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An inquiry into the emergence of Roskilde Festival

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ROSKILDE FESTIVAL

BY
DAN HVIDTFELDT

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AALBORG UNIVERSITY
DENMARK

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ENGLISH SUMMARY

Title: Creativity as a Musical Practice: An Inquiry into the Emergence of Roskilde Festival

This Industrial PhD dissertation has been developed in collaboration with Roskilde Festival, the largest music and arts festival in northern Europe. It has been written with the overall purpose of promoting a theoretically and empirically informed understanding of creativity, which is relevant for the ongoing organisational, musical and artistic development of Roskilde Festival.

The findings of the dissertation contribute to the current conceptualization of creativity as a socio-material practice. Creativity is here understood as a dialogical process infiltrated in and dependent on the situation in which it takes place. The creative processes leading to new and appropriate ideas, products or performances are thus not understood to be based solely on mental activities, but rather as distributed practices both contributing to and depending on the surrounding material, social and cultural environment. Research on creativity must therefore be analytically attentive to the continuous dialog between subject – the creative person – and objects involved in the process: the materials, be they used by for example the festival volunteer in the process of creating the event or the instruments used by the professional musician, have an authority, an affordance, shaping creative behaviour.

Specifically, this dissertation is conceptualizing how the general philosophy of emergence theory, that a *whole* is other than the sum of its *parts*, inform the understanding of creativity as a social-material practice. The overall research question asks, '*how do creative processes, understood as musical and socio-material practices, develop in dialogue with emergent phenomena?'.* Creativity is defined as depending on musicality, understood as both an ability to contribute to the process of emergence and a quality of the emergent phenomenon. Methodologically, the dissertation is based on semi-structured interviews with musicians performing at Roskilde Festival (2016-17) and participant observations collected by following a one-year musical writing and production process resulting in the release of the mini-album *Syl* (2018) – a mini-album composed and produced by Dan Hvidtfeldt, Eske Nørrelykke and Anna Brønsted based on lyrics written by author Josefine Klougart.

The findings of the dissertation are presented in three published articles. The first article provides a theoretical language describing the emergent phenomenon as a 'material', akin to tangible, physical objects, though ephemeral. The article finds, that studies of creative processes, interested specifically in the relational, continuous dialog between subjects (e.g. musicians) and objects (e.g. instruments), must refer to the emergent process *to* which they are contributing and *through* which they become musical. Building in this theoretical framework in analysing interview and participant

observational empirical material, the second article explores *how digital materials – such as instruments and samples – can be involved in musicians' creative processes on stage in a 'musical' manner conducive to the process of emergence.* It concludes, that musical creative processes taking place on stage, involving digital tools and materials, depend on an openness towards a fragility, imperilling the situation and 'cracking' the digital materiality. With the intention of further exploring the theoretical framework presented, the final article illustrates, using examples from different levels of the organization, *how creative processes realizing Roskilde Festival become musical in dialogue with the event seen as an emergent phenomenon.* We demonstrate how Roskilde Festival is ritually (re-)created and how the ephemeral, emerging whole serves as a 'macro-structure' entangling creative behaviour within the organisation. Finally, it is discussed how the theoretical model presented could be further developed in future studies.

DANSK RESUME

Titel: *Kreativitet som en musikalsk praksis: En undersøgelse af emergens på Roskilde Festival*

Denne Erhvervs-ph.d.-afhandling er udviklet i samarbejde med Roskilde Festival, Nordeuropa største musik- og kunstfestival. Afhandlingen er skrevet med det overordnede formål at udvikle en teoretisk og empirisk informereret forståelse af kreativitet, som er relevant for den fortsatte organisatoriske, musikalske og kunstneriske udvikling af Roskilde Festival.

Afhandlingens konklusioner bidrager til den aktuelle konceptualisering af kreativitet som en sociomateriel praksis. Set fra dette teoretiske perspektiv er kreative processer distribuerede og situerede, da de både bidrager til og afhænger af de konkrete fysiske, sociale og kulturelle omgivelser. Analyser af kreativitet bør derfor rette opmærksomheden mod den løbende dialog imellem *subjekt* – den kreative person – og *objekter* involveret i processen: materialer, om det så er instrumenter, udstyr eller andre redskaber anvendt af den frivillige festivaldeltager eller den professional musiker på scenen, har en autoritet, et brugspotentiale, som infiltrerer og former kreativ adfærd.

Afhandlingen bidrager med ny viden ved specifikt at undersøge hvordan den generelle filosofi fra 'emergens'-teori – at en *helhed* bør forstås som noget *andet* end summen af de enkelte dele – informerer forståelsen af kreativitet som en sociomateriel praksis. Det overordnede forskningsspørgsmål lyder, *'hvordan udvikles kreative processer, set som musikalske og sociomaterielle praksisser, i dialog med emergente fænomener?* Kreativitet defineres således som afhængig af musikalitet forstået som både en evne til at bidrage til emergensprocesser og en kvalitet ved emergente fænomener. Metodologisk er afhandlingen baseret på semi-strukturerede interviews med musikere som indgår i Roskilde Festivals program (2016-17) og deltagerobservationer indsamlet igennem et en 1-årig musikalsk skrive- og produktionsproces som resulterede i udgivelsen af *Syl* (2018) – et mini-album med musik af Dan Hvidtfeldt, Eske Nørrelykke og Anna Brønsted, skrevet med udgangspunkt i Josefine Klougarts tekster.

Afhandlingens resultater er præsenteret i tre publicerede artikler. Den første artikel udvikler et teoretisk sprog der beskriver det emergente fænomen som et flygtigt og levende 'materiale'. Artiklen konkluderer, at analyser af kreative processer, specifikt interesserede i den relationelle, kontinuerlige dialog mellem subjekter (fx musikeren) og objekter (fx instrumenter), må referere til den emergente proces *til* hvilken de bidrager og *igennem* hvilke de bliver musikalske. Afhandlingen præsenterer desuden en artikel der undersøger *hvordan digitale materialer – som eksempelvis instrumenter og samples – kan involveres i musikeres kreative processer på scenen på en musikalsk måde, der bidrager til emergensprocessen.* Artiklen konkluderer, at musikalske

kreative processer, som involverer digitale instrumenter og andre materialer i skabelsen af en performance, afhænger af en åbenhed overfor det skrøbelige og 'farefulde', og det som 'bryder' den digitale materialitet. Den sidste artikel, som er inkluderet i afhandlingen, udforsker den foreslåede teoretiske ramme ud fra spørgsmålet: *Hvordan bliver kreative processer, som er involveret i realiseringen af Roskilde Festival, musikalske med reference til begivenheden set som et emergent fænomen?* Vi demonstrerer således hvordan Roskilde Festival hver år rituelt (gen)skabes som emergent fænomen, og hvordan denne flygtige helhed fungerer som en makrostruktur infiltreret i kreativ adfærd i organisationen. Afslutningsvist diskuteres det, hvordan den teoretiske model, som præsenteres i afhandlingen, kan videreudvikles i fremtidige studier.

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The process of writing an Industrial PhD project is dependent on the trust and support of many people. I find it appropriate to use this first opportunity to express my gratitude to the co-funding partners. I decided to pursue a career in academia during my years as a master's student, and had been working on the project proposal for 3 years when the application was finally accepted at Innovation Fund Denmark and Roskilde Festival. It was, at least for me, a challenge to secure funding for a (predominantly) music- and arts-related research project, and, in my experience, it is generally becoming increasingly difficult to secure funding for studies within the liberal arts. Therefore, at several levels, I am genuinely thankful for the support given to the development of the ideas presented in the present dissertation.

Thank you, Signe and Anders! Thank you for having confidence in me, knowing that the process and output of this type of project are unpredictable. You have provided me with exactly the means necessary for any true creative process: I got the time and resources to start in the corner and grope my way through the Roskilde Festival maze and the research literature within the field. I sincerely hope I found a way that provided inspiration as we went along, and one which will also prove to be fruitful for the organization in the future. It has been a great adventure for me, and the trust placed in me by both of you, and of course by many other inspiring and supportive colleagues at Roskilde Festival, has been vital.

Thank you, Lene! From the very first emails we ever exchanged, you have been an indispensable source of inspiration and motivation. I have left each supervisor meeting with new ideas, renewed energy and confidence that I could ever finish an overwhelmingly complex and exhaustive project like this one. You have transformed the potentially challenging, lonely, frustrating and tiresome process of writing a PhD dissertation into a primarily social, fun, natural, focused and interesting adventure – I have most certainly already forgotten some of the darker sides of being a PhD student, but at least this is how I will remember the past years at the department. It has been such a privilege for me, as an apprentice, to have you as my supervisor.

Thank you to the talented and hardworking musicians and artists involved in the project, for setting aside the time needed for interviews and observations! The many hours spent with you in concert halls, studios and rehearsal rooms has been rewarding at many levels and precious to the understanding of creativity presented in this report.

Finally, from a more personal perspective, this project has been written at a wonderful and challenging time of my life – thank you, Maja, Ege, brothers, sisters, Mor & Far, and friends!

PREFATORY NOTES

This is a second, revised version of the originally submitted PhD report. I have, over the past six months, reviewed the manuscript in the light of the constructive and thought-provoking suggestions made by the PhD Committee. Many small adjustments have been made throughout, and whole sections have been added and deleted, which explains why the report is substantially different to the first edition. Below, I will present a brief overview of the key changes made to each chapter.

Chapter 1: Introduction

The introductory chapter has been extensively rewritten. I have relocated the introduction to the Roskilde Festival organization, so that the chapter gets to the point earlier and begins with a presentation of the background to, and research focus of, the dissertation. The research questions have been reformulated and reorganized into a primary research question focusing on my overall contribution to the specific research field of creativity, and two sub-questions addressing the empirical and theoretical explorations of the publications included in the dissertation. Hence, it should now be clearer that the dissertation is *primarily* an exploration of how I see theory on emergence informing a socio-material take on creativity, and *secondarily* a project focusing on music and Roskilde Festival – a distinction which justifies a core focus, in the introduction and throughout the report, on reviewing literature on the key notions of creativity, musicality and emergence. Therefore, these terms are now included in the tentative definitions of the terminology used in the report and the articles published. I have discontinued my earlier focus on 'meaning' and 'meaning-making', and redefined creativity to be dependent on musicality – a reformulation made with the aim of eliciting a simpler and more cohesive theoretical framework.

Chapter 2: Theory

Generally, the chapter now provides a more nuanced and structured review of relevant literature and core concepts of my theoretical framework. I have included an exposition of the 'material turn' in social and human sciences as a general history of ideas leading to socio-materialism, and a discussion of how I see the connection between the 'social' and the 'material'. I have kept the section (2.3) exemplifying how technological developments have infiltrated musical creativity over the years, but underlined that the purpose of the section is to exemplify my socio-material understanding of creativity rather than to detail how digitalization has changed the music industry. Finally, the chapter now provides a more thorough discussion of my understanding and use of musicality as a component of processes of emergence and a model visualizing how I understand the process of emergence in the creative settings studied.

Chapter 3: Methodology

The vagueness of my theoretical framework, as it was presented in the previous version of the report, contributed to the lack of a clearly demonstrated methodological approach – it is hard to convey a stringent narrative on how to reach a destination if the theoretical framework and analytical focus are not set straight. I have further reflected on the advantages of combining interview and participant observations as a methodological approach in the dissertation, inserted examples from the observational material, evaluated the use of principles from the phenomenological tradition in the development of a relevant analytical strategy and presented the emerging themes in the material gathered. Further, I argue for my decision not to frame the study specifically within an autoethnographic approach.

Chapter 4: Conclusions and future perspectives

The first part of the concluding chapter has been completely rewritten and is now an actual concluding chapter, summarizing the PhD's contribution to research on creativity as seen from a socio-material perspective. I end the chapter with a critical reflection on the publications presented, focusing primarily on definitions of and use of terminology and the theoretical framework. Over the years of working on the project, I have naturally developed my methodological and theoretical language and understanding, and thereby the terms used to describe the studied phenomena. The chapter seeks, among other things, to reflect on and navigate this development in an effort to develop a more coherent theoretical narrative. Finally, I now end the chapter with a discussion of the project's future research potential.

CHAPTER 1. INTRODUCTION

I first attended Roskilde Festival in 1996. My older siblings were kind enough to sacrifice some of their precious time with their best friends to introduce me, their twelve-year-old brother, to our hometown's major annual music and arts event. David Bowie played on the Sunday night on the Orange Stage, the main stage. It was overwhelming! My interest in playing music and in the music industry generally began at that time with my first attendance at Roskilde Festival; though I cannot describe exactly how, that concert played a key role in my musical development. When my older brother played the festival in 2000, he took me to see it. At the age of 21, I played my first concert at Roskilde Festival in 2005. I have been playing, studying and working with music and the industry ever since.

The music industry and the products supplied by its various actors have changed dramatically since I started listening to and working with music. Even though I am not *that* old, I was brought up at a time when the music industry was not fully digitalized. I listened to reel-to-reel tape recordings in the basements of my friends' houses; I have owned a Walkman, a mini-disk player, an iPod and now – once again – a vinyl record player. The recording studios where as an apprentice I learned how to track and edit music moved from fragile, expensive analogue tape recorders and massive mixing consoles in the 90s to portable digital sound-recording systems that are much more efficient and less expensive after the turn of the millennium (for a detailed historical overview, see e.g. Tschmuck, 2012). Prior to the digital age, the job title of 'record engineer' was appropriate, as one once had literally to be highly technically trained in order to operate the equipment needed to record any kind of sound or music. Today, music recording has become much more accessible and basically follows the trends in other fields, where the everyday use of computers is an intuitive part of day-to-day work. Of course, recording high-quality music still demands a high level of knowledge of music, acoustics and technology, and it is, at a professional level, a task for people both trained and talented. However, many opportunities have opened up for the musician who wants to experiment with sketches for new songs and digital simulations of old, expensive machinery (Brøvig-Hanssen and Danielsen, 2016).

It has always been obvious to me that these modern instruments and tools have great potential to both support the development of completely new musical expressions which will be alien to anything audiences have ever heard before, but also that they sometimes seem to be detrimental to the intentions of artists who are struggling to make a great, organic and 'living' live performance or 'perfect' musical album. I have attended concerts involving digital tools which were absolutely thrilling, engaging and in perfect musical balance, but I have just as often had the experience that the music was great, the musicians very skilled, the production highly professional, but still the concert seemed paralysed, absent-minded and inorganic - in other words, without *musicality*. I have been left wondering when and how digital tools are relevant

in a musical situation. I have been in the same situation myself, struggling in the studio or on stage, trying to make the music sound right with the 'digital tools' in hand.

I have experienced first-hand how music creation and performance in the studio and on stage have changed over the past 25 years. I can provide 100 arguments as to how it has changed for the better, and 100 more for how it has changed for the worse. I have been, and still am, puzzled and mesmerized in equal measure by the digital development of the music industry – especially by how it is affecting creative processes, audience experiences and musicality. This wonderment has piqued my curiosity, and my personal interest and engagement with creativity, music, musicality and Roskilde Festival has given me the motivation, courage and knowledge to follow through with the demanding task of authoring this Industrial PhD project.

1.1. THE EMERGENCE OF A THEORETICAL CONTRIBUTION

As indicated above, my motivation for engaging in this project was 'breakdown-driven' (Brinkmann, 2012, 2014) – driven by a genuine interest in exploring something I did not understand within a field of endeavour in which I had been daily involved. I have spent many years on stages and in studios working with more and more digital equipment, as the technological innovations and in the industry introduced them, but never – after hours and hours of discussions with musical colleagues – understood how digitalization infiltrate, challenge and support musicians' work processes on stage. I therefore picked up an overall research focus on 'musicians creative processes in the digital age', with the intention to specifically explore how digitalization of the 'materials' involved in musical performances (i.e. instruments, computers, etc.) is either conducive or detrimental to the creative processes.

I started framing a research project, based on – and with the aim of contributing to – a socio-material perspective on creativity. For the past years, this perspective of creative processes has emerged as a reaction to the focus on intra-psychological factors that hitherto dominated creativity research, drawing especially on socio-cultural psychological and anthropological perspectives. A social and material turn in research on creativity inspired by Latour (2005), Ingold and Hallam (2007) and Hastrup (2007) highlighted the argument that researchers seeking to understand creative work processes must take bodily aspects, people, artifacts, objects, nature, materials, and psychical surroundings into account. As stated by Ingold and Hallam (2007:3), *"the creativity of our imaginative reflections is inseparable from our performative engagements with the material that surrounds us".* The physical contexts of creative processes are not at all passive frames for individual mental processes, but rather *"substantial components of creativity in itself"* (Tanggaard,

2013:20): The creative process is understood to be weaving back and forth in a transactional dialogue between *subjects* – individuals who engage in creative processes – and *objects* – various tangible, physical materials, with all their symbolic and sociocultural meanings, involved in the process. As such, my initial exploration of musicians' creative processes was based on the fundamental theoretical idea that creative processes develop in dialogue with the constantly forwards moving and increasingly digital world: With digitalization, the socio-material context of individual creative processes in the music industry changes. New tools appear with digitalization (Tschmuck, 2012). The sound and general quality of music changes (Brøvig-Hanssen and Danielsen, 2016). Though a socio-material perspective on creativity is new and still developing relative to the broad field of research on creativity, a solid theoretical frame paying special attention to the socio-materiality of musicians creative work, the instruments used on stage, could be incorporated in an analytical model, and observation and interview guides.

Approximately six months into my project, I finished my initial theoretical readings and began interviewing musicians about their experiences involving digital tools and materials in their work. This became a pivotal point in my research process: I soon realized that asking musicians directly how they 'relate to their instruments' and 'what their experience was on involving various instruments in concerts' appeared to be questions that were too vague, open and thus difficult to respond to. These questions typically elicited the answer: 'well, it depends on the situation. The format of the concert' (see Hvidtfeldt and Tanggaard, 2018:636). My observations of and conversations with involved musicians during the data collection process started to interfere with an isolated focus on creative transactions between subject and object. Sometimes, perhaps in a small room, the musical relationship between a musician and a specific digital tool is in perfect musical harmony and inspiring, whereas the same interaction could be terrible if the situation were different.

As my work with the PhD took shape and I read more closely into the research field, I realized that the key theoretical problem I encountered was that musical performances cannot meaningfully be *reified*. Inspired especially by Small's (1998) book *Musicking*, I started becoming aware, that the result of musicians' creative processes on stage is misunderstood if perceived as a "thing" produced by a group of musicians involving various instruments, and that this problematic 'thing-making' of music is linked to the above described challenge of analyzing subject-object relations within the field: The musical performance obviously involves physical, tangible materials, such as instruments and other equipment, but the *creative result* of a musical concert characteristically arises as an ephemeral phenomenon developing in intricate, social, and concerted processes, involving various contributions from different actors, such as musicians, acoustics, instruments, the audience, etc. Creative processes are always complex, but the ephemeral, living concert, understood as a creative 'product', is of a very different nature than the architects house or designers chair, and much analytical attention – within the literature on which I had based my

initial theoretical framework – had previously been paid to creative processes leading to design, architectural, artistic, or otherwise *tangible*, reified results. Without having the right words to describe this lack of theoretical grounding for my understanding of the ephemeral materiality of music and performances, I realized early in the research process that I needed a broader, more holistic theoretical framework than I could adapt directly from the available literature on creativity seen as a socio-material practice. An isolated focus on the relational creative interaction between musician and (digital/analogue) instrument was – to my immediate musical understanding and that of the interviewees – inadequate in an analysis of how digitalization affects musicians creative performance processes on stage.

As the report that follow and the articles published reveal, *emergence theory* provided me with a theoretical language that I found suitable. Inspired especially by the work of e.g. Sawyer (e.g. 2005, 1999) on social emergence and Small (1998) on the living, concerted nature of musical performances, I began, more openly, exploring the socio-material processes creating musical performances. The notion of emergence has been applied in many different fields, but Keith Sawyer is one of the few researchers who has written specifically on creativity and social, collaborative processes of emergence. He describes the emergent phenomenon as:

> *[…]not a final end product, like a creative product or a connectionist network end state; it is a constantly changing ephemeral property of the interaction, which in turn influences the emergent processes that are generating it. This results in both top-down and bottom-up processes; the emergent is 'initially' created with bottom-up dialogical processes, but immediately it takes on constraining, or top-down, characteristics. In complex multi-layered systems, top-down and bottom-up processes are always simultaneous and bi-directional.*
>
> Sawyer (1999:465)

I found his conception of emergence to be useful for my analysis in two ways: (1) I refer to emergence theory in developing a language describing the ephemeral phenomenon – the emergent 'whole' – appearing as something 'other' than the sum of the parts (Ferrell, 2014: 436), when skilled musicians succeed in playing 'musically' together in concert; (2) To a description of how this ephemeral, social results feed back in a transactional process, and, as such, function as a socio-(im)material reference for the continued, creative engagement with the musical performance. The work on my theoretical framework resulted in the published article *"Concerted Creativity: Emergence in the Socio-(Im)Material and Intangible Practice of Making Music"* (Hvidtfeldt, 2018a), while my actual empirical studies on musicians' involvement with digital materials in creative practices on stage are presented in the article *"Concerted Creativity in the Digital Age: How do we Crack the Code…?"* (Hvidtfeldt and Tanggaard, 2018).

Roskilde Festival - an emergent phenomenon

With the introduction of emergence theory, my project took a new direction deviating from the original focus on musicians' creative processes in the digital age. My research focus ventured from a theoretical focus on *musicians'* creative practices on stage and digital materiality to an exploration of *musicality*, more generally, in creative processes as seen from a socio-material perspective. As such, I broadened the theoretical perspectives of the musicians' creative processes to become an analysis of the various creative processes collectively creating Roskilde Festival as a major event. In an effort to, in a more general sense, discuss how theory on emergence informs a socio-material conception of creative processes, I wanted to explore how the creative result of 'Roskilde Festival', though social, ephemeral and 'intangible' like the musicians' performance, has socio-material qualities to the creative processes realizing the event: Each year, 130,000 participants come together to listen to music, party, camp and create the largest cultural event in Northern Europe. Although the event is facilitated by a smaller host organization, it is essentially realized by a major concerted creative effort – the realization of the festival cannot be ascribed to one actor in the process, why fractional analysis of subject-object relationships at its lower-levels will not do justice to the entanglements of the creative process nor a description of the result. Based on the theoretical ideas presented in my first published articles, this dissertation therefore also explores how emergence theory informs the analysis of the creative processes of participants at Roskilde Festival. My work resulted in the published article *"Creativity as a meaningful, socio-(im)material practice: The emergence of Roskilde Festival"* (Hvidtfeldt and Tanggaard, 2019).

Hence, while my work on the dissertation began with a breakdown in my understanding of musician's creative processes in the digital age, the final dissertation presented herein is, more broadly, theoretically and empirically interested in *musicality* and *emergence* in creative processes understood as a socio-material practice. Like so many PhD students before me, I started with an idea, studied, became wiser, worked my way through my findings, and finally conducted this investigation, which is substantially different from my initial expectations. It has been a truly open, messy and engaging creative process, which cannot be easily traced in retrospect. I have written the story above at the beginning of this dissertation with the anticipation, that a chronological description of my journey through the PhD maze and final identification of a research gap, can contribute to the meaningful reading of the following report.

The sections following this first introduction will present the research questions of the dissertation and discuss key definitions and limitations of the project. Also, the Roskilde Festival organisation is described in a discussion of the project's scholarly contribution to the strategic and commercial development. Finally, the overall structure of this report is outlined with a brief summary of the individual chapters.

1.2. RESEARCH QUESTIONS AND INITIAL DEFINITIONS

Building on the dual purpose of contributing with new scientific knowledge on creativity while contributing to the strategic and commercial development of Roskilde Festival, the research questions guiding the presented dissertation are:

RQ. *How do creative processes, understood as musical and socio-material practices, develop in dialogue with emergent phenomena?*

- SQ1. *How can digital materials – such as instruments and samples – be involved in musicians' creative processes on stage in a 'musical' manner conducive to the process of emergence?*
- SQ2. *How do the creative processes realizing Roskilde Festival become musical in dialogue with the event seen as an emergent phenomenon?*

The separation between overall research question and sub-questions underlines a hierarchic figure-ground relationship – the dissertation contributes new knowledge on creativity seen as a socio-material practice *before* it contributes knowledge on music and music festivals. Only secondarily are these fields addressed as *musical* domains. This is a key distinction, with decisive consequences for the literature reviews of the report and articles, and generally for the way in which the content is structured. I have focused on positioning the contributions within studies on cultural psychology and creativity, and targeted scientific journals within these fields, rather than e.g. musicology.

The overall research question (RQ) is broadly explored in all three articles published with the dissertation. The first article (Hvidtfeldt, 2018a) presents a theoretical framework that is then applied in two distinct musical settings having the transactional relationships between subject and object considered as units of analysis: (SQ1) the emergence of the music performance situation (Hvidtfeldt and Tanggaard, 2018), and (SQ2) the creative realization of Roskilde Festival, seen as a musical, emergent phenomenon (Hvidtfeldt and Tanggaard, 2019).

A tentative definition of creativity

Creativity, digitalization, emergence, and musicality are "big", theoretically loaded terms that have been studied from a vast number of different perspectives, why clear definitions, and a tentative discussion of their relationship, is essential to articulate the research focus of this project. Therefore, in a further effort to specify the research focus of the dissertation early in the report, some of the most obvious theoretical subjects related to the project will be explained.

Creativity is often associated with 'ideation'. However, in delimiting the research focus of the present study, it is important to underline that I am not studying how

musicians get the *ideas* for the composition of songs, themes, sounds, or lyrics. However interesting it may be, I am not following such authors as Folkestad (2012), Nilsson (2002), and Brøvig-Hanssen and Danielsen (2016) in focusing on e.g. how the generation of novel ideas for music composition can be stimulated via digital means, or how participants such as arts curators or music bookers at Roskilde Festival can 'brainstorm' new ideas for the development of the festival. I am focusing primarily on the other half of the equation: beyond the aspect of novelty or ideation, creativity is very much about making new ideas – or good old ones, for that matter (Tanggaard, 2014) – *work* within a specific setting. In this case, musical processes of emergence.

Inspired by Mason (2003), Sternberg (2006), and Glăveanu (2010), I define creativity as a process of *'acting in and on the world in new and musical ways'*. Hence, creativity is understood as both action and *re*action – as a transactional process between creators and their socio-material situation, in a given social practice in a specific historical moment. I prefer this definition as it highlights how creative processes are not developing inside peoples' heads while paying specific attention to musicality.

Creativity as dependent on *musicality*

The use of the noun 'music' and the adjectives 'musical' and 'musicality' throughout this dissertation can lead to confusion as music refers to a specific domain, musicality to a general ability or quality, and musical potentially to both. I have deliberately used *musical* in the title of this report because of this duality, referring to both uses of the term in the dissertation. Therefore, let me underline, in this project, musicality reaches far beyond the world of music – I use the term to refer to much more general ability, trait or quality of people, situations, and materials. In doing so, I have been inspired by Hansen who wrote that:

> *One could speak of the musicality of a poem or even in a novel, one could speak of the musicality in a person's way of using the body: in dancing, in sports, when running or walking, simply the way people move seems borne out of musicality. We can also speak of a joint musicality in the manner we socialize – or a lack of musicality. Sometimes we experience great challenges in the communication between mother and child because they do not 'play' the same 'tune', so that they completely lose contact with each other. The good contact demands, that the two of them synchronize the interaction into a single 'melody'.*
>
> (Hansen, 1990:43) [translated by the author]

There is an obvious link between music and musicality. Musicality is named after the practice of performing music, as it is a very good example of an outlet of the quality – most people know, intuitively, what musical, 'living' music, is all about, as many of us have heard and felt music that was euphoric living, and really 'swinging'.

However, it is, as described in the quote above, found elsewhere. Also using examples from the musical domain, Bastian (1987), a Danish musician and author, outright defines musicality as 'tonal emergence', that is the ability with sound, the instrument, and the body as the material, to create unity, something other than the individual actors and elements combined. When asked if the *un*musical exists in an interview given to one of the Danish morning papers, Bastian replied: *'Yes, just like good and evil exists. Musicality is the ability to create tonal emergence, whereas unmusicality separates and disintegrates. A bawling, destructive blind and deaf*' (Bastian, 2012) [translated by the author]. Hence, musicality is understood to be the ability to make the music 'come together' or 'come alive', as many of my interviewees have formulated:

> *One should have the experience, that the music comes alive (App. D:43)*
>
> *You need some chaos, you need a 'margin of error' before the music can live (App. F:95)*
>
> *One could say, that the reason why we bring "real", or analogue instruments, with us on stage – it is exactly to make the concert more vivacious (App. C:33)*

The interviewed musicians describe how they have practiced for years, both in solitude and together, and experimented with involving different (both digital and analogue) instruments in their performances with the aim to develop a musical concert that emerges as a 'living', ephemeral phenomenon. Not a concert that is precise and mathematically 'correct', but rather living as something in itself, with all kinds of 'imperfections'. Inspired by conceptualizations both driven by practice and theory, I thus see musicality broadly as the prerequisite, not only for the emergence of music but also, for example, for the creative realization of Roskilde Festival to be seen as an emergent phenomenon. For music or Roskilde Festival to emerge out of the various contributing input, a *musical* ability to make things come alive is key.

To summarize, I see musicality as 1. an ability to contribute to a process of emergence and 2. quality of materials and emergent phenomena.

Digitalization of musicians' performances

The main driver in the initial phases of my project has been, as described, my curiosity in relation to the involvement of 'digital materials' in musician's creative practice. I should, therefore, underline what I mean when I talk about digitalization and digital materiality. Today, 'digitalization' is omnipresent; it is a fundamental, transformational process by which most industries have been affected, why the term has given rise to many associations. When asking musicians about the consequences of digitalization in their careers, they have often spoken about economic developments; that is, how the digital revolution has changed revenue streams in the industry. Clearly, these changes have had a huge impact on many musicians' professional lives, so their attention is automatically drawn towards these matters.

Also, in the interview sessions I conducted for this project, the question has led musicians into discussions related to communication with fans online and the co-creation processes as recording sessions and tracks can be shared efficiently with listeners and colleagues worldwide in the digital age.

