accents than done by most arts-based research advocates (whereby I remain sceptical about the terminology of 'objectivity', preferring the earlier-mentioned terminology of inter-subjectivity when discussing the networking of partial perspectives).

Outlook: Practicing artful sustainability research & education

Lazy readers expect to find a summary of the main ideas and insights from an article or chapter in its conclusion. I will not comply with this convention here. Instead, I prefer to use the final chapter pages to address those readers who did read the whole chapter.

I close this text with two threads of outlook: (1) a few words about those colleagues around the world who are already developing the transdisciplinary practice of artful sustainability research today; and (2) a brief commentary of how artful sustainability as I proposed it in this text, relates in both complementary and contrasting, unitary and opposing ways, to Dieleman [22]'s interpretation of transdisciplinary hermeneutics.

Studies on of the roles of the arts in relation to sustainability-related issues are being published every few years for already more than a decade. See the published reviews on the roles of visual, performing and community arts for environmental sustainability (Curtis et al. [76], Blanc and Benish [9]), of ecological art for sustainability (Blanc and Ramos [4], Kagan [5], Weintraub [8]), of literature and cinema from the perspective of ecocriticism (see e.g. Zapf [77]), of music in relation to sustainability (Kagan and Kirchberg [78]), and reviews focusing more specifically on the roles of literature (Johns-Putra [79]) and the arts (Galafassi et al. [80]) regarding the challenge of climate change. However, reviews of arts-based approaches as they are already being practiced *by* sustainability science researchers themselves, are rarer and emerged only more recently: see

for example Heras and Tàbara [81] on the uses of theatre-based participatory tools and methods in sustainabilty research projects.

For my part, my efforts at the Leuphana University Lüneburg, from 2005 to 2017, most often in collaboration with Volker Kirchberg and/or further colleagues, have included multiple projects integrating arts-sociological, cultural-scientific, arts-based and inter- and trans-disciplinary approaches, combining research with higher education. Among the specific arts-based and arts-related approaches I employed are Identity Correction (after the Yes Men), documentary film-making, trans-situ art installations (with the CCC of Geneva Art University), transect walks (after Martin Kohler), walks with video (after Sarah Pink), performative interventions in public space, and systems games (originally developed by Dennis Meadows and Linda Booth Sweeney) modified in order to bring some element of qualitative complexity. Further formats and approaches were developed by my colleagues and students throughout our research projects (related to performative re-enactment, creative writing, photography, theatre of the oppressed, contact-improvisation dance, and further approaches). In summer 2010 I directed the "International Summer School of Arts and Sciences for Sustainability in Social Transformation" (ASSiST, Gabrovo, Bulgaria) with a focus on the transdisciplinary development of walking-based place-making methods, and in summer 2016 another international and transdisciplinary summer school on “Artistic and other Creative Practices as Drivers for Urban Resilience” (in Espinho, Portugal, co-directed by Nancy Duxbury) with a focus on urban practices that create spaces of possibilities for sustainable urban development.

In November 2016, a coalition of (mostly early-career) sustainability researchers working with arts-based research organized an international symposium at the Institut d’Estudis Catalans and Autonomous University of Barcelona, entitled " Realizing Potentials: conversations and experiments at the frontier of art-based sustainability". Further universities co-organized this gathering: Universitat Oberta de Catalunya, Societat Catalana de Biologia, Universidade de Evora, Universidad Pablo Olavide Sevilla, and University of Hohenheim (suggesting the emergence of some meagre institutional for these approaches). The event included a series of practical arts-based research workshops, and I was invited to give the keynote speech on " Artful Sustainability: The artistic turn in sustainability science" (which overlapped with some of the points I am discussing in this chapter). Several dozen researchers from around the world presented their current arts-based research projects in fields of environmental sciences and sustainability science.

New Higher Education programs emerge that focus on artful sustainability research. For example, the federal university of São João del-Rei (in Brazil) opened a postgraduate program in 'Arts, Urbanities and Sustainability' that started offering a Master in 2016, rooted in the university's transdisciplinary research group in 'arts, cultures and sustainability' initiated in 2013 by Adilson Siqueira. The 'PIPAUS' MA places a strong emphasis on artivism, "based on an expanded definition of art that follows the redefinitions of art conceived not as a formal act but as an intervention in society, so that the artist works in interdisciplinary community teams and artistic creativity is no longer an act of isolation" (PIPAUS website, own translation from the Portuguese: https://ufsj.edu.br/pipaus/informacoes_gerais.php). This postgraduate programme is, to my knowledge, one of the very few and first in the world to integrate urban studies, sustainability research and arts-based research. It is being taught by fourteen professors from five Departments: Literature, Arts and Culture (DELAC: Literature, Theater and Social Communication); Architecture, Urbanism and Applied Arts (DAUAP: Architecture and Urbanism and Applied Arts-Ceramics); Natural Sciences (DCNAT: Biology); Zoology (DEZOO); and Administrative and Accounting Sciences (DECAC). The programme enables its students to "collaborate in the society-nature relationship mediated by communication, technology and the field of applications in order to contribute to the sustainability agenda" (PIPAUS website).

These are only a few examples, but they may be early signs of an artistic turn in sustainability science, which hopefully may take up in pace and grow in scale in the coming years, allowing sustainability research to more deeply integrate arts-based research and thereby more fully realize its potential for transdisciplinarity.

Artful Sustainability, as I elaborated over the preceding pages, corresponds largely to Dieleman [22]'s interpretation of "transdisciplinary hermeneutics" that he claims "will change science into art" (Dieleman [22]: 197) - "an art rather than a science, because it has the potential to make us combine what is with what may be, and what is measured with what is felt and intuited" (Ibid: 180). Most especially, the interplay of different approaches to knowledge production is a primary goal of transdisciplinary hermeneutics and of artful sustainability, as is the recognition (after Morin and Nicolescu) that reality is complex and discontinuous and that the dimensions of the subject of knowing (through "cognitive knowing, embodied knowing and enacted knowing") are as important as, and to be related to, the dimensions of the object of knowing (e.g. as an object of study, as a (philosophical) idea, as a creation and as an experience). Artistic and arts-based research not only combine cognitive and embodied knowing both for their practitioners and audiences, but also develop enacted knowing for all participants who are actively involved at some level of arts-related performance, through the enactment of roles and situations (not only strictly in performing arts but also through other forms of artistic expressions). Scientific writing is insufficient and "artistic forms are necessary to capture the results of processes of perceiving and sensing, which are essential parts of team-based transdisciplinary hermeneutics" (Ibid: 196). The thereby constituted "transdisciplinary approach gives room for the simultaneous existence of multiple truths" (Ibid: 178). Artful Sustainability, as I advocated in this chapter, does give this room, as well as it strives to "constantly question the knowledge we develop in terms of its possible biases, which are not only rooted in the way we think and analyze, but equally in the way we see, feel and act" (Ibid: 179).

Dieleman [22] focuses on two "key competencies" to learn to master transdisciplinary hermeneutics: mindfulness and dialogue. He sums up the qualities of these two approaches, pointing out their value as correctives to the limitations and dangers of unreflected habits and de-contextualized (modern-scientific) discussions. However, notwithstanding their qualities as correctives, some limitations and dangers are associated with mindfulness and dialogue as well.

I acknowledge that mindfulness (in principle) allows developing "a state of heightened consciousness of our own physical experiences, feelings and thoughts [and] find[ing] a new equilibrium between brain, body and environment, overhauling the dissociation of the brain from the body and of awareness from experience" (Ibid: 191). Nevertheless, as I experienced over recent years over a variety of situations, the current spread of the practice of mindfulness, in its concrete implementation, is placing consciousness and awareness on a pedestal, leaving too little space to subconscious flows of the body-mind, sometimes even suffocating intuition while praising it and strangling creativity while invoking it. I saw some of its advocates effectively perpetuating a delusional imaginary of control (though replacing cybernetic and technocratic control with mindful self-awareness) and also developing a simplistic imaginary of reaching harmony by appeasing tensions and avoiding conflicts.

Dieleman [22] makes a convincing plea for mindfulness as a competency that allows practitioners of transdisciplinary hermeneutics to know through the use of the bodily senses, and emotions. However, it is important to mention that the opposite should be accomplished to what now usually is achieved in some mindfulness practices: Instead of realizing merely a mindful control over the body, one should realize a state in which the mind also serves and follows the body. This is only implicitly present in Dieleman’s latest article and should be stressed more explicitly.

As to dialogues, it is important to mention a different shortcoming and danger. I already warned at several points earlier in this chapter against a one-sided privileging of dialogics against dialectics. Further warnings against the uncritical use of this approach can be found among (self-)critical accounts of practices of "Nonviolent Communication" after Marshall Rosenberg, which stress the consequences of dialogical approaches that leave no genuinely legitimate space for contradictory tensions and conflicts ([82, 83, 84]). The acceptance of multiple truths then turns into an a-political escapism towards avoidance and denegation-suppression of direct tensions. Ultimately, if left unchecked and unbalanced by other approaches, this a-political practice may end up contributing to a soft-totalitarian form of consensus-ism. On the contrary, arts-based approaches can allow tensions and conflicts to be expressed and reflectively processed in non-oppressive *and* non-censored ways, if they take care to avoid the a-political biases that loll in mindfulness and nonviolent communication.

Dieleman [22] concludes that transdisciplinary learning and knowing, when it moves in between levels of reality, "allows us to see unity and connectedness [as] a capacity we create inside of us" (Ibid: 197). It is what Nicolescu calls the "Included Third" as a way to realize unity in knowing and surpass the fragmentation of knowledge. I second that but once more, I need to emphasize that such unity and connectedness must explicitly be seen as "uniplurality" within qualitative complexity, without tipping into any form of holistic simplification. Artful Sustainability is convivial *and* discordian. This is why a crucial quality of artistic and arts-based approaches is to maintain tensions, discomfort, irritations and challenging experiences at all levels of reality. An approach that would be merely content with certain currently practiced forms of mindfulness and dialogics and tend towards a-political practice, would fail to address the deep injustices perpetuating global unsustainable development. A qualitatively complex transdisciplinary imaginary of sustainability needs to associate ontological, epistemological *and* political imaginations[97].

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Proving the world more Imaginary?
Four Approaches to Imagining Sustainability in Sustainability Research

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Abstract

Sustainability research has set itself the double-challenge of uncovering the complexity of a globally, locally and historically unsustainable development path, and of contributing to a search process for more sustainable development paths for humanity.

A small number of researchers involved in this area have suggested "that maybe the challenge of sustainability isn't to prove the world more real [...] but to prove the world more imaginary" (Robinson as quoted in Taylor 2012, n.p.). Taking up this invocation of the imaginary, the article investigates some imaginaries and imagination of sustainability at play in sustainability research. Four relatively distinct approaches to sustainability research are identified, characterized and differentiated: "triple bottom-line", "sustainability transformation", "holistic healing/biophilia", and "culture of qualitative complexity". They each develop a specific focus, are nourished by partly different imaginaries and develop their imaginations in distinct directions.

In this article, *imagination* is understood as an individual and social, perceptive and creative process by which we shape realities in our encounters with the world; whereas the *imaginary* is understood as a deep symbolic matrix that enables our access to the world. Imaginaries are not just made up and imposed on the world by the humans, but the result of an imaginative encounter with the human and other-than-human world.

Focused attention on imagination and imaginaries not only allows to observe the area of sustainability research through a differentiating perspective that helps understand certain contrasting and/or shared features across different approaches to sustainability research. This focused attention also bears a potentially instrumental value for inter- and transdisciplinary sustainability research itself, because it encourages sustainability researchers to further reflect on the importance, modalities and different framings of creative and reflective approaches to futures-oriented research agendas. The creative exercise of the *imagination* is not only at the core of "anticipatory competences" (Wiek/Withycombe/Redman 2011, p. 7) for sustainability, but also at the core of percipience to nature-culture's dynamic complexity. In this respect, sustainability research needs to develop its self-reflexivity beyond discourse-rational approaches to narratives, with a deeper understanding of both embodied cognition and of culture. Reflection on, and radically imaginative work with both dominant and alternative *imaginaries* that sustainability researchers operate from, such as the four imaginaries discussed in this article, are a precondition to any movement beyond institutional path-dependency to a globally unsustainable development.

Zusammenfassung

Die Nachhaltigkeitsforschung hat sich der doppelten Herausforderung gestellt, zugleich die Komplexität eines globalen, lokalen und historisch nicht-nachhaltigen Entwicklungspfads aufzudecken und zu einem Suchprozess für nachhaltigere Entwicklungspfade für die Menschheit beizutragen.