I have operated with what was perhaps, at first, a relatively strict separation between 'analogue' and 'digital' materials in the analysis. As discussed in the methodology sections of the report (see Chapter 3) and the article on digital materiality in creative processes (Hvidtfeldt and Tanggaard, 2018), this framing, if presented properly, is typically and intuitively meaningful to musicians. The profound changes to the music industry provoked by digitalization have had such rapid and profound consequences for both musicians and listeners that musicians typically have had a strong and embodied experience of the material difference between 'digital' and 'analogue'. Discrete, digital 0s and 1s are often involved in music production and performance owing to their 'quantitative' potentials, which are characteristically different from the potentials of their continual, analogue counterparts. Musicians and producers have felt that, when standing on stage or working with music in the studio 'holding music in their hand'.

Hence, although the separation between analogue and digital materialities might at first appear strange, it is not too abstract for the interviewees to discuss. Obviously, in the interview situations, I sometimes needed to specify and provide details, but when I succeeded in presenting the project concisely in the opening talk of the sessions (and I learned to be very careful), the focus on the *materiality of digital production tools and instruments* and how the interviewees have experienced those tools' involvement in musical processes was clear (see the interview guides in Section 3.1).

1.3. THE INDUSTRIAL PHD PARTNER: ROSKILDE FESTIVAL

Before getting further lost in theoretical discussions and methodological considerations, the main partner in this project, Roskilde Festival, along with the interest of the organization in the project, must be presented. My motivation for engaging in the work on this dissertation, as described above, is ignited by both my personal and professional interest in music and creativity. This is atypical for a project of this kind involving a business partner as Industrial PhD projects are often driven by a specific strategic and commercial interest in the field of study. Obviously, I did not approach the industrial partner with an idea for a project completely alien to the organization, as I wrote the proposal with knowledge about, great interest in, and motivation to develop Roskilde Festival as a cultural event, but *I* took the initiative and based the PhD proposal on my previous work and professional interests – not the other way around. I see it as a great privilege (!), both professionally and personally, to have been able to conduct research that arose out of my own curiosity. It is

obviously highly motivating and personally rewarding to explore a question out of genuine interest, and it provides the opportunity to pursue interesting, personally engaging methods of inquiry.

Roskilde Festival is the largest music and arts festival in northern Europe (Roskilde Festival, 2018b). Since the first festival in 1971, the non-profit organization has presented a heterogeneous programme of music and arts performances and installations for hundreds of thousands of participants and donated more than €40m to humanitarian and cultural projects. In 1971, the festival had one stage, around 20 artists (a few from UK and US, but mainly from Denmark), and 10,000 visitors per day. In 2019, a total of 130,000 participants (volunteers and paying audience) from 67 different countries were introduced to 184 artists from a wealth of genres, from more than 30 different countries. In terms of the music programme, the 2019 artist roster featured major acts such as Bob Dylan, hip-hop legends Wu-Tang Clan, and Danish pop act MØ on the Orange Stage, a great number of Danish and international acts performing on stages around the main site, and upcoming Nordic artists playing on the smaller stages during the warm-up days in the camping area. As such, the phenomenon of Roskilde Festival has grown from a predominantly local music event inspired by the music festivals of the time – for example, the Isle of Wight (1968-70, UK) and Woodstock (1969, USA) – into a highly diverse, international, and lively affair.

Figure 1. *Map of the Roskilde Festival site 2019*

In the above map of the festival site from 2019, it becomes clear how Roskilde Festival in many ways, resembles a medium-sized Danish city, with a railway station

(participants can take the train directly to the main site), grocery stores in the camp area, food courts and a city centre around the Orange Stage. Both the camping site (open the whole week) and the main festival area (Wednesday to Saturday) consist of different zones, some livelier than others. Depending on temperament, it is both possible for the youngsters to get the full experience by living close to all the parties and concerts, and for the more easy-going participants to get a good night's sleep in one of the more remote areas, which are also reserved for the hard-working volunteers who sometimes must get up early.

ORGANIZATION AND STRATEGY

Formally, Roskilde Festival is organized by the Roskilde Festival Association, which is part of the Roskilde Festival Group alongside the Roskilde Festival Foundation. Roskilde Cultural Service that employs the festival staff, is a subsidiary company of the Foundation. The overall stated purpose of the Roskilde Festival Group is *'to support humanitarian, non-profit and cultural work with a specific focus on children and young people'* (Roskilde Festival, 2018b [translated by the author]).[1] The strategic ambition is to develop *'open and engaging communities, making way for change through music, arts, sustainability and active participation' (*Roskilde Festival*,* 2018b [translated by the author]*)*[2].

In 2016-18, an overall strategic 'theme' of the festival has been 'equality' (Roskilde Festival, 2018c) – a theme which has guided curational practice in the artist talks, events, performances, debates, etc. during the festival. In that sense, Roskilde Festival is and has always been much 'more than a music festival' (Roskilde Festival, 2018e). It should rightfully be described as an activist, political, and non-profit organization that seeks to influence social discourses, supports humanitarian projects and fosters political awareness though involvement in art and participation in a strong socio-cultural fellowship. Roskilde Cultural Service employs approximately 70 people full time who work primarily on the production of the main event, but an increasing number of activities are organized throughout the year.

[1] Original, Danish version: *'Formålet er at støtte humanitært, almennyttigt og kulturelt arbejde med særligt fokus på børn og unge.'*

[2] Original, Danish version 'Vi udvikler åbne og engagerende, der flytter mennesker gennem musik, kunst, bæredygtighed og aktiv deltagelse.'

MUSIC, ARTS & ACTIVISM: IMPLEMENTATION OF THE PROJECT

I have been positioned in the Content Division, later renamed to Music, Arts & Activism, the division with the main responsibility for the music and arts programme of the festival. Anders Wahrén (Head Booker – Content, music programming) has been my closest superior and day-to-day advisor, and Signe Lopdrup (CEO) has been my main supervisor in the organization. The division mainly employs music agents and art curators who follow and explore current trends within their fields and align the content booked according to the overall strategy of the organization.

The core artistic values of the Programme Strategy are summarized in the following quotes:

> *We believe in the value of art to the community. Art and culture are kaleidoscopes for the societal agenda of the time, giving nuances to and unfolding how we view the world we live in. Art projects can strengthen the community by collecting, engaging and creating unique experiences*[3].
>
> (Roskilde Festival, 2018d [translated by the author])

Further, in the strategy for the musical and artistic programme, the highlighted ambition is presented as *'a programme setting a cultural agenda, where the most socially relevant issues of the time are brought forward by creative and significant musicians, artists and debaters'*[4] (Roskilde Festival, 2018d [translated by the author]).

Musical and artistic content is thereby presented to the audience at Roskilde Festival in a dual effort: one that reaches *in* towards the development of the product sold at the festival market, and one that reaches *out* towards political and socio-cultural change in general. Firstly, Roskilde Festival seeks to facilitate distinct experiences for the festival participants: the music and arts programme must have a lot to offer not found elsewhere in the market, for the festival to be relevant and thus sell tickets. Secondly, the organization aims to push cultural boundaries in seeking to broaden horizons and challenge the norm on social and cultural issues related to e.g. gender and economic equality, the environment, and sustainability. Hence, by identifying and showcasing artistic talent and producing concerts and performances, the festival agents and curators obviously seek to entertain the audience, but they also have a strong emphasis

[3] Original quote: *'Vi tror på kunstens betydning i fællesskabet. Kunst og kultur er et kalejdoskop for tidens samfundsmæssige dagsorden, den nuancerer og udfolder udsynet på den verden vi lever i. Kunstprojekter kan styrke fællesskabet ved at samle, engagere og skabe unikke oplevelser.'*

[4] Original quote: *'Et program der sætter kulturel dagsorden, hvor tidens mest samfundsrelevante dagsorden bæres frem af nyskabende og markante musikere, kunstere og debattører.'*

on exploring and challenging how people generally understand music and art, and hence contemporary social and cultural issues.

The strategic scope of Roskilde Festival is broad, and obviously, no project would ever, not even if focusing specifically on a single sub-strategy, be capable of exploring the vast number of organizational challenges in a rapidly changing and complex market. With this dissertation, I have argued that the pursuit of 'the creative' underlies both the commercial and the cultural progress of the festival, and is fundamental to the mark the organization seeks to make in the world. Hence, beyond the direct academic purpose of developing new scientific knowledge relevant in its own rights to the field of creativity research, I have written the dissertation with the intention of strengthening the organization's understanding of its own creative character, including the contributions of the creative musicians on stage (sometimes) struggling to make and perform music in the digital age.

I have held monthly supervisor meetings where the trajectory of the project has been evaluated and dissemination of the knowledge generated both internally in the organization and externally in the extended network of actors of the festival, has been discussed. The theoretical territory explored in the project on creativity, psychology, music history, musicality, technology, and digitalization, interesting stories that have been told by the interviewed musicians, and ultimately the knowledge generated via the analysis, has been discussed in both informal and formal meetings with colleagues at Roskilde Festival throughout my period of employment.

I have presented the research focus of my project to the music agents, the production department and, as the project developed, more broadly to the art curators and management at internal meetings and seminars. Further, I have been involved in the development and organization of content for the festival, such as specific concerts and collaborations with external partners. In more informal, everyday settings, I have obviously been preoccupied with the subject of my dissertation, and the theoretical framework of the project has, therefore, been brought into all kinds of daily conversations with colleagues about, for example, whom to hire and how to position the artist within the programme of the festival in a manner conducive the 'creative emergence of the festival'. In return, my colleagues have been an indispensable resource when it comes to inspiring me in terms of who to interview, how to gain access to their creative processes, and how digitalization changes the industry. As such, my research design has been greatly influenced by their knowledge, willingness, and the general potential for access to the industry ensured by the strong brand of the organisation which opens many doors.

Not always have my ideas and concepts been presented with the utmost concision, and they have most certainly not been easily transferable into concrete actions, but I hope some of the contributions have been at least inspiring, and when they were not, that my colleagues will forgive a preoccupied PhD student engaged in an open, creative research process.

1.4. STRUCTURE OF THE DISSERTATION

I end this introductory chapter with a brief outline of the main content of the four chapters of the dissertation.

Chapter 2 further examines the background to the development of a socio-material perspective on creativity and seeks to link and illustrate the theoretical position directly to the world of music, technological development, and theory on emergence.

Chapter 3 is devoted to a presentation of the methodological considerations related to the development of the article *Concerted Creativity in the Digital Age: How do we Crack the Code…?* (Hvidtfeldt and Tanggaard, 2018) and, specifically, to SQ1. I present the background and strategies for the collection of interview and observational data, with specific emphasis on the challenges of gaining access to the field and of engaging previous knowledge in a manner conducive to the research process.

Chapter 4 presents a summary and discussions of the findings of the three articles constituting the main contribution of the dissertation, and briefly discuss how the theoretical framework can be relevant and further developed in future studies.

CHAPTER 2. THEORETICAL BACKGROUND AND CONTRIBUTION

Individual accomplishment is always fascinating and alluring. We honour the individual scientist with a Nobel prize, read long biographies of the CEO who led the company to great success, and admire the soccer player dribbling past the defence and scoring impossible goals one after the other. The individual is very often held responsible, both when things go well and when they go wrong. We are also very quick to blame ourselves when we fail, instead of openly questioning often complex circumstances and courses of events. But why is this so when scientists, CEOs, and soccer-team-players alike are obviously dependent on so many people and things in so many ways? Science always builds on previous knowledge, companies depend on the extended and complex division of (cognitive) labour, and soccer teams obviously win the game through a concerted effort of all involved.

One explanation of why we are so preoccupied with the individual is that social and material situations are too complex for us to comprehend. As described by Sloman and Fernbach (2017) in the book *The Knowledge Illusion*, we are incapable of understanding the world directly in all its complexity, although it is a common illusion. As a mental defence mechanism, we simplify the world in order to be able to act in it: we perceive the family car as one thing, rather than as the thousands of individual parts that it is actually made of. But when a simple mechanism, one we never noticed before, is suddenly not working, the whole system breaks down. Similarly, not until one aspect of a social situation changes, an aspect that our conscious attention is not directly focused on, do we wake up and react. This project illustrates how hard it is to describe directly what is involved in meaningful performative and social situations – a good concert, for example – as the relationship between the parts involved in its creation is not at all easily understood and described. As well, when producing musical performances we tend to simplify our complex world and attribute success and failure to the individual: the musician on stage, on the poster, and in all the interviews, even though the concert is developed in a concerted effort (see e.g. Small, 1998).

The history of creativity theory is no different, as much theoretical attention has already been devoted to the development of research seeking to understand its individual intra-psychology (Glăveanu, 2010; Tanggaard, 2011). However, as the following section reveals, the analyses of this dissertation are rooted in a much more social and distributed theoretical approach to creativity. This chapter is dedicated to a broader introduction to the socio-material perspective on creativity, which has guided this project and to which the published articles contribute.

I begin by presenting my definition of creativity, continue with a brief introduction to the history of ideas within creativity research including the socio-material perspective, use examples of technological development within music, and end by introducing the

contribution of the dissertation on how I see emergence theory informing the field of study.

2.1. DEFINING CREATIVITY: NOVEL AND MUSICAL

Creativity is often defined as that which is both *novel* and *appropriate* (Sternberg and Kaufman, 2018; Amabile, 2018). At a distance, a relatively simple definition and a forceful way to understand creativity, as it points to the core of the matter: if a product, service, idea or event is creative, it is because it has something new to offer, something we appreciate. If seeking to produce something creative, one has to come up with a new idea, something that no one has ever seen or heard before, which at the same time is something understandable and of value. It seems simple, but one does not have to scratch too deep into the surface of this basic definition before it becomes hazy and ambiguities start to emerge. What does it mean that something is new? When is something new appropriate? To whom? One could even raise the question, if there is an inherent ethical dimension built into the defining aspect of 'value' or 'appropriateness', like, for example, it is done in the book *The Dark Side of Creativity* (Cropley et al., 2010). Are the processes leading to the invention of the atomic bomb simply a dark side of creativity, just as creative as the processes of writing the Beatles' songs about peace, love, and harmony?

The definition of creativity applied in this dissertation, as a more narrowly defined version of the general one presented above, is inspired by and aligned with a socio-cultural psychological tradition of studying creativity as a distributed practice. Inspired especially by Mason (2003), Sternberg (2006) and Glăveanu (2010), I have defined creativity as *'acting in and on the world, in new and musical ways'*. Hence, the 'world', the physical, social, tangible, symbolic, cultural world we inhabit, with the potentials, barriers, materialities, history, and knowledge it holds, is seen as integral to creative processes. The following sections introduce and discuss the key – and theoretically loaded – terms of this definition.

When is what new?

Novelty and processes of ideation are often highlighted as defining features of creativity and arguably, digitalization hold great potentials in terms of generating new ideas; the *'era of endless undo'* (Brøvig-Hanssen and Danielsen, 2016:101f) enabled by modern recording technology, for example, facilitate experimentation ensuring that no musician should be afraid of trying new things out in their search for new musical expressions far outside the notorious 'box'. They can easily 'undo' their failed attempts in the computer, do not have to fear running out of disk space or wear out fragile magnetic tape recorder reels – the computer enables them to work and experiment until the best ideas are realized. In that sense, for example, though this topic is not addressed specifically in this dissertation, digitalization is arguably

conducive to creative processes. A theoretical conception of relationships between digitalization of musicians' practices and *serendipity* would be very relevant, and several interesting perspectives could be found in the data of this dissertation. However, I chose not to follow this path in the material, for two main reasons. Firstly, interesting earlier studies on musical creativity, also seen from a social-material perspective, has been written by for example Folkestad, Lindström and Hargreaves (1997) and Folkestad (2012), exploring how creative processes and compositional practices are stimulated, and develop in different directions, in a computer-based environment. Also they conclude, that the computer enables the young musicians to perform, simply on the basis that the whole group of participating children succeeded in composing a meaningful piece of music, irrespectively, that they typically had close to no training. Bertelsen, Breinbjerg, and Pold (2009) also focus on how the generation of novel musical ideas can be stimulated via digital tools and as argued by Sawyer, western psychology has generally induced research on musical creativity to study primarily processes of individual composition (Sawyer, 2012:338). For this reason, it is alluring to focus attention in another direction.

But more importantly, another reason for not focusing specifically on novelty or ideation as defining criteria have been based on an ontological argument. In all moments, even the oldest idea will be presented in a context that is different from the moment we just saw – the 'flow of the stream' notoriously makes it impossible to step into the same river twice (Heraclitus). As aptly formulated by Hastrup, *'the interim is saturated with ontological uncertainty'* (2007:196) – in all moments, the future is unpredictable and the world is, so to speak, *'always in the making'* (Jackson, 1996:4).

In this light, the original, unique or novel is inevitable. Musicians, for example, even when they actually intend to mimic their heroes, necessarily personalize (Sawyer, 2012:337f) and always present their ideas, in a new context. As argued by Tanggaard:

> *I am, in fact, less interested in celebrating the new, which is typically integral to the discourse on creativity. I argue, in explicit contrast to the modern conceptualization, that creativity is less a rebellion against limitations present in the current world than it is a type of adaptation and response to the possibilities and barriers with which we live in this ever-changing world.*
>
> Tanggaard (2012:26)

In line with Tanggaard conception, I have perceived novelty as an integral aspect of everyday life, rather than a unique feature of creativity, and creative processes as entangled with the 'barriers' – the old, social, cultural and material world – rather than deliberately isolated from them. As described in the below, I have emphasised how creative contributions become meaningful as a musical contribution, not because novelty is irrelevant, but rather because it is, in a sense, inescapable in musical settings. I have been specifically interested in how 'music becomes music' – or, more precisely, how music becomes 'musical' – and, from there, how e.g. 'digital materials'

can be musically included in this complex process. I have seen that, not as the only challenge, but as a key challenge of creativity in music-making today. Hence my breakdown in understanding as described in the introduction. Therefore, in this project, I have highlighted the other half of the creative equation, being value, appropriateness, or *musicality* as I have preferred to label it.

Why musicality / 'meaning'?

Consensus does exist, at a general level, on the definition of creativity, but the specific words used in describing the term are not well aligned. Depending on the field and research interest, creativity is often defined as, for example, depending on usefulness, value or e.g. significance. Teresa Amabile (2018) suggests that appropriateness can act as an umbrella term capturing these various terms related to various processes and specific tasks. She exemplifies this by describing how creativity within natural sciences demands 'correctness' – the appropriate solution to a mathematical problem is the *correct* one. In the – for the sake of the argument – diametrically opposite corner of maths, within the world of art, creativity perhaps depends on the *thought-provoking,* or the aesthetically, conceptually interesting. In this dissertation, I define creativity as depending on the new and the musical. Not because notions of appropriateness, usefulness or value are irrelevant in describing creative output in many scholarly, everyday and professional situations, but rather to underline the musical, emergent nature of appropriate actions and contributions within the studied field.

Initially, from a purely linguistic perspective, the moral and rational connotations of 'value', 'usefulness' or 'appropriateness' appear alien to 'musicality' and 'emergence' explored here, and in a sense too pragmatic. More importantly, though, whereas several of the suggested notions primarily target an evaluation of the finished product, i.e. whether it can be understood as bringing something of value or significance into a specific culture at a specific point in time, the notion of musicality better points to the process, to the more fundamental question of making musical situations 'come together'. In a practical sense, I interviewed relevant interviewees about their general experiences of making music or performance work – not about how to make a 'useful' or 'appropriate' cultural contribution such as the 'product of a composition'.

In the articles, written prior to my final work with this report, creativity is defined '*acting in and on the world in new and* meaningful *ways'* (Hvidtfeldt, 2018a:232 [emphasis added]). I have thus been working with a conceptual connection between musicality and meaning-making, but realize in hindsight with this reporting of my collected work with the dissertation, that the separation between the two confuses more than it details. 'Meaning', 'meaning-making' and 'meaningful' are all complex terms, conceptually fundamental to a variety of research fields. Initially, think about the classic, all-encompassing Existentialist question 'what is the meaning of life?' (asked by e.g. Kierkegaard and Sartre); we are certainly in the category of large questions here. But meaning-making is also a key concept within more contemporary

fields, such as cultural studies, (social) semiotics and linguistics (See e.g. Hall, 1973, 1980; Halliday, 1978; Thibault, 1991). Within psychology, meaning-making is typically understood as the process through which the individual makes sense of various events in life (see for example Frankl, 1971, 2006/1946; Jacobsen, 2011), and within a socio-cultural psychological tradition, for example, as the way in which mental processes and cultures are mutually constituting in an ongoing process of sense-making (Valsiner, 2014; Glăveanu, 2010). Although the aspect of meaning has become a defining criterion of creativity elsewhere (see e.g. Kaufman and Gregoire, 2015; Sääksjärvi and Gonçalves, 2018; Tanggaard, 2018), it is not necessarily defined in the same way. In the articles, I (simply) have used 'meaningful' to refer, in a narrow sense, to the process of emergence – how a musical practice moves from chaos to cosmos, from random notes to musical, living and engaging music, and from cacophonous social and material situations to meaningful, though temporary and ephemeral, communal phenomena.

Specifically, I have interviewed, observed, and written about how musicians can *meaningfully* involve digital tools and resources in staged performances (Hvidtfeldt and Tanggaard, 2018) and how creative engagements, at various levels of the festival organization, become *meaningful* with reference to an emergent whole (Hvidtfeldt and Tanggaard, 2019). The *meaningful* contribution to the analysed situations is precisely the *appropriate* one, but the notion of *musicality*, I will argue, takes a step closer to the core of the matter.

Musicality can be defined in different ways (Gembris, 1997; Burnard, 2012) and the development of theories on musicality has been, similar to the one found in research on creativity, characterized by moves away from focuses on personal abilities, talents, and psychometric analysis. Gembris (1997) suggests three historical phases, describing musicality from a phenomenological, psychometric, and sense-making perspective. He describes how one of the first writings on musicality, which was directly inspired by the work of Kant (1724-1804) on aesthetics, was done by Germain philosopher Christian Friedrich Michaelis (1770-1834). The aim of his work was to generate a list of abilities that were understood to be relevant in terms of performing and listening to music. He detailed categories such as *'musical discrimination skills, musical memory, attention to music, enjoyment of music, good musical taste, imagination for performing and composing'* (Ibid: 18f). Some of which are, arguably, still relevant as indicators of musical abilities, but it is striking how *good taste* is considered an ability that some 'musical' individuals are supposed to exhibit. At this point and time, the 'musically talented' probably enjoyed classical 18th-century aesthetics, where today, we see how tastes in music also depend on socialization rather than isolated on abilities or talents. As formulated by Gembris:

> *It was typical in this initial phase of research on musicality for an attempt to be made to develop a global description and phenomenology of musical*

abilities. However, in retrospect, we can see a strong connection between contemporary music and aesthetics and the concept of musicality.

(1997:19)

The second phase continues the search for objective criteria for musicality and with the development of experimental psychology, it became possible to generate standardized tests assessing musical abilities. Now more objective, unbiased criteria were sought, so the assessment could be made independently of social tastes and aesthetics. However, the psychometric techniques generally met critic for their low validity and reductionist focus on only a few receptive aspects of e.g. listening and perception (Ibid). The earliest test was label *Seashore Measurement of Musical Talent* (1919), which was further developed by Seashore himself in his book Psychology of Music (1938/1967). This measurement technique – and its followers indirectly – was later criticized by Theodor Adorno (1940/1984) for, among other issues, not considering the *meaning* of music, which is exactly the focus of the third phase. Sloboda outright defines *'musical ability is the ability to make sense of music.'* (1993: 106). Stefani suggests, that *'by 'musical competence' we understand the ability to produce sense through music'* (1987:7), whereas Blacking describes, using similar terms, musical intelligence as the *'cognitive and affective equipment of the brain with which people make musical sense of the world'* (1990:72).

As presented in the introduction and in my definition of creativity, I prefer to conceptualize musicality as an ability to ensure *emergence* rather than 'sense' in music, but as argued, and illustrated in the above perspectives on the matter, I understand the concepts of meaningfulness, sense-making, and musicality to be closely connected. From my definition in this dissertation as presented in the introduction, inspired by the above theories and especially Hansen (1990) and Bastian (1987), I conceptualize musicality as the ability – of humans or materials – to contribute to the emergence of musical phenomena. By using the term 'emergent phenomena', I specifically refer to a meaningful, coherent musical whole, as opposed to the chaotic or random – in that sense, I do not differentiate to create a dichotomy, but rather to convey my theoretical framework in a simple and coherent manner: Notions of meaning and musicality have been defined in a number of ways throughout time and used rather uncritically in the articles submitted with this dissertation, why I – in this reporting – seek to limit and simplify my theoretical framework to focus on musicality and emergence in creative processes.

2.2. A HISTORY OF IDEAS: CREATIVITY

While several attempts have been made to categorize the various traditions within research on creativity (see e.g. Sternberg, 1999; Tanggaard, 2008), the following overview has been primarily inspired by Glăveanu's (2010) conception of He-, I- and

We-paradigms within the field. This assessment of different understandings of creativity should not be seen as a strict categorization of the progression in the history of research on creativity, but rather as a way to place overall landmarks for the development of new perspectives.

He-paradigm: praise of the genius

The He-paradigm represents a strong focus on the individual 'genius', and is sometimes referred to as the romantic, mystical or magical notion of creativity (Tanggaard, 2008). The interest here is concentrated on the very few people who have introduced new schools of thought, fundamentally changing how we see the world or live our lives by, for example, producing epoch-making artistic expressions. We find this understanding of creative individuals in the conception of the Great Men of the Renaissance, the ground-breaking scientists of the Enlightenment or artistic geniuses of the Romantic era. The myth of the creative genius suggests, that a few selected individuals should be guided either by divine inspiration, by the invisible hand of muses or gods, or more prosaically by inherited biology; that creativity is bestowed rather than learned (Boden, 2014). Either way, this view of creativity and creative processes is elitist, as it reserves the capacity and task for a small group of people and disconnected, as these people were understood to be working *ex nihilo*: Isolated, with no previous knowledge, with no connection to others, cultures or material surroundings. While this idea of the creative person as a detached, perhaps also eccentric, rather crazy and anti-social *genius* has its roots in pre-modern thought, it is still present in today's scientific landscape and in popular culture (Cook, 2018). Musicians, for example, sometimes talk about mystical, inspirational processes as involving communication with specific muses or other spiritual connections (ibid).

I-paradigm: we are all (potentially) creative

Graham Wallas' 'Stage theory' (1926) (reparation, incubation, illumination and verification), which is still functioning as a conceptual anchor in writings on creative processes, was introduced already in 1926 but not fully acknowledged due to the dominance of behaviourism, idealising observable and quantifiable results, in the first half of the twentieths century (Cook, 2018). Therefore, modern psychological research on creativity was typically understood to have begun with the speech by Joy Paul Guilford at the American Psychology Association convention in 1950 (Guilford, 1950). Here, among other theoretical contributions, Guilford suggested the distinction between convergent and divergent thinking and thereby suggested that creativity was a human capacity, rather than reserved for the few. The I-paradigm represents a democratization of creativity, now everyone holds the potential to become creative and Guilford started a wave of psychological research interested in personality, intelligence and other attributes of creative individuals (Amabile, 1996).

Key theoretical and methodological concepts developed within this paradigm include the characterization of the creative personality (originality, willingness to take risks,

ambiguity tolerance, preference for complexity etc.) (see Amabile, 1996); cognitive studies of mental processes related to creativity (See Ward et al., 1999); and the development of psychometric methodologies measuring people's abilities within divergent or lateral thinking, as opposed to convergent or logical thinking, and their ability to solve various open problems (beyond Guilford (1950), see Torrance, 1974; Sternberg, 2003). These new ideas paved the way for broader perspectives within the field, but they were, like so many American psychological perspectives at the time, primarily interested in individual, intra-psychological processes (Glăveanu, 2010).

We-paradigm: creativity as a distributed process

From approximately 1980, research on creativity became more social in its orientation, accepting the distributed nature of creativity as a processual transaction between the individual and the environment (Glăveanu, 2010). Here, two examples will be brought forward which have been dominant in the research field, and not least in my schooling on creativity, as they formed the theoretical foundation for the analysis of my Master's thesis (Hvidtfeldt, 2012).

Csikszentmihalyi, acknowledged for his flow theory (1988a, 1996), deserves to be mentioned here – especially his *systems perspective on creativity* (1988b, 1999). As the figure below illustrates, creativity here is understood to develop in a three-legged process involving individual, social, and cultural aspects.

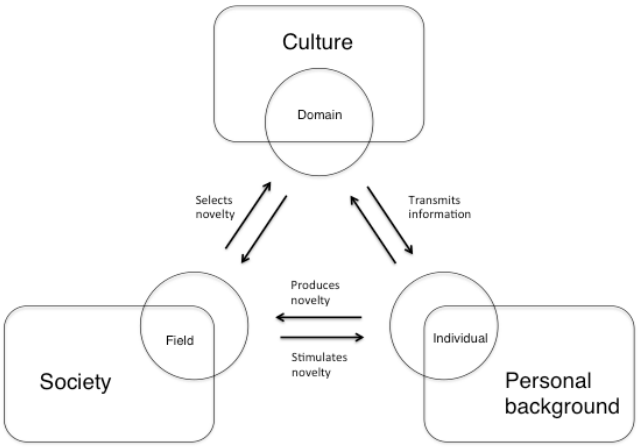


Figure 2: *The Systems Perspective on Creativity,* Csikszentmihalyi (1999:314)

The model describes an evolutionary process where creative ideas are suggested by the individual, evaluated by a field of experts holding knowledge about the specific

field, and ultimately, if accepted as such, embedded in the culture, which again transmits information back to the individual. A key insight from this model is that creativity can only be acknowledged in retrospect (Tanggaard, 2008) and no process or product is creative in itself, but only with reference to the socio-cultural setting to which it is contributing. Csikszentmihalyi's model is essential to the emergence of the We-paradigm (although it is primarily relevant to a discussion of *historical* rather than everyday creative contributions), as it underlines the distributed, ecological, contextual nature of creativity, which has been relevant to the further development of more holistic approaches.

Another well-known theory within this paradigm is the *componential model* suggested by Amabile (1996) where creativity is defined as depending on domain-relevant skills, creativity-relevant skills, and intrinsic motivation for the task. If the creative task is to write a new symphony, learning about music theory and the history of the genre would be key skills relevant within the domain. Aspects, such as willingness to take risks, self-confidence, and divergent thinking abilities are skills relevant to engaging in the often challenging, unpredictable, and open-ended creative task. Amabile's theory is also well-known for the separation between intrinsic and extrinsic (synergetic) motivation, the final aspect of the model. Here, intrinsic motivation is defined as '*the motivation to engage in an activity primarily for its own sake'* (Collins and Amabile, 1999:299). The task should preferably be absorptive to the individual in itself and it is argued to be detrimental to creativity if she/he is engaging in the work primarily because of external pressure or rewards (such as money). *Synergetic extrinsic motivation* is, on the other hand, understood to enhance creativity, as it – under certain supportive, rather than pressuring, conditions – is conducive to *intrinsic* motivation. In other words, the social link in this theory focuses on ensuring an environment that is motivating for the individual to work in. As also argued by Glăveanu (2010:6), the focus of these conclusions is still on conditions for *individual* creativity, how individual creativity can be stimulated; arguably, there are a few steps to take before the conception of creativity becomes truly *social.*

From two different perspectives, Amabile and Csikszentmihalyi underline the importance of analytically acknowledging 'the world' *in* which the creative individual is placed, and *to* which, the creative individual contributes, but today, several theoretical articles and books on the subject latter, we are still developing a thorough understanding of creative subjects and their entanglements with the tools, objects, and materials involved in their creative processes. Hence, the theoretical ideas presented here are related to the presented ideas from the WE-paradigm, but in a radically more social and distributed sense.

2.3. CREATIVITY AS A SOCIO-MATERIAL PRACTICE

With this project, I contribute new perspectives to a currently developing understanding of creativity as a socio-material practice. The following section is devoted to an introduction to the background to, theoretical perspectives of, and exemplifications using the technological development in the music production industry to explain how creativity is entangled with the socio-material setting.

I worked on the project with reference to a general 'material turn' in the social and human sciences, or 'topographical turn' as I often labelled it in the articles presented, with inspiration from Hastrup's anthropological perspective (2011). The current emphasis with various academic disciplines on materiality must be understood in the light of previous 'turns' in the history of social and human sciences, and thereby is a reaction to previous focuses on understanding the social world via, for example, linguistic (see Lévi-Strauss, 1958), discoursive (Foucault, 1969) and narrative (Ricoeur, 1991) approaches. As such, with the postmodern breakdown of the great ideologies of modernism, came a focus on semiotics, and situated local texts, and stories. With social constructionism, the 'text' about the social world written by researchers, e.g. anthropologists studying a foreign culture, was now not only understood as a representation of, but rather as writings of, the *actual* world – this instrumentalization of narratives was spread widely across the social sciences (Hastrup, 2011). Such ontological perspectives that isolate epistemology in determining what is "in the world", gave rise to the material turn, which is, broadly speaking, insisting on the value of the natural world with all its histories, materiality, and bodily components. The material turn can thus be seen as a (re)introduction of the real, tangible world to human and social sciences.

A 'turn' is characterized by its widespread dispersion into a variety of fields, where individual perspectives and trajectories are then followed. The work of philosopher Bruno Latour (2005) and colleagues on Actor-Network Theory developed from the 1980s should be mention here as a landmark in the material turn; its model described networks of both semiotic and materials *actors* – both human and non-human. This position can be understood as a radical introduction of the material agency seeking to explain how complex actor-networks develop and are constantly performed as 'a whole' (ibid). The conception that began its development in social studies and science and technology (STS) is today applied as a methodological tool for studying diverse perspectives within various fields.

James Gibson's (1979) seminal work on visual perception within ecological psychology and especially his notion of 'affordance' has been vital to the interest in materiality within several fields including anthropology (Ingold, 2010) and psychology (Glăveanu, 2016a). Gibson argued, in contrast to most psychologist at the time, that perception should not be seen as the result of an isolated effort by the mind processing sensory data collected, but rather as an achievement of the body as a whole as it is moving through and exploring the world. The 'mind', Gibson argues, is not limited by the skin (Ingold, 2002:3): the material world *afford* specific action. In the

words of Gibson, *'the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill'* (Gibson, 1979:127). The significant theory underlined, how our environment, '*the ocean of materials'* (Ingold, 2007:7) we swim in every day of the more-or-less graspable, raw, manipulated and culturally shaped objects and artifacts, holds a potential to be used and manipulated in various ways.

In this project, I conceptualize creative processes as *socio*-material. In doing so, I seek to contributed to an emerging research tradition underlining the developing, dynamic nature of materiality, in perceiving the social and the material as fundamentally intertwined. Here, the work done be Orlikowsky (2007) within organisational studies deserved to be mentioned as a key contribution. Orlikowski wrote:

> *Materiality is integral to organizing […] the social and material are constitutively entangled in everyday life. A position of constitutive entanglement does not privilege either humans or technology (in one-way interactions), nor does it link them through a form of mutual reciprocation (in two-way interactions). Instead, the social and the material are considered to be inextricably related – there is no social that is not also material and no material that is not also social.*
>
> (2007, 1437)

Though taken from another field of study, the point made, that the social and material are always inextricably related, points to an important understanding that neither the individual nor the physical object 'live' in a vacuum with a fixed value or cultural identity. With the preference to the notion of 'topography', I seek to highlight how the socio-material take is underlining the social nature of materials in our surroundings. As I state in one article (Hvidtfeldt, 2018a:232), inspired by Hastrup (2011) and Ingold (2010), we cannot do with static descriptions of 'the physical terrain' to understand material practices – the notions of topography and creative practice suggest an intricate materiality consisting not only of isolated tactile and physical 'objects', but also traces from their 'materialized' history:

> *The properties of materials, regarded as constituents of an environment, cannot be identified as fixed, essential attributes of things, but are rather processual and relational. They are neither objectively determined nor subjectively imagined but practically experienced.*
>
> (Ingold, 2007:14).

Whereas physical objects obviously exist in and for themselves, regardless of human existence and behavior, materiality *unfold* for us (Ingold, 2007) – the reality if the material world is not *of* material objects but *for* its inhabitants (Gibson, 1979:8). As

described by James (2003) and Hastrup (2011), our fundamental experience of taking part in a social community is tightly connected to our material and spatial understanding of the world. The meanings of individual materials are inseparable from their socio-cultural position and our subjective understanding of their affordances: A painting is not only a physical object but brings with it a tradition of painting and all the histories behind its realization (Tanggaard, 2012). Hence, the socio-material must be understood from the *practices* in which both the material and the social unfold, which is why I often refer to the term in the dissertation. For e.g. Bourdieu (1977) and Lave (1988), a practice is exactly not an isolated individual activity – something people *do* – but rather a *'socially shaped arena in which activities are collectively negotiated'* (Leonardi, 2012:35). Thus, a *creative* practice is understood to be constituted by both social and material entanglements.

To give a specific example from the world of music: If a musician, today, is inspired by an acoustic guitar built by the American company Gibson in 1968, it is not only because of its tactile qualities but also – and perhaps primarily – because of how it was previously used by other musicians throughout time. Often, when describing how I understand creativity to my informants in the interview situation, I used Neil Young's guitar as an example of how materials can have an authoritative social history. That type of guitar had traditionally been, and still is, used by him, and many other musicians, why musicians today see the instrument in a certain social and historical light. In a similar way, digital instruments represent cultural artefacts of our time. They do not dictate but infiltrate creative action, both because of their tactility and their socio-cultural position. Gibson (the psychologist, not the guitar company) states, that '*the furniture of the earth, like the furnishing of a room, is what makes it livable'* (1979:78 [emphasis added]). In this dissertation, the notion of 'livability' is literally the goal of musical creative processes.

Building on these conceptions of how the world is simultaneously constituted by social and material qualities, my theorizing on creativity has been especially inspired by the work of Glăveanu and Tanggaard (Tanggaard, 2011, 2015; Glăveanu, 2010; Glăveanu et al., 2014). In the words of Tanggaard:

> *This socio-material rethinking of creativity implies a research perspective that consists of following not only the individual thinking processes or the influence of context on the individual creative process but more precisely the movements of ideas and the continuous and productive re-associations found in relational spaces during a creative process.*
>
> Tanggaard (2015:111)

I explore how musicians and festival participants *react* and *participate* in a situated creative process, rather than contribute to the continuous development of an unresponsive world as isolated individuals 'exporting' creative products from intra-psychological mental processes. In the understanding promoted here, musicians create

in a transactional dialogue with specific instruments that afford specific actions, and the ephemeral, emergent, living music; Roskilde Festival participants behave based on their relationship to and the general social-material constitution of Roskilde Festival as an emergent, ritualized phenomenon.

In the first article of my dissertation, I formulated this fundamental understanding of creativity in the following manner:

> *As underlined by Ingold and Hallam (2007), imaginative, creative reflections are inseparable from performative engagements with the surrounding materials. Hence, though having one is an evident prerequisite for working creatively, studies of creativity should not be limited to the brain; creativity is not solely an intellectual exercise where mental ideas are exported into a passive, unresponsive world (Tanggaard, 2013, 2016). New ideas always come as a reaction to something already existing in the landscape, in a developing, transactional process between subject and object (Brinkmann, 2015). Therefore, in exploring creative processes […], research should be methodologically attentive to relations.*
>
> Hvidtfeldt (2018a:231)

As a final comment, I should point out, as also underlined by Csikszentmihalyi (1997) and Sternberg (1999), that the various traditions presented in the above sections are connected, as none of them is capable of capturing the full meaning of the complex phenomenon of creativity. Creativity must be understood to be shaped by inspiration (divine or not), mysticism (musicians are not always interested in or capable of tracing their sources of inspiration), intra-psychological cognitive processes (it is good to have a brain when working creatively, even in the most social of settings) and also topographical conditions. Creativity is a complex and unforeseeable endeavour, and a broad diversity of research perspectives and methodologies in the study of the phenomenon is needed.

EXAMPLES FROM THE DIGITAL WORLD OF MUSIC

The following section is developed with a twofold purpose: (1) to further concretise the socio-materiality of creative processes presented in the articles published, and (2) to illustrate how musicians' creative practices changes with digitalization. Hence, the sections serve as both background for the theoretical framework and the empirical work in the published article (Hvidtfeldt and Tanggaard, 2018). The review is obviously non-exhaustive and should been seen, rather than as a complete list of

technological developments in the industry, as an attempt to *exemplify* the socio-material nature of creative processes in the music industry.

I prefer to go directly to the source and present structural, contextual changes for music-making using the words of musicians. I therefore start with David Byrne, whose popular book *How Music Works* (2012) written from the perspective of the practitioner has served as a general inspiration for the following section, and have supplemented his arguments with academic literature on music and technological development within the field written by Tschmuck (2012) and Brøvig-Hanssen and Danielsen (2016). Byrne has written incisively about the 'reversed' nature of musical creation – how music is something that depends on and develops within a specific context, rather than an isolated, individual effort by a lone genius composer or band:

> *I had an extremely slow-dawning insight about creation. That insight is that context largely determines what is written, painted, sculpted, sung, or performed. That doesn't sound like much of an insight, but it's actually the opposite of conventional wisdom, which maintains that creation emerges out of some interior emotion, from an upwelling of passion or feeling, and that the creative urge will brook no accommodation, that it simply must find an outlet to be heard, read, or seen. The accepted narrative suggests that a classical composer gets a strange look in his or her eye and begins furiously scribbling a fully-realized composition that couldn't exist in any other form. Or that the rock-and-roll singer is driven by desire and demons, and outbursts this amazing, perfectly shaped song that had to be three minutes and twelve seconds – nothing more, nothing less. This is the romantic notion of how creative work comes to be, but I think the path of creation is almost 180° from this model.*
>
> (2012:13)

Did the musical genre 'grunge' develop because the musicians had an inner, intra-psychological need to play that specific kind of music, or because their living conditions, the acoustics of the garages where these bands rehearsed in the suburbs of Seattle in early 1990s, and the instruments of the time allowed it? Did Mozart write his masterpieces because of an inborn desire to express precisely these symphonies, or because the socio-cultural and material surroundings allowed these ideas to bloom? Why had West African drum music, with its complex, dynamic poly-rhythms, developed in the environment existing in, for example, Mali, rather than in the churches in Europe? These are all (perhaps, relatively annoying and rhetorical) questions leading to the point that the world of music is full of good examples of how physical and socio-cultural surroundings entangle creative behaviour. I write this, not to belittle the importance of individual talent, hard work, or motivation to engage with challenging work processes, but rather to illustrate creativity as an action in and of the world. To Byrne, this discovery is a revelation (Byrne, 2012). In what follows, both radical and more incremental technological developments are presented in a

discussion of their influence on and involvement in the creative development of genres, and specific artists' albums and songs.

Technological influences on music over the years

Perhaps the most obvious example of how technology has changed the way music is both produced and experienced is from 1877 when Thomas Edison presented the *Phonograph* (Tschmuck, 2012): a surprisingly simple hand-wound machine with a wax cylinder, a needle, and a funnel or horn into which the speaker directed his or her voice, or the musician would play the music. It is amazing that it worked, and perhaps also that the machine had not been invented earlier, as the means needed had been around for ages (Byrnes, 2012).

From that year, sound waves could be recorded, though the quality was miserable, the process tricky, and the playback volume very low. One machine could record in *one* narrowly defined direction, write onto *one* wax cylinder at a time, and the final recordings could not be copied. A practical implication is, therefore, that multiple copies of one recording could only be made if more than one machine was operating or if the band played the same tune repeatedly (a potential business model, but perhaps not the most promising).

Around that time, the first phonograph companies (Columbia and Edison) were interested in presenting not new music, but rather recordings of old classic songs popular at the time (Tschmuck, 2012). The names of the artists did not appear in the promotional material – the front cover of the record typically showed, for example, a sizeable picture of Edison himself. The production was owned and put on the market by the phonograph company that generated profits by installing 'coin-slot' machines (a precursor to the jukebox) in bars and restaurants (ibid). In that sense, the very first technology invented was not used to record and produce new, 'creative' compositions, but the process by which music was recorded is the first example of how the technology used shaped creative behaviour behind the 'horn'.

The phonograph companies wanted to document live performances of classic songs of the time and to do that they – paradoxically – needed to rearrange the orchestra so that the 'real' sound of the live situation was recorded. If the musicians just played as they usually did on stage, with the lead melody, such as a singer, in front of the rhythm and harmony sections, the bass would completely disappear as it was very difficult to record anything below mid-tones. The musicians needed to rearrange the orchestra, moving the drums, for example, far away and the singer very close to the phonograph so as to obtain the correct levels, which must have greatly impacted the quality of the performance itself. In other words: The technology involved shaped the creative process. As such, the music recording was not a 1:1 documentation of the live orchestra, but – especially as the quality of the sound became just a little better – a musical artefact in itself. Conversely, as pointed out in the interview sessions by Høffding (Hvidtfeldt and Tanggaard, 2018:638), today the challenge is often to re-create the recorded music that was written and 'perfected' in the studio so that it fits into the performance situation. Most music gets to be known as a recording, on radio,

Spotify, or elsewhere in the digital sphere prior to ever entering any stage. In that sense, the challenges of involving technology in music production have shifted 180 degrees from a *performance industry*, something played live on stage, at parties or at home with your family, to a *mediated industry* selling records or streams. What comes first, mediated or performed versions of the songs, greatly impact the creative relationship between the subject (musician) and object (technology).

The use of wax cylinders was gradually succeeded by the gramophone (first recorded on shellac, later vinyl) invented by Emile Berliner in 1887 (Tschmuck, 2012). Radio broadcasting started in the early 1920s, and another radical change came in 1925 when the U.S. company Bell presented a method for electric recording. Now, musicians did not need to gather in front of the horn to be recorded; the introduction of the microphone had obvious advantages in terms of improving sound quality, and new music technology soon followed. Reel-to-reel tape recording was developed around the turn of the century up until the 1950s when the quality of magnetic tapes and machines became so good that we still listen to the original recordings of Bing Crosby (for example, *White Christmas*) and Elvis Presley made at that time.

It also became evident in the interview sessions that even today some musicians produce much more modern-sounding music, but prefer recording on an old Studer professional tape recorder that became the industry standard in the 1960s. Not only did reel-to-reel tape machines improve sound quality drastically, but the technological breakthrough was also a pilot study for modern-day sampling techniques, as a reel-to-reel tape – unlike wax cylinders or gramophone records – can be cut into pieces, put together in new ways and then replayed (perhaps reversed) on a new recording – a creative method bands like The Beatles did not hesitate long before exploring. Listen for example to their tracks *Tomorrow Never Knows* (1966) or *Yellow Submarine* (1969).

The examples given above obviously represent radical changes in the world of music, but small-scale improvements to music equipment have brought about a lot of creative changes, too. For example, the microphones developed and adopted in studios in the 1950s-60s made it possible for vocalists to develop new styles of singing.

Perhaps, and even without visiting YouTube or Spotify, you can recall how the Gilberto couple sang on the classic recording from 1962 of *The Girl from Ipanema* with Stan Getz and Antonio Jobim. They are almost whispering into the microphone, but both vocals sit perfectly fine in the mix because of the technological improvements to the 'condenser' microphone made in these years. The new equipment was capable of capturing and amplifying the recorded music, even the silent details, in much greater quality. The legendary recordings of ballads with Louis Armstrong and Ella Fitzgerald (*Summertime*), Frank Sinatra (*My Way),* or Elvis Presley (*Love me Tender* or *Are You Lonesome Tonight?)* would never have been recorded in these versions if not for the microphones that were developed. Sinatra allegedly never went into a

studio without his high-fidelity Telefunken U47 microphone (introduced in 1948), which is still used in many professional studios today.[5]

Digitalization of music

Digital signal processors, instruments and effects were developed as early as the 1950s (Roads, 1996), although there is obviously a direct connection between the use of computers for music production and their general quality. It is not hard to imagine the limitations of digital music production at that time. The first commercial digital recording system was the Sony PCM-1 from 1977, and from there development was fast. The CD was invented in the mid-70s laying the ground for the digital revolution in the music industry of the early 1980s (Tschmuck, 2012).

As illustrated in the figure below, when a sound wave is converted from an analogue signal into a discrete digital code, it is digitized according to the horizontal sample rate and vertical bit depth.

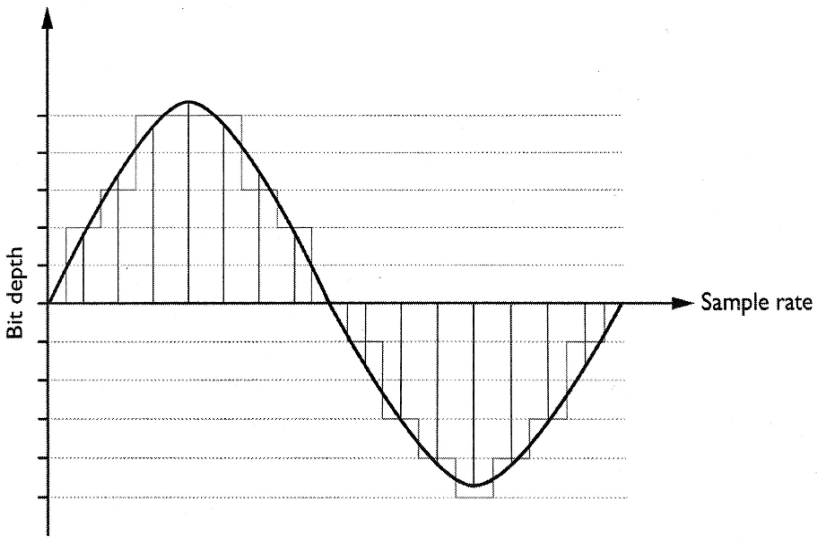


Figure 3. *From analogue to digital sound,*
Brøvig-Hanssen and Danielsen (2016:10)

In other words, the signal is chopped into bits and pieces, converted from a continuous wave into measurable and countable numbers. Directly translated, 'digit' (or 'digiti' in Latin) means figure or 'finger'. Digitalization can be described as a process of

[5] See e.g. *The History of the Microphone*, retrieved on 26 January 2019 from http://lossenderosstudio.com/article.php?subject=14

counting ‘on the fingers’ – a process of *quantization*. To give a few examples of how digitalization has affected the development of modern music technology and thereby creative processes, the development of MIDI (Musical Instrument Digital Interface) and digitally simulated reverberation effects deserve to be mentioned.

As formulated by Byrne (2012:137), *‘as soon as technology makes one thing easier, it leaves a host of things in the dust’*. This obviously is intended for all kinds of technology that we use in our everyday lives, such as mobile phones and computers, but it is also true of music equipment and how we use it. MIDI was introduced in the early 80s: a digital interface recording and carrying the ‘infrastructural codes’ of a recording, that is, how hard the notes are played, for how long, the pitch, vibrato, time, etc. The MIDI code provides all these details and is a powerful tool that allows the producer behind the computer screen to efficiently switch between sounds. To change the tuning of a key or the sound of a drum, the producer does not have to re-record a piano or drum session; he or she can simply replace it with a new sound from a sample library.

This process works very well with instruments that are played on a keyboard or a drum; guitars, strings or vocal recordings are not easily translated into codes owing to the nuances and characters of the sounds. Byrne’s argument is, therefore, that MIDI inclines composers to use specific instruments in certain ways:

> *Using MIDI […] tends to entice people away from using those instruments [strings, guitars, etc., red.] and the kinds of expression they are uniquely good at. A lot of MIDI-based recordings tend to use arrays of sounds generated or at least triggered by keyboards, so, for example, it’s easiest to play chord inversions that are keyboard friendly. The same chords on guitars tend to have a different order of the same notes. Those keyboard chords, then, in turn, incline composers to vocal melodies and harmonies that fit nicely with those specific versions of the chord, so the whole shape, melody, and arc of the song are being influenced, not just the MIDI parts and instruments.*
>
> Byrne (2012:137)

Relative to the powers of modern computers, the simple MIDI code has a strong impact on both creative processes and results, as its use affords specific actions, giving more room for some decisions than others. The MIDI code is still the standard format.

One of the artists who was a first-mover in terms of experimenting with the new opportunities of digitalization was Kate Bush. In 1982, Bush released the album *The Dreaming*, including the closing track *Get Out of My House*, allegedly inspired by the horror novel *The Shining* (Stephen King, published in 1977, and later a movie by Stanley Kubrik, premiered in 1980). I highly recommend finding the track online while reading through my arguments for how the digital realm inspired the development of the track. Brøvig-Hanssen and Danielsen (2016) use the track as a

good example of the creative opportunities released when moving from analogue to digital reverb and delay. Reverb is an effect used on most records, for example, simulating the sound in a specific room such as a concert hall. On the track, Bush seems to explore the full potential of digitally simulated spatiality. She and her co-producers use all kinds of reverb effects on most of the instruments. As the authors write:

> *While some of Bush's otherworldly effects could have been produced with analogue technology, they achieve unprecedented prominence here thanks to their digital origin and context, to the extent that they become, in short, signifiers of the digital.*
>
> Brøvig-Hanssen and Danielsen (2016:134)

Digitalization has provided new, efficient, powerful, complex and – obviously for many artists like Kate Bush voyaging into the future of music – exciting technological inventions that shape how and what they create.

Let us take a big jump in time: in 2002, I bought one of the first (reasonably priced) digital recording setups made by the company Avid; an Mbox, including the software program Pro Tools LE that was able to record a stereo track onto a (good) home office-style computer. The revolution was that digital music recording was now affordable, and the editing software set no noticeable limits to what you could produce. Until this point, in the reel-to-reel recording studio, editing was restricted in several ways; a Pro Tools session is like an open, blank canvas on which all kinds of musical genres can be recorded (although, again, the design of the software editing and mixing console obviously shapes the outcome of the production process, as discussed by Byrne (2012:133f)).

Compared with traditional analogue editing tools, the editing interface has new features, such as quantification and grid modes, allowing the producer to have hyper-accurate control over the tempo and tuning of the track. For example, a 4-bar drum beat can now be edited with precision and then copied throughout an entire song; earlier samplers did something similar, but the process has become much simpler, much more efficient and much cleaner sounding with the computer (Brøvig-Hanssen and Danielsen, 2016).

Today, almost all music studios use Pro Tools, Logic, or similar software to record and edit music, and the quality of the digitally sampled and simulated effects (such as reverberation), etc. have become very good and very complex. Most people would not be able to hear the difference between an old analogue reverb or delay effect and its digital simulation. However, as discussed in the interview sessions, some musicians prefer the tactile and material qualities of the old analogue machines – a quality of the old instruments that companies producing editing software are actually striving to resolve, e.g. by developing the graphic representation so that it resembles the original as closely as possible.

Hence, digitalization has radically changed and provided new opportunities in the music industry. People have good access to all the tools needed to create music, even if they do not want to play a traditional instrument like a piano. Csikszentmihalyi (1999) has described how creativity flourishes when there is good access and distribution of cultural understandings within a domain; digitalization has pushed this development forward within the music industry. Knowledge is easily stored, available to many, and very diverse, and different actors actively teach and inspire each other. Look at the effect the development of the printing press had on the dissemination of knowledge and thereby on creativity. The Internet, and subsequently new social media, have had and will have, an immense effect on the distribution of knowledge within many domains, not the least music. It seems obvious that much creative and musical talent has been lost to a lack of basic tools and resources prior to digitalization as gate-keepers of the field (to use the term presented in Csikszentmihalyi's System Model (Figure 2)) demanded a lot of money to record and distribute music. This theory has also been supported in research literature comparing the levels of output in the industry to the reviews given by critics (Waldfogel, 2012). According to these figures, the output of the music industry has increased dramatically since the digital revolution, as entry barriers have been removed and production costs reduced, and the quality of the music has, interestingly, apparently just improved. Many people will claim that the quality of music has just been decreasing since the death of Tchaikovsky, as discussed by Luca and McFadden (2016), and music is obviously not an exact science, but these studies have suggested that the quantitative increase in music output has not led to a decrease in quality.

2.4. CONTRIBUTION: MUSICAL EMERGENCE AND SOCIO-MATERIAL CREATIVITY

As the above examples illustrate, neither the historic, ground-breaking compositions throughout time nor the more incremental achievements within genres, have just magically appeared in the heads of musicians of the time, although the process might feel that way as subject-object interaction is not easily traced. The aim of the following section is to discuss and visually merge the theoretical perspectives on creativity, musicality, and emergence into the theoretical framework presented in the dissertation.

One of my key sources of inspiration has been Peter Bastian (1943-2017), the Danish author and musician, who sadly passed away while I was preparing my interview with him; the email asking for an interview was sketched out in a document on my computer, but I never got to send it until it was too late. I owe a great debt to Bastian, who had provided the key philosophical, practice-based and music-theoretical context for the development of the theoretical framework of my analysis. Until studying his work, I was stuck on the idea of 'synergy', how organizational processes become

'more' than the sum of their parts, as a conception of how things 'play together' in concerts. Basically, I wanted to build the argument, also inspired by Small's (1998) idea of 'musicking' as an act like 'cooking' or 'dancing', that not only the contributions of musicians are important to the event, and that the isolated behaviour of musicians must be understood from a more communal perspective. However, the notion of synergy is too narrow, as one basically deprives music of its true potential in suggesting that a melody is "*more"* than the sum of its notes. Who would ever be moved by good music if it were just the result of a cold calculation, where the result of putting certain rhythms and notes together could be predetermined? In a sense, much research and many experiments have done well in describing what types of music need what kinds of structure and tempo, and how long the pop audience has the patience to wait for the pleasing chorus, but there is no clear recipe that works every time. Music is, in *that* sense, not maths, and if it were, computers would probably completely outshine humans musically:

> *Computers with appropriate software could do better than most humans on tests of pitch, melody, and rhythm included in music aptitude measures, but they certainly are not more musical than humans.*
>
> *(Gembris, 1997:20)*

Though music – digital or not – involves math and physics, and some musicians and composers have had an explicitly formal relationship to the art, the quality and challenges of emergence in music cannot be reduced to cold calculations. Again, like affection between people cannot be forced with 'right' and 'wrong' moves, like in a game of chess, music cannot be "figured out". Sometimes it works. Sometimes it does not.

EMERGENCE IN MUSICAL SETTINGS

The description of music as a material phenomenon and the creative processes leading to it needs a distinct language, something which the following quote from Bastian has provided me with a key to understanding:

> *When things are not working out, you have chaos. Chaos is not death; it is a potential death or a potential life. It can go either way. Chaos means that there is a diversity, but disorder. The aspiration when creating music is a tremendously complex articulated unity, and that is cosmos. Chaos is a great place to be. It is the border between the old and the uncreated. It can go either way - towards death or towards life. As a creative person, you do everything you can to go in the direction of life. Towards greater*

> *intimacy, towards a situation where things start to play together or emerge, to use a foreign word.*
>
> Lyhne (2011) [translated by the author]

This specific quote has been included in two of my articles in the project, as I believe it vividly has described how the notion of 'emergence' contributes to both the specific understanding of music creation and a broader conceptualization of musicality in creative processes. Perhaps I genuinely have fallen for the quote, as it reminds me of the hours I have spent in rehearsal rooms, alone, trying to make a drum rhythm come together, or, with a band, trying to bring a song out of chaos and into something meaningful with a coherent direction. It takes years of rehearsal to develop this ability, and the quote has painfully reminded me, as a musician, of the struggle. It points to the feature of music that it can never be put into a formula. In that sense, his quote, and the one word 'emergence' hit me and has provided a key to describing what I, at that time in a superficial and intuitive manner, felt to be lacking in research on creativity seen as a socio-material practice.

As described in the introduction, Keith Sawyer is one of the few researchers who has written specifically on creativity and social, collaborative processes of emergence (see 1999, 2005). In line with Bastian, Sawyer has described processes of emergence as complex, simultaneously top-down and bottom-up processes (1999:465). In one article, Tanggaard and I had written:

> *The work of Sawyer (1992, 2000) on collaborative emergence borders directly on our work, in that it discusses emergence in jazz music, where musicians collaborate in a continuous flow through which the music appears, and the way in which improvised theatre, where nothing is scripted or otherwise planned, develops on the spot as one line or action leads to the next. Here, the actors use the improvised lines as material inspiration for the next (more-or-less conscious) creative decision.*
>
> Hvidtfeldt and Tanggaard (2019:547).