Einige Forscher auf diesem Gebiet haben vorgeschlagen, "dass die Herausforderung der Nachhaltigkeit vielleicht nicht darin besteht, die Welt als realer zu beweisen [...], sondern die Welt als imaginärer zu beweisen" (Robinson, zitiert nach Taylor 2012, *eigene Übersetzung*). Der Artikel greift diesen Aufruf des Imaginären auf und untersucht einige *imaginaries* und Imaginationen von Nachhaltigkeit, welche in der Nachhaltigkeitsforschung von Bedeutung sind. Vier relativ unterschiedliche Nachhaltigkeitsforschungsansätze werden identifiziert, charakterisiert und differenziert: "Triple Bottom-Line", "Nachhaltigkeitstransformation", "ganzheitliche Heilung/Biophilie" und "Kultur der qualitativen Komplexität". Sie entwickeln jeweils einen spezifischen Fokus, werden von teilweise unterschiedlichen Imaginären genährt und entwickeln ihre Imaginationen in verschiedene Richtungen.

In diesem Artikel wird die *Imagination* als individueller und sozialer, perzeptiver und kreativer Prozess verstanden, durch den wir Realitäten in unseren Begegnungen mit der Welt formen; wohingegen *das Imaginäre* als eine tiefe symbolische Matrix verstanden wird, die unseren Zugang zur Welt ermöglicht. Das Imaginäre wird nicht nur von Menschen erfunden und der Welt aufgezwungen, sondern ist das Ergebnis einer imaginativen Begegnung mit der menschlichen und der nichtmenschlichen Welt.

Eine Fokussierung der Imagination und des Imaginären erlaubt nicht nur die Beobachtung des Gebiets der Nachhaltigkeitsforschung durch eine differenzierende Perspektive, die hilft, bestimmte gegensätzliche und/oder gemeinsame Merkmale verschiedener Nachhaltigkeitsforschungsansätze zu verstehen. Dieser Fokus hat auch einen potenziell instrumentellen Wert für die inter- und transdisziplinäre Nachhaltigkeitsforschung selbst, da sie Nachhaltigkeitsforscher dazu ermutigt, die Bedeutung, Modalitäten und unterschiedliche Ausrichtungen kreativer und reflektierender Ansätze für zukunftsorientierte Forschungsagenden weiter zu reflektieren. Die kreative Ausübung der Imagination steht nicht nur im Mittelpunkt von "anticipatory competences" (Wiek/Withycombe/Redman, p. 7) für Nachhaltigkeit, sondern auch im Kern der Wahrnehmung der dynamischen Komplexität des Natur-Kultur-Nexus. In dieser Hinsicht muss die Nachhaltigkeitsforschung ihre Selbstreflexivität über diskursrationale Ansätze zu Narrativen hinaus entwickeln, und ein tieferes Verständnis sowohl der "Embodied Cognition" als auch der Kultur gewinnen. Die Reflexion auf und die radikal imaginative Arbeit mit sowohl dominanten als auch alternativen *imaginaries*, von denen Nachhaltigkeitsforscher ausgehen, wie auch die vier in diesem Artikel diskutierten *imaginaries*, sind Voraussetzungen für jede Bewegung, welche über die institutionelle Pfadabhängigkeit von einer global nicht-nachhaltigen Entwicklung hinausgeht.

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Village Triangles: games to playfully learn about complex systems

Prolegomena

In my doctoral research on the interface between the search process of sustainability and diverse artistic and arts-based practices as forms of research and action oriented towards social and ecological transformation (Kagan, 2011), I not only came across and learned greatly from the practices and thinking of ecological artists across the world, but also learned and embraced an approach to research, education and action rooted in (Basarab Nicolescu's understanding of) transdisciplinarity and in qualitative complexity (as articulated in Edgar Morin's 6 volumes of *la méthode*: cf. Morin, 2008). These approaches still influence my research and educational practice to this day.

Another insight influencing my own practice for a longer while is the necessity to integrate the senses, emotions and logico-deductive reasoning with each other in order to achieve any non-trivial learning process. Over the past two decades, I learned about progresses in cognitive sciences' understanding of embodied and embedded learning, and about approaches to education such as experiential learning (Kolb, 1984), which put such insights into practice. These approaches are relevant in developing connections between sustainability and creativity, and they can be related to the epistemic insights of both Morin and Nicolescu.

The integration of these approaches is discussed by Hans Dieleman (2016, 2018) with the notion of "transdisciplinary hermeneutics". I associate this integrative notion to a call for practicing "artful sustainability research" (Kagan, 2017). The playful-learning exercises discussed in the following pages are to be situated in this context.

The importance of play for learning sustainability

Resilient socio-ecological systems survive by evolving in the face of changing contexts (Folke et al., 2002, 2010). Achieving resilience requires transforming a system in relationship to its environments. This underlines the necessity to learn from the unexpected, which is only possible when human communities nurture their creativity. Hence effective resilience has to be a creative process. Creativity is indispensable to the search process of sustainability, for any social system. Indeed, "we need to learn to deal with complexity and uncertainty rather than learning a predetermined 'sustainable' set of values and behaviors" (Sandri, 2013: 767).

Transformation processes in the sense of sustainability thus depend on challenging existing mental models and synthesizing new ones through creative breakthroughs (Lozano, 2014). To allow this, social systems must open up to instability, disorganization and uncertainty, and see chaos as a chance for reorganization (Purser and Montuori, 1999). This cannot be achieved simply through the creative ideas and actions of single individuals. Beyond mere individual creativity, the focus must lie on social creativity (which combines individual and group creativity in communities of practice). Cooperative learning, as well as communicative processes that facilitate experimentation in a group, are called forward (Purser and Montuori, 1999, Paulus and Nijstad, 2003, Sawyer, 2003).

Furthermore, the search process of sustainability requires multi-dimensional and integrative approaches to the questions of humanity's civilizational development. This poses the challenge of a high degree of both quantitative and qualitative complexity. If creativity is not combined with developing a "comfort with the complexity" (Stables, 2009) - i.e. neither being simplistic, nor drowning the capability for creativity with complex information, then the attempts at harnessing creativity for sustainability will remain helplessly superficial.

Systems thinking games aim to meet such requirements for both social creativity and comfort with complexity. The potential of games-playing as part of an experiential learning process for sustainability education has already been stressed, articulated and implemented by a few sustainability researchers: As argued by Dieleman and Huisingh (2006), playing games offers shared experiences, fosters team building, helps each individual learn more about one's habits and the similarities or differences with other players' habits, allows testing of multiple scenarios, and generates energy and optimism.

Playful approaches to mediating sustainability (such as games) allow the players to "deal with the different dimensions of sustainable development and the participants' perspectives […] sharing [...] different understandings among participants [as well as their] creative ideas regarding sustainable development" (Schulz, Kawamura and Geithner, 2017).

Researchers have investigated the possible functions of playing in sustainability education, focusing especially on role-playing (Dengler, 2008, Gordon and Thomas, 2018) and on video games (Kelly and Nardi, 2014) that may offer both quantitatively and qualitatively complex possibilities for players to experience alternative future-scenarios as well as social interactions, interdependencies, strategies and experimentation. Specific applications of simulation games for purposes such as e.g. urban planning for sustainable urban development have been the subject of ethnographic research (Podleschny, 2008). Video games, especially when they foster dynamic interactions beyond fixed roles, have been especially credited with significant potential benefits: "Video games can be generative platforms to develop adaptive strategies, make the strategies visible and critiquable, and give members of the gaming community an entry point from which to begin and develop discussions about the future" (Kelly and Nardi, 2014).

One of the learning potentials of games lies in their simulative character: They allow the imaginary institution of simulated social realities with their own sets of rules and roles. They allow one player to play with different roles (role switching) and to experimentally bend or even break rules without severe consequences (code breaking). They allow learning by failing, and thanks to group dynamics and emotional involvement developing during role-play, they allow participants to combine comprehension and apprehension of reality.

Successful game dynamics can open up a playful space where convergent and divergent thinking processes (which are crucial to creativity – cf. Milliken et al., 2003) can be individually and collectively experienced. Playfulness facilitates the combination of mutual trust and openness for dissent and divergence. Such a playful space helps to relax an otherwise habitual pressure for conformity in the group that hinders divergent thinking (cf. Nemeth and Nemeth-Brown, 2003).

More specifically, a number of "systems thinking games" developed by Linda Booth-Sweeney and Dennis Meadows (1995) have been applied around the world over the past 2 decades. 15 years ago, having gotten the opportunity to learn some games directly from Dennis Meadows in 2003, I soon became a convinced practitioner and advocate of this approach, arguing that they would contribute to a

"new literacy [of systems thinking beyond a] reductionist linear thinking [that] hampers our understanding of the complex realities and issues that produce the known symptoms of global

unsustainable development. However, a merely theoretical and abstract understanding of systems thinking won't suffice […] effective learning requires more than the rational, conceptual comprehension of reality: It also requires the performative apprehension of reality through tangible experiences and processed feelings" (Kagan, 2009).

Indeed, my focus in this chapter is, not on screen-based types of games (such as the video games discussed by other researchers mentioned above), but on embodied forms of play and games that engage their participants corporeally. I aim thereby to also highlight the specific benefits of corporeal engagement while playing (which is not just some kind of gymnastics). It is "the corporeality, sociality and situatedness in the practice of play [that] render possibilities for specific forms of creativities and creative action" (Küpers, 2017: 7).

Booth-Sweeney and Meadows' "Triangles" game, which I took as basis for an own further development, allows an embodied learning of some basic properties of the working of systems: feedback loops, interdependencies, high vs. low leverage points, time delays, short term vs. long term loops and the importance of a system's structure for individual behavior. This game engages participants in a kinaesthetic experience, being dynamically inter-related to each other as parts of a dynamic system, or even (as turns out even more dramatically in my "Village Triangles" game) as systems within systems. The Triangles game helps people understand how the relationships binding together the structure of a system can impact its behavior; it helps demonstrate how behavior can be changed by an outside influence and what happens when people/elements with high (or low) leverage in a system are impacted by external influences.

The main strength of this game is to enable an embodied cognition of leverage points. However, this is only a starting-point and participants should be encouraged especially to read Donella Meadows on the topic (e.g. Meadows, 1999), in order to learn about deep leverage points for societal and civilizational transformation.

The Triangles game is on the one hand limited to simulating a very basic abstract system made up of mere numbers, and on the other hand reduces systemic relations to only one type of relation, i.e. relations of influence. Living and social systems are, however, not made up merely of such straightforward relations: They involve qualitative complex relations (in the sense of "complexity" theorized by Edgar Morin; cf. Morin, 2008, Kagan, 2011), whereby two elements in a system can subsequently or/and simultaneously endure relations of antagonism but also unity, competition but also cooperation… and develop webs of ambiguous, ambivalent and otherwise paradoxical/non-dichotomous relations. Qualitative complexity points to the need to learn an approach to dualities that moves beyond established European traditions of thinking, whether basic dichotomous thinking, dialectics (with Hegel, Marx, critical theory, and agonism) or dialogics (with Bahktin, consensus, and mindfulness): This requires a qualitatively complex 'dia-logical' (in Morin's sense) grasp of intersubjective relations and political processes that allows to recognize complementarities through tensions and contradictions as interdependences in the eco-logical webs of life and society.

The question that drew my attention thus was: How to both make the Triangles game more concrete and introduce more qualitative complexity into the game? While looking for new game rules, I found inspiration in the fictional characters from one famously rebellious and mind-boggling 'anti-system' television series of 1967-1968, over which I had been ruminating for many years: *The Prisoner*. This fictional work, which gained a cult status over the past 5 decades, introduces some themes of individualism and collectivism from a critical perspective.[98] I expected, by borrowing the basic narrative, situation and characters from the series, that the

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[98] For an overview of this television series, please consult the dedicated Wikipedia entry at https://en.wikipedia.org/wiki/The_Prisoner ; for lack of space, I will not describe it in further details in this chapter.

combination of systems thinking/leverage points and an anti-systemic work of fiction could bring interesting embodied insights. I had previously investigated, through a collaboration with the Australian artist Jenny Brown that gave rise to an exhibition at the gallery of Bettina Semmer in Berlin, how *The Prisoner* can be interpreted as a dramatic allegory of the illusion of a purely individualistic freedom, as opposed to a more systemic discovery of possibilities for freedom: Allowing an understanding of freedom *with* vs. freedom *from* – i.e. a complex understanding of interdependence vs. the limiting binary of independence vs. dependency (Kagan, 2013 ; for a further interpretation of *The Prisoner*, see also Biderman and Devlin, 2008).

This symbolic figure of The Prisoner, with its complex take on the question of freedom, fits well with the qualities of embodied play.

"The playground is not something rigid and predetermined waiting to be acted upon. Nor are players sources of absolute freedom in shaping an infinitely malleable environment. On the contrary, players themselves make play by co-configuring the playground. In other words, play happens when people's playing bodies enter into playgrounds. But, at the same time, all the ways in which playgrounds and their conditions are available to players are radically connected with and affected by their playing subject-bodies (Torres, 2002: 143).

"Play does not only reaffirm people's bodily character in the world, but involves a meaningful structuration of the situated socio-material back-(play-)ground in which it happens and specific rules that are organizing the play" (Küpers 2017: 6).