Sawyer has suggested, with reference to the creative processes of jazz musicians and theatre actors, how emergence theory describes the acausal correlational relationships characterizing emergent wholes, which are irreducible to the sum of the involved parts. Where Sawyer focuses on creativity on stage, between musicians and actors, I am are interested in the social and topographical situation. In referring to especially Christopher Smalls (1998) conceptualization of musicking as a socially distributed practice rather than a reified thing presented from a stage and directed at an audience, I have sought to bring Sawyer's arguments into a larger social and material performance situation involving many other, both human and non-human, actors than the once found in isolated processes on stage. Hence, I have argued with the intention

to illustrate how Sawyer's concept of the 'process as creative product' can be conceptualized as even radically depending on and infiltrated in the topographical setting. The processes of emergence in musical settings like musicians' performances and the musical development of Roskilde Festival as a social gathering have developed in an open, all-inclusive process. An experience of a musical performance at Roskilde Festival cannot be described in a formula-like manner: the contribution of the band + the contribution of the acoustics + the contribution of the audience + … + …. However, the creative subject-object transaction between musicians and instruments, digital or not, is *referring* to this emergent whole: they become musical with reference to this contextual, complex unity, being the music in the situation. Similarly, the character of Roskilde Festival shapes creative behaviour at the lower levels of the emergent phenomenon, too. All three articles of this dissertation have discussed exactly these themes in much greater detail, as it is within this particular research area that this dissertation contributes with new knowledge.

The following quote, taken from my own article, has described (1) how I understand the socio-materiality of emergent phenomena and (2) how I see the general philosophy on emergence as relevant to the understanding of subject-object relationships of creative processes as seen from a socio-material perspective.

> *Emergence theory, with its relational understanding of individual elements and wholes, provides a language for the complex materiality of the creative processes of musicians and arguably all other creative processes involving both the tangible and the intangible in social situations. Emergence theory acknowledges the (developing) performance or product as an intangible material for the creative processes of musicians. Further, emergence theory lends new meaning to the argument of socio-material theory on creativity, that one cannot separate the elements in analysis and study them separately, out of context. In analysing the relationship and associations between subjects and objects – the key analytical focus of studying creativity as a socio-material process – one must discuss the situation in which the studied phenomena participate so that the meaningful [musical, ed.] relationship between subject and object can be examined. The materiality of creative processes becomes meaningful [musical, ed.] through the emergent process where different elements are brought together in 'wholes' that none of the 'parts' could have anticipated.*
>
> Hvidtfeldt (2018a)

Studies of subject-object transactional dialogues, the unit of my analysis of the studies of creativity as a socio-material and musical practice, as they have been presented here, must refer to the process of emergence and the ephemeral whole it generates, in dialog with which they become "meaningful" as "musical" contributions.

In the model below, and with the intention to summarize my theoretical framework presented and applied in the published articles, I seek to illustrate my understanding of how creative practices, as seen from a social-material perspective, depend on musicality in processes of emergence.

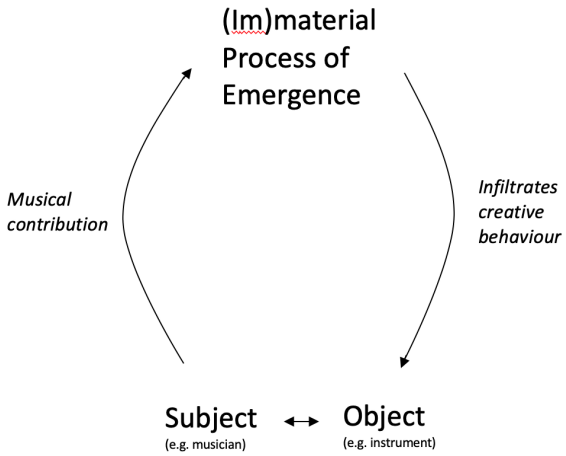


Figure 4: Illustration of the theoretical framework

The transactional subject-object dialogue of creative processes is represented at the bottom of the model. Musicality is defined here as both an ability to provoke processes of emergence and ultimately a quality of the emergent phenomenon. Musicality is thereby key to the model as a central component in the realization of the *'6th member of the quintet'* (Hvidtfeldt, 2018:235), the 'life' of good music in performance which my informants have been describing – the irreducible emergent whole arising when everything falls into place and makes sense as a meaningful, musical whole. Simultaneously, the model illustrates how the emergent phenomenon feeds back into the creative dialogue at the lower levels, in a downward causational process, in functioning as an (im)material for the continued process. In naming the result a 'the process of emergence', I have intended to underline the process ontology; the temporal, ephemeral nature of the phenomenon.

CHAPTER 3. METHODOLOGICAL CONSIDERATIONS

The following chapter has been developed with the aim of presenting and discussing my methodological approach to collecting and analysing the data in the article *Concerted creativity in the digital age: How do we crack the code…?* (Hvidtfeldt and Tanggaard, 2018). In the article, with reference to SQ1, we explore creative processes from a socio-material perspective as further defined in the article and the chapters above, and therefore pay special attention to the relational musicality between creative subject (musician) and objects (the instruments/tools they bring on stage), and how this dialogue 'plays into' the processes of emergence. The analysis is based on semi-structured interviews and participant observations (collected via a musical project resulting in the release of the mini-album *Syl*) gathered with the specific methodological ambition of gaining access to musicians' experiences of involving 0s and 1s – digital tools and materials – in musical creative practice.

In the following, I seek to introduce the two methodological approaches, discuss how in this dissertation they have been connected and infiltrated in one another and, ultimately, the challenges of involving these methods in the study. Initially, I present my interview strategy of interviewing artists performing at Roskilde Festival, and follow this with a description of the observational project 'Syl'. The project was initiated with the aim of getting close to the musical creative process as it evolves and thereby the dialogues, questions and worries of musicians regarding the digitalization of musical creative processes. Finally, I discuss the validity, reliability and generalizability of the process and results. Here, I find it especially relevant to dwell on the consequences for my research process of defining a research focus based on personal engagement and experiences, and on how, throughout the data collection process, I have sought to bring my previous knowledge into play.

3.1. THE LIFEWORLD OF A MUSICAL ELITE

The semi-structured interviews conducted for this dissertation are especially inspired by Kvale and Brinkmann's (2015) and Tanggaard and Brinkmann's (2015) take on the phenomenological 'lifeworld' interview as a general, qualitative *method*. My emphasis in the following and in the article is therefore on the epistemic ambitions, methodological potentials and inspiration from terms such as *lifeworld, bracketing/epoché* and *essence*, rather than the philosophical position of phenomenology. Initially, my attraction to the phenomenological tradition leads back to my breakdown-driven engagement with the study – I needed a methodological approach supporting my openness towards the questions raised, allowing the informants to reflect critically on their own experiences with digitalization.

Put simply, the *lifeworld* describes a specific reality as experienced and taken for granted by the individual. It is our point of reference in communicating, learning and acting – the world we, as individuals, live in (Jacobsen et al., 2015:219). *Epoché* describes the fundamental understanding that research should lead back to the experienced phenomenon of the lifeworld: the researcher must put 'brackets' around common-sense and scientific pre-understanding in order to understand the 'nature' of the studied phenomenon in a 'pure and unbiased' manner. The final goal of the analysis is then to reach and investigate the general nature – the 'essence' – of the studied phenomenon via subjective descriptions. And let me underline from the get-go: I use many inverted commas in the above to focus attention on potentially confusing, positivist connotations. My empirical or analytical strategy is *not* to reach a universal, objective 'truth', but rather to illustrate the *general in the specific* - what musicians generally have to say about digitalization and its involvement in musical situations that is intersubjectively valid (Jacobsen et al., 2015). Notions of 'nature', 'pure and unbiased' and 'essence', especially, are striking and should be used in this qualitative study with care and precision, which is why I also return to these questions in my verification and validation of the study. I am generally inspired by the method and analytical strategy, as the notions of lifeworld, bracketing and essence provide a connected framework inviting an open, though stringent, qualitative exploration of a complex phenomenon.

THE INTERVIEW SITUATION

For the article, I interviewed the following musicians (name (act)): *'Asger Baden (Mikael Simpson and Peder), Jacob Bellens, Marie Louise Buch (ML Buch), Tomas Høffding (WhoMadeWho, Bon Homme), Niels Juhl and Theis Vesterløkke (Gents), Sarah Mariegaard (Soleima), Hannah Schneider and Nicolai Kornerup (AyOwA), Anders Trentemøller, and Nikolaj Vonsild and Kristian Finne Kristensen (Cancer, When Saints Go Machine)'* (Hvidtfeldt and Tanggaard, 2018). Beyond these, three interviews were conducted (Thorbjørn Radisch Bredkjær (Bisse), Henrik Balling (Gangway) and Morten Søgaard (Masasolo)). I chose not to transcribe and include these three interviews in the article, as – due to my learning curve as an interviewer – they went a bit too far off track and/or did not bring new perspectives to the analytical focus.

Most of the informants were interviewed in the months leading up to their performance at Roskilde Festival in 2016-17, while some were chosen on the expectation that they would contribute interesting perspectives on the studied phenomenon. They all have a relatively long history with music making, and though the band might be 'upcoming', as the music agents employed at Roskilde Festival are always striving to present a music programme with this quality, all my informants are experienced musicians. I therefore categorize the interviews conducted in the study as 'elite interviews' (Harvey, 2011) and have worked with the interview questions and

format of the interview situation as a professional, informed dialogue between me as a researcher and musician, and the interview participants as experts on their own creative practice. This situation brings up a number of considerations which have guided my general approach towards the interview situation, the formulation of interview guides and my observational strategies.

During the interview sessions, I was faced with the challenge of finding a productive balance between, on the one hand, asking and listening carefully and being open to new perspectives putting theories, reflections and assumptions on the topic aside, and, on the other, informing the interview process with my previous knowledge of the issues addressed and leading the conversation in an analytically appropriate direction. Brinkmann distinguished between 'doxastic' and 'epistemic' traditions to illustrate various epistemological ambitions (Brinkmann, 2012:133-134), the doxastic ambition being to gather unfiltered experiences of the informants on a given topic. Here, the interviewer passively 'mirrors' the stories told by the interviewee without objections based on theoretical knowledge. The ideal is to openly let the interviewees present, in their own words, their private experiences, assumptions and opinions – a detailed reading of the informant's understanding of him- or herself or a given subject. This is a pure ethical approach, because it takes account of the individual's inviolability prior to theoretical assumptions on the researched topic (ibid). With reference to the phenomenological methodology presented above, this passivity is represented in the notion of epoché, but while my ambition *is* to let my interviewees present *their* stories, my project has epistemic ambitions which go further, seeking to synthesize and present essences of the lifeworld experiences across the interview and observational material. I seek to generate knowledge of a specific, theoretically framed subject, and I therefore gather the interview material in an analysis with the ambition of producing a general theoretically based understanding. Further, I kept (or tried to keep) the interview session on track, and sometimes pushed the informants, who all hold great knowledge of the subject but do not necessarily share it offhand. The situation of the interview, my position at Roskilde Festival, their potential knowledge of my position as a musician and the multiplicity of interview genres conducted with different purposes in the music industry all contribute to the interviewees' impression of and approach to presenting their experiences. It is paramount for the interview situation that I pursue an appropriate balance between my receptive, epistemic ambitions and how assertive, in an effort to open the conversation, the interview style should be. The good interview therefore depended on a great deal of craftmanship, and I learned a lot during the data collection process. I have been inspired by Kvale's (1997) metaphor of the challenge and role of the interviewer to act as a *supportive co-traveller on a journey*, with the ambition being to strike a balance between intrusiveness and curiosity appropriate to the specific interview. In the interview situation, my aim was to invite the informants to reflect intellectually and in retrospect upon their experiences. I aimed to avoid asking interview questions which were too leading and might push the interviewee into giving the answer they felt was expected or that I

wanted to hear. On the other hand, the questions could not be so wide open that any answer would be legitimate and thus indifferent (Jacobsen et al., 2015:231-232).

All interviewees were very aware of their PR image, though some were more skilled at handling the media. I underlined that I was first and foremost thinking of our conversation as a research interview, with other goals than publicity, but still they sometimes found it hard to leave this identity behind, as entrepreneurial musicians selling a product, who therefore – to the public – have to appear confident in all artistic and creative decisions. However, in the actual situation, this was rarely a major challenge, as most of the informants – especially the more experienced ones, who were not in the middle of promoting their first single or album – agreed to the premise of the interview. To my mind, the informants were not deliberately holding on to the promotional strategies agreed on by the record company, or otherwise holding back on their stories of how to develop music or live shows. But my awareness of this perspective, and this potential challenge, led me to be very careful in formulating questions and letting the interviewees tell their stories. Confronting questions – however theoretically informed – on the qualities and challenges of different ways of making music could be read by the interviewee as a critique of their approach. A critical approach to the involvement of digital materials in e.g. pop music production could easily be misunderstood by the interviewee as negative prejudice against their genre, band or perhaps newly released album – a sentiment which would be detrimental to the interview situation, as it builds direct mistrust. On the one hand, I could push the informants – they were in a position of power, being successful and talented musicians with a fanbase. They had already proved to me and the world that they knew what they were doing. But still, they were/are in a vulnerable position as artists who continuously have to be relevant to their audiences, meaning that in my position as both an employee at the festival (where they all want to play (again)) and a PhD student scrutinizing the subject, I am, in the interview situation, an authority. The interviewees could therefore worry that dangers were lurking around every corner, as I could perhaps try to lead them into theoretical traps. However, my perception was that the interviewees generally appeared not to be afraid of sharing their honest experiences.

I tried to interview in the natural, creative surroundings of my interview participants, which proved, as intended, to be conducive both to comfort and the regulation of power in the situation, and to the general inspiration of the conversation. Often, the stories told by the interviewees (and participants in the observational project) were directly motivated by the instruments or computers found in the space. It did not always succeed, as not all informants had the time, opportunity or (simply) the wish to invite me into their creative space, so we would meet in a café or living room. It was striking how much this affected the conversation. Typically, it was more difficult to get these conversations going, as we now could not point to the specific instrument or computer in question – in a sense, we were faced with the same challenges as an

actor without scenery and props. Not impossible, but challenging, as we could only illustrate points verbally and by using gestures.

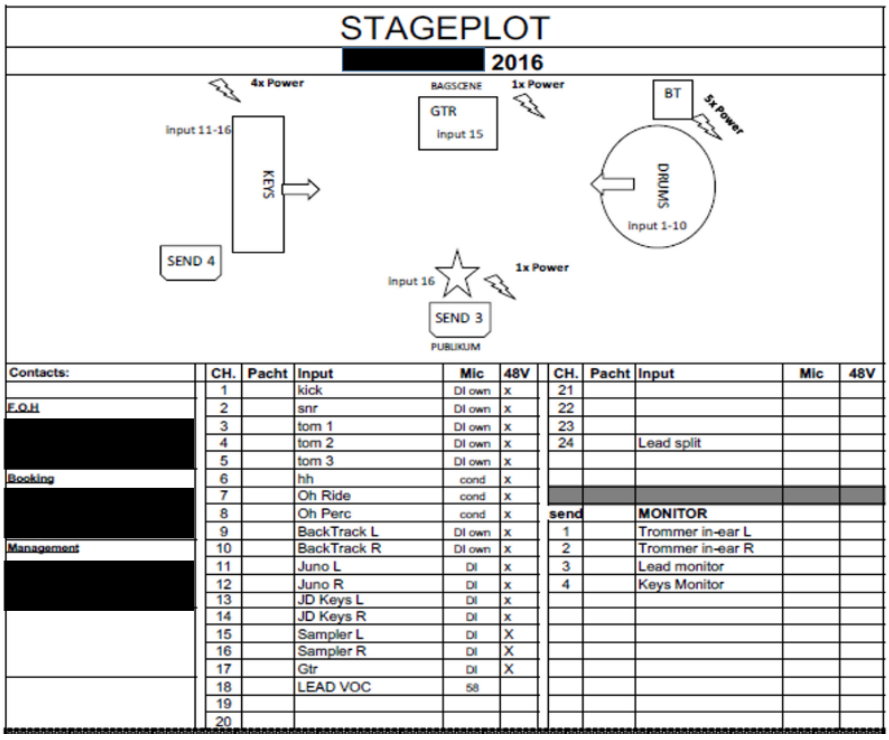
INTERVIEW GUIDES

My research focus developed continuously throughout the interview period, along with my skills and knowledge as an interviewer, with the consequence that the first interview was very different from the final one. In line with my attempts to make the research process and result relevant to the project partners, the focus changed, and the interview sessions are, as a result, relatively broad in scope, exploring different themes from various angles. All interviews, however, started with a brief introduction to the project, as the notions of digitalization and creativity – as discussed in Section 1.3. – evoke many associations, not the least for musicians.

The following four questions were originally included in the interview guide, with the intention of starting with a few opening questions, not easily answered though easy for the interview participants to identify with:

- *What is good music to you?*
- *As a musician, seen from the stage, how would you describe a good concert?*
- *Do you have any specific expectations of the concert at Roskilde Festival? / How was your experience of performing at Roskilde Festival?*
- *Is there something unique about Roskilde Festival that other festivals do not have?*

These questions reveal the early stage of the project, as they are obviously fumbling for relevant content to analyse, preferably of relevance to the festival organization. I only asked these questions in the very first interviews, after which the interview form was modified. As an alternative method, I began using the stage plot of the artist in question as a 'prop' to inspire the dialogue (Figure 5). The document served as a constructive tool, both opening and focusing the conversation, and generally supporting the comfort of the interview situation. I realized that, rather than making the interview participants feel comfortable, the open questions presented above on the contrary often generated a feeling of self-consciousness and doubt as to where the interview was going. The presentation of the stage plot made the conversation develop on the interview participants' terms: they could start by telling me a specific story about their world, rather than groping in the dark and speculating as to the direction of my research.



Contacts:	CH.	Pacht	Input	Mic	48V	CH.	Pacht	Input	Mic	48V
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F.O.H	2		snr	DI own	x	22				
[redacted]	3		tom 1	DI own	x	23				
	4		tom 2	DI own	x	24		Lead split		
	5		tom 3	DI own	x					
Booking	6		hh	cond	x					
[redacted]	7		Oh Ride	cond	x					
	8		Oh Perc	cond	x	send		MONITOR		
	9		BackTrack L	DI own	x	1		Trommer in-ear L		
Management	10		BackTrack R	DI own	x	2		Trommer in-ear R		
[redacted]	11		Juno L	DI	x	3		Lead monitor		
	12		Juno R	DI	x	4		Keys Monitor		
	13		JD Keys L	DI	x					
	14		JD Keys R	DI	x					
	15		Sampler L	DI	X					
	16		Sampler R	DI	X					
	17		Gtr	DI	X					
	18		LEAD VOC	58						
	19									
	20									

Figure 5. *Example of a stage plot*, Roskilde Festival 2016

All artists performing on all stages at Roskilde Festival are asked to forward a stage plot so that the sound engineers on stage can prepare the technical aspect of the performance and the changeover time between artists can be as short as possible. The sketched stage in the top half of this example shows the position of instruments, amplifiers, monitors and musicians on stage, whereas the table below details the types of instruments and other musical equipment, microphones and also, importantly, how the various signals will be channelled to the sound engineer producing the show. Hence, the stage plot provides a good overview of the technical aspects of the performance, so that it gave me an initial idea of the involvement of both analogue and digital instruments and also functioned as a good conversation-starter on the specific research topic in the interview session. I therefore started presenting the plot to the interviewees early in the sessions, with the intention of asking the following questions, which formed the core of my second version of the interview guide. The questions were not asked in any specific order, and were typically followed by clarifying, or sometimes sceptical, questions, as I preferred to use them in an improvised manner as appropriate as possible to the situation:

- *I have printed and brought your stage plot – can you describe your band and the kinds of instruments you use on stage?*
- *Do you bring a computer onto the stage, and why/why not? Any digital instruments? What role does your computer play in your live setup?*
- *Does the abstract distinction between analogue and digital in describing musical instruments make sense to you? Is it possible to separate the two?*
- *What do you see as, respectively, the digital and the analogue worlds' potentials in terms of performing music live?*
- *What are the consequences of digitalization in terms of making the music come together or reach the audience?*
- *How improvised are your concerts? How much do you plan in detail before entering the stage? And why?*
- *What is the overall potential of involving digital materials, tools and instruments when creating music?*

The interviews were generally very inspired – the informants were often very engaged with the topic, as it points to some of the key challenges of making music today. Therefore, the sessions were sometimes relatively long and took a few detours, so that asking the question directly, to keep the interview on track, was often conducive to the data collection. Typically, I tried to keep the description going by inviting the interviewee to continue their monologue, by pausing, rephrasing the points made in order to confirm that I had understood them properly, or simply asking if they had more to add. At other times, though, I followed up by asking rather leading or confrontational questions, if the interview atmosphere 'asked for it'. Obviously, I did not want the situation to be uncomfortable for anyone participating, but at the same time I needed to be critical: a leading question can 'lead' some interviewees into giving specific answers, and thereby reduce the reliability of the material, but it can also intentionally be used as a tool to open conversations with people – those from a self-confident musical elite, for example – who simply reject a question if they disagree with its assumptions (Kvale and Brinkmann, 2015:230). For example, in one interview with Tomas Høffding (WhoMadeWho), who plays primarily electro music, I presented the pervasive discourse that digitally produced and auto-tuned music sometimes become too 'clean' and lacks the soul and authenticity of analogue music. I framed the question in a polite manner, and the relatively mild provocation ignited a personal and very well-formulated story on the topic, which ended up being an important full-length quote in the article. Sometimes, it pays off to take a chance in the interview situation.

3.2. PARTICIPANT OBSERVATIONS

It would have been interesting and relevant to meet and interview the musicians again and catch up on the subject after a while, as I suspect that the conversations would also have led to reflective processes for them, and thereby to new stories and insights in the weeks after the interview session. They all participated, relatively unprepared, in an interview never more than 1½ hours long; an interview returning to some of the questions and making them much more specific to the interviewees during the time we spent together would have created more focused and detailed interview material. I write this as a retrospective evaluation of the process, with the only explanation for not re-interviewing being that I found it too much to ask them for: at the time, I was satisfied and humbled that these talented musicians had even wanted to participate in *one* research interview session with close to no promotional potential at all. But, in reality, at least some of them would probably have agreed to meet for a second (or perhaps even a third) interview.

However, as described below, the participant observations of the project are included as a supplement to the interview sessions, with strategic ambitions similar to those for re-interviewing: to develop a natural, sustained, deep relationship to musical creative processes, in the studio and on stage, and an intuitive understanding of various involvements of digital tools and materials. I did not formally interview the project participants, but rather participated in the creative conversation as we went along, so that the method allowed me – over (a relatively long) time, due to the many detours and open, unstructured format – to get a closer look at how the participant both described and 'lived with' the studied phenomenon. The following sections describe my methodological strategy towards collecting empirical material from what I label 'participant observations', though drawing on inspiration from e.g. autoethnography.

TAKING PART IN AND OBSERVING CREATIVE WORK

The method of observing is associated with many approaches to the collection of data: anthropology, with its studies of cultures; psychology, with its observations of human behaviour; or the natural sciences, with their neutral observations of experiments. These approaches to observing are built on fundamentally different epistemological assumptions, and the notion of *participant* observation is, in a sense, an oxymoron (Szulevicz, 2015:83): the active notion of 'participating' is in conflict with the passive ambition of 'observing' the studied field. The first suggests practical engagement, while the second connotes objectivist distance. Hence, built into the method is the challenge to the researcher aiming to observe how people live and behave in their natural surroundings of finding a good balance between, on the one hand, participating and socially engaging, and on the other, leaving space and allowing the observed practice to happen.

Participant observation is naturally aligned with, and holds various advantages as a supplement to, the interview material of creative processes as a situated practice. Firstly, both the method of participant observation and the theoretical basis of the study contributed to what Hastrup (2011) suggests as a general 'topographical turn' in the human and social sciences, representing an orientation towards the relations between people and their surroundings. The practice of observing is specifically developed with the intention of studying relations between persons and material surroundings, and the method is thus directly linked to the theoretical understanding of creativity as a socio-material practice. As such, my task as a researcher becomes to participate and observe where the creative processes take 'place' (Szulevicz, 2015:85).

While the interviews invited the musicians to reflect in retrospect on their processes, the participant observational approach '*read the process'* forwards (Ingold and Hallam, 2007:3) and followed the creative work as it went along. Firstly, observing provided me with the opportunity to experience at first hand and develop an intuitive understanding of the materiality of digital tools involved in creative processes, and it also opened up the opportunity to immediately converse with the participating musicians on specific aspects, in the situation, when we were actually in the middle of the process. Hence, the study of creativity becomes very specific and 'tangible', rather than abstract and retrospective as in the formal interview situation. Hence, some of the main reasons for including participant observations are based on the potential of the method to open up the studied field, to build trust and relations between the involved actors and to enable the right topics to be brought up and the right questions to be asked in the formal interview sessions (Szulevicz, 2015:86f). The interviews give privileges to the interviewed musicians who are good at detailing their experiences, and most of them are, but by observing I gain access to the tacit and hidden parts of the process, which are hard to put into words. The two methods inform each other in the sense that observations can inspire the application of a relatively openly structured interview guide, just as the interviews conducted potentially lead on to new observations.

THE MAKING OF *SYL*

Creative processes relating to the creation and production of music are not very accessible. They are often fragile and easily interrupted, at least in the case of 'open-ended' processes where the artist or otherwise creative individual or group has no predefined goal, where the work demands focus and dedication, where intruding outsiders – such as researchers – are not welcome. The extreme example is the author working in solitude. It seems obvious that a researcher would not be allowed to sit in the corner and observe how the work process unfolded, no matter what the research objectives were. As is also evident from the interviews, many musicians, too, write

alone or in small groups either in home recording studios or in more professional studios, where the first tracks are laid. Here, too, it would be disturbing to have a researcher present. Even if there were other musicians in the room, it would not work if I were taking notes from all the conversations the musicians were having on digitalization and related 'creative ups and downs'. In order not to interfere with or derail the work of the musicians, I needed a natural role - a role in the recording space, where I as a researcher and thereby alien to the process would not affect the creative work of the musicians in a manner detrimental to the open, creative process. I needed a methodological approach allowing me to take part, ask questions and open discussions without obstructing the process.

Therefore, early in the process, I decided to include participant observations of a creative process in which I was taking part myself. Firstly because the method allowed me to get close to the materiality of the creative challenges musicians face when developing music, either in recorded format or in preparing for a concert, and secondly because it was interesting and personally motivating for me to explore how my background as a musician could be engaged as a methodological tool in the project. I decided to develop a small-scale creative process and record a mini-album with fellow musicians: by including myself in the creative process, I could obtain a positive and constructive position in the room, inviting all participants to 'forget' that I was doing research and focus on my role as a musician making music with them. Obviously, I ran the risk of the whole situation becoming forced and artificial, in the sense that the academic purpose of working together could outshine the importance in itself of the creative process which I was actually interested in. However, I recall wishfully repeating to myself that, if successfully implemented, the method would allow me to gain a unique, inspiring first-row look into the engines that drive creative processes in the digital age.

I applied a method with clear links to an autoethnographic approach, but which I deliberately chose not to label as such. 'Auto' means 'self', and in broad terms the methodological approach focuses on an introspection where the researcher concentrates on his or her own observations and reflections on a cultural (ethnological) phenomenon (see e.g. Baarts, 2015). However, my initial idea, as presented above, was not to reflect on my own experiences of involving digital tools and materials in creative processes and how I understood them as either conducive or detrimental to musical practice, but rather to gain direct *access* to other musicians' experiences, stories and reflections as the creative process unfolded. In that sense, I do not see the interviews and observations as two 'separate halves' of my empirical material, but rather as a cohesive material. I perceive the Syl project as an opportunity to develop deeper relations, compared with the relatively short time spent with the interviewees; as an alternative to re-interviewing the musicians, but both drawing on and informing the formal interviews in an iterative process – hence, the two methods are not separate, but rather are fully integrated, informing each other with their distinct potentials for obtaining a close and reliable look into musicians' creative practices in the digital age. Also, though I had been working with music for many years, I had

never written or developed a record or concert 'on my own', so I knew that taking up such a challenge would be very stressful. The complex task of writing the dissertation was already a sufficiently transgressive step out of my comfort zone. My idea was rather to involve musical colleagues in a project which they could co-write and co-develop with me. The following sections describe how it went.

WRITING AND PRODUCTION PROCESS

In the winter of 2017, I gathered a group of professional musicians with the aim of starting up the recording project, which I hoped could lead to a few concerts later on, so that I could include the considerations of the musicians on how to creatively transform the recorded material into a musical performance. I started with two musicians, Tomas Raae and Eske Nørrelykke, whom I had previously worked with on a great variety of projects and knew well. After their positive recognition of both the purpose and the scope (financial framework, timespan and workload) of the idea, we/I invited two other artists into the project: the musician and singer Anna Brønsted and the author Josefine Klougart.

We all agreed to base the project on Klougart's book *New Forest* (2016). Hence, even though some of them had never worked together before, the musicians had a point of reference. The musicians were all established as artists and therefore knew of each other's individual 'sound', aesthetic qualities and character, but the group had never worked together in that specific constellation. A work situation with both advantages and disadvantages in terms of igniting a creative spark. If all participants in the group know each other well professionally, they know – generally speaking – both where to start and where to end. They will follow routines efficiently. The risk of putting together a new group is that they potentially do not understand each other, and work in separate directions. On the other hand, if successfully implemented, putting together a new group gives the potential to force a genuinely new and fresh energy, allowing people to give their best, think new and challenge their existing culture. Many factors play into this, but, generally, my line of reasoning can be reduced to the following strategy: when included in a group of people you respect for their professional achievements, you present the best version of yourself. You do what you can to give the best impression when there is no beaten path to fall back on. It is my experience that this tension between familiarity and novelty in the group can be conducive to the creative processes of making music (if motivation is high). Therefore, in seeking to develop a positive, creative energy and inspiring atmosphere in the project group, and with an eye for the history, personality and aesthetic of the participants, I opened the project with a start-up meeting early in February 2017. The creative tasks described below were included in project and creative process:

Initial writing phase (February – September 2017)

- All participants read through *New Forest* (Klougart, 2016).
- Klougart selects 15 pages as pivotal points for the musicians (led by Hvidtfeldt/Brønsted); continuous work with lyrics for the recording.
- Single lines and sections are selected and rewritten.
- Chords, themes, moods and other musical elements are written over the tone, language and specific lyrical lines (led by Hvidtfeldt/Brønsted).
- Drafts of the main elements of the production are recorded and edited in a demo studio in Nørrebro, Denmark.

Production and performance phase (October 2017 – May 2018)

- The group records main tracks in a professional studio.
- The recordings are further developed with new elements, such as additional layers, strings and choir in the studio/demo studio and on mobile recording systems at home.
- Mixing of the collected musical and lyrical production.
- First performance of the music, for Møn Sessions.[6]
- Post-production and mastering.

All the music was recorded, edited and produced on a computer. Many of the instruments recorded were digital: software bass, drums and synthesizers. I led the writing and recording process, and obviously tried to balance analogue and digital instrumentations, precisely in order to push the dialogue on how to merge these different material qualities musically and creatively. Throughout the entire process, my role would be to balance the role of artist legitimizing my presence in the creative space and my main task as a researcher on the project, justifying my financial commitment and time spent. I sought to participate in as many parts of the project as possible, but, since the creative process should ideally live its own natural life, I chose not to dictate to the participants when and where to work. My strategy was to follow as much of the creative process, as it naturally unfolded, as possible. Therefore, for example, I allowed all informants to start sketching ideas at home while reading through the (relatively complex and heavy) book. Both informal discussions and actual interviews with the project participants were included throughout the project period. No matter how I structured the process, the music would appear through an ephemeral process with ideas coming and going in unpredictable patterns; my task as an observer was to read the process as it unfolded, to follow the creative trajectories as closely as possible, while my task as an interviewer – both in the loose conversations with the project participants and in the more formally organized

[6] The live performance for 'Møn Sessions' was videotaped and can be found here: https://www.youtube.com/watch?v=70Jt7XnDHFM (retrieved 19 March 2019).

discussions – was to ask questions, inviting the participants to reflect on their experiences of the process.

Figure 6. *Vinyl record cover of the mini-album Syl* (Hvidtfeldt, 2018b). Photo: Anders Graver; graphic design: Lea Charbonnier.

The recordings were released on 10 November 2018, approximately three months after the article was published. The academic writing process and the production and performance of the mini-album were thus relatively well synchronized, to the benefit of my studies and the disadvantage of my stress levels and sleep patterns. It was a great challenge, as I had never headed the musical writing process before, and the stakes were relatively high: if the music we wrote together did not work and sound right to begin with, I knew that the motivation of the participants would be limited or perhaps even disappear. Perhaps the observations and stories gathered would even be unusable in that they would not be 'honest' and engaged, and as a result not really relevant as data for my research. All things considered, everyone involved is happy with both the process and the result. The Syl project succeeded in becoming both a production and a performance project, as we ended up playing a live version of some of the music recorded.

My article, however, mainly contributes perspectives on music making in performative and social concert settings, but, as the interviews and article show, the processes are intertwined. My intention in observing was to create reflectional space informing the interviews I was conducting in parallel. The analysis is not based on actual observations of musicians in performance, but rather on conversations about strategies for handling the challenges of making 'music musical' in concert situations. In participating, I succeeded in observing musicians as they worked, initiating dialogues with them on creative decisions as we went along and discussing with my fellow musicians how the music we were creating could theoretically be performed in

a live performance situation, and thereby supplementing the interviews, which were not repeated, with comprehensive and profound material collected over a year-long period. Hence, in a sense, the process of gathering and analysing the data is in itself a creative practice, depending on the context of interviews and observations as well as my individual contribution as a researcher, the person I bring into the project. Rather than trying to see everything from nowhere (Haraway, 1988), I have conducted research as a specific individual immersed in the creative research process, seeing some things, not seeing other things, using a specific lens.

In my view, by taking part in the process, I did succeed in establishing both a good creative space and a forum for reflection on the studied practices – which was conducive to the development of the dataset on creativity – and also on musicians' concert situations, though these were not observed and evaluated as such. And, of course, at the time when I was interviewing and observing, the project was still relatively open, so the specific focus of my research was constantly developing. In what was a long and complex process, both observational and interview data holds many perspectives relevant to understanding how digitalization plays into musical creative process which have not (yet) been addressed. I was open to the development of the project, and took a few methodological chances and therefore also a number of detours (see also the discussion in Section 1.2. defining the core terms of the subject), so that my data broadly explores the studied phenomena. For example, there is an interesting, though not yet theoretically framed, research perspective on how digitalization shapes and fosters serendipity in musicians' creative work.

OBSERVATIONAL FOCUS AND NOTE-TAKING STRATEGY

My analytical focus in the interview and observational sessions was the same, and I therefore used my interview guide as a mental reference during the writing and recording sessions. The prime aim of the interview sessions was of course to converse on predefined subjects, whereas the aim of meeting up with the Syl group was to make music, so my 'application' of the research focus to the data collection process was more informal. As described, my task was twofold: to ensure that the writing and production process moved forward, and to ensure that the participants were motivated to dwell on aspects of creating music relevant to the research. Some of the questions asked in the interview sessions were obviously not relevant to the writing sessions, whereas some of the most general followed me throughout the process. Both directly and indirectly, I discussed with the participants questions like the following: *Does the abstract distinction between analogue and digital in describing musical instruments make sense to you? Is it possible to separate the two? What do you see as, respectively, the digital and the analogue worlds' potentials in terms of performing music live? What are the consequences of digitalization in terms of making the music come together or reach the audience? What is the overall potential of involving digital materials, tools and instruments when creating music?* The answers I got were sometimes specific and easily written down, but often – sometimes owing to the

typical jargon of musicians in such situations – the conversations took many detours, a mix of conversations on creative ideas, jokes of doubtful quality, stories from late-night adventures at concert halls over the weekend and feelings about the qualities of specific instruments, songs, bands etc. My task has been to navigate this maze of information and focus strictly on how my colleagues understand the challenges of ensuring musical, living music in recording and performance situations, as this was my analytical point of refence for understanding creative processes.

I needed the writing and recording process to be 'real' and non-academic. Though, for obvious ethical reasons, all participants were informed about their participation in a research project, it was therefore important for the generation of an authentic creative process that they perceived the work situation as creative first, and an academic contribution second. Taking notes during the work process, and thereby putting on my identity as a scientist, would potentially disturb the creative process and make the participants self-conscious. I was working on the record, interviews and report simultaneously throughout most of the project period, and knowledge from one domain fed back into the other in a continuous, iterative process, so that relevant notes taken from the Syl project have been just as much mental as formally written down; as discussed in the section below, my analysis of the materials involved in the process was early and ongoing.

Notes were taken both *ad hoc* throughout the process and, more formally, after meetings with the project group. Often, I had an idea while on my bike, on my way to pick up my son from kindergarten or on the train to the office in Roskilde. Ideas pop up at the strangest and sometimes most inconvenient moments, as vividly described by Danish artists in the book *In the Show with Picasso* (Stadil and Tanggaard, 2014), so that the observational notes were relatively unstructured and written down on sheets of paper or on napkins I had to hand, or recorded on the Memo app on my iPhone. I endeavoured – although my schedule did not always allow it – to sit down with the computer for an hour after each recording session to write down what came to mind in an effort to provoke a more theoretical, project-specific and organized evaluation of the recording process. I primarily used the project to gain access to other musicians' stories and reflections, enabling us informally to reflect on and validate some of the questions I used and answers I received in the formal interview sessions. I therefore allowed this open-endedness in the note-taking process. Generally, one could say that this dissertation is permeated with the idea that both *knowledge* and *musical* creation are developed in a continuous dialogue with the studied and lived-through practice (Hastrup, 2015:69).

Below, I present some examples from the formal log notes taken after our work sessions. I have done this in an effort to illustrate the iterative process, and how the observational project generally functioned as a creative, reflectional space, inspiring both the interview sessions and the analytical trajectories.

> *[…] Eske [Nørrelykke, ed.] said something quite interesting today. If you really engage in the potential of computer editing software such Ableton Live, Pro Tools or Logic [use samples, edit extensively etc.], and then press 'solo' on a single track, they all sound great on their own. They do not necessarily do that if you press 'solo' on the individual tracks of a Stevie Wonder recording. Somehow, you have to think a lot about the whole rather than the individual parts. That is a very inspiring thought, I think, relating to the flow afforded by digital editing software, actually.*
>
> (Log notes, 15 June 2017, Nørrebro, Copenhagen)

I found this comment inspiring, in a general sense, as it opens up questions on the emergence of music in a very specific example of the way in which digitalization affects the materiality and workflow of creative processes of musicians in the studio. It inspired my thinking and theorizing on digitalization in a number of ways, and I brought the idea with me into the interview sessions.

> *We [my two-year-old son and I, ed.] listen to an old record, which I haven't heard for years. I play the drums myself, and it is, to my surprise, pleasant to hear the record again. I recall not being particularly happy with the tracks at the time when they were recorded, four to five years ago, but somehow it now makes more sense to me. Perhaps because it has something that the record [Syl, ed.] does not. It made me aware that the recordings lack some of the life several of the informants are talking about, which they are struggling to realize in studio and on stage. It sounded live, played with the hands, organic, and it is. Our recordings are perhaps 'conceptually alive', but not as music. That is what the recordings are missing. Something improvised. We clearly have the problem at this point that we are all working a lot on the music in solitude, each with our computer and microphone. I do not have the option, as the work procedures are now, to bring Eske and Anna into a rehearsal space and try things out with instruments as a band. It is not part of the deal we made […] and would demand a lot of time and hard work. It is two fundamentally different ways of writing, cooperating and processes of production. Nonetheless, the music needs some elements of 'living music', just like the record I heard had in abundance. Like Anna said at some point, when working on computer, in solitude, one does not make music, but rather some kind of conceptual, musical maths – the movements I have made with arms and legs on the drums have, in theory, a musical idea, but no longer, after hours editing in solitude, a life as music in practice.*
>
> (Log notes, 17 September 2017, Christianshavn, Copenhagen)

As evident in this quote from the formal log, my thoughts as written down concern my own analysis of our creative processes, ideas from the interview sessions and

direct comments from the participants. The Syl project was truly an open forum where theoretical and analytical ideas could be evaluated. Inspiration from, for example, the above log note has specifically helped build the arguments in the article on performing complexly layered studio music on stage (Hvidtfeldt and Tanggaard, 2018:637). The final quote included here has a similar focus. It was written on the day we started preparing our first public performance:

> *We meet today to work on the final vocals, but also to find a way to perform Lys I live [first track on the EP, ed.]. The recorded version is currently full of edited string recordings, mainly in the intro and outro, that cannot be performed on stage in a meaningful way, so I suggest a simple acoustic version without these parts. Some are more interested in developing a more modern sound, with sampled instruments, so it is hard to make these decisions on the spot, quickly. We discuss how sampled versions of the strings would work in the live video, how they would perhaps become 'musically dull', and also that we do not have too much time to prepare, so we end up with a version within our musical comfort zone for now and talk about how to develop things in future performances.*
>
> (Log notes, 10 February 2018, Nørrebro, Copenhagen)

As the log quotes indicate, we dream of involving digital tools in the live performance, but struggle, mainly with our own skills and anxiety in terms of making a musical, living performance. As underlined in the introduction, I define the creativity of musicians as dependent on musicality – the above quotes from the observational notes made are included to illustrate exactly how I have striven to observe when digital tools and materials can be involved in performative situations in a musical manner, and to discuss with the participants how this can be done. As such, I have not been too concerned with exploring the newness or originality of the ideas presented in the recording sessions, but have rather focused on the challenges of and discussions about how to create living, emergent and musical productions in studio and on stage. Also, as the examples demonstrate, my primary observational focus has been the lifeworlds and creative practice of the project participants, rather than 'self-reflection' in a typical autoethnographic sense. Still, I involve myself in both the creative and observational space, so that the points made by the participants and interviewees are entangled with my own reflections – the log contains my own analytical reflections, just as the interview sessions and transcripts do.

3.3. ANALYTICAL STRATEGY AND FOCUS

Implicit in the process of involving oneself in doing research, whether in interviewing, observing or discussing creative practices, is the idea that it is difficult to divide the

analytical process into distinct sections. Formally, the process of 'analysing' began as I sat down with interview transcripts and notes from the participant observational sessions; in another, and probably more accurate, sense, the process of analysing for the project has been continuous and began as soon as I formulated the project proposal.

In addition to the phenomenological approach to the lifeworld interview presented earlier, the formal analytical strategy of the study is inspired by Spinelli (2005) and Giorgi (2008). The research strategy, as presented, is to express the *general* in the specific (Jacobsen et al., 2015) – to find tendencies in the materials and organize them into a meaningful, coherent analytical narrative which is then – in the specific article – confronted with previous theoretical ideas and qualified in a section discussing the findings. As described above, my goal has been to find a good balance between leaving room for the stories of the interviewees and provoking reflection, keeping the interview and observation process on track and challenging presumptions of the interviewees and participants. Initially, interview data was gathered and – in an effort to ensure reliability – carefully transcribed in full, so the studied phenomenon is presented in the words of the interview participants and 'as experienced'. I listened – live, in the interview situation – as the informants described their lived experiences, and afterwards read through the empirical material a number of times prior to organizing the material into meaningful categories.

The emerging themes of the data were organized under the following headlines: *The Format Matters*, presenting the overall argument which directed my attention towards emergence theory, namely that the musical relationship between subject and object depends on the situation of the creative practice; *From Studio to Stage,* highlighting the argument that digitalization often 'increases' the distance between studio and performance work by underlining the differences between the two types of creative processes; *'Enslaving' the Situation,* focusing on the argument promoted in the data that digital tools risk limiting the freedom, social engagement and presence of the musicians on stage; and finally, *Imperilling the Situation*, underlining the importance of running risks, having something at stake, in musical processes of emergence. These were the themes and points in the data *generally* agreed on by the interviewees and participants; many other experiences with digitalization and interesting anecdotes from the industry were told, arguably owing to the general openness of the interview format, my learning curve as an interviewer on the subject and the many interpretations of the consequences of digitalization to the industry. The data is rich and holds other relevant analytical trajectories, especially – as argued – in terms of the studio potential of digitalization, that are not fully analysed in this dissertation.

3.4. VERIFICATION OF THE STUDY

The quality of qualitative research should be evaluated on the basis of different criteria depending on the types of methodology applied and the general aim of the study. In the following, I will dwell on the type of knowledge generated and how it can be verified with reference to the traditional concepts of validity, reliability and generalizability of qualitive research results. Here, I am especially inspired by Kvale's (Kvale, 1997; Kvale and Brinkmann, 2015) interpretations of these terms, which are otherwise typically associated with the natural sciences.

VALIDITY

The notion of validity typically refers to questions of whether the research project is in reality studying what it was developed with the intention of studying. Hence, validity as a qualitative criterion leads directly back to the research questions formulated. Validity questions the strengths of the arguments presented, whether they are reasonable and well founded, and this depends on several aspects of the study, ranging from the general craftmanship and professional trustworthiness of the researcher, to questions of how the interview and observational material was collected and handled, to how the analysis was presented. As such, the aspect of validity is represented in parameters saturating the research process in its entirety (Kvale and Brinkmann, 2015:320).

Hence, initially, the verification of research validity depends on the theoretical paradigm to which the study subscribes. I apply a pragmatic, moderate approach to the idea of scientific, social 'truths'. As stated in the introduction, in using the term 'essence', taken from the phenomenological tradition, I do not look for universal truth value in any positivist, objective sense of the term, where results are carved out of the social world like gold from a mine (Kvale, 1997). Nor is the antipole of subjective relativism relevant in describing how various subjective descriptions of lifeworlds are understood and presented in the study. Rather, I seek to collect and present the 'general' in the specific, derived from what is shared in the stories told in the interview situations and observed in the Syl project. In the interview sessions, I have tried, with an open attitude, to twist and turn the studied phenomena and invite the informants to profoundly consider their understandings. I do this in an effort to provide a thorough, detailed and well-articulated argumentation relevant to answering SQ1, which details various possible subjective variations of understandings (Jacobsen et al., 2015:221). From these subjective descriptions, I then filter and detail the 'essences' of the stories told, in an effort to present a coherent narrative in the second article of my project.

The observations in the Syl project were collected over 1½ years. Though the group did not meet every day, the relatively long project period was good in the sense that I

had the time to develop ideas, let impressions mature and shape conclusions. I focused only on the arguments which were represented throughout the material. In that sense, the findings are based on a solid empirical foundation. I state this with reference to the point made by Kvale (1997:17f) and Brinkmann (2012:76), who argue from a pragmatic perspective that the validity of the study should also be evaluated on its ability to enable the reader to act. I developed the project out of genuine curiosity, motivated by a breakdown in my understanding as researcher and musician, and the results also gain validity through the impact they have both on me and on other readers within the discipline.

If moving focus from the validation of the findings to a discussion of how the project has been validated throughout the process, here I specifically consider questions related to thematizing and designing the methodological framework (see Kvale and Brinkmann, 2015:320). Firstly, a strong argument for the validity of the general logic and the research gap motivating the analysis is the fact that the theoretical foundation has been thoroughly framed and published in a separate article. Seen in retrospect, my entire research process was fortified by the writing and publishing of the first theoretical article (Hvidtfeldt, 2018a). My research process became structured and focused when my previous knowledge of how the musical process unfolds allowed me to identify a research gap in the literature on creativity as seen from the socio-material perspective – a theoretical viewpoint which I could then apply in the empirically based study and further refine throughout the PhD process. Further, the methodological framework applied has been chosen, not out of a specific veneration for the application of specific methods, but because those methods are perceived as conducive to answering the specific research question. As further discussed above, the two methods inform each other, being interested both in *talking* with and in *taking part* in the life lived by the people who engage in the creative processes of the digital age. Other, more experimental approaches could have been applied, but the combination of these two methods proved to be valid in terms of the knowledge generation process, as well as my personal methodological ambitions and the engagement of my professional background.

RELIABILITY

The question of reliability is concerned with whether and how the findings are trustworthy, and hence with the process of the interview sessions, the potential biases of the interviewer and the way the data is handled (Kvale and Brinkmann, 2015:318). As the following section will critically reveal, steps could have been taken to increase the reliability of the study, while the main argument for the reliability of the article leads back to my access to and position in the gathering of empirical material. I start by evaluating some typical questions in terms of ensuring reliability of the findings.

The reliability of the study is increased if it can be repeated with the same result. Would the interviewees give other researchers other answers? I interviewed what I label a musical 'elite' – interviewees who are not easily manipulated into giving answers they actually do not agree with, and I therefore speculate that they would have presented similar stories to other researchers. Obviously, I shaped the way the observational process unfolded, as I participated myself, but, with reference to the phenomenological ambition of my analytical strategy, I will argue that potential biases shaping the interview or observational process have been thoroughly eliminated in the process.

Also, reliability is increased if the data is shared and discussed in intersubjective processes. I did, as the findings started to emerge from the material, start testing some of the ideas in the interview sessions, and I did, obviously, discuss the development of the article with my co-author, but it would have been relevant – also because of the general learning potential – to listen to the interviews together with my supervisors, with other colleagues and perhaps with the observational project participants in a focus group setting after the recordings were done. I generally regret that I did not go back to the Syl project participants, to whom I had good access, and ask them to evaluate the findings of the article. It would have increased the reliability of the study if they could have qualified the arguments and confirmed the trustworthiness of the conclusions. Also, I never formally interviewed the musicians participating in Syl; that would have been a great way to end the observational project, as a sort of debriefing, for example – but the timing was not right.

My position as interviewer and observer

In the interview guide, on the basis of the phenomenological ambition of the study, I formulated open and unbiased questions, asking the interview participants to bring up their perspectives and experiences. In the actual situation, I sometimes pushed the informants by asking leading or confronting questions, but never did I, in any sense, try to impose 'my' belief and understanding of the studied phenomenon. If my intention in interviewing was simply to have informants confirm my beliefs on the matter, it would be hard to ensure the reliability of the project, as I would no longer be looking for an explanation in a breakdown-driven research process, but rather trying to convince the world that my perspective was right.

In the interview and observation situation, it was generally an advantage that I had been working professionally with music for many years. My previous experience has been conducive both to the actual interview situation and to understanding the 'language' spoken during musical creative processes. I have used my experiences with the topics discussed to adapt to the environment and blend in with the musicians in a natural manner. Mutual understanding and the ability to converse using common jargon obviously builds trust between people, which opens up the conversation about difficult, explorative and personal work processes.

Hence, there are obvious advantages to the situation in that I know the field I am culturally exploring, but 'seeing is another way of not seeing' – I might have had an advantage in terms of seeing a research question and gaining access to the field, but sometimes the ones who get the best answers are the ones who ask the most 'stupid' questions. As suggested earlier, being part of the observed field and in a sense sharing the lifeworld with the informants, I am in a paradoxical situation in that my task is to interview, observe and analyse as an open, naïve and unbiased researcher. In order to have the interviewee speak freely and feel comfortable, I use my knowledge of the field to speak their language and generate a sense of community, which again could have the unwanted effect of making the informant mute, the conversation esoteric and the points implicit. This is a methodological pitfall with potential consequences for the reliability of the process and findings, one which I was much confronted with and sought to handle by not getting 'too' close to the informants and by placing myself in a rather challenging, unfamiliar position in the Syl project.

My position in musical creative situations has always been different from those of the interview participants. The writing and recording processes of the Syl project are the first I have initiated myself; usually, I have been employed as a session musician, supporting the development of other people's writings and performances. Hence, I know the distinctive jargon and culture, but approach the interview situation with sincere curiosity, as I have never been in their position as the composer or producer in a creative process, the main driver of the project. I know the 'culture behind the words spoken' on stage and in the studio, and thus had good access to the field, while not being in a position where I knew 'too much' about the practice actually studied, generating a fragility, uncertainty and curiosity needed for new insights to emerge – and for the results of the analysis to be reliable. My knowledge of the field, my understanding of music and the practices associated with its creation, provided me with the opportunity to understand the 'life' behind the lexical definition of the words spoken by my interview participants. I already knew a lot about music and music production, but in terms of the studied processes, in reality, I started as a novice (Dreyfus and Dreyfus, 1980).

GENERALIZABILITY

Music is something special. The emotions that music evokes explain its widespread involvement in various rituals throughout the planet and throughout time. In that sense, the processes of emergence in the creative practices of musicians and the present conclusions related to digitalization should not uncritically be transferred to other domains. But, while a concert cannot be substituted 1:1 with other artistic productions or performances, if valid and reliable, the findings of the study can potentially be used to describe challenges related to the materiality of digitalization in creative processes in domains other than the musician's.

In the analysis, I have written about the common lifeworld and observed experiences that immediately stood out in the data. Most of the interviews gave many different, interesting perspectives on the use of digital instruments in musical practice, both in the studio and on stage, but to ensure validity I chose to write about the ones that seemed 'obvious': the points that the interviewees independently highlighted as important and the ones that I intuitively could identify with from the participatory observational process. This strategy had consequences in that the findings presented in the article seem rather natural, which is arguably a good sign in terms of generalizability (Brinkmann, 2012:77). I have not, in presenting the results, met strong counter-arguments (from musicians, scholars or myself) suggesting that the conclusions do not describe a general understanding of how musicians relate to digital tools in their practice. It seems natural, like making the 'obvious obvious' (Brinkmann, 2012:41), though not self-evident: my exploration was profoundly breakdown driven, and I learnt a lot from the findings.

3.5. ETHICAL CONSIDERATIONS

In the process of writing my theoretical framework, collecting data, analysing the material and reporting the findings, I have been faced with a number of ethical issues, and I reflect on those I find to stand out in the following, final part of the methodology section.

Firstly, two general perspectives of an ethical character. I have, both in the interview situations and the Syl project, involved real, fragile people, however successful in their endeavours, working hard to overcome all the challenges of embarking on and maintaining a professional career as a creative musician. Perhaps because I have struggled to handle these challenges myself, I have generally approached and included the participants in the project, interviewed and observed them and ultimately presented their stories with the utmost respect for their professional lives. Also, I developed the research focus for the project with attention to the general value of the findings to the music industry, and more broadly to people interested in the musicality of our societies. In other words, my ambition has been to present research results that could inspire musicians who work in music production using digital tools and materials to succeed in their creative work. I am stating this as I want to underline that my ambition has never been to create a separation between various types of musical genre, but rather I have acted in the hope that the findings would be useful to all kinds of musical expression, whether involving digital tools and materials or not.

Ethical dimensions of the interview material

The industry is (hopefully) reading along, and I have therefore been very cautious in presenting the argument and points made by the musicians in an appropriate manner, not misrepresenting them or otherwise putting them in the wrong light (Kvale and

Brinkmann 2015:320). Generally, I tried in the interviews to avoid talking behind other musicians' backs, though it was actually not too easy, as the informants sometimes wanted to give examples of how badly other musicians handled the challenges of using digital materials in creative work. I began all interviews by clearly marking the context of the interview: that it was part of a research project and that it therefore would not be printed on the front pages of the music magazines. This, combined with the relative symmetry of power distribution in the elite interviews, to my understanding meant that the interviewees perhaps sometimes felt too much in a safe zone where no one was listening. I transcribed all interviews, but for the ethical reason that I did not want the project to criticize specific artists' work – though the arguments were my interviewees', not mine – I decided to anonymize some examples in the interview transcripts. This, however, did not affect the results of the article, as the specific examples were not used.

As pointed out in the article (Hvidtfeldt and Tanggaard, 2018:634), I also refrained from using my observations of the actual concert of any of my informants in the analysis or in other interview sessions, as it would have been detrimental to the phenomenological ambitions if the interviewees felt as if they were 'under surveillance' – that the points they made in their interview sessions on how to ensure a meaningful concert would be used against them in the analysis or, perhaps even worse, used as good examples of how bad a concert could be in conversations with other interviewees.

CHAPTER 4. CONCLUDING DISCUSSION AND FUTURE PERSPECTIVES

This final chapter is written with the tripartite purpose of (1) summarizing the contribution of the dissertation, (2) discussing the individual publications and (3) suggesting future research perspectives of the findings presented.

4.1. SUMMARY AND DISCUSSION OF SCHOLARLY CONTRIBUTION

This dissertation has been written with the aim of contributing to the current understanding of creative processes as seen from a socio-material perspective. The overall research question asks, '*how do creative processes, understood as musical and socio-material practices, develop in dialogue with emergent phenomena?'.* The core contribution is presented in three published articles. The first article presents the theoretical foundation and introduces my initial thoughts on the relevance of the general philosophy of emergence to creativity research as seen from a socio-material perspective. With the aim of further illustrating these theoretical ideas, the second article focuses on musicians' creative practices on stage in the digital age, while the third explores the diverse socio-materiality of creative processes involved in realizing Roskilde Festival as a socially emergent event. Hence, I perceive the dissertation firstly as a contribution to research on creativity as a socio-material practice, and secondly as a contribution to the development of new perspectives on musicians' performances and the creative development of Roskilde Festival as an emerging event. In the sections below, I present the findings of the published articles.

Article I: ***Concerted creativity: Emergence in the socio-(im)material and intangible practice of making music***

The article explores how the general philosophy of emergence informs a socio-material understanding of creative processes and finds, inspired by the conception, that a *whole* is other than the sum of its *parts*, '*that the relationship between subject and object – the main analytical focus of studies on creativity as a socio-material practice – is fundamentally embedded in an emergent process'* (Hvidtfeldt, 2018a:228). In discussing the socio-material differences between physical things, objects and emergent phenomena, the article provides a theoretical language describing the process of emergence as an ephemeral 'material' for creative processes

and suggests that studies of the socio-materiality of creative practices must refer to the emergent process *to* which they are contribution and *through* which they evolve meaning [become musical, ed.].

Article II: *Concerted creativity in the digital age – How do we crack the code?*

The second article of the dissertation is a further illustration and empirical application of the theoretical framework presented above, in exploring (SQ1) *how digital materials – such as instruments and samples – can be involved in musicians' creative processes on stage in a 'musical' manner conducive to the process of emergence.* Firstly, the study concludes that the musical emergence of musicians' creative processes in performance situations on stage, involving digital tools, computers and instruments, is dependent on the format or situation of the event: *'Depending on the situation of the creative practice, music must be painted with more or less "broad brushes", making the aesthetic expression either thin or thick – features digital materials hold significant potential for controlling and developing'* (Hvidtfeldt and Tanggaard, 2018:643). Further, the article finds that musicians utilizing the full potentials of the digital realm in the studio need to take a few steps back when translating the 'perfect' and finalized production into an emergent, living live performance, as uncritical digital replay potentially, depending on the format of the situation, confines the process of emergence. Also, the emergence of a musical performance is understood to depend on fragility: *'the artist needs to have something at stake, akin to the funambulist walking the tightrope. The utilization of digital materials to "produce" the performance and control the situation must be balanced, and often compensated for. It appears that the overall challenge of involving digital materials in emergence processes in staged performances is to give them "life": the digital "code" literally needs to be "cracked open", so other elements in the creative situation experience the performance as an invitation into the process of emergence'* (ibid).

Article III: Creativity as a meaningful, socio-(im)material practice: The emergence of Roskilde Festival

With the intention of further exploring how the general philosophy of emergence informs a socio-material understanding of creative processes, the final article submitted with the dissertation focuses on the socio-materiality of Roskilde Festival, seen as an ephemeral, emergent phenomenon. In the article, we discuss (SQ2) *how the creative processes realizing Roskilde Festival become musical in dialogue with the event seen as an emergent phenomenon.* We demonstrate, using examples from different levels of the organization, how *"Roskilde Festival" is ritually re-created and saturated with cultural, symbolic meaning'* (Hvidtfeldt and Tanggaard, 2019:544) and how the ephemeral, emerging whole serves as a 'macro-structure', a socio-material

reference, *'motivating and justifying creative behaviour at the lower levels of the emergent phenomenon'* (ibid).

4.2. POST-PUBLICATION CRITIQUE

Writing a PhD project is a learning process. The first article was published relatively early, and over the course of working on the rest of the project I have developed my theoretical language and empirical understanding of the studied field. Hence, in the following sections, I have inserted a few post-publication reflections discussing the general use of terminology and the findings of the contributions.