In the following pages, I give a short overview of both the basic Triangles game and of my two variants, "Number 6 and the Village" and "Village Triangles". This text cannot replace the embodied experience of playing the games, but shall hopefully give some hint as to their learning benefits. Being genuinely embodied and embedded learning exercises, the sense and the relevance of games and playful approaches such as discussed in this chapter, can only be fully understood and appreciated when physically played and experienced, not merely talked and read about. Furthermore, reading their description on paper will not be sufficient in order to immediately implement them with satisfactory results. It will require practice, and ideally some help from already experienced players.

Process, rules and effects of the "Village Triangles" game

To introduce basic systemic insights (including especially the notion of high vs. low leverage-points) and gradually train the participants, one should start by playing the original Triangles game by Booth-Sweeney and Meadows (1995). However, when time is limited and a shorter gameplay must be organized, my Village Triangles version can instead be played directly.

The game is played in a large open space, where participants can move around without hurting themselves. For the classical Triangles games and especially for the very first time such a game is played, a space without any obstacles is preferable (safest). For the two other variants (especially "Number 6 and the Village"), it is advantageous if the game can be played in a lively and inhabited/dwelling setting where the gameplay may develop interesting unforeseen interactions with the immediate physical and socio-ecological environment. (However, facilitator and participants need to consider everyone's safety and avoid reckless behavior.)

The game is animated by a facilitator who is already experienced with the game and who gives instructions, advice and manages feedback. The materials needed are a large writing surface and

something to write with (e.g. a flip-chart and some marker-pen), as well as enough sticky tags (e.g. post-its) on which some numbers (in part 1) or keywords (in part 2) will be written.

Playing the classical Triangles game[99]

1.1 Have all participants (minimum 10, maximum about 30; additional persons and those uncomfortable with playing can be observers, staying at a safe distance) stand in a big circle. Have as many numbered sticky tags as the number of participants in the circle, and hand out one sticky tags to each participant in the circle, who should wear the tags visibly on themselves for the whole duration of the game. Tell everyone that in the next minutes, they will form together a basic system.

Image 1. Introducing the classical triangles games, University of São João del Rei (Brazil, 2017). Source : Marcius Barcelos.

1.2 Inform participants about the rules of the game: (a) Each participant must choose 2 other participants as "reference points", according to the following rules: (a1) all participants with an odd number must choose number 6 as one of their two reference points; (a2) nobody can choose numbers 9 and 10 as reference points; (a3) apart from that, participants choose their reference points freely. (b) Everyone remembers his/her two references points for the whole duration of the game, but keeps it to her-/himself until the final feedback session. (c) When instructed to "go", everyone will walk around and each participant will move to get equidistant to her/his two reference points (i.e. forming an equilateral triangle; whereby it doesn't matter how far one is to the two reference points, as long as the distance to each of them is equal) and stop moving when reaching an equidistant point but then need to move and find equidistance again as soon as the reference points are moving 'out of equidistance'. (d) There will be several rounds of gameplay. Each round will have a different set of rules to see how those rules influence system behavior. Before each round, participants are asked to speculate 'what will happen'. After each round, participants are asked 'what happened', and asked to reform into the original circle in order to start the next round.

[99] See Booth-Sweeney and Meadows (1995) for a detailed introduction to this and other systems thinking games. For the sake of brevity, I only give here a shorter description of the game. (I did minor modifications in order to ease the transition to the "Number 6 and the Village" game, if played successively.)

Image 2. Playing the classical triangles game, Municipal Museum of Espinho (Portugal, 2016).

1.3 The rounds are played and reflected upon: (a) Participants with numbers 1, 2, and 6 will move around the room until they find their equidistance positions, but everyone else must stay in place and not move. (b) Everyone moves until the system stabilizes by itself and everyone ‘feels right’ i.e. equidistant. (c) Everyone moves; when the facilitator says, “Stop!” (already after a couple of seconds of gameplay) only numbers 9 and 10 stop moving. (d) Everyone moves; when the facilitator says, “Stop!” (after a couple of seconds of gameplay) only numbers 2 and 6 stop moving.

Hint for the facilitator: It is expected that the system stabilizes faster when high-leverage number 6 is immobilized, and that immobilizing no-leverage numbers 9 and 10 will have no effect on others except as obstacles (as long as participants understood and respected the rules).

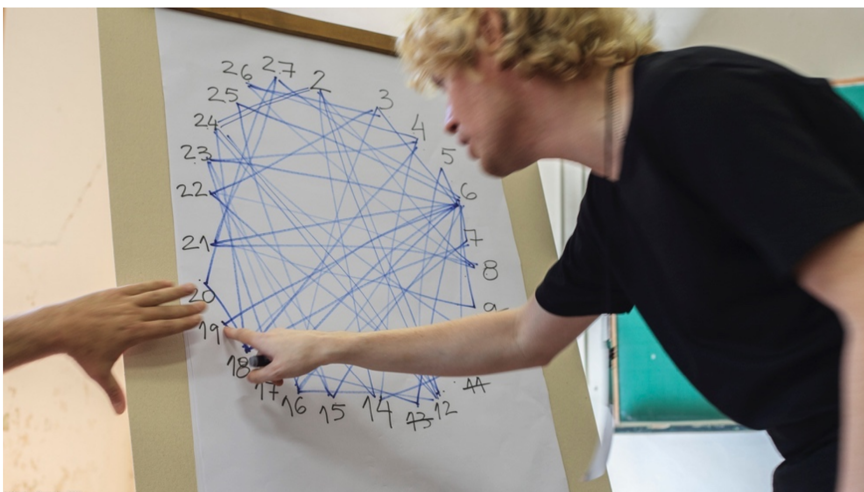

Image 3. Counting lines on the simple diagram, University of São João del Rei (Brazil, 2017). Source : Marcius Barcelos.

1.4 The facilitator and participants draw a circle diagram composed of equally spaced numbers, and for each participant, a new line is drawn to each of his/her 2 reference points (*please* draw 2 parallel lines, not one line with 2 arrows, if 2 participants mutually selected each other as reference point). Count the relative number of lines connected to a number, to find out that participant’s relative leverage in the system. (Numbers 9 and 10 should have each only 2 lines; number 6 should have many lines.) Discuss the graph together, as well as what was learned from

the game. Ask: “What principles or general rules would help you explain and predict the behavior of the system to a newcomer entering it for the first time?” (Booth-Sweeney and Meadows, 1995). Among the concepts to be highlighted by the facilitator in this process are, as mentioned above in the theoretical part: feedback loops, interdependencies, high vs. low leverage points, etc.

Playing the ‘Village’ game variants

2.1 Prior to playing the Village Triangles game with the fully modified rules as will be described below (see 2.2), a simpler and especially playful modification of the Triangles game can be played first (but preferably only after playing the basic game), which I call “Number 6 and the Village”, in homage to *The Prisoner.* When I facilitate this simpler version of the modified game, I usually start by shortly telling the story of *The Prisoner*, before playing this version of the game, which most directly borrows from the narrative of the television series.

The characters in the series, as prisoners in a seemingly idyllic village/prison-island, are identified by their number and no longer by their individual names; this fits ‘nicely’ after playing the basic game, and starting to question the numbers-based playing. At this point, I usually tell participants the main character’s most famous line in *The Prisoner*: “I am not a number, I am a free man! [followed by laughter from ‘Number 2’, the second-in-command of the village]”.

Image 4. Telling the story of The Prisoner, Glocksee Theater, Hanover (Germany, 2017). Source : Detlev Hoffmann.

In this game, we then take up the main three figures from the series:

- Number 6 (a.k.a. the “free (wo)man” constantly rebelling and trying to recover his/her independence, her/his *freedom from* the captors), played thus by a participant who in the basic game had high leverage;
- Number 2 (the manager of the Village), played by another participant (who probably had a lower leverage than Number 6 in the basic game);
- and the villagers, played by the other participants.

Image 5. Playing "Number 6 and the Village", Glocksee Theater, Hanover (Germany, 2017). Source : Detlev Hoffmann.

We then resume playing the game, only for one extended round (as in 1.3.b above), with two new/changed rules: (a) Number 2 is asked to keep an especially watchful eye on Number 6 and never let her/him get out of sight, while continuing to obey the rule of equidistance; (b) Number 6 is asked to try to manage to 'discretely' escape the other villagers, and allowed to ignore the rule of equidistance (i.e. stop trying to get equidistant to her/his two reference points from the basic game). Other participants play again with the same rules as in the basic Triangles game and keep the same reference points.

What happens then is that Number 6, and the others as well, start moving increasingly wildly, exploratively and/or creatively into the space around them, beyond the relatively circumscribed space that they used in the basic game. As they interact with their environment (places, objects, humans and non-humans), and the game's system, the "Village", suddenly starts relating in unexpected ways to the 'real-life' systems around it; unpredictable interactions and potential learning situations may unfold.

For example, when I first fully implemented this version of the game in September 2016 at a summer school I coordinated in Espinho, Portugal, the result was a peregrination of our 'villagers' through the public spaces and some private commercial spaces (e.g. a small shop) of that town, leading to new interactions of our system with a wider system, i.e. the place and local inhabitants. (To those familiar with some episodes from *The Prisoner*, some of the situations that emerged out of the improvisations of Number 6 with the other players and with the inhabitants, felt uncannily familiar.) Being focused on the triangles, and on the prisoner-village fictional world, superimposed on the local place of Espinho, and on the concurrent ongoing everyday life of the local place itself, opened up multiple layers and dynamics of interactions and interpretations:
- e.g. unlikely, strange and nearly unreal interactions between participants and motorized vehicles, passers-by, shop-keepers, with ambivalent and ambiguous mixtures of playfulness, laughter, fear, stress, invasiveness, shyness, incomprehension, complicity, and tact;
- e.g. diverse interpretations by participants of our interactions with and relations to the inhabitants during the game; interpretations of what we were doing by the local inhabitants (one of which being that we were enacting a sort of religious group following and orbiting around a saint/sacred character).

When I implemented again "Number 6 and the Village" with a different group of participants in Hanover (Germany) in late Spring 2017, the players spontaneously developed unexpected fast-

paced interactions with their immediate environments (a skateboard ramp, private balconies, a riverside green meadow, a children playground, a graffiti-spraying-wall zone, etc.).

At some point (to be determined based on the immediate context and evolving situation, e.g. participants getting exhausted from expectedly 'sportive' gameplay) usually after about 20 minutes, the facilitator should decide to stop the game. This should be followed by a feedback round, whereby learning outcomes are discussed (and the facilitator should raise the theme of independence and interdependence in systemic terms).

The participants can then (if time allows) be invited to work either in teams or all-together, focusing now on their own projects/cases and mapping potential actors/agents/actants (people, organizations, non-humans, things) as leverage points in relation to each other, i.e. creating simplified draft networks of influence (e.g. on flip-chart paper) – with the aim to use this as a basis on which to play the Village Triangles game as described below. (Remark: At this point, participants may be asked to also consider whether some relations of 'incompatibility' may exist between specific elements in the system they modeled.)

2.2 Taking the Triangles game as a basis, the Village Triangles game is characterized by the following differences:

(a) The first difference is a logical extension of the basic game: instead of an abstract system made up of numbers, a specific topical area, issue, project or situation is taken up as the system to be played; each element of the system played by the participants now is characterized by a short keyword or symbol, written on the sticky tag. (The system to be played and the keywords can be either pre-selected by the facilitator, or elaborated with the participants in a preliminary phase, as mentioned above).
The equidistance relation is no longer arbitrarily chosen by the participants: each participant should choose the two most influential other elements in the system (i.e. those two elements that most significantly influence the element oneself is 'impersonating' with the keyword/symbol one is wearing).

(b) In addition to the 'equidistance' rule of the basic game, one extra relation is added for some elements in the system (but not necessarily for all). Each participant should consider: Is my element in the system 'running away/escaping from' or 'in strong opposition to/incompatible with' one specific other element? If that is the case, the extra rule in this game is to move away from that other element (i.e. the other participant wearing the keyword/symbol for that element), while continuing to perform the basic rule of getting equidistant to the 2 most influential elements.

Image 6. Participants discussing the next system to be played in the Village Triangles game, Municipal Museum of Espinho (Portugal, 2016).

(*Please note*: One of the 2 equidistance-reference-points may also be the chosen element to move away from. To keep the game easily playable and thus the system simplified: If a participant thinks of several elements that his/her element needs to move away from, she/he should select the one element that has possibly the most significant incompatibility.)

The game can then be played in several rounds exploring this more complex system (and experimenting with different interventions at each round, adapted by the facilitator to the system's dynamic as it unfolds).

In the Village Triangles game, the group should dedicate more feedback time to discuss both the participants' interpretations of relations of influence (i.e. the equidistance) & relations of incompatibility (i.e. the 'move away from') and the ways in which the participants experienced the overall system dynamic, especially the emerging, unexpected phenomena/system behavior related to the interactions between relations of influence/equidistance and relations of incompatibility. Most especially, feelings of ambivalence, ambiguity, frustration and other qualitatively complex impressions and situations should be given special attention in the feedback rounds, and the facilitator should then ideally introduce Edgar Morin's understanding of qualitative complexity to the participants.

Image 7. Playing the Village Triangles game, Municipal Museum of Espinho (Portugal, 2016).

For example, when I first implemented this variant of the game for an event (in July 2017 at the Xplore Symposium that I curated within the Xplore Festival of creative sexualities in Berlin), directly using the Village Triangles game only (after I gave a lecture on "BDSM Sagacity – embodying complexity") to explore the complexity of embodied cognition through 'kinky' sexual practices together with participants, the feedback session was very rich and all participants managed to articulate their own qualitatively complex insights from personal sexual and other (intimate) embodied experiences.

If the system being played is an ongoing project carried out by the participants, the game could be played again later with a modified setting of relations.

Conclusion

The effectiveness of playing games for sustainability has been insufficiently researched to draw conclusions as to the influence of different types of play and games on changes in the cognitive, emotional, behavioral and social realities of their players, whether short- or long-term (Van Pelt et al., 2015, Soekarjo and van Oostendorp, 2015). For example, according to a recent study of a "serious games", a simulation game meant to to create awareness on sustainable energy transition, such a game would have been "more successful in achieving cognitive (understanding/knowledge) and affective (emotion/interest and concern) engagement than in motivating attitudinal or behavioral engagement" (Ouariachi, Elving and Pierie, 2018: 1). However, even this existing research neglects or rather altogether ignores the present or absent embodied-cognitive, phenomenological and inter-subjective qualities of games and of playing when they do (not) integrate significant corporeal qualities. Such research insights are thus probably largely irrelevant to the kind of game I introduced in this chapter, and differently designed empirical research would be required, which would take the artistic turn I called forward elsewhere, with arts-based research (Kagan 2017). Several sustainability research publications do refer to experiential learning though games, and thus have more relevance, but they also fail to specifically consider the corporeal when evaluating the effects of games for sustainability (Liarakou et al., 2012, Gugerell and Zuidema, 2017).

Sustainability researchers need to better understand the effects of corporeal complex play, such as in the Village Triangles game, in order to engage into differently designed empirical research. Küpers advocates for "an extended, more integral interpretation of play as an embodied and unfolding process [with] qualities and intrinsic meanings that are or cannot be framed and tamed by economically governed, calculative and purpose-driven orientations" (Küpers, 2017: 2). He discusses the phenomenological qualities of play, "as situationally, immediately and directly apprehended and 'lived through', thus revealing itself in relation to others and in or towards the world" (Küpers, 2017: 2). And he too sees the need for an artistic turn in researching this topic: "Inquiring into the making of sense of embodied playing while thinking from and with lived bodies and embodiment can be realized by using more sensual methodologies and art-based research practices" (Küpers 2017: 14).

A research and educational practice strengthening creative approaches to sustainability, developing artful sustainability research, should facilitate the growth of an embodied sensibility to and literacy of qualitative complexity, mediating between several realities without flattening them. It should help us learn to conceive of and to practice other kinds of complementarity than the 'synthesis' offered by classical dialectics and its offspring in the political left and critical theory. It should also move beyond the holistically simplistic reductionism of mere mindfulness and consensus whereby complex harmonies-in-tensions get stripped out of their political complexities.

Any living relationship needs to be experienced through the 4 overlapping and de-re-connecting lenses of competition, cooperation, antagonism and unity. This means acknowledging Chantal Mouffe's stress on antagonistic relationships (and her plea for "agonistic" politics: Mouffe, 2013) as important dimensions of democratic practice, warning against a reduction of politics to mere consensus-based processes.[100] However, a dynamic balance between cooperation and opposition needs to be found, rather than Mouffe's privileging of agonism over consensus. This very dynamic balance, where harmony emerges from tensions (as in the aphorism of Heraclitus), is something that the Village Triangles game allows its participants to corporeally experience, in a symbolic way. A crucial quality of the process is to maintain tensions, discomfort, irritations and challenging experiences. The Village Triangles game (in its two variants) fulfills Küper's criteria of

"an embodied practice of inter-play [that] would help to deal with the dominating agonistic orientation (competitive play) differently. It would do so by integrating more alea (chance), mimicry (simulation or role play), and ilinx (disorientating vertigo, risk- taking) forms of play that are decentering the self, in a daring, but also prudent way. While in agon, the player relies only on him- or herself and s/he bends all his efforts to do his/her best; in alea, s/he relies on everything except him-/herself and he surrenders to forces that elude him/her. Furthermore in mimicry s/he imagines that s/he is 'other' than s/he really is and invents a fictitious universe; while ilinx also is characterized by an 'othering' as it serves as an answer to one's need to feel the body's stability and equilibrium momentarily disoriented, to escape the tyranny of sedimented perception" (Küpers 2017: 11).

The dynamic balance between cooperation and opposition is also at the core of Richard Sennett (2012)'s analysis that demonstrated how, over the history of modern Europe, different approaches to social and political participation and cooperation have been caught in a tension between

[100] As I experienced over recent years in diverse situations, the current spread of the practice of mindfulness, in its concrete implementation, often places consciousness and awareness on a pedestal, leaving too little space to subconscious flows of the body-mind, suffocating intuition while praising it and strangling creativity while invoking it. I saw some of its advocates effectively perpetuating a delusional imaginary of control (though replacing cybernetic and technocratic control with mindful self-awareness) and also developing a over-simplified imaginary of harmony through appeasing tensions and avoiding conflicts.

'dialectic' and 'dialogic' tendencies. (In a dialectic process, in a Hegelian sense, tensions between opposing views are resolved through compromises or argumentative resolution/synthesis. In a dialogic process, in a Bakhtinian sense, different views co-exist and respect each other's difference, whereby oppositions remain open and unresolved.)

The “Number 6 and the Village” & “Village Triangles” games that I presented here (for the first time in written form) are only one element as part of wider attempts to share and further unfold these insights trough means of embodied (and possibly embedded) cognition, aiming to contribute to (aesth)et(h)ics of complexity for cultures of sustainability.

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PUBLICATION 24

Original Publication Type: Article

Title: Retracing My Steps: A 10-YEAR Journey To Walking-Based Transdisciplinary Research

Author: Sacha Kagan

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Retracing my Steps: a 10-years journey to walking-based transdisciplinary research

Abstract

Engaging in a chronological retrospection of his professional and personal transdisciplinary practice of walking-based research over the past decade, and embedding some elements of arts-based writing into the article itself, Sacha Kagan articulates the influence of walking art, transect walks by urban researchers, and especially of Sarah Pink's sensory ethnography on his own use of walking-based method-elements for sustainability research. He discusses how these approaches bear relevance to urban sustainability research, and suggests a queer-ecological direction for walking-based transdisciplinary research.

Keywords: walking, walking-based research, arts-based research, transdisciplinarity

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PUBLICATION 25

Original Publication Type: Book Chapter ("Zwischenspiel" text)

Title: Zwischenspiel 8: Ricklingen, Bornum und Linden-Süd – Urbane Randzonen

Authors: Annette Grigoleit and Sacha Kagan

Share of Authorship of Sacha Kagan (see documentation in the appendices): **30%**

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

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Ricklingen, Bornum und Linden-Süd – Urbane Randzonen

Das folgende Zwischenspiel schildert Erfahrungen, die wir gemeinsam mit Lena Greßmann während eines ganztägigen Transect Walks zwischen den Stadtteilen Oberricklingen, Bornum sowie Linden-Süd gemacht haben. Dabei konzentrieren wir uns insbesondere auf die Randzonen und die Sphären des Übergangs[101].

DOI: https://doi.org/10.14361/9783839445853-013

[101] Während dieses Transect Walks haben wir die Stadt Hannover am 24. August 2016 entlang einer Linie durchquert, die vom südwestlichen Stadtrand im Stadtteil Wettbergen ihren Ausgangspunkt nimmt, und über den Stadtbezirk Ricklingen sowie die Stadtteile Bornum, Linden-Süd, Linden-Mitte, Linden-Nord, Nordstadt, Vahrenwald-List bis nach Nord-Ost, d. h. bis nach Vahrenheide, Sahlkamp und Bothfeld reicht. Unser Anfangspunkt war die Haltestelle »Wettbergen«, die Endhaltestelle der U-Bahn-Linie 3 im Süden Hannovers ist. Diesen Transect Walk haben wir in zwei Teile geteilt, wobei dieser Erfahrungsraum zum ersten Teil gehört. Endpunkt dieses ersten Teils war Linden-Nord. An der Haltestelle Hannover-Glocksee sind wir in die U-Bahn gestiegen, um zurück zum Hauptbahnhof zu gelangen. Unsere Eindrücke haben wir mit einem GPS-Tracking, per Videokamera, mit einem Audio-Aufnahmegerät und einem Fotoapparat ›dokumentiert‹. Dabei haben wir uns insbesondere auf (un)gewöhnliche Interaktionssituationen zwischen Menschen und Umgebung, unser Gehen, auf (un)gewöhnliche Geräusche und Geräuschquellen, (Un)Möglichkeitsräume eines urbanen Alltags, charakteristische Besonderheiten von Stadtteilen, sowie Übergänge, Grenzen und Grenzgebiete in und zwischen Stadtteilen, sowie das Grün in der Stadt fokussiert.

PUBLICATION 26

Original Publication Type: Book Chapter ("Zwischenspiel" text)

Title: Zwischenspiel 9: Linden-Nord

Authors: Sacha Kagan and Annette Grigoleit

Share of Authorship of Sacha Kagan (see documentation in the appendices): **60%**

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

Publisher: transcript Verlag, Bielefeld

Year: 2019

Pagination in original publication: 365-368

Linden-Nord

Das folgende Zwischenspiel ist eine imaginative Synthese verschiedener Walks (Transect Walks, Walks with Video und Soundscape-Walks) in Linden-Nord[102].

DOI: https://doi.org/10.14361/9783839445853-018

[102] Für dieses Zwischenspiel haben wir auch auf verschiedene Notizen von Patricia Wedler, Volker Kirchberg, Lena Greßmann und Schulamith Pieper zurückgegriffen.

PUBLICATION 27

Original Publication Type: Book Chapter ("Zwischenspiel" text)

Title: Zwischenspiel 10: Ein Spaziergang durch Hannover-Mitte

Authors: Sacha Kagan

Book title: Stadt als Möglichkeitsraum: Experimentierfelder einer urbanen Nachhaltigkeit

Book editors: Sacha Kagan, Volker Kirchberg and Ursula Weisenfeld

Publisher: transcript Verlag, Bielefeld

Year: 2019

Pagination in original publication: 369-372

Ein Spaziergang durch Hannover-Mitte

Dieses letzte Zwischenspiel verknüpft, vermischt und verwischt mehrere Erfahrungen der Spaziergänge durch Hannover-Mitte, das etliche Transect Walks, Videowalks und wiederholte ethnografische Beobachtungen (inklusive einiger teilnehmender Beobachtungen) durch mich, Kolleg*innen und Student*innen in diesem hyperzentralen Stadtteil von Hannover umfasst.

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Conclusion

The texts gathered in this manuscript offer a largely congruent set of insights on the cultural dimension of sustainability and on the important functions of the arts in relation to the cultural dimension of sustainability, not only in society – more particularly in cities – but also more self-reflexively in transdisciplinary sustainability research itself. The following pages give a summed-up overview of these insights for each text as well as in their articulation through the manuscript's structure.

The four texts in the first part of this manuscript (PART 1 - Culture(s) and Aesthetics of Sustainability) articulate the relations between culture and sustainability. They focus on a theoretical dimension of my postdoctoral research that further developed an understanding of "cultures of sustainability" and of "aesthetics of complexity" that was initiated in my PhD, bringing them in a dialogue with other ongoing and emerging discourses about "cultural sustainability" and "queer ecologies".

I started this first part of the manuscript with a recently published text (Text 1: "Culture and the Arts in Sustainable Development: Rethinking Sustainability Research" –published as a book chapter) because this text provides a short review and overview of discourses that have developed about the cultural component or dimension of sustainable development or sustainability, over the past two decades. Several clusters of discourses are identified and discussed:

1. The establishment of culture as a "fourth pillar of sustainability" and formulations of a "cultural sustainability";
2. The identifications of "culture(s) of sustainability";
3. The articulations of a "cultural dimension" of sustainability or sustainable development.

The text also discusses how these different clusters of discourses also intersected or converged with approaches relating the arts and aesthetics to theoretical and practical aspects of sustainability. I explicitly placed my own research and discourse within the reviewed clusters.

This research output highlights a number of cultural-scientific (*kulturwissenschaftliche*) insights and issues at the intersection between wider considerations of "culture and sustainability" on the one hand, and a more specific interrogation of relations between "the arts & aesthetics and sustainability" on the other hand. Among these insights are the importance of imaginaries, of imagination and of aesthetics of complexity, as well as the interface of memories and futures. Whereas the importance of qualitative complexity already had crystallized through my PhD-research in earlier years[103], the other two insights mentioned here, most especially the importance of imagination and imaginaries, were not as central to my work in earlier years, and therefore the question of imaginaries and imagination grew in importance in my own research agenda over recent years (as exemplified by several of my texts in the remainder of this manuscript).