Firstly, if I could re-write the articles, I would be more precise in my use of the terms tangible, intangible, immaterial and material. I am worried that the connotations of dichotomies between different types of matter distort a coherent presentation of the actual aim of, and points made in, the article. To begin with, 'intangible materiality' appears to be an oxymoron. When I refer in the article to 'intangible' and 'immaterial', I seek to develop a language for the result of the creative process – be it creating Roskilde Festival or the emerging result of a musical performance. We cannot touch 'Roskilde Festival', though the elements constituting the event are very physical. We cannot hold 'the total result of the creative process leading to a song performed on stage' in our hands, though many of the constituent elements are tangible and visible. The aim is not to discard ideas on creativity as a material practice and state that some practices are material while others are not, but rather to add to our understanding of materials: my aim is to build the argument, in line with e.g. Sawyer's (1992, 2000) ideas on creative performances as processes of emergence and Ingold's (2007) conception of the environment as consisting of different types of materials and materiality, that the emergent phenomenon holds ephemeral, material qualities.

I should also have been more careful with my wording when discussing the 'complexity' of creative processes within different domains. In the article, I state that '*if the materiality of creative processes related to sculpturing is relatively simple, and that related to music production fairly complicated, the socio-materiality of music performance is highly complex!'* (Hvidtfeldt, 2018a:236). The argument could be read as an attempt to exalt the creative processes of musicians as more interesting, because other creative processes are 'easy to trace'. This is, however, not my intention. All creative processes are obviously – as underlined in the general socio-material approach of this project – developed in highly complex, unpredictable processes, which are not easily described at all. With less emphasis on highlighting one domain over the other, I could have made a better effort in underlining the point I was actually trying to make: that concerts, festivals and other social events are chaotic and involve many people – that the experience of attending a festival concert, either as a musician

or as an audience participant, is messy, rowdy and materially very different from the studio production process.

Chaos, cosmos and emergence

In line with Small's (1998) point that music cannot be reified, music on stage is something that lives: in the performance situation, musicians look in different directions (chaos), and eventually, if they are skilled and things turn out right, reach a state of 'cosmos', as I write in the articles. In the process, they move in and out of the shared energy to make it move, live and breathe (chaos), but if there is no shared 'product' there is no material reference (cosmos) for the continued creative process. Actually, though, *chaos*, defined by its randomness, and *cosmos*, understood as an orderly system, are perhaps not the most precise terms to use in descriptions of processes of emergence. Firstly, 'cosmos' should be equated with the *musical emergent phenomenon* and not with orderly systems or 'provisation', as we label the controlled performance in the article (Hvidtfeldt and Tanggaard, 2018). Conversely, as we write, you *need* some chaos or fragility, in order for music to emerge. In that sense, the musical emergent phenomenon depends on *both* chaos (life, fragility) and cosmos, understood as an emergent material reference for the creative processes. In the article, I do state that *'When working on a piece of music, the instruments hold specific qualities, the room creates a certain acoustic setting etc., but the created music* – though not "finished" *and non-physical – also feeds back into the process'* (Hvidtfeldt, 2018a:236 [emphasis added]), which does suggest a similar understanding of and relation between the terms 'chaos' and 'cosmos' as I now underline here, but the terms could have been defined with more precision.

This point also leads back to my intentional lack of focus on novelty: arguably, there is also an important connection between the defining features of the new and the musical in terms of emergence. Improvisation, which is a key term in, for example, Sawyer's (2000) understanding of processes of emergence in jazz musicians' creative processes on stage, could be understood as a musical ability to introduce a constant flow of new ideas driving the process of emergence forwards. Perhaps it is precisely the new idea, leading the process of creativity in a musical direction, that gathers the creative threads suggested by all involved actors and pushes the processes towards the creation of a 'cosmic' whole.

Artistic music and identity

In the analysis of musicians' creative practice, I have been focusing on discussing the emergence process as it is seen from the stage, and thereby how musicians, with their relationship to digital materials, contribute to the musical development of the situation. However, performance situations sometimes become relevant to audiences based on other qualities than the ones we usefully ascribe to musicianship – no matter

how badly performed, the mere rendition or even mention of specific songs can bring people to tears, as they 'mean' so much to them. Sometimes, the emergence of a musical situation – and let's stick to the example of a concert for now – is driven by the identity of the audience members. Therefore, with no naïve expectation of getting to the bottom of what is a complex issue, I find it appropriate to mention this aspect and open the theoretical development of a model describing the relationship between identity and musicality in emergence processes.

Music has been used, within most cultures throughout all times, to regulate and maintain a great diversity of feelings and as a resource for identity construction, at both the individual and the collective level – a core topic with e.g. music psychology and therapy (Bonde and Koudal, 2015; Ruud, 2013). Identity 'plays into' music performances and their processes of emergence. We all participate as audience members based on our personal background and musical biography – we navigate in the musical chaos and identify with emergent wholes based on our emotions and previous knowledge. The flipside of this argument is obviously that, sometimes, the way the participating audience member identifies with the musical expression works *against* the process of emergence – it is hard to win over an audience who for some personal reason have already decided, prior to entering the concert hall, that they dislike the artist. Hence, this perspective on processes of emergence in creative processes would be a highly relevant trajectory for future studies following this project. How does identity play into 'musical' processes of emergence in other domains?

To further complicate things, not all performances are supposed to be 'meaningful' in the musical sense. Music becomes relevant in different ways, to individual people, with various characters and identities, in specific situations, and Roskilde Festival captures many of these diverse processes and feelings – a good argument as to why the festival continues to be relevant. The festival presents popular acts, so people can sing along to the tunes they have heard on the radio, but also has a strong focus on new music and genres that no one (yet) knows of, with the potential to challenge people's understanding of music. Experimental, artistic music, not singable at all, is however also represented, and this final category of music completely breaks out of the theoretical model presented here (Figure 4). If 'music' is understood as an outlet for avant-garde *artistic* expression, it is not even necessarily a domain depending on any notions of musicality or meaning as it is understood in my theoretical conceptualization. As suggested (see Section 2.1), creativity within the arts could be dependent on, for example, the *new* and *thought-provoking*. Here, the purpose of presenting the concert is not at all to reach euphoric levels of 'life' or even to make people happy; the purpose could simply be to disturb, distort and shake things up - perhaps deliberately, as an antipole and backlash to all the 'polished' and 'meaningful' music. In this case, the musical process completely steps out of the above model and asks to be evaluated on completely other parameters. The heterogeneous world of music certainly calls for an open approach to the definition of creativity, as it becomes

'appropriate' to participants in different ways. Another useful approach to this conundrum is to speak, like Burnard (2012), of musical creativities rather than of various definitions of a monolithic term. I see this as an important final note, as it points to the limitations of my theoretical framework in terms of understanding the diversities in the world of music. The concepts of 'musicality' and 'music' are often related, but not always dependent on each other. A point that leads me to the final section discussing how my conceptualization of musicality, emergence and creativity can, potentially be relevant far outside the music industry.

4.3. FUTURE PERSPECTIVES

I end this section, and thereby the dissertation, with a few suggestions for future research perspectives that could open the findings of the dissertation up and thereby further explore and qualify the potential of a focus on musicality and emergence for a socio-material take on creativity. I wish to return to the breakdown in understanding that initially motived the research focus: how can *analogue* and *digital* emerge in musical, creative situations?

The point made by the musicians interviewed in this project was precisely that emergence in musical processes depends on 'fragility' and creative methods 'imperilling' the situation (Hvidtfeldt and Tanggaard, 2018a). I will argue that these findings invite a broader question. Is the relationship between digital and analogue equivalent to the one between mathematical and poetic language in terms of processes of emergence? I transfer the analogy from Bastian (1987), who suggests such a dichotomy between mathematical and poetic language:

> *The sentence: 'she is neither beautiful nor ugly, and still she is the most beautiful creature I have ever seen', is immediately understandable; we know what the author is talking about and recognize the emotional state. If we had unambiguously defined the meaning of the word beautiful, the sentence would become meaningless and of the type: 'the book costs neither five nor ten kroner, and still it costs ten kroner'. So, we see that by refraining from unambiguity in the parts, we can achieve an astoundingly comprehensive and precise whole.*
>
> Bastian (1987:18)[7] [translated by the author]

[7] Original quote: *'Hvad med poesien? – sætningen: "hun er hverken smuk eller grim, og alligevel er hun det smukkeste væsen jeg nogensinde har set", er umiddelbart forståelig; vi ved godt hvad forfatteren taler om og genkender følelsestilstanden. – Havde vi nu lagt os entydigt fast på hvad ordet smuk betyder, ville sætningen være meningsløs og af typen: "bogen koster hverken fem eller ti kr., og alligevel koster den ti*

Poetic language is ambiguous, whereas mathematical language is discrete. As illustrated earlier (e.g. Figure 3), digitalization represents a quantification of an analogue, continuous signal – digital materials involved in music making and performance arguably speak a language related to mathematics. There is an obvious limit to how far the analogies are meaningful, as the experience of digital phenomena can be both ambiguous and poetic to the listener, but I will argue that it is relevant to explore further whether and how musical emergence generally, in our everyday and professional lives, is placed in a complicated situation challenged by a linear, discrete and unambiguous language of digitalization.

Our lives are nowadays being digitalized at an incomprehensible pace. Consultancies, design bureaus and software development companies specializing in transforming insights on user experiences into software, apps and websites that are both technically functional and 'human-appropriate' cannot find enough employees to meet the demand. Computers and robots are taking over many daily tasks, and smartphones are literally involved in most activities of all people, all day long. Is the future mother tongue of our lifeworlds the language of discrete mathematical digits? What are the consequences for our musical and performative engagement with the world, as seen from a socio-material perspective on creativity? To give just one specific example: the city is often used as an example of an upwards-causational emergent phenomenon (e.g. as presented in Jane Jacobs's classic book *The Death and Life of Great American Cities* (2000/1961)). What gives the urban space and situation its distinct character must arguably be found at street level. What happens to the social process of emergence in a time when more and more elements of the city function on digital premises? What happens to the musicality of the city's social situations when the construction processes of the buildings in the city are driven by incentives to utilize the potential of the digital domain in terms of precision, efficiency and effective production? Are we looking into a future with fewer analogue ambiguities and more digital, polished 'perfection'? Is it one of the main challenges of top-down urban development that modern, cost-efficient construction does not sufficiently 'imperil' the social and material urban situation? From a normative perspective seeking to uphold the musical, creative emergence processes in future cities, these are important questions to ask and empirical research areas to explore, as the musical 'life' of our social spaces is at stake.

kr". Så vi kan se, at vi ved at afstå fra entydigheden i delene, kan opnå en forbløffende omfattende og præcis helhed'.

Et samfund kan være så stenet
At alt er en eneste blok
Og indbyggermassen så benet
At livet er gået i chok

Og hjertet er helt i skygge
Og hjertet er næsten hørt op
Til nogen begynder at bygge
En by der er blød som en krop

Christensen (1969:211)[8]

[8] Action, Symmetries in 'It': *'A society can be so stone-hard, that it fuses into a block, a people can be so bone-hard, that life goes into shock. And the heart is all in shadow, and the heart has almost stopped, till some begin to build, a city as soft as a body'* (Christensen, 2007).

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APPENDIX A: PUBLISHED ARTICLES

CONCERTED CREATIVITY: EMERGENCE IN THE SOCIO-(IM)MATERIAL AND INTANGIBLE PRACTICE OF MAKING MUSIC[9]

Dan Lund Hvidtfeldt[10]

Keywords: Creativity, Emergence, Socio-materiality, Music

Abstract The purpose of this article is to explore how the basic conception of 'emergence' informs the study of creativity as a socio-material practice. Initially, the article explicates how creative processes, products and performances involve not only tangible, but also intangible and social elements. Secondly, the theoretical conception of creativity as socio-material and the general philosophical notion of emergence are introduced. Inspired by the idea that a 'whole' is other than the sum of its 'parts' and by examples primarily from the world of music, the article argues that the relationship between subject and object – the main analytical focus of studies on creativity as a socio-material practice – is fundamentally embedded in an emergent process. The article concludes by highlighting how emergence theory acknowledges the performance or product as an intangible material for creative processes of musicians, and that studies of the socio-materiality of creative practices clearly involving tangible, intangible and social elements must refer to the emergent process through which the creative product or performance evolves meaning. The theoretical framework suggested is relevant for researchers interested in exploring how materials, social settings and physical environments are involved in creative processes.

Introduction

This theoretical article draws on and contributes to the socio-material perspective on creativity emerging within cultural psychology as a reaction to the focus on intra-psychological factors hitherto dominating creativity research. It has been written as part of my PhD studies on creativity, having professional musical practices in the digital age as empirical focus. In developing a theoretical framework for the understanding of creativity as a situated and distributed practice, a discussion of qualities and characteristics of materials and products inspired the article that follows. It appears that much attention within the socio-material approach, in exemplifying,

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defining and discussing characteristics and qualities of 'materials' involved in creative processes, has been paid to physical and tangible products and tools. In general discussions of affordance and materiality in the creativity research literature, as e.g. presented by Glăveanu (2016a, b), tangible materials (in this specific example, the creative use and understanding of bricks and jugs (adapted from Heidegger, 1971) are used as key examples in the discussion. Tanggaard (2015) uses the work processes related to the re-invention of the Danish designer Bjørn Wiinblad (1918–2006) to get closer to an empirical understanding of the creative process and its materiality as it unfolds. Here, the main driver and inspiration of the work is obviously the original product line (cups, vases and cans) designed by Wiinblad, but also the main outputs of the studied process, the ceramic products produced, are physical and tangible. Further, Jacucci and Wagner (2007), in seeking to develop a better understanding of the role of materiality in creative, collaborative settings, focus on the involvement of physical materials for modelling and visualizing prototypes in the work processes of architect and designer students. Within music research, Gander (2015) studies the situated creative production process of making a pop song in a recording studio, but contributes specifically with an understanding of how the recording process is managed in terms of the spatial and physical environment. In that sense, the theoretical framework presented is building on a typical understanding socio-materiality within creative processes, as tangible, physical context. Bertelsen et al. (2009) writes about materiality in electronic music composition and argue, that the often-expressed understanding of digital software as immaterial is inadequate. The authors argue, that software holds material dimensions on several levels. However, the article does not further explore the intangible nature of the music created. Hence, it seems reasonable to argue, like Leonardi (2010), that this is a tendency within studies on materiality in general. I will argue, that convincing depictions of the rich complexity of tangible materials involvement with senses, perception and experience have been presented within creativity research literature, but a solid theoretical fundament for the analysis of the intangible nature of musical processes, products and performances demand further theoretical exploration.

This emphasis on the tangible, physical and tactile qualities of the materials and products is obviously relevant, as all creative processes involve physical materials in their production processes. If no other, bodily and spatial, as creative processes always involve someone, somewhere. But sometimes a creative process generates products that one cannot hold in the hand. Sometimes materials that are tangible are involved in the creation of products that are not. The creative processes related to the production of music provide good examples of such messy creative processes: the musical instrument is physical and tangible, but the music created with it is not. Various analogue and digital media can physically contain sound waves, and in a modern-day music studio we are able to see them on a computer screen, but what we experience as music is ephemeral, intangible and socially dependent (see e.g. Bastian, 1987; Small, 1998). As suggested by Christopher Small (1998:61), music by not a 'thing': *"the reification of musicking into music and of making the latter more real than the*

former has been a major obstacle to our understanding the nature of the act.". In other words, the reification, or thing-making, of music is a misconception – music should rather be understood as an action, like dancing or cooking.

The Intangible Nature of Music Making

No creative process is straightforward. Irrespective of domain, the development of the new is always inspired by a multitude of intrinsic and extrinsic resources. As a reaction to years of intra-psychological studies of creativity, the socio-material perspective seeks to demonstrate how creativity develops in a dialogue between subjects and objects, and in many situations the materials involved in creative processes seem rather obvious: the painter works with paint and canvas to make a painting and the architect with pen, paper, wood and stone to build a house. But in the creative process in the recording studio, musicians are constantly confronted with a chaotic realm of both tangible and intangible materials – elements which talented and industrious musicians gradually process into a final creative product. It is a highly complex process, dependent on a vast variety of sounds, harmonies, improvisation and attempts to make the production 'come to life'. The music performance situation, bringing the music out of the closed studio environment and into a social setting with an audience in, for example, a concert hall with acoustics and aesthetics, has an even more complex materiality. The creative performance of music is fundamentally contextual and social: the music is not only presented in a social setting, it is rather defined by the social setting, as a 'concert' does not equal the 'output from the stage' (Small 1998). Though the contribution of the musicians on stage is obviously key to the performance, other elements can contribute both negatively and positively to the creative result characterized by all its intangible, musical, social and aesthetic qualities. The creative processes of painters, architects and musicians are equally challenging and unpredictable, both for the artists seeking to produce something creative and for the audience (e.g. researchers) seeking to understand them. But to fully explore and study the diverse outputs and materials of creative processes, we cannot study them as identical: the creative relationship between artisan, clay and pottery is different to the relationship between musician, instrument and music. The materials involved and outputs produced are fundamentally different.

In seeking to explore how musicians understand and relate to the materials involved in the creative process, which is a specific research focus of my PhD studies, a broad theoretical framework is needed: a theoretical language stressing the fundamentally situated relationship between person and material. A musician might argue that in this specific situation, including these people, in this room, the relationship to this instrument is fruitful, but in another situations it most certainly is not. The individual note, drum fill, audience behaviour or relationship between musician and instrument does not make sense 'in itself' in all situations. Hence, to understand how music works

and why musicians relate to their instruments in the way they do, one must refer to the specific situation. The socio-material take on creativity specifically highlights this social, situated and distributed character of creativity, and it is therefore a relevant point of departure for the study of music as a creative practice, but further theoretical discussions and examples of products and materials that are both social, tangible and intangible by nature are needed. While previous studies of creativity as a socio-material practice have provided relevant examples and discussions of relationships and dialogues between individual and concrete, physical materials, the chaos of elements characterizing both the process of making and the final product of music needs a holistic theoretical grip to be analytically explored.

This article suggests that the philosophical concept of emergence is relevant in contributing to filling this theoretical gap, in describing how 'wholes' are other than the sum of their 'parts' (Ferrell, 2014:436). Hence, as emergence theorists would argue, affection between people cannot be described as one person plus another person. Similarly, a musical product or performance emerges out of a multitude of elements, but cannot be reduced to the sum of them. Music – like other products and performances fundamentally constituted by both social, intangible and tangible materials – is all about making a multitude of elements come together, be they notes, harmonies, rhythms, audiences, sound systems, spaces or aesthetics.

The following sections are intended to introduce a holistic ontology relevant to the study of a music production or performance as a socio-(im)material and creative practice. Initially, the socio-material standpoint is presented, followed by a general introduction to the philosophy of emergence theory, and finally there is a discussion of how emergence can inform a socio-material exploration of creative practices.

The Socio-Materiality of Creativity

The socio-material standpoint is inspired especially by Latour (2005), Ingold and Hallam (2007) and Hastrup (2007) in arguing that research seeking to understand creative work processes must take bodily aspects, people, artefacts, objects, nature, materials and social surroundings into account.

As underlined by Ingold and Hallam (2007), imaginative, creative reflections are inseparable from performative engagements with the surrounding materials. Hence, though having one is an evident prerequisite for working creatively, studies of creativity should not be limited to the brain; creativity is not solely an intellectual exercise where mental ideas are exported into a passive, unresponsive world (Tanggaard, 2013, 2016). New ideas always come as a reaction to something already existing in the landscape, in a developing, transactional process between subject and

object (Brinkmann 2015). Therefore, in exploring creative processes, as described by Tanggaard below, research should be methodologically attentive to relations.

> *This socio-material rethinking of creativity implies a research perspective which consists in following not only the individual thinking processes or the influence of context on the individual creative process, but more precisely the movements of ideas and the continuous and productive re-associations found in relational spaces during a creative process.*
>
> (Tanggaard, 2015:111)

The theoretical argument here is that creative processes are ― consciously or unconsciously ―facilitated by the 'terrain'. Therefore, as argued by Hastrup (2011), we should not settle for 'maps of the world' and descriptions of its elements as static entities; in order to understand the social world, we must describe the dynamic and relational movements between people and their surroundings. Thus, within this paradigm, creativity is therefore often defined as acting in and on the world in new and meaningful ways (Mason, 2003; Sternberg, 2006). The socio-material perspective becomes relevant when seeking to understand creative work in practice in analysing associations and connections between people, spaces and materials as they appear in the actual process (Tanggaard, 2016; Hastrup, 2011).

The Socio-Materiality of Creating Music

The work processes leading to new and valuable musical products and performances vividly exemplify the socio-materiality of creative processes. All musicians have an individual, culturally shaped understanding of what good music is and how it should be recorded and performed. Musicians involve very different materials in their production processes: some produce music using only the human body as an instrument, e.g. solo acapella singing, whereas the creative productions of DJs and other electro-musicians are highly dependent on modern technology through which the production is mediated. From that perspective, one could speak of musical creativities, as the diversity of outputs and production methods of the industry is immense (Burnard, 2012). Some perceive music mainly as an art form and see the key creative challenge as an exploration of new expressions, formats and sonic aesthetics. Others seek to produce and perform pop, with the aim of being understood and valued immediately by a large audience. Some musicians are endlessly fascinated by the materials involved in their creative process: they study old vintage gear, talk about the newest editing and production software, save up to buy remarkable collections of instruments and sleep with their best microphone under the pillow. Others randomly grab the nearest guitar, not especially interested in the instruments they use – they write, record and perform music with the tools they happen to have at hand. The theoretical premise of the socio-material understanding of creative processes is that,

whether consciously or unconsciously, instruments, computer software, facilities and other materials and resources used by musicians when composing and performing have a history, an authority (Daugbjerg, 2014) or affordance (Gibson, 1986; Glăveanu, 2016a) that communicates pre-existing ways of doing that the creative musician taps into and draws on when working. Despite the diversity in terms of genres, production methods and audience preferences, the context-dependence and -infiltration of its creative processes are inescapable. The materials do not necessarily dictate a way of working, but they represent and shape performative action (Tanggaard, 2015), both in the practical, physical resources and limitations they offer, and symbolically in the ways they have previously been used. Music is created in dialogue with the world: a new song, symphony or genre does not suddenly appear out of the blue, but comes 'from somewhere'. Or maybe rather, 'from something'. In the words of David Byrne (of the rock group Talking Heads):

> *I had an extremely slow-dawning insight about creation. That insight is that context largely determines what is written, painted, sculpted, sung, or performed. That doesn't sound like much of an insight, but it's actually the opposite of conventional wisdom, which maintains that creation emerges out of some interior emotion, from an upwelling of passion or feeling, and that the creative urge will brook no accommodation, that it simply must find an outlet to be heard, read, or seen. The accepted narrative suggests that a classical composer gets a strange look in his or her eye and begins furiously scribbling a fully realized composition that couldn't exist in any other form. Or that the rock-and-roll singer is driven by desire and demons, and out bursts this amazing, perfectly shaped song that had to be three minutes and twelve seconds – nothing more, nothing less. This is the romantic notion of how creative work comes to be, but I think the path of creation is almost 180° from this model.*
>
> (Byrne, 2012:13)

With the point made by David Byrne above in mind, it seems obvious that West African drum music could not be invented within a culture with a tradition of playing music in large concert halls. That kind of music does not really work in such a room, with lots of reverberation. The complexity, volume and dynamics of the drums and rhythms do not fit the context. Similarly, it seems obvious that opera would not be invented within a culture with a tradition of playing music in the savannah rather than in a room. It is unnatural to sing opera without walls reflecting the notes. Rock music was naturally invented in garages/clubs where that kind of music worked. Generally, musicians move around in and depend on their world to find inspiration. However, what is not at all trivial is the description of how these interactions between people, social contexts and materials unfold. It is to understand such issues that this cultural-psychological understanding of creativity as socio-material has been developed.

Glăveanu (2016b) distinguishes between things, objects and artefacts in describing the relativity of our perception of materials: how individual character and cultural conventions shape our understanding and use of materials in creative processes. A material can therefore be perceived as an undefined thing, a culturally shaped object or an artefact, which is open to a myriad of uses. Notions of 'topography', creative 'product', and describing the creative environment as consisting of things, objects and artefacts connote a physical, tangible materiality of the creative environment, but creative processes generate and are generated by much more than what we can touch and hold. The sections below seek to further contextualize and inform the socio-material exploration of the creative process by including a philosophical notion of 'emergence'.

Emergence in Creative Processes

Emergentism, as an independent philosophical field, is typically traced back to English philosopher John Stuart Mill (Kim, 2010), though similar ideas were presented much earlier.[11] The concept of emergence has influenced a wide variety of research fields, from natural science to the arts, and within psychology it has been applied to both gestalt, cognitive and social studies (Sawyer, 1999). In this context, the term is used as a basic philosophical concept illustrating how simple elements of the physical and social worlds 'come together' in emergence processes forming new wholes that cannot be understood from nor reduced to their individual elements (see e.g. Beckermann et al., 1993; Sawyer, 2005; Kim, 2010).

The notion of 'synergy' underlines the positive effect a good combination of people in collaboration can have. In a synergetic process, 2 + 2 = 5. In a creative process, however, the goal is not 'more' of the same. The idea of emergence better describes what is at stake in creative processes. The concept of emergence suggests that 2 + 2 = #. Here, the result cannot be described as more than the sum of its parts; it is rather different to the sum of its parts. As underlined by Sawyer, 'an emergent effect is not additive, not predictable from knowledge of its components, and not decomposable into those components'. (Sawyer, 1999:448). Send one light wave into the eye, and you will see the colour red. Send another, and you will see yellow. Send both, and you will see orange. The orange colour requires both light waves, but there is no 'orange-ness' in the parts alone. The qualities of the colour orange cannot be reduced to red plus yellow. The note F and the note C create the interval 'a fifth', which is something

[11] See e.g. Galen (AD 129 – c.200): On the Elements according to Hippocrates, 1.3, 70.15–74.23 and Aristotle (384–322 BC): Metaphysics, Book H6, 1045a 8–10: 'which have several parts and in which the totality is not, as it were, a mere heap, but the whole is something besides the parts'.

completely different from the two elements in themselves. A unique tonal constellation appears that cannot be explained from the qualities of the individual parts. A hundred thousand in themselves meaningless pencil strokes become a wonderful Michelangelo.

Of related theoretical conception, the Werner's physiognomic theory and Ehrenfels gestalt psychology deserves to be mentioned. Werner (see e.g. Werner, 1978; Müller, 2005) argued, that a sufficient qualitive description of a piece of music or other work of art cannot be based solely on static, object-technical geometries or data. In analysing music, one must discuss what he labelled its physiognomic qualities – the affective elements of the work. Music is not only mathematical intervals, metrical rhythms, correct intonation etc.; affective and dynamic qualities arises out of the material, that must be taken into consideration in a just description of how music is perceived. But while physiognomic phenomena represent specific aspects of perception, the emergence perspective presented here is openly interested in all elements engaged in the development (tangible instruments, physical space, the musical human body, the intangible music output etc). Further, Ehrenfels (1988/1890), one of the founding fathers of Gestalt Psychology, famously explained how a melody can be transposed into another key and thus consist of completely different parts, without losing the whole. Of course, the laws of physics describe how the lengths of the sound waves change when the key is changed, but the experience of the melody remains. A melody cannot be described as the sum of its parts, but rather as the unique result of elements coming together. To be precise, gestalt qualities and emergence properties should be defined as two related but different concepts (see e.g. Ferrell, 2014:436f). A specific constellation of elements only qualifies as having gestalt quality if all the elements can be changed, while the intervals between and perception of them remain – arguably, a concept with little relevance to the exploration of the ever-changing and dynamic social world. An emergence phenomenon is described by the whole appearing when elements combined become something in themselves, which is a more suitable definition for creative, social processes.

The Danish musician Peter Bastian (1943–2017) describes emergence in music in dramatic and poetic terms. When asked about his description of movements from 'Chaos to Cosmos' (from the book 'Ind I Musikken' (1987)) in an interview given to an online music magazine, he states:

> *It's a very good image, which I haven't thought of for many years. When things are not working out, you have chaos. Chaos is not death, it is a potential death or a potential life. It can go either way. Chaos means that there is a diversity, but disorder. The aspiration when creating music is a tremendously complex articulated unity, and that is cosmos. Chaos is a great place to be. It is the border between the old and the uncreated. It can go either way - towards death or towards life. As a creative person, you*

> *do everything you can to go in the direction of life. Towards greater intimacy, towards a situation where things start to play together or emerge, to use a foreign word.*
>
> (Lyhne, 2011) [translation by the author, red.]

Bastian describes how he as a musician has developed a special sensitivity towards what happens in the social relationship between musicians and the music they play. For years, he collaborated with the Romanian conductor Sergiu Celibidache, who, after five years of creative cooperation, stated that now the 'orchestra has become a better musician than they were' – a better musician than the individuals combined (Bastian, 2011). The quintet consisted of five living human beings, but after years of rehearsing, concerts, more rehearsing and more concerts, something extra had been added to the group. And this extra contains a depth that could not be described as the sum of what the individual musicians had mastered on their own. Through their identification with this 'whole', the group had an experience of unity characterizing their collaboration, though not described as existing at the expense of individuality. On the contrary, the individuals in the group each had a profound responsibility for the situation of 'cosmos' – as Bastian notes, 'you need all five musicians to play in tune. Only one to play out of tune' (ibid). Bastian describes very precisely how the orchestra strive towards emergence, how the individual elements meet and (potentially) develop into something more, which is irreducible. While this description of musical emergence focuses on properties as they appear in the collaboration between musicians, the conception of emergence in this theoretical conceptualization is wider and concerned with the relationship between musicians, materials and spaces. But the arguments are alike.