Another insight from my research, already shortly evoked in this text, more at the epistemological level, is that a culturally sensitive approach to social-scientific research, involving the arts and aesthetics, reveals the potential for a transdisciplinary advancement of

[103] The widespread reception of my PhD publication (as I mentioned in the introduction), as well as numerous invitations to speak at scientific events worldwide since then, showed this central insight to be fruitful and inspirational not only for my own further research, but also for other researchers around the world.

sustainability research, laying the ground for an "artful sustainability" research beyond the limitations of the young neo-discipline of "sustainability science". This insight was articulated in much more details in further research outputs, to be found in part 4 of this manuscript.

This manuscript then includes an earlier text, published in 2012 (Text 2: "Toward Global (Environ)Mental Change: Transformative Art and Cultures of Sustainability" – an essay published as a small monography) because it already programmatically laid out my research directions, making the link between the outcomes of my doctoral research and some then-emerging insights of my post-doctoral theoretical work on cultures of sustainability. The essayistic form of this text also mediates the insights in a compact, accessible form.

The main argument made in this text is that the global crisis of unsustainability is not only a crisis of the hardware of civilization, but also a crisis of the software of minds. The essay argues that the search for a more sustainable development has been focusing too much on what I metaphorically called "hardware updates", such as new technologies, economic incentives, policies and regulations, and too little on "software revisions" – that is cultural transformations affecting the ways of knowing, learning, valuing and acting together. In this context, the essay discusses where to look for the potential of art in the transformation process toward cultures of sustainability. Art is here not understood as a mere means or medium, but as an active process that can (but does not necessarily always) work with interdependences between different dimensions of human crisis, ask questions about possible futures, and harbor potentially transformative societal forces.

The essay can be summed-up as providing fives clusters of programmatic arguments that grounded my further research in the subsequent years:

1. *Overcoming dichotomies*: Opportunities for embodied learning lie beyond a body/mind dichotomy. Opportunities for community empowerment and democratic practices of commons-based self-organization & governance lie beyond a State/Market dichotomy. The nature/culture dichotomy needs to be turned into an appreciation of the qualitative complexity of NatureCulture.
2. *Critically working with technology*: Technological innovations need to be met with sufficiently critical reflexivity, aware of the harm caused by narrowly purpose-oriented rationality that otherwise short-circuits a complex reality and ignores most of the side-effects of human enterprises. Furthermore, technology-mediated experiences can in some cases contribute to a numbed experience of NatureCulture. Nonetheless, technologically mediated aesthetics can instead, in other cases, add something more, and valuable, to the perception of complexity. A careful and reflexive, critically aware, but also open-minded, attitude towards techno-aesthetics is thus warranted. We must hereby recognize and renounce the dangerous illusion of a globally interconnected "technosystem" that would be capable of replacing the biosphere's ecosystems.
3. *Doing away with cultures of linear thinking*: Linear understandings of economic growth and of societal progress contribute to cultures of unsustainability by conveying a linear and fragmented experience of reality. Linear problem-solving, which is the traditionally advocated methodology of planning schemes, including many local Agenda21 processes (that attempt to formulate a vision, diagnose the problems and assess the risks, then develop alternatives, and finally implement and execute), also needs to be challenged. Instead, "question-based learning" (David Haley) should be implemented, mobilizing the capacity to ask, again and again, wider questions, and thereby to reframe problems in new ways. Question-based approaches avoid being trapped into the path-dependency of conventional problem-definitions.
4. *Cultivating cultures of qualitative complexity*: This means to heal from the habits of atomization, fragmentation and reductionism, to overcome rigid modes of thinking

(including disciplinary silos and hierarchies of thought), to challenge the dominant obsession with “clear” concepts and definitions and with value-neutrality in science. Resilience necessitates the preservation of diversity, both biodiversity and cultural diversity, which together with the sagacity of serendipity, allow societies to learn from the unexpected. Aesthetics, in a Deweyian sense (embedded in daily life), mobilizes sense perception and sense-making to apprehend qualitative complexity, and thus plays a key role in developing cultures of complexity.

5. *Embracing a queer ecology*: This means doing away with a straightforwardly harmonious culture of nature, recognizing uni-plurality, value pluralism, contestation and tensions, beyond the simplifying comfort found in holistic ideals of consensus and organic unity (which are indispensable to mutual understanding but might also, if too systematized, breed forms of soft-totalitarianism).

The essay is followed by another, much shorter essayistic magazine-article (Text 3: “Which wealth for which sustainability?”), which does not constitute a traditionally academic article. I decided to include this text (unlike the other magazine articles I authored over the past seven years) in the manuscript and to place it at this point within the collection of texts, because its insights bring a complementary small addition to the arguments made in the essay I published at the Böll Foundation around roughly the same time period.

This short text argues that while for centuries, the question of wealth has been discussed by European and American economists in relation to the theme of the individual “good life”, today, the issue of wealth, reconsidered under the perspectives of sustainability, is related to the question of what it means to “live well, together.” The text shifts the center of the question of wealth from the realm of economics to the realm of culture. This direction of thought was inspired by my earlier studies in Cultural Economics at the Erasmus University of Rotterdam, where I was brought to consider how the discourses of economics are deeply rooted in culture. This short text also prefigures my later further interest in the question of living well together, in relation to the “Convivialist Manifesto” (to be found in text 21).

The first part of the manuscript finishes with a text (Text 4: “Complexity as experience: The contribution of aesthetics to cultures of sustainability” – published as a book chapter) that more thoroughly articulates how my approach to aesthetics of complexity inserts the arts within a search for cultures of complexity – hence functioning well as a transition to the second part of the manuscript.

If “art as experience” characterizes aesthetics as an intense and rich relationship with the world (after John Dewey), I suggest that “complexity as experience” characterizes aesthetics of sustainability as a tense and complex relationship with the evolutionary challenge of resilience-prospects for human communities embedded in natureculture's future, in the age of the Anthropocene. I propose an understanding of aesthetics of sustainability that brings together the insights from (a) Gregory Bateson's perspective on aesthetics as the sensibility to “the pattern that connects”, (b) David Abram's animistic take on phenomenology, (c) Edgar Morin's paradigm of complexity, and (d) Basarab Nicolescu's transdisciplinarity. These combined insights inform an articulation of aesthetics which sustains close connections to ethics, science, art, the 'lifeworld' of experience and the noosphere of cultures.

The experience of complexity is in tune with the ambivalences stemming from simultaneously holistic, complementary, competing and antagonistic inter-relations between multiple logics at play in sustainability problems. Complex aesthetic experience guards us against mistaking this complexity with a set of multiple relationships forming merely 'complicated' networks of relationships under single non-complex, unified principles. It also guards us against the simplifications stemming from merely holistic or dualistic discourses.

A first illustration is drawn with the example of walking, as an embodied, ecological and transversal element for participatory action research (to which I come back in my later research, included in part 4 of this manuscript). I shortly introduce my understanding of walking as 'serendipedestrian' aesthetic practice.

A second illustration comes from a short discussion of ecological art (for which further articulations are to be found in text 6, included in part 2 of this manuscript). The question of the relevance of "ecological art" practices for the development of aesthetics of sustainability is raised. In so doing, I further characterize these practices as typical of an integration of artistic practices within wider transdisciplinary frameworks nurturing serendipity, embodied learning, and a creatively evolutionary capability for resilience at the level of social systems. This is about "art as a verb" as already argued in my 2012 essay (text 2), and eco-art as a potentially transformative process that fosters subversive imaginations while embedding itself in living communities, in the search for lived cultures of sustainability.

The four texts in the second part of this manuscript (PART 2 - The Arts in Relation to Culture(s) and Aesthetics of Sustainability) represent the part of my research that constituted a closer examination of specific artistic practices: ecological art (texts 5 and 6), musical practices (text 7) and contemporary interdisciplinary arts in urban arts organizations (text 8).

I started this second part of the manuscript with two texts that deal with "ecological art", an artistic genre that I had started to research in my doctoral research; a genre originally conceived in the 1990's on the basis of practices that emerged from the late 1960's onwards. The two texts lay out the further research insights I gained on ecological art in my postdoctoral years:

First, I expanded the geographic range of my empirical research focus on ecological art, from its original context in the USA (in my PhD Thesis), to its articulations in Europe and Asia over the past couple of decades. In one publication (Text 5: "Art and Sustainability: The search for cultures of sustainability is not an easy journey" – published as a book chapter), I discuss artistic practices that qualify as ecological art or relate to the discourses and search process of sustainability in respectively European and Chinese contexts.

In Europe, the most significant and spectacular development over the past decade (i.e. in the years leading up to the publication of text 5, as well as in subsequent years too, as reviewed in a more recent article I co-authored, *not included in this manuscript*: Galafassi et al. 2018) has been the surge of interest in issues related to climate change and to changing unsustainable practices in the arts and cultural industries. Artistic practices concerning ecology and climate change also emerged in China in the years leading up to the publication of text 5, yet remained relatively more marginal.

Fostering a sensibility to complexity through artistic approaches meets different challenges in Europe and China. In Europe, the tradition of disjunctive thinking is a major challenge, as is its inverse with the holistic simplification of harmony-orientations. In China, the challenge exists at a different level: The political structures remain insufficiently appreciative of diversity and the ruling political system tries to impose harmony through establishing a uniform consensus in society. Besides, China and Europe are both plagued by a (globally widespread) naive belief in green technologies, mistaking complicated cybernetics for the deeper complexity of ecologies.

Second, having gained wider international perspectives, I then revisited and synthesized the main shared properties of the practice of ecological art, in text 6 ("The Practice of Ecological Art" – published as article).

The genre of “ecological art” does cover a wide variety of artistic practices. Though this variety is not the main focus of text 6, I do discuss several lines of differentiation:

- material and infrastructural interventions vs. focusing on perceptions and consciousness;
- Subversive political agendas vs. efforts to engage with the mainstream;
- Work at grassroots communities vs. at the level of top-down organizations;
- Short-term vs. long-term engagements;
- Varying degrees of engagements with e.g. phenomenology, or/and applied natural sciences, or/and new technologies and socio-techno-scientific systems.

These practices are nonetheless united, as social-ecological modes of engagement, by shared principles and characteristics that cut across their diversity, namely: connectivity, reconstruction, ecological ethical responsibility, stewardship of inter-relationships and of commons, non-linear (re)generativity, navigation and dynamic balancing across multiple scales, and varying degrees of exploration of the fabric of life's complexity.

My research also included a focus on the specificities of musical practices in relation to culture(s) and aesthetics of sustainability, conducting a transdisciplinary review of relevant literature also reaching beyond the rare publications directly and explicitly dealing with music and sustainability (Text 7: “Music and sustainability: organizational cultures towards creative resilience – A review” – published as an article).

A specific focus on music is lacking in sustainability research, in comparison to the greater (but still very modest) attention paid to other art forms. What are then the specific potentials of music?

The main insights from this review were the following:

- Generally (and unsurprisingly), the experience of and practice of music can work either way: They can help advance sustainability but can also be used to strengthen prejudice and unsustainability;
- More specifically, musical improvisation has specific qualities that are especially relevant for the search process of sustainability and for the emergence of cultures of sustainability (as I characterized them in the texts collected in part 1): Improvisational music-making enhances group cohesion and trains social creativity. (The less improvisational the music practice, the less it trains social creativity. However, group cohesion is enhanced with any kind of collective music practice.)
- Music is therefore, through its mobilization of both group cohesion and social creativity, a valuable resource for organizational resilience and creative resilience.
- Turning to the experience of music on the individual level (without necessarily practicing the music oneself): Cultures of sustainability can be fostered through a musical aesthetics of complexity that opens up to ambiguities, ambivalences, contradictions and creatively chaotic dimensions of experience. However, the experience of music (individually and collectively) can also deploy an emotional power that may foster unsustainability through strengthening prejudice, simplifying worldviews and restraining creativity.

The research did not point to particular musical genres as specifically “sustainable” or most akin to “cultures of sustainability”, but it allowed to expose the mechanisms operating at the intersection of music and sustainability and to highlight key areas where the social experience and practice of music can contribute to the cultural dimension of sustainability in communities, organizations and society. Most especially, a qualitative complex musical experience (of any musical genre), and improvisation, are two aspects that bear great potential.

The second part of the manuscript finishes with a text (Text 8: "Prefiguring Sustainability: Response-Ability & Spaces of Possibility" – published as a book chapter) that discusses how urban arts organizations can mobilize contemporary interdisciplinary arts in opening up spaces of possibility for an urban society to explore and prefigure potentially sustainable futures. This text functions well as a transition to the third part of the manuscript, which focuses on urban cultural and artistic practices in relation to the challenge of sustainability in cities.

Beyond mere awareness-raising and environmental management at arts organizations, the arts contribute to the search process of sustainability as a cultural project, which is about re-inventing worlds in the "spaces of possibilities" that arts organizations (together with others) have the capacity to open, sharing with local communities a response-ability for a diffused artful doing and learning through challenging experience, imagination and experimentation. This response-ability refers to constituencies along three axes of space (from local to global), time (heritage, present and futures) and otherness (from other humans to non-human others).

The text discusses how cultural organizations can managerially best support artists and cultural workers in such endeavors, arguing that arts organizations need to develop qualitative performance indicators that address the multiple dimensions of sustainability. The art manager can develop a supportive context (welcoming of indeterminacy and transversal networking) for the artistic inquiry that opens both critically reflexive and adventurously experimental learning spaces. As I argue in text 8: "This is about developing safe and trust-inspiring places that invite their visitors to a participation with consequences [...] These places need to foster a social creativity". *I researched the challenge of fostering social creativity in much more details at the "City as Space of Possibilities" research project (2015-2018)* (see text 17 in part 3 of this manuscript).

The ten texts in the third part of this manuscript (PART 3 - Creative Sustainable Cities) share the insights gained in the parts of my research work that focused on urban cultural and arts-related phenomena in their relationships to urban sustainability. Several of the texts (10, 11, 12, 13) lay out a critique of the "Creative City" and demonstrate an effort to develop an alternative understanding of the Creative City that would deserve to be also named a "Sustainable City". Later texts (14, 15, 16, 17, 18) share the insights from my part of the "Stadt als Möglichkeitsraum" ("City as Space of Possibilities") research project (2015-2018).

Part 3 starts with a publication (Text 9: "Extreme Climate Events as Opportunities for Radical Open Citizenship" – published as an article) that considers some political consequences of climate change for urban and regional development. Stressing the prospects for increasing instability in established social, economic and political institutions (caused by expected future global risks and catastrophes related to climate change), the text discusses the growing challenges for adaptation strategies and disaster management, and argues that the overall resilience of socio-ecological systems may soon depend on civil society's ability to draw from its self-organisation rather than relying on increasingly unstable established structures. Specific conceptual resources for self-organisation are proposed in this text, such as "horizontalism" and "right to the city", and are related to research insights on the resilience of socio-ecological systems. These insights flew into my further research (in several later texts of part 3) that includes a more specific focus on urban cultural practices.

The publication coming next in the manuscript is an earlier one where the reader finds a critique of Richard Florida's "creative class" discourse and a first articulation of a few elements towards an alternative "sustainable creative city" (Text 10: "Creative Cities and (Un)Sustainability: From Creative Class to Sustainable Creative Cities" – published as an article).

The critique of creative cities conducted here is based on earlier sociological critiques of the creative class and relates it to my critique of a culture of unsustainability (cf. part 1 in the manuscript). The two cities of Toronto and Hamburg are taken as illustrations of the unsustainable developments brought about by creative city discourses and their political implementations – also considering the critical responses from cultural actors in the two cities. The then proposed few elements towards an alternative conceptualization of the creative city are rooted in my work on cultures of sustainability and on the functions of the arts in relation to cultures of sustainability (cf. parts 1 and 2 in the manuscript). In this publication, I suggest a more ecological understanding of creativity (which prefigures my later empirical research interest in social creativity, cf. text 17) and point to the importance of open dialogue in collaborative work with local urban communities.

The next text (Text 11: "The roles of artists in the emergence of creative sustainable cities: Theoretical clues and empirical illustrations" – published as an article) further develops this critical research, including empirical research insights and further theoretical articulation. My contribution to this text, at the theoretical level, was especially to articulate an understanding of cultures of sustainability towards urban development (drawing on concepts of resilience and serendipity) in relation to some discourses of critical urban sociology (Lefebvre's 'Right to the City' concept, Molotch's 'growth machine' thesis, and Smith's elaboration on 'gentrification', as synthesized by my co-author Volker Kirchberg in this text) and in relation to urban social movements involving artists. As the empirical research in Hamburg shows, these social movements generally both resist unsustainable urban development and strive for opportunities that allow urban communities to become creative sustainable neighborhoods. The three empirical cases, Rote Flora, Gängeviertel and Frappant, demonstrate a range of crossovers of artistic, social and political objectives. They represent degrees of resilience against an unsustainable urban political economy with an unsustainable grasp on creativity, and different degrees of engagement with questions of sustainability, fostering growth-critical approaches and social solidarity while exploring and shaping creative possibilities for socially and ecologically responsible urban living.

Taking up some of the insights from Hamburg as laid out in text 11, I reframed the issues of climate change, urban resilience and (un)sustainable creative cities for the context of the City-State-Island of Singapore (Text 12: "The City is our Anthropo-Scene! Art as a Verb and Urban Sustainability Transformation" – published as book chapter).

The book chapter was meant to introduce readers outside academia to the issues and thus provides a short introduction to a multi-dimensional definition of sustainability, to cultures of sustainability, to climate change mitigation and adaptation, and to the concept of resilience. The text points at challenges to resilience in the case of Singapore, as the City-State benefits from a rich cultural diversity, but suffers from deficits in terms of redundancy and self-organization (not the least because of its political regime).

The text also shortly introduces the readers to a process-based understanding of art (art as a verb – cf. text 2, in part 1) in relation to aesthetics of complexity, as opportunities to better enhance Singapore's resilience to climate change than with a Floridan Creative Class approach. Aware that my readership in this text included Singaporean architects and administrators of the powerful URA (Urban Redevelopment Authority of Singapore), I encouraged with this text the city to allow more space for indeterminacy, with physical spaces not government-controlled and not pre-designated, to counter both the over-regulative cultural policy and the cancerous growth of commercial centers in the city (which have indeed become the principal socializing spaces in Singapore, according to my respondents). The Gängeviertel in Hamburg is used as an illustrative example for this. I then point at Singapore's emerging maker-spaces and at cultural and artistic initiatives in the historical site of "Bukit Brown" (a site of contestation against the government's plans to destroy the city's last historical cemetery, i.e. a site replete with world-class heritage

value about to be torn down to build a highway-extension) as pointers to areas where potentials already lie in Singapore, if the government were to recognize the unsustainability of its development course and to change its course. (The published text itself conveyed these insights in a milder tone than just done right here, because the strict State censorship of all publications in Singapore, i.e. the explicit extreme-limitation of freedom of expression, would not allow otherwise.[104])

In the years that immediately followed the empirical focus on Hamburg, I did several short empirical research stays in cities in Asia (Bangalore, Mumbai, Singapore, Seoul), Europe (Köln, Hannover, Cluj-Napoca, Oslo) and the US (New York City). One published book chapter (Text 13: "The Emergence of Creative Sustainable Cities") distilled a few synthetic insights from the international urban perspectives I gained from these research trips.

The publication first consolidates my conceptual articulation of "Creative Sustainable Cities", based on my earlier texts (texts 9, 10, 11 and 12, and another text not included in this manuscript: Kagan and Verstraete 2011). At the centre is the goal to enhance urban resilience understood as a creative process, through specific forms of artistic practice that bring artists (and other creative practitioners not explicitly labelled as "artists") together with other urban subjects in processes of urban development to help them collaboratively "un-plan" cities, make urban questions more interesting, queer conceptions of urban development, and "plan" cities in more participatory, creative, and emergence-friendly ways (privileging indeterminacy over control). In this text, I also argue that the advancement of self-organization in civil society (as discussed in text 9), should not however, especially in the short-term, partake in a politically toothless strategy of exodus from institutional politics, but instead should be articulated with critical collaborations with institutional politics. *This balanced approach, aiming to articulate grassroots cultural engagements and institutional innovations involving formal policy-making, was to form the basis for my further research in Hannover from 2015 to 2018 (cf. texts 14 to 18).* The text also stresses the importance of sustainability, convivialist and commons-oriented cultural networks, and the value of this transversal networking for urban resilience.

The international perspectives from the nine cities in Asia, Europe and the USA confirmed this, and they pointed to one specific line of differentiation in the engagements of different artists and cultural actors with urban (un)sustainability: Several of them developed an array of creative variations of protest cultures, whereas in the work of several others, I identified the emergence of diverse forms of "spaces of possibility" that go beyond mere protest movements, awareness raising, or individual project-based initiatives, by striving to inspire experiments of transformations in the everyday lives of urban subjects. The latter approach was the one that I then researched in much more detail in the "City as Space of Possibilities" research project in Hannover in 2015-2018, the insights from which were shared in some of my most recent publications (texts 14 to 18).

The next text (Text 14: "Culture in sustainable urban development: Practices and policies for spaces of possibility and institutional innovations" – published as an article) was indeed the first one that stemmed directly from the three years empirical research project in Hannover, SaM ("Stadt als Möglichkeitsraum", i.e. the city as a space of possibilities), of which I was one of the

[104] My ethical choice was to achieve the effectively most productive critical output within the Singaporean context, overcoming the two simplistic escapist-strategies of either (1) radically denouncing the Singaporean political system from the outside, thereby being forbidden further access and becoming unable to support reformist efforts by the Singaporean intellectuals, artists, academics and professionals with whom I have been exchanging, or (2) denying the issues in order to gain privileges in the Singaporean system (as do, to my dismay, several European colleagues employed at Singaporean universities and art schools for high wages).

four Principal Investigators in the Inter-Faculty project consortium[105]. Besides my initiative as the original initiator of the overall research project idea, and subsequently my role in the collegial coordination of the whole research project together with the three professors, I was in charge of the research area "creative and artistic practices for a sustainable urban development" (i.e. in the German official formulation: Federführung des Forschungsbereichs "Kreative und künstlerische Praxis für eine nachhaltige Stadtentwicklung").

Text 14, which I also spear-headed and coordinated, gave a first overview of SaM's research insights (at a preliminary stage of our research process, unlike texts 16 to 18 that were written at the final stage), integrating my research area's insights with those from the other research areas in the project. The article focuses on relations between culture and policies for sustainable development in cities. It discusses the potentials to advance a cultural approach to sustainable urban development by enabling urban "spaces of possibility", relating them to institutional (social, cultural, and political) innovations. The article's empirical base is utilizing both the SaM project in Hannover, as well as earlier and newer research insights from Hamburg, allowing a comparative discussion of the two cities. The article examines the relations between four selected cases of cultural actors/initiatives (two cases per city) and the differing policies of the two cities, pointing at the seized or missed opportunities for innovative forms of transversal partnerships through a culturally sensitive urban policy.

The article formalizes a set of criteria and questions to characterize and assess the properties of urban spaces of possibility, and to put them in relation to urban policies and issues of sustainable urban development (cf. table 1 in text 14) in empirical cases.

The obtained research insights attest the impact of culturally-sensitive policy on the emergence of Spaces of Possibility for Sustainable Urban Development. Culturally sensitive Sustainable Urban Development-oriented policies engage with culture in its wide definition and enable transversal partnerships horizontally - i.e. combining so-called "bottom-up", "top-down" and "sideways" processes, whereby artists and other cultural actors are given the opportunity to play a central role beyond their own professional sectors, together with a variety of urban actors from other sectors, in the inter- and trans-disciplinary process of transforming urban ways of life towards Sustainable Urban Development - re-inventing possible worlds in Spaces of Possibility by working on symbolic universes, imagination and experimentation. However, to enable such processes requires challengingly-unconventional institutional innovations allowing transversal collaboration between cultural policy and other policy areas, which succeeded only to a minor extent in the empirical cases under consideration. The research also demonstrated the paradox ability of existing institutional path dependency to support institutional innovations and spaces of possibility: Although path dependencies endeavour stability and resistance to change, they often allow (intended or unintended) incremental transformations and institutional innovations. The article also highlights the difficult entanglements of institutional innovations with a globally dominant process of neoliberalization that threatens to orient urban development into an unsustainable development path.

The 15th text in this manuscript (Text 15: "IHM-agining sustainability: Urban imaginaries in spaces of possibility" – published as a book chapter) demonstrates how I operationalized my increasing research interest in imagination and imaginaries (cf. text 1 in part 1 and text 22 in part 4 of this manuscript), into the empirical research in Hannover within the research area I coordinated at the SaM project: The book chapter (published in the *Routledge Companion to*

[105] Reminder: The three other PIs were Prof. Dr. Volker Kirchberg from the Faculty of Cultural Research, Prof. Dr. Ute Stoltenberg from the Faculty of Sustainability, and Prof. Dr. Ursula Weisenfeld from the Faculty of Economics, all based at Leuphana University Lüneburg.

Urban Imaginaries) reports insights about the imagination and imaginaries at play among several grassroots organizations, initiatives and arts-related groups in Hannover:

The text analyses how urban spaces of possibility for sustainable urban development are constituted to a significant extent by the spaces opened up for imaginative processes, enriching urban imaginaries with potentially radical imagination pointing towards possibilities for urban transformation. Spaces of possibility are both spaces of imagination and spaces of experimentation, and the integration of imaginative and experimental experiential processes enhances their relevance for potential urban transformations.