Emergence as a Meaningful, Creative Collection of Elements

Things, objects and artefacts of socio-material creative processes can take many forms, and potentially include both tangible and intangible, finished and unfinished materials. Often, the key materials involved in the process and the final product are evident. The inspiration for the new piece of art comes from various more-or-less traceable mental and physical resources in the landscape, but the work materials involved throughout the process and end result are physical: the sculptor in the process of creating a bust out of marble, for example. As described in the introduction, in other processes, such as the creation of music, the materiality is less clear, but the concept of emergence highlights how both types of 'products in process' have similar properties. In both situations, 'the sixth member' of the orchestra, the phenomenon of 'cosmos', guides the continuous, creative development of the music or the ceramic design in a continuously developing, dynamic and dialogical manner. When working on a piece of music, the instruments hold specific qualities, the room creates a certain acoustic setting etc., but the created music – though not finished and non-physical –

also feeds back into the process. Emergentists refer to this mechanism as 'downward causation' (Kim, 2010:25) – when emergent properties influence lower-level elements from which they originate. In terms of understanding the work process of a sculptor, this might seem like an uncontroversial argument, as the dialogue between material (marble, hammer etc.) and creative individual seems relatively easy to trace, compared with the case of chaotic music production. But in both cases the creative product emerges out of more-or-less tangible and intangible resources and social circumstances: both the musician and the sculptor seek to make things come together with the resources they have, and the 'product in process', though unfinished, feeds back into the creative process - in this case, either as an unfinished marble figure or as a sketch for a new piece of music.

If the materiality of creative processes related to sculpturing is relatively simple, and that related to music production fairly complicated, the socio-materiality of music performance is highly complex! Imagine attending a festival concert: the art displayed, the smell, the participants, the music and the general atmosphere. It seems obvious that the experience of attending a festival concert is not solely defined by the musicians on stage, but by a total cacophony of elements. Unlike creative processes in the music studio, the end result is not controlled by a small group of people working to finish a product ultimately presented to the market; the creative result of a music festival performance is dependent on many actors and elements in a complex social process. A concert is in general defined by a much wider group of elements than what the musicians, for example, deliver alone: the concert organizer, who selects and decorates the concert room, is an active actor. It is not irrelevant to the result what mood the musicians or audience enter the concert room in. It is not irrelevant to the creative result what aesthetics the various actors meet in the performance space. A performance can take many shapes, involve different constellations of people and take place in different physical and social settings. It can be performed by one actor in monologue, in an anonymous and passive environment or a symphony orchestra of a hundred musicians in a historical, aesthetically and acoustically 'active' hall. A theoretical understanding of creative performances focusing solely on the individual creative actor, the affordance of the materials at hand or the room in which the performance takes place leaves out elements of a performance that potentially have a great say in the creation of the final 'product'. Literature on creativity often differentiates between small-c creativity and capital-C Creativity, in distinguishing between mundane everyday creativity and historical Creativity, radically changing how we see the world (Tanggaard, 2016). Both creativity and Creativity are relevant to the description of emergent phenomena in creative practices related to music performances. When an audience member enters the concert room, there is a potential to learn and experience something new, an experience constituted by all the elements of the given context. Everybody who participates in a concert learns from it and contributes to it via their mere existence as physical and psychic human beings. People constantly create the world they inhabit (Tanggaard, 2011:9; Ingold and Hallam, 2007). In that sense, the Creativity (capital C) of the performer on stage and potentially

other actors involved in the intentional creation of the performance merges with the creativity (small c) of the individual audience member into a socially configured emergent phenomenon. The creative performance is shaped by both types of process.

From this theoretical understanding of creativity, a concert organizer facilitates an emergence process where music, space and participants create something together, just as the music recording and the ultimate experience of it is the result of a wide variety of elements and participant contributions coming together. Hence, the introduction of emergence theory pushes the social understanding of creativity further in making even clearer the argument that neither the creative product (Csikszentmihalyi, 1999) nor the creative process has any meaning in an isolated vacuum. Taken in isolation, the individual elements of a concert or music production often become meaningless, just as the individual brushstrokes of a painting do. A concert or music production becomes meaningful when the thousands of in themselves meaningless elements come together. When they 'act in concert'. One might not think of attending a concert as a creative act, but from the theoretical perspective of emergence all elements of the process are fully fledged participants in creating the event. Hence, one element of the creative process cannot meaningfully be studied in isolation while ignoring its relationship to the whole. Ultimately, with the perspectives of emergence in mind, it becomes meaningful to speak of the creative processes related to the music performances as 'concerted creativity' or joint creativity, and a matter of temperament (or marketing strategy) whether 'the creative product' of a music performance should be defined as created by the artists on stage or by the totality of elements contributing to the situation.

Studies of Meaningful Creative Relationships

Studies of creative relations between subjects and objects in socio-material processes must take account of the nature of the 'product' which the musicians' instruments, painters' paint, sculptors' marble or ceramic designers' clay serve as materials for: is the studied process aimed at developing a finite product in a closed environment, or is it an open performance, service or otherwise social situation dependent on several elements beyond the control of the individuals initiating the creative process? One could argue that, though the obvious creative relationship is between a tangible instrument or material and the creative subject, any creative process is also dependent on social and intangible topographical circumstances more-or-less consciously infiltrating the creative process. Not all examples are as clear, but just like the music performance, the material, creative relationship between actor and prop is arguably also infiltrated in and dependent on the social atmosphere in the theatre space. To give an everyday example, the preparation of dinner on a Tuesday afternoon is not solely dependent on the relationship between cook and ingredients, though these might be the main actors of the process; in many families, the creative process depends on a

chaos of both tangible and intangible elements (such as the general social atmosphere, smells etc.) all contributing to (and complicating) the process leading towards creative 'cosmos'.

Though the point is more relevant to some analyses, a study of the relationships in creative processes clearly characterized by both tangible, intangible and social materiality, such as the creation of music on a stage in a social setting, must refer to its emergent nature. The socio-material analysis of creative processes must discuss the situation in which the studied phenomenon participates, so that the meaningful relationship between subject and object can be examined. The meaningful, and thereby potentially creative, relation between subject and object is dependent on the emergence of all involved elements. In that sense, the important thing is not whether materials are physical or non-physical; materials matter, as an analytical reference of socio-material processes, if they are relevant to the emergence of the creative product.

Conclusion

This article reminds us that, though terms like things, objects, artefacts, products and topography arguably connote such a reality, not all 'materials' or 'surroundings' of creative processes are tangible and visible. Unlike the creative process of, for example, artisan designers working with clay to create a plate made of clay, musicians work with tangible instruments to create intangible music. And the process is often embedded in social, performative situations, entangling the relations between subject, material and situation even further. Hence, a socio-material analysis of creative practices of musicians must be built on a holistic ontology, not overemphasising physical materials and their affordances.

This article suggests that emergence theory contributes to this development, in describing how meaningful 'wholes', such as a creative music production or performance, develop when a multitude of 'elements' come together. Good music is developed in a chaotic, concerted creative process often involving physical musical instruments, computers and acoustics, where the music created – though intangible – feeds back into the creative process in a downward causational process. In creative performances, such as a music concert, emergence plays a defining role, as a music concert (potentially) consists of a much richer diversity of elements, all contributing to the whole. Emergence theory, with its relational understanding of individual elements and wholes, provides a language for the complex materiality of the creative processes of musicians and arguably all other creative processes involving both the tangible and the intangible in social situations. Emergence theory acknowledges the (developing) performance or product as an intangible material for creative processes of musicians. Further, emergence theory lends new meaning to the argument of socio-material theory on creativity, that one cannot separate the elements in an analysis and

study them separately, out of context. In analysing the relationship and associations between subjects and objects – the key analytical focus of studying creativity as a socio-material process – one must discuss the situation in which the studied phenomena participate, so that the meaningful relationship between subject and object can be examined. The materiality of creative processes becomes meaningful through the emergent process where different elements are brought together in 'wholes' that none of the 'parts' could have anticipated.

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Compliance with Ethical Standards

Conflict of Interest Author Dan Lund Hvidtfeldt declares that he has no conflict of interest.

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CONCERTED CREATIVITY IN THE DIGITAL AGE: HOW DO WE CRACK THE CODE…?[12]

Dan Lund Hvidtfeldt[13] and Lene Tanggaard[14]

Abstract: The purpose of the present article is to contribute to the development of a holistic, situated conceptualization of creativity, in exploring music making as it becomes meaningful in performative emergence processes of the digital age. It uses the creative practices of musicians to analyse and discuss the qualities of 'digital materials' in a creative setting, today very often playing a critical role in the production and performance of music. Methodologically, the analysis is based on interviews with professional musicians performing at Roskilde Festival and observations inspired by the autoethnographic approach. The study concludes that creative musical emergence in performance situations of the digital age depends on an openness towards a fragility, imperilling the situation and 'cracking' the digital materiality.

Keywords: Cultural Psychology; Emergence; Concerted Creativity; Socio-materiality; Creativity; Music

Introduction

This article explores the socio-materiality of musical creative processes in the digital age. It builds on the theoretical notions developing within cultural psychology, seeing creativity as a socially situated and material practice (see e.g. Glăveanu, 2010 and Tanggaard, 2011, 2013). Hence, while previous intra-psychological emphasis within creativity research on e.g. the individual genius, divergent thinking, personal traits, talents and acquired domain specific skills is arguably relevant to the theoretical conceptualization of creativity, the cultural psychological perspective underlines how a comprehensive understanding of creative work demands a more distributed perspective. Creativity is here seen as a process developing in a dialogue between self (the creator), other (the community), the (in-)tangible creation itself and previous knowledge and practices (Glăveanu, 2010; Hvidtfeldt, 2017). When working creatively, people are not only inspired by the terrain; their thought processes fundamentally depend on previous knowledge and socio-cultural materials. Individual mental processes are understood to be both social and socially contingent; person and

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culture are mutually interdependent, as we create culture, which again shapes us (Hasse, 2008; Valsiner, 2014). It is thus already clear that when we in this study refer to notions of 'culture', focus is not on a nationally framed or otherwise 'boxed' culture, but on *culturally infiltrated practices of creative musicians in the digital age*. The aim is to explore creative activities from the understanding that the creative space, understood as a space in time affected by what came before and after (Tanggaard, 2017), directly or less so affects the way creative people think, behave, live, work etc. The digital age, and the way it addresses changes in creative spaces, has implications for the means by which people – in this context, musicians – 'furnish' their creative 'topography' (Hastrup, 2011), the outline of their musical material terrain and thereby the behavioural, perceptive and cognition processes (Brøvig-Hanssen & Danielsen, 2016; Byrne, 2012).

Aiming to fully situate the socio-materialistic understanding of creative practices, Hvidtfeldt (2017) argues that creative work processes of musicians are dependent on the emergence processes through which the social and material relations of the production or performance become *meaningful*. Music is not a tangible 'thing', but rather a socio-material 'process' (Small, 1998); music emerges when thousands of in themselves meaningless elements, such as notes, rhythms and harmonies played on various instruments, come together in a meaningful and irreducible whole. And in staged musical performances, which are the specific creative practices studied in this article, the emergence process becomes even more complex: emergence in creative performance processes, compared to 'tonal emergence', depends on audience behaviour, the aesthetics of the room, acoustics etc. Hence, Hvidtfeldt argues that emergence theory helps promote an anti-reification of the socio-material perspective on musical performance as a creative practice; his conception of 'concerted creativity' is preoccupied with the ontological notion that the socio-material analysis of relations between subject and object must refer to the emergent nature of music creation, be it in production or performance, as the relationship has no meaning in itself: the meaningful relationship between musician and instrument appears in the emergence process.

Musical emergence in the digital age

Arguing that creative processes *are* socially situated and culturally dependent is one thing; developing a specific understanding of *how* is another. Hence, in this article we seek to go a step further and specifically ask how musicians experience the involvement of 'digital materials' in the emergence process of musical performance. We focus on exploring what the emergence process of musical performance, involving musician(s) and various digital/analogue instruments in a tangible and socio-cultural setting, demands in the digital age. When digital materialization becomes fundamental to the creation and performance of music in both production

and performance processes (see e.g. Brøvig-Hanssen & Danielsen, 2016), it becomes necessary to thoroughly consider its qualities in terms of emergence in creative practices.

The study follows on from other research seeing creativity as a socio-material practice within both the world of music, digital materiality and emergence in creative processes. But studies of musical creativity and digitalization from the socio-material perspective typically focus on composition (e.g. Bertelsen et al., 2009; Folkestad, 2012) and, as in studies on materiality in general, are preoccupied with tangible instruments and environments (Leonardi, 2010; Hvidtfeldt, 2017). Gander (2015), for example, studies the situated creative production process of making a pop song in a recording studio, but specifically contributes knowledge of managerial potentials related to the spatial and physical environment – a notion of materially as tangible and physical - whereas this study explores music materiality as a more intangible, ephemeral and social concept. The emergence perspective has been adapted in studies on creative practices within a performative setting, in studies developed by Sawyer (1999, 2005) on improvisation in theatre and jazz music. This article is inspired by these studies in seeking to further develop the understanding of emergence, materialization and meaning making in musicians' creative performances.

Interviews: Musical Creative Processes at Roskilde Festival

Inspired by the phenomenological 'life-world' interview as presented by Kvale and Brinkmann (2015) and Tanggaard and Brinkmann (2015), nine semi-structured interviews conducted with artists performing at Roskilde Festival – the largest music and arts festival in Northern Europe – in 2016 and 2017 constitute the primary empirical material. Specifically, interviews were conducted with the following artists (name (act)): Asger Baden (Mikael Simpson and Peder), Jakob Bellens, Marie Louise Buch (ML Buch), Tomas Høffding (WhoMadeWho, Bon Homme), Niels Juhl and Theis Vesterløkke (Gents), Sarah Mariegaard (Soleima), Hannah Schneider and Nicolai Kornerup (AyOwA), Anders Trentemøller, and Nikolaj Vonsild and Kristian Finne Kristensen (Cancer, When Saints Go Machine).

As described earlier, the socio-material take on creativity is focused on relations between subject and object within specific creative spaces (see e.g. Hastrup, 2007, 2011; Tanggaard, 2017). Hence, we seek to explore in detail artists' experiences and their conceptions of the relations involved in making music work on stage or in the studio. The interviews began with a brief presentation of the project's theoretical position and from there, the dialogue became much more specific in focusing on open and neutrally framed questions, such as: *Do you bring a computer on stage and why/why not? What potentials do you see in the involvement of digital instruments in your music in the studio and on stage? What are the consequences of digitalization in*

term of making the music come together or reach the audience? How does a digital production process affect the staged performance process? The analytical focus of the interviews was constant, but the interview format and especially the opening questions were reframed during the interview period. Sometimes, the interview was initiated with a very specific question, while at other times it took shape at an abstract level. Asking these kinds of open and explorative questions gives us a thorough understanding of the key challenges and potentials of involving digital tools – being it computers, digital music samplers, digital drums/drum loops, specific instruments etc. – in the creation and performance of music. Hence, we intend to let the interview participants guide the theorizing on the qualities of the digital materiality – not the other way around. We do not ask into the qualities of specific instruments, but rather ask open questions, inviting the participants to unfold their experiences in an open, explorative manner to get at; the essences of digital materiality seen from a musical perspective. This is a strategy, which enable a phenomenological understanding of the qualities of a digital materiality to the emergence of musical creative processes.

'Digitalization' is a broad concept, with various implications for the music industry. Also, the world of music is highly diverse in terms of genres and creative work methods. With the intention of ensuring validity and preventing sampling bias, the study strove for a diverse representation of informants within the selection of popular music presented at Roskilde Festival. Hence, the music industry is not represented as such, as not all musical genres are presented at Roskilde Festival, but all artists interviewed, are affected by digitalization both in the studio and on stage. The gender representation in the sample is (notably) 75%/25% (nine male/three female), which is close to the representation at the festival and in the music industry in general (approximately 80%/20%, Niras, 2012).

This study explores digitalization as an open, abstract concept in relation to creative processes, as it is experienced and described by the interview participants. As such, an explorative approach towards the collection of empirical material has invited the interview participants to dwell on their work and openly describe their creative processes, with special attention to digital materiality. Subsequently, we compound and highlight, for the analysis of emergence in musical performance, relevant aspects of digitalization. With this analytical strategy, we intend to let both open-ended data collection and concept-driven coding guide our theorizing on digitalization as a creative material (Kvale & Brinkmann, 2015). Hence, with reference to the basic definition of the process of emergence as irreducible, we are not seeking to produce a final list of elements and subject-object relations involved in making a performance meaningful. The analysis of its separate elements will logically be partial. Therefore, we are not seeking – as we will never be able to reach – a full description of the emergent process/product. On the contrary, our reason for building the analysis on interview data and observations, with professional musicians, is to get closer to some of the key questions – the essences, in a phenomenological sense – of how musicians

experience the involvement of 'digital materials' in the emergence process of musical performance.

Observations: The making of SYL

To get closer to the musical creative process, an observation project, inspired by the autoethnographic approach, supplements the primary data. Throughout 2017, the authors followed and partly participated in the production process of a music mini-album.[15] The project (referred to below as 'SYL') was initiated to add analytical depth to the semi-structured interviews. In doing research on material and social processes, 'forward reading' (Ingold and Hallam, 2007:3), taking part, becoming practically and physically involved in the processes as it develops is methodologically relevant, for obvious reasons: the socio-materiality of creative processes is not easily verbalized in retrospect, as it draws on both conscious and subconscious culturally embedded behaviour. By participating in the process, by actively taking part in the recording process, the authors gained a unique position allowing them to observe both others' and own relations, reactions and involvement with digital materials in the process.

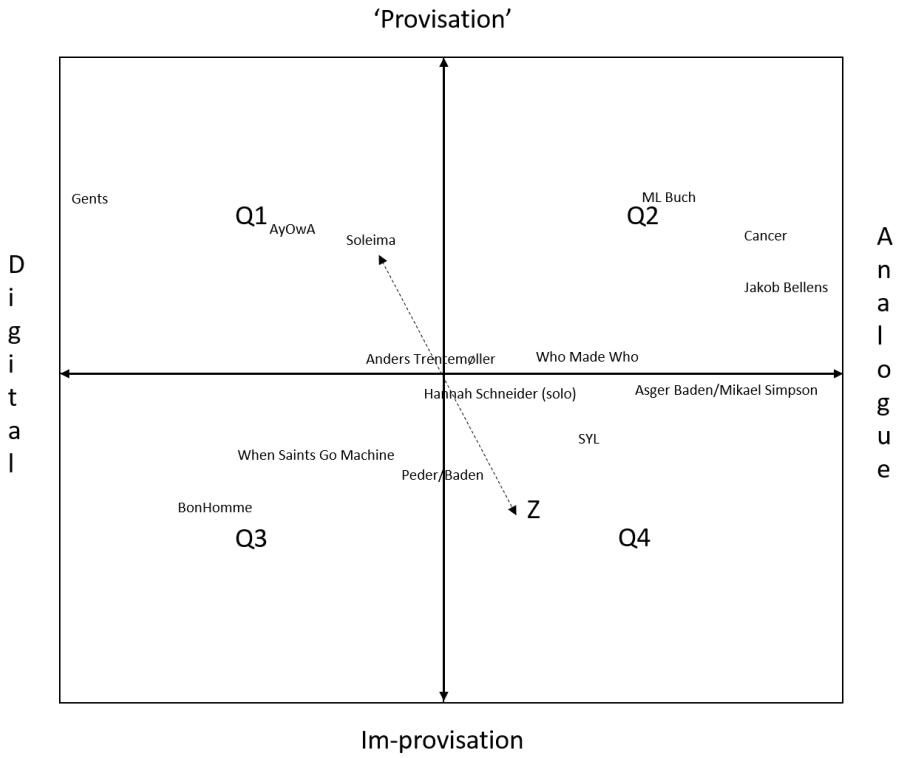
The observations are made during production processes and during performance preparations. Hence, experiences of the actual realized performance are not included as analytic material. In general, the theoretical points made here are not based on observations or rather 'evaluations' of the informant's performances or productions, in either staged or produced format. From both an ethical and methodological standpoint, this would challenge the open phenomenological approach which forms the basis of the interviews. What we sought were unfiltered experiences of involving digital materials in creative processes. We tried to avoid the expectation that we as researchers had a normative theoretical 'solution'. Our interest in interviewing and observing focuses on the musicians' aspirations and not how they succeed in their aspirations.

Analytical results

In order to secure a stringent and transparent analytical narrative, 'Model 1', presented in the following section, is included as an overall analytical reference. It is presented early in the analysis with the aim of positioning the diverse group of artists interviewed on the map of the musical landscape, so that further discussions become

[15] The mini-album 'SYL' (working title) was written and produced in 2017 and released and performed in 2018 by Dan Lund Hvidtfeldt in collaboration with (among others) author Josefine Klougart and musicians Anna Brønsted and Eske Nørrelykke.

less esoteric. Model 1 presents a continuum separating 'analogue' and 'digital' materiality into two distinct domains (X), and a workflow between 'provisation' or 'im-provisation' (Y). Due to the lack of an adequate term, the invented term 'provisation' is included to illustrate a music performance as a controlled, pre-programmed and detailed practice as opposed to the mainly 'improvised' performance, here referring to open, spontaneous performance. Naturally, performances representing all quadrants are 'prepared' in the sense that open, meaningful and creative improvisation demands (extensive) preparation and experience. With the aim of ensuring a flexible model for the analysis, a third dimension (Z) is indicated, but not labelled. In the analysis, the Z-axis represents, for example, introversion/extraversion. A predominantly 'provised' performance, involving mainly digital instruments, can be both highly introvert and extravert in terms of stage appearance – arguably a dimension with consequences for the emergence process of the performance.



Model 1: Creative approaches to musical performance practice

For example, the far upper left corner (Q1) presents the 'played-back' approach, i.e. the sole use of pre-recorded digital tracks in the performance situation. Here, nothing in the performance will happen by accident. Every musical action is pre-programmed and loaded into the computer, sampler or other digital instrument. The only thing that can stop this high-speed train is an electric power failure, as (unless intended) no tempo will change, no note will be out of tune – the musician has prepared everything. The lower right corner (Q4) presents the diametrically opposite situation. Here, the analogue 'music' can be understood as an artistic and avant-gardist decision to explore sounds. The far upper right corner (Q2) describes the ultimate control over analogue music, a well-prepared situation characterised by 'provision': control, precision and pre-arranged musical expressions. Here, the strategy is to limit improvisation, i.e. nothing in the performance happens spontaneously. Note the difference between 'playing back' a digital track (Q1) and 'playing' scripted music (Q2) – relying on provision in the analogue domain secures an ability to repeat a performance, but not to deliver an exact (e.g. digital) 'copy'. A concert played back by mechanical (and hence analogue) means, with full control and no musical spontaneity, is possible, though not presented in the interview material and arguably not common in the digital age. Conversely, the lower left corner (Q3) represents open, non-pre-programmed digital performance. Here, digital materials and instruments are explored on stage in an open and improvised manner.

We have intentionally refrained from organizing the interviews and artists based on musical 'genre', as we specifically seek to examine variations in approaches towards involving digital materials in the creation of musical performances: A rock group and a teen pop group could arguably be placed in the same spot in model 1, and face similar challenges in terms of making the musical performance work, irrespectively of the differences in genre. The artists ML Buch and Cancer represent different genres though placed approximately in the same area of Model 1. They face some of the same challenges in terms of making their musical performance emerge. The important thing, we will argue, is therefore not what kind of music they play, but what kinds of instruments they involve (analogue/digital), what their approach towards performing is ('provisation'/improvisation) and then aspects such as thick/thin sound scape etc. Hence, the artists interviewed for this study are plotted into the model based on their own descriptions of approaches towards handling the performance situation. The positions are therefore not considered as finite results, but rather as illustrative examples.

The format matters

Let us start by underlining that the interviewed musicians, of all quadrants in Model 1, confirmed the emergent nature of music in performance. They describe how concerts develop in a social setting, which professional artists cannot ignore. The

'euphoria' of a concert, as e.g. WhoMadeWho (Høffding, 2017) puts it, depends on a situated relationship between audience, artists and the socio-material setting.

Anders Trentemøller describes how he perceives the production of music and the performance of music as two fundamentally different challenges with regard to digital materiality. As he states, *'you must paint with broader brushes when playing live, because the sound becomes less detailed. There are fewer facets when you play a large PA sound system. Especially when playing festivals'* (Trentemøller, 2017). Hence, whereas in the studio little details, such as the smallest chime or the tiniest vocal line, can be highlighted and adjusted in the mix, the socially situated music performance, with the rowdiness of the crowd and the more-or-less diffuse acoustic setting, demands more expressive and clear-cut outputs. For the musical expression to reach the audience – to become meaningful for the audience in the emergence process – it must be characterized by a certain level of 'precision' and 'distinction' – features that the digital realm, is argued below to hold significant potential for developing.

In line with this argument, Hannah Schneider (solo artist and lead singer of the electro act AyOwA) (Schneider and Kornerup, 2017) describes how she, in her solo shows, has been experimenting with all kinds of effects, loop stations, synth and samplers – a digital electronica setup, but including analogue and acoustic elements, and no computer as such was brought to the stage. The performances have been characterized by improvisation, though the point of departure is popular songwriting. Hence, the project is located at the centre of Model 1, close to Anders Trentemøller, but there is mayor aesthetic difference between the two artists, namely the richness and volume of the sound. Trentemøller seeks the large and voluminous sound developed with the intention of filling the festival tent, whereas Schneider's sound is described as too 'thin' to ever function in a larger setting.

Schneider describes how she is working with both thin and thick aesthetic expressions, which she sees as working in completely opposite situations. Her solo project is developed for smaller concert halls and clubs, whereas her other act, AyOwA, like Trentemøller, is developed to have a rich sound that works in larger, e.g. festival, situations. Hence, for AyOwA, being an upcoming artist predominantly playing smaller concert halls in that sense works against the aesthetic ambitions of the group (AyOwA, 2017). Another Z-axis, in addition to the 'introvert-extravert' dimension in Model 1, could thus be a continuum describing 'thin-thick' sound — a dimension with arguably great effect on the emergence processes in various socio-material settings.

As such, the data clearly supports the theoretical notion that the relationship between subject and objects in the creative processes of musicians in performance is dependent on the actual setting and the specific creative space, through which it becomes more-or-less meaningful. And the informants already, in exemplifying their experiences, indicate how the involvement of digital materials on stage holds various potentials. The following sections seek a deeper understanding of these aspects.

From studio to stage

The digital age has radically changed, not necessarily what musicians *actually* do in the recording studio, but obviously what they *can* do. Replacing the tape recorder and other analogue recording technology with a computer opens a wealth of possibilities for producers and musicians in studios, as computing capacities and storage options ease some/many of the earlier limitations on recording processes (see e.g. Byrnes, 2012). Now musicians could, for example, record an (almost) unlimited number of (mono/stereo) tracks in one session, edit the sound quality using flexible software instead of expensive hardware and store (and duplicate) the recorded wave-files onto hard drives instead of fragile magnetic tape. In the book *Digital Signature*, Brøvig-Hanssen and Danielsen write about the musical 'era of endless undo' (2016: 101f): a musician, in the digital sound studio, can do, redo, do, redo, and finally end up with the 'perfect', often complexly layered, musical product. Hence, the digital environment fundamentally changes how music can be produced – a change that arguably also affects how musical performances are developed and conducted.

Asger Baden (Peder/Baden (Q3/4) and Mikael Simpson (Q2/4)) (2017) describes how he, in the studio, uses the computer in a process characterized by serendipity. He starts in one corner, experiments and lets the material guide the next step. This is a way of writing and producing music that several of the musicians interviewed describe as characteristic of the digital domain. When asked about his work process, he describes how he manipulates the musical material in the computer, *'[…] and then you change it into half the tempo. Mess around with it, completely. It would absolutely not be possible to make music in this way without the computer'* (Baden, 2017). Baden argues that the computer facilitates a tonal emergence process in the production studio, which is unique for the digital domain. In his situation, a current recording process involves mainly analogue, organic sounds, such as bowed piano strings recorded in the studio and hand-claps in a large church room with a 'large' reverb, but other interview participants describe a similar process involving pre-recorded 'samples' bought online (e.g. Buch, 2017; Trentemøller, 2017). Baden (and his co-producer Peder) created a large audio sample library from which they picked and messed around with short soundbites, which they looped, pitched, and finally end up with an organic soundscape which again was paired with more metrical and stringent elements creating a complex blend, characteristic of Baden's sound, of 'organic/analogue' and 'artificial/digital'. The sound is not decidedly representative of the digital domain, as many of the samples stem from analogue sources, but the work process draws on the potentials of the digital domain. For this type of recording, Baden argues, the computer is indispensable.

In working on the SYL project (Q4), though working primarily in the analogue domain, we collected personal learning experiences on the potentials of involving the computer in music production. In not having taken the lead in a music-writing or production process before, the process was approached from a different perspective

than most of the interview participants. As indicated in the introduction, it became clear that the digital resources of production software open a wealth of opportunities, being intuitively built and having seemingly no limits to the 'do-redo' experiments. The music developed as a big experiment in the computer, where different melodic ideas, harmonies, rhythms and general instrumentation were tested in a very open process, and therefore the end result – the final musical product – was never actually played by a performing group of musicians before being finalized and printed to the vinyl record. The final product has all the layers in the music typically played by a bass, a keyboard, a drum etc., but was in reality emerging as a collage of all kinds of instruments that no one in the project had ever played from beginning to end. A situation which obviously challenges the movement of the music from production to performance.

Thomas Høffding (WhoMadeWho (Q2) and Bon Homme (Q3)), primarily representing the electronic scene, describes the challenges of moving music produced in the digital domain with the creative potential described above into the performance setting.