The text focuses on the relationships between (physical, social and mental) spaces fostering sustainability-related imagination and the unfolding imaginaries of sustainability in such spaces. It accounts for my empirical investigation of the development of imagination and imaginaries across five grassroots cases (initiatives, projects, networks) in the city of Hanover, Germany (in the Linden district, alongside the Ihme River). The empirical research insights reveal how these imaginaries are both emplaced and place-making, how they facilitate cooperation in urban society through balancing dialogical and dialectic communication processes, and how experimentation and imagination are mutually constitutive in such spaces. These insights strongly suggest that urban imaginaries, when researched in relation to urban spaces of possibility and to (changes in) social institutions, should become a central concern in research for sustainable urban development.

Texts 16, 17 and 18 are taken from the final book publication of the SaM research project, published in German language (Kagan, Kirchberg and Weisenfeld 2019) and synthesize research insights from that project.

Text 16 („Stadt als Möglichkeitsraum – Möglichkeitsräume in der Stadt: Eine Einführung“) is the books‘ general introduction. It articulates the questions that relate to the SaM research project as a whole: Why is sustainable urban development important? Why are we interested in spaces of possibility? How can comprehensive transformations lead to a sustainable city? Why did we choose Hannover as a case study? Who are the protagonists of sustainable urban development in Hannover and what does sustainable urban development mean for them? And of course, the introduction gives an outlook on all the chapters of the book.

In this text, I focused especially on summing up the project’s characterization of spaces of possibility, as physical, social and mental spaces, in which possible sustainable developments for the future have already been created through imaginative, experimental and creative processes. The criteria and questions to characterize and assess the properties of urban spaces of possibility (see also text 14) are presented in their final form in this text.

The manuscript then includes my individual chapter in the book (Text 17: “Kreativ-kulturelle und künstlerische Praktiken für städtische Möglichkeitsräume”), which communicates the research insights from the research area I coordinated (“creative and artistic practices for a sustainable urban development”).

The chapter focuses on creative-cultural and artistic practices in the making of urban spaces of possibility. The latter are understood as both materialized, physically identifiable places of social and cultural renewal, and in the mental sense, i.e. as spaces for experiments, mediation and communication of sustainability-seeking ways of life and values.

One of my main foci is on creativity: Creativity is a central feature of learning processes that address sustainability challenges in the city. On the one hand, individual characteristics of creativity are explored. On the other hand, forms of collective creativity are of interest, whereby

experimenting and imagining transcend established norms. The organizations and initiatives I researched in Hanover, are all striving to initiate spaces and processes whereby the creativity of participants can be stimulated and deployed. They have a more or less specific orientation to the challenges of sustainability, which needs to be balanced with non-dogmatism in open-ended creative processes. Though they all strive to foster both individual and collective creativity, they do so in a variety of ways and with different means (including sometimes artistic, new media and/or collective-participative formats). They address different forms of creativity: ideational, processual, and/or objects and making-oriented forms of creativity. Not all of them manage to foster social creativity (i.e. an integration of individual and collective creativity) to the same level. The difficulty of creating appropriate spaces and times for both collective divergent processes and collective convergent processes, as well as the importance of resources and personnel to support the development of the participants' creative capabilities, should not be underestimated.

A focus is also placed on imaginaries and imagination, continuing the discussion of empirical insights already published in text 15. My research highlights relationships between physical, social and mental spaces that promote sustainability-oriented imaginations and the unfolding of imaginaries of sustainability among the actors discussed in the various cases.

Another focus is on individual and collective experimental, cultural and artistic practices that interact with the themes and goals of sustainable urban development. My research discusses how the actors experiment. It identifies the relationships between experimentation and several different characterizable experiences and experiential processes (e.g. determined and / or indefinite, challenging or comfortable), cooperation processes (e.g. dialogic and mindful and/or dialectical and confrontational), and imaginative processes (e.g. linked to an imaginary of disruption or an imaginary of harmony). Creative indeterminacy, irritations and challenging experiences require quality in space and time to unfold and affect the participant (instead of being dismissed or too superficially integrated), if they are to provide learning-opportunities and to contribute to an entrepreneurship in conventions, mobilizing unconventional experimentations towards changed social conventions. The created spaces of possibility are spaces for experimentation when they inspire experiments for the transformation of everyday lives, moving beyond awareness-raising and/or protest-focus, whether by trying out vague ideas or by prototyping and testing specific things and practices. Experimentation unfolds in the different projects more or less instrumentally, open-endedly, or spontaneously. This relates (unsurprisingly) to the different forms, levels and qualities of creativity at play: Spontaneous and open-ended experimentations relate to process-oriented and less dogmatically sustainability-oriented forms of creativity. Instrumentally sustainability-oriented forms of creativity, with more limited levels of creativity, relate to narrower spaces of experimentation focused on the testing of more clearly formed and relatively finite concepts and plans.

My empirical results show how a social imaginary is at the same time emplaced and place-making, as well as how experimenting and imagining mutually constitute each other in such spaces. The most promising urban spaces of possibility for sustainable urban development are inextricably spaces of imagination, experimentation and creative design. The integration of imaginative, experimental and creative-participative processes, each based on concrete experiences, into sustainability-seeking urban making, increases their relevance for possible urban transformations.

My empirical cases in Hanover, with their imaginaries, their experimentations and their creativity, should also be replaced within a wider ongoing tension between two approaches to urban development that can observed worldwide:

On the one hand, mainstream discourses and policies are still dominated by an imaginary of control, grounding determinate planning-based approaches to urban development. Within this approach, sustainable urban development is an engineered and regimented roadmap to a better future. Urban resilience is understood as resistance and reconfiguration in the face of adverse environments. The boundaries and borders of objects are clear, as are the modernist concepts that construct them in our minds. Complexity is perceived quantitatively, as something manageable through advanced cybernetics, and the future lies foremost in 'smart cities' and big data algorithms. A pessimistic view on human beings dominates, whose self-interest is seen to dominate their behavior, and thus bottom-up societal movements are not trusted to bring about a transformation to sustainability, unless they are strong-handedly guided.

On the other hand, an alternative discourse suggests different policy directions, guided by an imaginary of uncertainty and indeterminacy, grounding emergence-based approaches to urban development. Within this approach, sustainable urban development is a generative journey of discovery of desirable futures. Urban resilience is understood as a balancing act between gracefully letting go and exploring creative ways to respond to crises beyond the dichotomy of resistance vs. adaptation. The boundaries and borders of things are blurred and shifting (as they are alive), as are the concepts that we embed in wider meta-conceptual meshworks, aiming to better perceive the qualities of qualitative complexity on our planet and across human societies. Complexity is perceived as something qualitative (involving ambiguities, ambivalences and paradoxes), and it is dealt with by dancing with uncertainty (which is an improvised dance, without a pre-established choreography).

More generally, this is also a tension between two approaches to sustainable development, as explicitly pointed out by Robinson (2015): On the one hand, some of us think that "we know the story", and as we already know the story, we just need to implement the solutions. On the other hand, some of us, informed by an ontology and epistemology of qualitative complexity, recognize that "we do not know the story" – nor should we believe any other expert boasting to know the whole story. Instead, in uncertain times, in a complex world, wrought with conflicts and marked by the violence of those who are enforcing pre-determined solutions (whether e.g. in the name of the markets or sometimes even in the name of sustainability) and/or repressing open experiments in their fear of genuinely-qualitative complexity and uncertainty, we must learn together with many others to write that story, continuously, anew.

The creative and imaginative experiments and experiences fostered by cultural actors such as those I researched in Hanover, relate more to the emergence-based than to the planning-&-control-based pole of the field of tension sketched here, even though they can involve, sometimes, limited and pragmatic cooperation with the dominant approach to urban development (at the risk of destroying the imaginative, creative and experimental qualities of such initiatives).

Text 18 („Perspektiven der nachhaltigen Stadtentwicklung: Übereinstimmungen, Diskordanzen und Empfehlungen") is the book's general conclusion. It discusses some similarities and differences between my research insights and those of my other colleagues at the SaM project, and formulates recommendation of relevance to the social actors, organizations and policy makers in the city of Hannover.

Hannover proves to be a place with a very active and diverse project landscape with the demand for, and realizations towards, urban sustainability. Not a few actors belong to a united governance level of city and civil society; a few specific municipal offices of the city administration often act as interfaces of civil society networks. Among the actors, we could identify "institutional entrepreneurs" or "entrepreneurs in conventions" who change prevailing rules and conventions in such a way that the actors of sustainable urban development are active not only in niches, but also aim to affect structures and processes of the city as a whole. However, most actors remain in

small niches and act, if at all, only out of these into the city, thus trying - not always successfully - to influence the structural "fabric of the city" in a bottom up way. Nevertheless, these niches are important despite their short range, because of their qualities as spaces of possibilities. Through experimenting, failing and trying again, the actors within those niches can deliberately break routine conventions, test and develop imaginative ideas and cultural-creative practices, in safe conditions which are not provided outside of the niches. Spaces of possibilities first create an environment for serendipity, which is an essential condition for the development of innovations.

On the one hand, there is a need for urban political conditions that allow many spaces of possibilities, as incubation spaces for imagination and experimentation for sustainable urban development, and on the other hand there is a need for key mechanisms that promote the comprehensive implementation of niche ideas and artistic-creative projects as more widely relevant urban practices, so that it may come to overarching transformations of urban society. The combined empirical insights from the research project showed how little this double-challenge is met in practice.

The hitherto strong formalization of the city's political and administrative organizations does not promote a critical production of desires for the renewal of society towards comprehensive sustainability. We thus advocate for a hybrid structure of organization, thinking and working, which would be especially needed in the powerful municipal offices. The realization of "real-utopian" ideas requires resources in the creative field for the development of desirable alternatives, as well as resources in the management field for the development of feasible alternatives. Both levels should not be played off against each other, but should be used together for the development of visions and the implementation of ideas.

The nine texts collected in the fourth part of this manuscript (PART 4 - Towards Artful Sustainability Research) reflect how my ongoing research work included a transdisciplinary reflection and development in terms of epistemology and methodology, incorporating increasingly more elements of arts-based research and of phenomenology and integrating them with systems thinking and qualitative social-scientific research. This development brought me to reflect further upon the imaginaries and research practices of sustainability researchers, and to advocate for an "artistic turn" in sustainability research (including the more specific field of sustainability science).

The first text included in part four (Text 19: "The transcultural and artscience: The 'Karamoja Campaign' as an attempt at transdisciplinary action research" – published as a book chapter) reflects back on an earlier piece of empirical research that was not included in my PhD and that is also not included in the present cumulative Habilitation[106]. Text 19 was a reconsideration of my early empirical work, yielding insights on the experimental integration of one piece of artistic research (*Caution Border*, a "trans-situ" art installation developed as a collaboration between two groups of students in Lüneburg and Geneva) within a wider sustainability research project.

The next publication (Text 20: "Artistic research and climate science: transdisciplinary learning and spaces of possibilities" – published as an article) discusses the relations between artistic research and climate science. The text suggests some more radical potential for the collaboration of artists and climate scientists than the timid "boundary work" performed in one instance in

[106] This was a research project about decades of unsustainable development and conflicts in Karamoja, a northeastern region of Uganda. The project especially revealed the inadequacy of past and present development policies based on sedentary land management and cultures when applied to semi-arid landscapes where semi-nomadic landscape management and cultures had used to thrive. The research also confirmed the inadequacy of widespread but misleading anti-pastoralist capitalist discourses such as the so-called "Tragedy of the Commons".

Hamburg (which is not directly discussed in my text, as it was discussed in other articles by other authors in the original publication, a special issue of a journal). If they muster more efforts to reach beyond the traditional boundaries of their respective social systems, artistic research and climate science may then manage to genuinely engage in a shared transdisciplinary learning process. They may communicate with the rest of society by engaging with others to develop 'spaces of possibilities', thus nurturing the creative resilience of communities.

The next text (Text 21: "Artful Sustainability: Queer-convivialist life-art and the artistic turn in sustainability research" – published as an article) unfolds the core argument of the fourth part of this manuscript. The article includes a detailed analysis of the properties of arts-based research and of its relevance to sustainability research, preceded by the argument that sustainability not only requires to be *artful*, but also to be *queered* (with a queer-convivialist life-art). I articulate in this text what specific qualities artistic and particularly arts-based research (and artful learning more generally) hold, which contribute to the development of transdisciplinary hermeneutics. Indeed, artful approaches to research aim not merely at explaining phenomena, but at gaining an understanding of phenomena, exploring subjects in more existential human depth than usually done in scientific research. My argumentation in this text also builds upon my earlier developments about the transdisciplinary experience of qualitative complexity.

The article points at early signs of such a queer & artistic turn, both in the discourse of 'convivialism' and in sustainability research & education, noticing an already emergent trend that hopefully may take up in pace and grow in scale in the coming years, allowing sustainability research to more deeply integrate arts-based research and thereby more fully realize its potential for transdisciplinarity.

The following publication (Text 22: "Proving the world more Imaginary? Four Approaches to Imagining Sustainability in Sustainability Research" – published as an article) refocuses my reflexive analysis towards the current state of sustainability research, reviewing different kinds of imaginary worlds and of imaginative engagements with sustainability that are present among researchers.

A small number of researchers involved in this area already suggested "that maybe the challenge of sustainability isn't to prove the world more real [...] but to prove the world more imaginary" (Robinson in Taylor 2012). Taking up this invocation of the imaginary, the article investigates some imaginaries and imagination of sustainability at play in sustainability research. Four relatively distinct approaches to sustainability research are identified, characterized and differentiated: "triple bottom-line", "sustainability transformation", "holistic healing/biophilia", and "culture of qualitative complexity". They develop each a specific focus, are nourished by partly different imaginaries and develop their imaginations in distinct directions. Thereby, I understand *imagination* as an individual and social, perceptive and creative process by which we shape realities in our encounters with the world; whereas I understand the *imaginary* to be a deep symbolic matrix that enables our access to the world. Imaginaries are not just made up and imposed on the world by the humans, but the result of an imaginative encounter with the human and other-than-human world. My attention to imagination and imaginaries (which is articulated in much greater details in text 22 than in my other texts collected in this manuscript) bears a potentially instrumental value for inter- and transdisciplinary sustainability research because it encourages sustainability researchers to further reflect on the importance, modalities and different framings of creative and reflective approaches to futures-oriented research agendas. The creative exercise of the *imagination* is not only at the core of "anticipatory competences" (Wiek et al. 2011) for sustainability, but also at the core of percipience to nature-culture's dynamic complexity. In this respect, sustainability research needs to develop its self-reflexivity beyond discourse-rational approaches to narratives, with a deeper understanding of both embodied cognition and of culture. Reflection on, and radically imaginative work with, both dominant and

alternative *imaginaries* that sustainability researchers operate from, such as the four imaginaries discussed in my article, are a precondition to any movement beyond institutional path-dependency to a globally unsustainable development (and to an otherwise under-reflected dominant social imaginary).

The last five texts of part four more concretely report how my own research practice developed the integration of arts-based research elements with systems thinking and qualitative social-scientific research.

One of the texts (Text 23: “Village Triangles: games to playfully learn about complex system” – published as a book chapter) focuses on my development of an embodied and playful exercise for both sustainability education and sustainability research. This playful, game-based exercises discussed in the chapter, invites participants to train their social creativity and experience qualitatively complex systems through embodied movement games. On the basis of an earlier "Systems Thinking Game" by Linda Booth-Sweeney and Dennis Meadows, known as the "Triangles" game, I developed the new “Village Triangles” game, with inspiration from the fictional characters of "Number 6" and "the Villagers" in the UK television series *The Prisoner* (1967-1968). While the earlier “Triangles” game allowed experiential learning of some principles of systems thinking, my game adds another quality of complexity stimulating both some insights on the ambivalent relations between individuals and systems (and the notions of 'freedom with' vs. 'freedom from') as well as new perspectives on the direct environment in which the players are playing the game. This tool is meant to contribute to the development of artful sustainability in research and education (as discussed in text 21).

Another text (Text 24: “Retracing my Steps: a 10-years journey to walking-based transdisciplinary research” – published as an article) constitutes, as stated by its title, a chronological review of my own practice of walking-based research over the past decade. Furthermore, the article itself is written in a hybrid style, combining traditional descriptive and analytic academic writing with bits of arts-based writing in the form of shorter, relatively more symbolic texts based on notes written during a long artistic walk. In so doing, the text aims to exemplify insights obtained through arts-based form.

This text articulates the combined influences of walking art, transect walks by urban researchers, and especially of Sarah Pink’s sensory ethnography on my own use of walking-based method-elements for sustainability research. I discuss how these approaches bear relevance to urban sustainability research and also relate them to the queer directions for transdisciplinary research that I proposed in text 21.

Finally, the last three texts (Texts 25, 26 and 27: “Zwischenspiele” – published as intermezzo-chapters within the final book publication of the SaM research project, published in German language: Kagan, Kirchberg and Weisenfeld 2019) share some of the empirical insights we gained about the fabric of the city of Hannover in our research project. We gained these empirical insights in the streets of Hannover by employing an array of walking-based method-elements (with transect walks and walks with videos, among others). I was the initiator and coordinator of all these walking-based elements at our research project, and Annette Grigoleit (co-author of two of these three short texts) was the one among my colleagues who followed this approach with the most dedication.[107] The short texts all have an essayistic form, aiming to retain some qualities of

[107] Similar short texts (not included in this manuscript because I did not formally co-author their final form, even though I contributed to the generation of most of them) were authored by other colleagues in the project (namely Volker Kirchberg, Ursula Weisenfeld and julia Barthel, and two more texts by Annette Grigoleit). They can all be found in the project’s final book publication (Kagan, Kirchberg and Weisenfeld 2019).

arts-based research in their textual form – yet we also varied the writing style in the different short texts.

Text 25 reports from a section of a full-day transect walk, which covered south-western urban fringes of the city. In particular, this text focuses on (non-)ordinary interaction situations between people and their environment, our walking, (non-)ordinary noises and sources of noise, spaces of (im-)possibility in urban everyday life, characteristic peculiarities of different city districts, as well as transitions, boundaries and border areas in and between districts, as well as the green in the city. The one-dimensional uses and boundaries between private and public spheres of deserted street spaces in these suburban neighborhoods are broken up by small zones of trade, consumption and social life. In the sense of Richard Sennett (2012), small "fringes" with open "borders" and "membranes" emerge, and are pointing to the possibilities of an urban life through the exchange between residents with different social and cultural backgrounds in densely inhabited spaces, as well as pointing to contradictory moral orders and to the eventuality of a merging of spheres of life and work.

Text 26 is an imaginative synthesis of various walks (Transect Walks, Walks with Video and Soundscape Walks) in one and the same Hanoverian neighborhood of Linden-Nord, merging the field notes and other media from all these actual walks into a single (hence fictional) walk, with a specific focus on the insights the urban soundscapes provide about the acoustic ecology of the city.

Text 27 concatenates, mixes and blurs together multiple experiences of walking in Hannover Mitte, which included several transect walks, walks with video and repeated ethnographic observations (including some participant observations) in the hyper-central district of Hannover, by myself, some colleagues and some students. The text highlights how hyper-central urban spaces are used and occupied as opportunities by different groups with specific goals, engaging in their respecting place-making activities. The experiential insights from artistic interventions in such spaces demonstrate how a specific hyper-central place can become, temporarily, a real place of encounter with *other* others – a potential place-making for public spaces otherwise palpable as potential yet usually unrealized commons and "Third Places". This stands in contrast to more conventional and mainstream places of encounters in the city center, leaving no (or hardly any) opportunity for alternative cultural uses.

My postdoctoral research, as the present collection of publications hopefully demonstrated, contributes to a transdisciplinary research approach that focuses on qualitative complexity. My main insight, throughout the years, remains indeed that transdisciplinarity, at its best, helps us to deal with qualitative complexity. This requires addressing the transdisciplinary challenges I discussed in the introduction to this manuscript, first of which is a constant vigilance to work against any flattening of complexity into a single level of reality (whether by reductionism or by holism). My research experience led me to consider a number of ways to meet these challenges of transdisciplinarity research:

We as researchers need to regularly cultivate and deepen a self-critical, self-reflexive alertness that focuses on the narratives and discourses being developed, by oneself and by other researchers within transdisciplinary research efforts. For example, Robert Emmet at the Rachel Carson Center (Munich) stressed the contribution of environmental humanities to "provide a critical framework for questioning narratives of global environmental change [including what he called] the crypto-normative discourse that has developed around the Anthropocene" (Emmet 2013).

To address these challenges and to articulate the ETH and CIRET approaches (also introduced in the introduction of this manuscript), transdisciplinary research also has to acknowledge and work with messy iterative and telescoping processes, involving a spiral movement of combined action and reflection where theory becomes "action theory", action becomes "reflexive action", and "problem-solving" must give more space to "questioning" (i.e. not only to "imagining" + "implementing"). This must reach beyond the sequential iterations already deployed in approaches such as problem-based learning.

The transdisciplinary organization of the "dialogue of knowing" (Dieleman 2017) should not aim for communication that reaches a definite point of consensus, i.e. it should abandon the Habermassian goal of a common reason reached through communicative action. Instead, the point is to enter a conversation in which researchers become mutually open to the others, also beyond the point of being able to fully understand the other in a rational or analytical way. Instead, the researcher aims to reach out to others at multiple levels: intellectually, emotionally, intuitively, physically, spiritually, without pre-imposing any set epistemological or ontological hierarchy onto different modes of knowing. The outcome does not have to be consensus, because contradictions and ambivalences are an important part of a complex living world, and collaboration is possible also without consensus, and without having to boil things down to one reductionist or holistic framework. Contradictions are accepted and worked with. They are neither ignored nor eliminated or solved... Here, researchers need to consider Laclau and Mouffe's (1985) post-Marxist theoretical insights on multiple hegemonies, whereby agonistic spaces are especially important to democratic polities. Besides, as Vilsmaier and Lang (2014, 2015) argued, the goal of transdisciplinarity should not be to merely "mix" the different forms of knowledge, but to bring them to relate more systematically to each other. This also requires allowing more space for these ways of knowing to criticize each other, while keeping a fine and fragile dynamic balance between mutual critique and mutual genuinely-respectful active listening. Such a process implies doing "boundary work" as discussed by Vilsmaier (2018), identifying and exploring existing boundaries that are the dynamic results of processes of identification and distinction at personal, phenomenological and institutional levels; making these implicit boundaries explicit; and thereby disclosing "transdisciplinary research spaces", allowing the emergence of an "in-between space" that is a "transgressive space" (Vilsmaier, Brandner and Engbers 2017).

The necessity to integrate a more-than-rational knowing, as argued repeatedly in the texts collected in this manuscript, implies that transdisciplinary research should engage more deeply into arts-based research (as I argued in the texts collected in part four). This includes reflecting the personal and the inner drives and interests of the individual person in the research process, exploring them and unearthing them when they are hidden. It includes training the researchers' aesthetic and phenomenological abilities, as suggested by Küpers (2016). It also includes surmounting the traditional taboo in science on including the personal and the subjective, but also articulating the intellectual (i.e. both the logico-deductive and the symbolic), the emotional, the intuitional and the corporeal processes into a qualitatively complex cognitive meta-process (and surely not merely reverting to intuitions, emotions or meditation only, as some kinds of 'magic bullets', which would be a regression of knowing to very limited cognitive processes). As part of such efforts, sustainability researchers may also need to dialogue more with the philosophers investigating relational ontology, as well as with earlier traditions of relational thinking, such as for example the notion of "Ubuntu" (from the Nguni Bantu people, in southern Africa, meanwhile popular across South Africa ad globally) that offers a fundamentally relational worldview where humans and nonhumans exist through each other (Chuwa 2014). One of the authors articulating ways to develop such an approach in Germany is Andreas Weber (2013, 2014) with his discussion of "enlivenment", advocating for the rehabilitation of a first-person position (with some of its roots in Goethe), acknowledging the ontological reality of subjective experience, and comprehending the world as made up of relationships infused through and

through with perceptive processes. Weber proposes combining an “empirical subjectivity” and a “poetic objectivity”, and substituting “sustainability” with “enlivenment”.

Collective transdisciplinary research processes should also further investigate and strive to enhance the qualities of social creativity (as discussed in texts 7 and 17) within their own work processes, in order to stimulate research outputs that are both critical and innovative.

In sum, my work thus points to ways of addressing a triple challenge of research and education for sustainable futures: (1) learning to perceive, understand and work with qualitative complexity; (2) learning to learn transdisciplinarily, with helpful epistemological approaches that allow us to reach beyond extended interdisciplinarity; and (3) learning to harness the potentials of humanities and the arts towards an artful approach to sustainability research (as research that aims to contribute to social transformation for desirable and viable futures). A crucial quality of artful approaches (including arts-based research and artistic research) is to maintain tensions, discomfort, irritations and challenging experiences while moving within, in between and across levels of reality. The artistic experience of qualitative complexity allows researchers to work with shifting articulations of the logic of contradiction and the logic of non-contradiction. It is in tune with the ambivalences stemming from simultaneously holistic/unitarian, complementary/ecological/intercultural, competitive/individualistic, and antagonistic inter-relations between multiple logics at play in so-called “sustainability problems” (both across multiple levels of reality as Nicolescu argues, and within single levels of reality). Qualitatively complex aesthetics, which should involve the training of the researcher’s aesthetic experience, aesthetic attention and aesthetic practice, guards against mistaking qualitative complexity for a mere set of multiple relationships forming merely complicated networks of relationships under unified principles. Aesthetics of complexity implies a queering of knowing (see texts 2 and 21 in this manuscript) that offers a chaotic compass – or rather, using the creative language of Felix Guattari (1995), a “chaosmotic” compass, for transdisciplinary researchers who are navigating the present world and possible futures (or in the creative language of Donna Haraway (2016), the “Chthulucene”).

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