> *Electronica live is somehow a [paradox, ed.]. If you have a [traditional, ed.] 'band', then you record an album by going through a lot of 'takes', and you do the best you possibly can. And then it [the best take, ed.] ends up on the record. Then you start playing it live, and again you do the best you can. Roughly speaking. But with electronica, you sit and produce this 'perfect album', and it can be very perfect with all kinds of 'imperfections', but then you must play it live. And all things considered, you see, the product is created inside the computer. It is somehow inside the computer. In the first situation, some people stand and play together in a room. It is somehow, how would you say it, 'authentic' that they just stand on stage and play the music as well as they can. But with electronica it is crazy, because you have this product that you really like as it is, but you have to […] ['break', ed.] it. You have transformed all these building blocks inside a software program into some music. And when you go out and play it live, you can either take this perfect product and 'press play' and then try to mess with some filters on top of that. Or else you must, like I always do, split everything apart. Because you need some chaos.*
>
> (Høffding, 2017)

Traditionally, music production was a documentation and mediation of a 'live' performance (see e.g. Byrnes, 2012: 81f). The transition from recording to live situation was natural, as the performer never 'left the stage'. Today, in a modern recording studio, music production has become a more independent practice. The descriptions of the creative processes of Baden and Høffding, and experiences in the SYL project, suggest a huge potential of digital materials in terms of editing and 'perfecting' the product. Not (only) in terms of time, pitch and other technical aspects,

but also in terms of working with the music until the creative process is musically 'done', rather than just 'over', due to technically imposed limitations of earlier recording processes. Høffding suggests that performance is different from the production situation to the extent that the original material as it is, in the computer, needs to be rebuilt into a socially situated performance taking the actual time and place into consideration. It is understood to be a matter of 'energy' in the performance space – the feeling that the situation actually does matter to what happens in the social setting: '*When you see a live drummer, you are kind of involved in every stroke. If a wasp shows up and stings him, he will* not *hit the beat. It is not like that with a backing track [*playing back pre-recorded material from the studio, ed.]' (Høffding, 2017). Hence, the music is here argued to be less involving and thereby less likely to facilitate an emerging process in live performance, if not opened towards the social situation. Høffding further describes how there is a great difference between his two main acts, WhoMadeWho and Bon Homme, with regard to this argument, as the basis of the former is open and improvisational by default: the recipe for WhoMadeWho has always been that they make a record, release it, and then start all over again and make a performance together with the audience. And, as Høffding summarizes,

> *We [WhoMadeWho, ed.] start all over again [having finished the production, ed.], and then something happens. And then it develops as we go along, together with the audience. You meet and create something in the studio space and think, yes, now it is done, and then you realize that the audience […] [do not really care, ed.]. It doesn't communicate. Somehow, I think it is beautiful, the fact that you cannot expect to figure it out [before standing in the situation, ed.]. There is a certain magic and beauty to it – you have go out and be in the situation, to see if it works or not.*
>
> (Høffding, 2017)

Hence, while the digital age continues to develop new editing software facilitating an open, inspiring and serendipitous creative process in the studio, the productions cannot uncritically be transferred to the performance situation. Jakob Bellens (Bellens, 2017) describes how he often takes the full consequence, and – though often producing music with a digital aesthetic, using modern recording technology – he starts all over again and performs the songs with a live band, no pre-recorded tracks and mainly analogue instruments.

'Enslaving' the situation

One strategy highlighted by the interview participants for overcoming the challenges of moving complex and hard-to-reproduce music from the studio to the performance

situation is the option of 'back-tracking' i.e. digitally playing back pre-recorded audio tracks on stage. For artists representing Q1 (and to some degree Q3), this is an often-used method. None of the interviewed Q1 artists perform a fully 'played-back' concert, but they all involve tracks playing, for example, bass lines, additional vocals, drums and percussion, and synthesizers. In that way, they can reproduce on stage what they have often worked for a long time to perfect in the studio. Soleima (Mariegaard, 2016) and AyOwA (Schneider and Kornerup, 2017), for example, describe this wish to present the songs 'as they are', and how digital technology holds a great practical potential in providing easy-to-access options to realize this with efficiency and accuracy. Depending on genre and position on a Z-axis describing a continuum between introversion and extraversion, several informants argue that this method has some challenges in terms of emergence in the performance situation. As pointed out, for example, by AyOwA:

> *All this about computer on stage and [backing-, ed.] track versus no track – it is one of the biggest discussions when playing electro music live. Also for us. We talk a lot about that. And we just had a big spring-clean and removed tracks and changed tracks, because it is a challenge. It is obvious there are some things that are lost.*
>
> (Schneider and Kornerup, 2017)

As described earlier, the artist is aware of the possibilities of using modern technology in producing 'thick' soundscapes, but also discuss a wish to involve more live musicians for parts that are now played back – mainly due to a perceived loss in terms of the flexibility of 'playing together', rather than for aesthetic reasons: in electronica, as also pointed out by Høffding (2017) in relation to the performances of WhoMadeWho (Q2), 'nothing communicates as well as a techno-keyboard bass'. Key aesthetic elements of the music produced by these two artists would arguably be wholly lost if taken out of the digital domain.

Trentemøller (2017) describes the involvement of backing tracks as '*enslaving*' the situation – the option to improvise in the situation is at best limited, and in relation to some musical aspects eliminated. Kristensen (Vonsild and Kristensen, 2017) describes how he was, prior to embarking on the collaboration in Cancer (Q2), sceptical that he would be 'confined' or 'pinned down' by Vonsild's (WSGM (Q3)) zeroes and ones. Further, though positioned in Q1 and having backing tracks in the performance set-up for aesthetic reasons, Gents (Juhl and Vesterløkke, 2017) describe how they deliberately do not have a 'computer' on stage – they want the performance to be 'alive' and do what they can to limit the potential constraints of the method. Vonsild (Vonsild and Kristensen, 2017) even points out that improvising in the digital realm is the skill which separates the professional from the amateur.

Hence, the tendency towards scepticism in terms of letting the digital materials overtake the performance and thereby 'confine' the emergence process is strong, but

finding the right balance between presenting a digital production and a situated performance appears to be an ongoing challenge. Further, as suggested by Trentemøller (2017), the revolution of digital music equipment and instruments for professional-level musicians is still relatively young and in development, and utilizing these potentials is resource-intensive and reserved for those artists who have the capacity to 'produce' and situate the full-blown digital performance: it demands spending days in the rehearsal room with sound engineers prior to performing and bringing expensive digital equipment on tour, an option only the few, above-mid-level artists can choose. If successfully implemented, however, the digital materiality arguably holds a potential to further refine and develop the emergence process, as it holds a great potential in terms of painting 'with broad brushes' (Trentemøller, 2017).

Imperilling the situation

The final dimension of the analysis is concerned with the vulnerability of music performances. The aesthetic expression of the SYL recordings is inspired by the lyrical universe of Josefine Klougart's stream-of-consciousness literature, which is characteristically fragile and intimate. Both in the instrumentation, use of the instruments, singing style and in the lyrics. Most of the music is created using only one or two instruments, and is in that sense intentionally 'thin'. In preparing for the performances of the recorded music, it becomes clear that there is a defining gap between 'performing' and 'playing back' these musical elements: the simple elements played by (typically acoustic) instruments in a situated performance holds a distinct fragility which completely disappears when played back as a sample, though the notes and rhythms played are theoretically the same. The intensity or presence of the performance, when mediated and played back, disappears. Trentemøller (2017) labels this the 'nerve' in the performance. It is a general point made in the interview material that jeopardizing the performance has a say in the emergence processes of the performance of music: if playing too 'safe', the performance risks being too distanced from the situation. ML Buch (2017) describes this as a matter of courage:

> *To me, courage is all about presenting something to people which is allowed to 'teeter' a bit. Something which is very well prepared, so the audience have the experience that these people really tried. You really feel that this means a lot to them. But still, there is room for it to sort of balance [like a funambulist walking the rope, ed.] – in reality, it is actually just a matter of having something at stake. It is extremely important. I'm not a guitarist, but I play. I really do my best. I'm really into it. Really. I have to play the music to feel that I am passing it on to someone.*
>
> (Buch, 2017)

As underlined by Buch, and learned in the SYL project, no matter whether the aesthetic expression is thin or thick, the stage appearance introvert or extravert, the performers must imperil the situation: in a nutshell, if playing fragile string arrangements back in the performance, it is no longer fragile, as everybody in the situation knows that this cannot go wrong. The informants make this point in the interview situation, to underline a strong potential and key pitfall of digital materials. The interview participants argue that there is not much suspense left if the performance is driven by backing tracks, long samples playing key musical elements or other machinery playing central elements of the performance. What ML Buch describes is essentially a situation where the 'artefactual' computer replaces human fragility, to adapt a term from socio-cultural theory on creativity (Glăveanu, 2016); a reification (Small, 1998) in the musical emergence process that it arguably cannot bear.

When describing the potential of utilizing digital opportunities to plan and execute a performance to 'perfection', Baden (2017) was confronted with the apparent paradox that one seeks the uneasy in the situation, and he replies, 'Yes, it is what you seek, because that is where the magic happens in performances. […] If you have the feeling that we have never played what we are playing right now, it becomes exciting. And I'm sure that the audience recognize that.' And as elaborated by Høffding:

> *All this about 'co-authoring' [being involved as an audience member in creation of, ed.] the concert is one of my strongest beliefs. Definitely one of the things that I believe I have figured out. If you can make people stand and have the feeling 'will he make it?!'. Just like in a horror movie. Or maybe just a regular action movie, but even though you do actually know that of course Bruce Willis will not die, the mood of 'will he make it?' makes the situation exciting. Reaching that point in a performance is just great. And that goes for all genres, all ages. I'm absolutely sure about that.*
>
> (Høffding, 2017)

Digital materials hold great potentials in terms of producing a performance to a technically perfect level, but throughout the interview and observation material it is suggested that the process of emergence demands fragility. And, if not found in the music itself, the fragility can be reached in the Z-axis (introversion/extraversion): if, for example, the performance is characterized by control and positioned in the upper left corner of Q1, other aspects, such as visual and choreographical, can imperil the situation. Hence, the involvement of digital materials in 'producing' the performance and controlling the situation must be balanced and often compensated for.

As a final note prior to summing the article up in the discussion and conclusion below, the terms used by the passionate interview participants should be considered. Notions of being 'enslaved' and 'confined', as suggested by the interview participants in the previous section, and having to 'imperil' the situation connotes rather negatively

framed understandings if digital materiality in terms of musical emergence in performance situations. Framed more positively, we suggest, that emergence in musical performance demands an openness towards the insecure, the fragile and generally, improvisation. The tension that arise with an openness towards potential failure ("will she/he make it?") and from a potential improvement ("will she/he perfectly match his improvisation to the context?") triggers the process of emergence.

Alternative Z-axes of Model 1

As pointed out in the introduction, the complex process of emergence in musical performance situations is irreducible. A concert, a music festival or social situation in general cannot be reduced to the mere sum of the individual elements in a direct, causal manner. For this reason, from our theoretical perspective, expecting that all aspects – all pieces of the puzzle – can be taken apart, put together again and unfolded in an analytical text, is unworkable. The analysis of the article was based in interview and observation material, with the aim to get closed to an understanding of some of the key aspects of making a musical performance emerge in the digital age – not to make an all-embracing list of causes and effects. Hence, while the notions presented by the above, based on the data collected, are understood to be key to this understanding, other aspects are arguably relevant to.

Two examples of alternate dimensions will be included here. As convincingly illustrated by Boesch (1997) cultural understandings of musical expressions, in his example the sound of the violin, matters to the meaning making in performance processes. The specific qualities of the instruments, its history, how its played and where play a role – both to the performing musician and the participating audience. The ‘identity’ of the instrument is not irrelevant, as it too becomes an agent in the process of emergence. Hence, a discussion of the cultural significance of the instruments brought onto stage, and how it is mastered and communicated by the musicians, could be relevant in the development of an understanding of digital materiality, just like a dichotomy between ‘famous’ and ‘non-famous’ could form a relevant Z-axis. Creativity is generally closely connected to persuasion (see e.g. Kozbelt et al., 2010), and one could rightfully argue, that processes of emergence in musical performance situations depends in the openness of the participation audience to engage in the music played, and further, that they are more motivated to be so, if the artist is already accepted within the field. If the artist is already popular and well known to the audience, chances are, that an intimate, emerging situation more easily created. Arguably, an artist can even become so popular, that the ‘digital’/’analogue’, ‘provisation’/’improvisation’ and e.g. ‘introvert’/’extrovert’ axes become irrelevant to the process of emergence – as long as the artist is present on stage and plays his or her popular songs, no one in the audience cares if the concert was digital and played-back or analogue and improvised. However, though clearly of general relevance to

the understanding of behavior of performance situations, this dimension is not especially productive in discussing opportunities for musicians and is also not directly related to the digital materiality of modern instruments. We have strived to include the present arguments in the data, though other perspectives could be relevant to.

Conclusions

This present study contributes to the further development of a holistic, situated conceptualization of creative processes within cultural psychology. It explores digital materiality in musical creative processes in performance situations. Specifically, it provides a representation of the argument that the creative relationship between subject and object cannot be studied in a vacuum: the musical relationship between musician and instrument becomes meaningful in a process of emergence. Thus, in asking how musicians experience the involvement of 'digital materials' in the emergence process of musical performance, the article has brought forth an analysis showing that digital materials involved in musical performance practices arguably hold both potentials and pitfalls in terms of emergence in performance situations. While other aspects of the emergence process are arguably dependent on the specific involvement of digital material to the creative process, the below presented findings were highlighted in the interview and observation material.

Initially, the analysis supports the theoretical argument that musicians' experiences of involving digital materials in creative processes in performances are situated and depend on the specific context. Depending on the situation of the creative practice, music must be painted with more or less 'broad brushes', making the aesthetic expression either thin or thick – features digital materials hold significant potential for controlling and developing.

Further, the analysis suggests that translating the produced material into a living and emerging performance often demands a step back from the finished recording. Especially if utilizing the full potentials of modern, digital music production software of sampling, editing and finishing (as opposed to recording as if the computer were a traditional tape recorder). The analysed material highlights the importance of redesigning the recorded production and taking the socio-material setting into account. Unlike the artist writing, recording and performing on analogue and amplified instruments, who – in a stylized sense – performs on stage what they recorded in the studio, as well as they can, digital production provides revolutionary possibilities of manipulating the music that on the other hand challenges the 1:1 reproduction in the performance situation. Hence, the distance between producing and performing music seems to be considerable in the digital domain, and should arguably be treated as such for the musical performance to emerge. The challenges of moving the 'perfect', though complex and hard-to-reproduce, music from the studio to the

performance situation is often handled via the option of digitally playing back pre-recorded audio tracks on stage. Though the study shows several advantages in terms of presenting and detailing aesthetic expression, the analysis reveals scepticism in terms of letting the digital materials overtake the performance as it potentially 'confine' the emergence process. Finding the right balance between presenting a digital production and performing a situated concert appears to be an ongoing challenge: Improvising in the digital realm is ultimately understood to be the skill which separates the professional from the amateur.

The analysis suggests that the emergence process of musical performances depends on the fragility of the performance situation or in a more positive fashion: an openness on behalf of the artists towards taking risks. For the situation to be inviting for the performance participants of the emergence process, the artist needs to have something at stake, akin to the funambulist walking the tightrope. The utilization of digital materials to 'produce' the performance and control the situation must be balanced, and often compensated for. It appears that the overall challenge of involving digital materials in emergence processes in staged performances is to give them 'life': the digital 'code' literality needs to be 'cracked open', so other elements in the creative situation experience the performance as an invitation into the process of emergence.

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CREATIVITY AS A MEANINGFUL, SOCIO-(IM) MATERIAL PRACTICE: THE EMERGENCE OF ROSKILDE FESTIVAL[16]

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Abstract: The purpose of this article is to contribute to the further advancement of a theoretical understanding of how emergence theory informs the study of creativity as a socio-material practice. Initially, the socio-material standpoint is presented, followed by an introduction to our theorizing on emergence in creative processes. We exemplify and discuss how various creative subject–object relations at Roskilde Festival, a Danish music and arts event, become meaningful in a process of emergence involving various levels of creative contribution, ranging from paying and volunteering participants, through the professional organization, to the headlining artists. We thereby illustrate how 'Roskilde Festival' is ritually re-created and saturated with cultural, symbolic meaning – how Roskilde Festival serves as a 'macro-structure' motivating and justifying creative behaviour at the lower levels of the emergent phenomenon. The article ends with a general appraisal of the theoretical perspectives presented, discussing the value of increased analytical attention to emergent phenomena in addition to their individual contributions.

Keywords: Creativity, cultural psychology, emergence, Roskilde Festival, socio-materiality

Introduction

We believe in people and in fellowships.
We believe in the value of art to the community.
And we believe that change in the community is best created collectively.
That is the foundation of the way we act and the way we would like to be known.[17]
Roskilde Festival (2018a: 6, translated by the authors)

[16] Published article: Hvidtfeldt, D. L. and Tanggaard, L. (2019). Creativity as a meaningful, socio-(im)material practice: The emergence of Roskilde Festival. *Culture and Psychology*, 45(4), 544-558.
[17] Original quote: 'Vi tror på mennesker og på fællesskaber. Vi tror på kunstens betydning i fællesskabet. Og vi mener, at forandring for fællesskabet skabes bedst i fællesskab. Det er fundamentet for den måde vi agerer på ,og den måde vi vil opleves på'.

How does community matter when it comes to creativity? This is one of the often-asked questions in creativity research, as knowledge of how people work creatively together is key to organizational and innovative progress, for example, and fundamental to psychological conceptualizations of who or what is 'creative', when, and where.

Two well-cited theories point to the relevance of communities to creativity. For example, and infamously, as argued by Csikszentmihalyi (1988) in his System Model, nothing is creative unless understood to be so by a community with a solid – and as a result defining – understanding of the given area of work: products are understood to be creative if seen as both a new and a meaningful contribution to the domain, by a field of relevant experts. By definition, the *new* must be understood as relative to the *old*. From another classic – and related – perspective, Amabile (1983, 1996) describes how the community within which the work process unfolds influences the level of individual motivation to work creatively. Broadly, it can be intrinsically motivating, and thereby conducive to creative processes, to be around other people when it gives the 'individual, lone genius' soothing company and a sense of belonging in often tiresome, risky and complex work processes. While many new steps have been taken in the research literature on creativity since the development of these theories, they were among the first to acknowledge the value of the community to creativity.

This article revisits the connection between community and creativity once again, but from another, rather experimental, angle. Specifically, our aim is to further examine and discuss the potential of introducing 'emergence theory' to the understanding of creativity as socio-material practice, as it is currently developing within cultural psychology (see, e.g. Glăveanu, 2010; Glăveanu, Gillespie, & Valsiner, 2015; Tanggaard, 2011). The socio-material standpoint is inspired especially by the philosopher Latour (2005) and the anthropologists Ingold and Hallam (2007) and Hastrup (2007, 2011). Here, creativity is seen as a dynamic, situated practice. New and meaningful ideas, products and performances are understood as reactions or responses to something already existing in the world, and studies on creative process should therefore be methodologically attentive to relationships between the subject, i.e. individual person(s), and the tools and objects involved in the work process (Hastrup, 2011; Tanggaard, 2015). When working creatively, irrespective of level and domain, we involve ourselves in a physical, embodied sense; we are always positioned somewhere in a tangible space, surrounded by physical objects with various 'affordances' (Gibson, 1986): things suggest specific actions, and often hold historical and cultural qualities for the perceiving, creative actor. Hence, rather than seeing creativity as merely an isolated, individual and intra-psychological process, as in the earliest studies in the field, creativity is here understood to be a more distributed practice: as a continuous dialogue between old and new, i.e. between the 'knowledge' which is already out there in the world, in other people and social, physical settings, and the learned and embodied knowledge which the individual creative person holds.

However, Hvidtfeldt (2018) suggests that isolated attention to subject–object relations is potentially inadequate in terms of understanding the complex work processes of, for example, musicians. Firstly, the creative work of musicians vividly exemplifies how materials and products of creative processes are not always physical, but rather ephemeral and intangible, why their socio-material practices call for a distinct theoretical language in order to be thoroughly understood. Secondly, musicians' relationships to the instruments involved in the creative process are always dependent on the broader situation in which they take part – the isolated relationship between musician and instrument has no value or meaning in itself. The individual brushstrokes of even a wonderful painting are meaningless out of context. Hence, Hvidtfeldt argues, a comprehensive understanding of musicians' subject–object relationships in creative practices demands a holistic, ontological approach taking into account the situation in which the process becomes *meaningful*.

Hvidtfeldt argues that the basic theoretical concept of *emergence*, describing the process through which simple elements (e.g. musical, tonal and rhythmic) come together in forming larger and irreducible wholes (e.g. music), is relevant to understanding how such ephemeral, living products – or rather performances – are created. In other words, a musician's creative process depends on the music created – the (im)material product shapes behaviour at lower levels of the creative process. Music is created in a situated process, and the relationship between musician and instrument must be studied with reference to this process of emergence to which it is contributing.

Whereas Hvidtfeldt applies his theoretical framework to the analysis of musical qualities of digitalization, exploring how modern instruments can meaningfully be involved in the creation of living staged performances (Hvidtfeldt & Tanggaard, 2018), we are, in this article, interested in exploring how this theoretical idea can be transferred from the creative processes of musicians to *musical* processes more generally. Specifically, we seek to further examine and discuss creative subject–object relations in the emergence processes of creating Roskilde Festival, the major music and arts event in Denmark. We seek to explore the realization of Roskilde Festival seen as a socio-material practice – as various levels of creativity situated in a complex process of emergence, forming an ephemeral whole, with consequences for the subject–object relations at lower levels of the creative process. Roskilde Festival is used in this article as a specific example because it is a complex social and material phenomenon developed in a communal process which, we argue, resembles the creative processes of a group of musicians striving to make the music come together. Hence, we suggest that a discussion of its creative materiality and general constitution can lead to perspectives on the general value of emergence theory to the study of creativity as a socio-material practice.

The socio-material perspective on creativity: Emergence theory

'Emergence' is traditionally, and in this context, defined as a basic philosophical conception of the way in which simple elements 'come together' to form new wholes that cannot be understood in terms of, or reduced to, their individual elements (see, e.g. Ferrell, 2014; Sawyer, 2005). The basic concept is ancient, has influenced a wide variety of research fields including philosophy, psychology and sociology, and can be linked to the study of creativity in various ways. Initially, there is an obvious connection between emergence and intra-psychological ideation: though true creativity also demands sociocultural appropriateness, value or meaning, the key aspect of novelty has often been described as 'emerging out of' subconscious mental processes (Sawyer, 1999; Simonton, 1988). The work of Sawyer (1992, 2000) on collaborative emergence borders directly on our work, in that it discusses emergence in jazz music, where musicians collaborate in a continuous flow through which the music appears, and the way in which improvised theatre, where nothing is scripted or otherwise planned, develops on the spot as one line or action leads to the next. Here, the actors use the improvised lines as material inspiration for the next (more-or-less conscious) creative decision.

The creation of music is often used as a basic example of emergence (see, e.g. Ehrenfels's classic example from Gestalt psychology, 1890/1988). In an atomistic sense, a song consists of individual elements such as notes, rests and beats, but, when they come together, when they emerge, they appear to us as a finite, meaningful whole with completely other and new qualities. Even at the simplest level, with only two elements, the note F played together with the note B creates the tritone interval, which is often labelled 'the Devil's interval' precisely because of the distinctive and – as it has come to be understood in Western culture – 'diabolic' character of the harmony, an emergent quality which is not found in the individual notes played in isolation and cannot be described as the mere sum of the two parts. The colour orange emerges out of red + yellow, but its distinct character is not found in either element (Hvidtfeldt, 2018). The Danish author and musician Peter Bastian (1943–2017) vividly describes emergence in the live performance of music:

> *When things are not working out, you have chaos. Chaos is not death, it is a potential death or a potential life. It can go either way. Chaos means that there is a diversity, but disorder. The aspiration when creating music is a tremendously complex articulated unity, and that is cosmos. Chaos is a great place to be. It is the border between the old and the uncreated. It can go either way—towards death or towards life. As a creative person, you do everything you can to go in the direction of life. Towards greater*

> *intimacy, towards a situation where things start to play together or emerge, to use a foreign word.*
>
> (Lyhne, 2011) (translation by the author – Ed.)

In other words, good, living, energetic 'music' does not appear simply because you press a few keys on the grand piano; it demands of the musicians and the collective group a *musicality* that takes individual notes out of a random chaos and brings them together. While Bastian presents these ideas in an effort to describe the challenging tasks of an ensemble where 4–5 musicians were struggling to make the music come alive, we suggest that the description of movements from 'chaos' to 'cosmos' can be useful to the understanding of creative processes in other social settings. 'Roskilde Festival', with its distinct character, does not simply and magically appear out of a chaotic socio-material situation when 130,000 random people are put together in the same topographical space; the process of emergence demands practice, collaboration and anticipation at a level similar, perhaps, to what is demanded of musicians capable of extracting meaning out of tonal chaos. Conversely, like a song, painting or similar artistic expression, the character of Roskilde Festival is not easily defined, as a description of its constituent elements does not suffice – arguably, precisely because of its emergent nature.

Specifically, what we intend to demonstrate is how socio-materially emergent phenomena (music or Roskilde Festival) have socio-(im)material potential at the lower levels of the creative process. With reference to some of the early psychological theories on learning, habits and attention (see, e.g. James, 1890; Tanggaard, 2018), much of the creative attention of, for example, a (skilled) musician in performance is – generally speaking – *unconsciously* directed at the physical instrument he or she is holding in their hands, and *consciously* directed at the constantly developing emergent phenomenon, the music in the making. In mastering the musical instrument and thus experiencing the performance of music as a flow of creation (Csikszentmihalyi, 1990), the musical surplus directs conscious attention to the emerging music, which in that sense functions as 'a material' for the further, continuous development of the creative product or performance. In other words, if you, as an apprentice, do not (yet) have mastery of your instrument, much attention is directed at making the relationship between the instrument and you, as a creative individual, work – you struggle to make the harmonies sound right, to keep time and, in many situations, to play together with fellow musicians. On the other hand, if you have practised the violin since you were three years old and therefore 'know' – in both a cognitive and an embodied sense – how to play (as you know how to ride a bike), much attention when performing is directed at the emergent music (see, e.g. Sawyer, 1999). Similarly, as elaborated below, the product of the concerted creative effort of creating Roskilde Festival is more or less consciously infiltrated in the lower-level processes of the festival participants creating it.

It is only right to mention that the theoretical conceptualization of emergence theory in this article is related to several other vital theoretical perspectives throughout time. The fundamental idea of the processes of emergence has its roots in the work of Aristotle[18] and Galen[19], but more recent related theoretical conceptions include Archer's morphogenetic approach to social development (1995), Werner's physiognomic theory (Werner, 1927/1978; Müller, 2005) and, as mentioned, Ehrenfels's gestalt psychology (1890/1988). Therefore, we should underline that emergence theory is not the only theoretical trajectory if one is seeking to point to qualities of musical, artistic or social phenomena more generally, reaching beyond the purely physical, mathematical, technical or geometrical. We will, however, argue that the basic definition of emergence adequately contributes a language for the understanding of the socio-materiality of creative processes that reaches beyond the world of music: emergence theories – and especially those focusing on complex social and collaborative situations rather than examples, however, interesting, from the natural sciences of, e.g., chemical and biological emergence (see, e.g. Johnson, 2001; Sawyer, 1999) – provide a theoretical framework which, at an abstract level, demonstrates how phenomena emerging out of both social and topographical, physical situations can be understood as materially involved in the ongoing creative processes that initially created them (see, e.g. Kim, 2010; Sawyer, 2005). We seek to show the potential of emergence theory for the study of creativity as a socio-material practice, by exemplifying how an understanding of creative behaviour at the festival site, be it pro-c creativity or related to learning experiences at the individual level, must be understood through a holistic approach.

Roskilde Festival as a socio-material emergent practice

Roskilde Festival was first organized in 1971, with inspiration from the popular music festivals of the time, e.g. the Isle of Wight (1968–1970, UK) and Woodstock (1969, USA). Today, the non-profit organization presents the largest music festival in northern Europe. In 2018, the highly international artistic and musical programme consists of 200 artists in a broad variety of genres, representing 36 countries, with an increasing focus on art forms other than music and on social, environmental and sustainability issues. The organization consists of approximately 65 full-time employed professionals with a key responsibility of leading the 30,000 volunteers reporting directly to the core organization or to one of the many affiliated associations (Roskilde Festival, 2018b) (Figure 1).

From a bird's-eye perspective, the festival site resembles a city with a centre, train tracks and station, food courts, shopping areas, camping areas, etc. For one week,

[18] Aristotle (384–322 BC): Metaphysics, Book H6, 1045a 8–10: 'which have several parts and in which the totality is not, as it were, a mere heap, but the whole is something besides the parts'.
[19] See, e.g. Galen (AD 129–c. 200): On the Elements according to Hippocrates, 1.3, 70.15–74.23.

Roskilde Festival is the fourth-largest 'city' in Denmark, with a population of 130,000 (in 2018) and a population density similar to that of Shanghai – a unique, complex phenomenon. The social and cultural event is not created by one individual or a small group of people. Rather, it is a living organism developed in a process involving many layers of creative contribution; a large and highly diverse group of people, with individual competences and levels of engagement, are connected with and contribute to the realization of Roskilde Festival each year, each playing their part, for varying time periods, for 'fun' or/and for 'real'.

Figure 1. Camping Area, Roskilde Festival (Photo: SH Luftfoto/Stiig Hougesen).

Roskilde Festival as a ritual

All participants enter the festival with various levels of knowledge about the event and different kinds of previous experience. A relatively large group of people participate for the first time each year – 21% in 2017 (Roskilde Festival, 2018b) – and therefore do not have individual experience of the festival, but the idea of Roskilde Festival, i.e. the cultural and historical knowledge of what the Festival is and will be, greatly affects festival behaviour. In that sense, Roskilde Festival is not improv theatre performed and situated in a dark and empty room. The goal is not to create a festival from scratch each year, with new rules for where to place the stages and camping areas

or, more fundamentally, what a concert is all about. Roskilde Festival has become *ritualized*: the cultural and historical characteristics of the festival set a narrow framework from which the experience and creative behaviour evolve. Participants do not improvise as 'blank slates'; they have certain expectations and act at the festival on the basis of previous experiences of, and knowledge about, the event. There is a historically emergent macro-structure predisposing participation. Participants have in a sense 'practised' their participation, comparably to practising music or acting skills: even though actors and musicians improvise on a jazz or improv stage, they often have years of training – in that sense, you do not improvise out of nothing. Also, perhaps especially in music, the music may appear to be created 'freely', out of nothing, but in reality musicians improvise 'around' prepared schemes (12 bars in a blues) and often reuse 'licks' (Sawyer, 1999). In a similar vein, Roskilde Festival is 're-created' each year. New participants buy tickets, and new content is programmed by the music and arts agents, but the participants know about Roskilde Festival, as well as concert participation in general, and have in a sense practised the performance of the event. Hence, creative behaviour (at all levels of the event) is situated in and dependent on downwards causation in an (im)material process that is both physically topographical *and* historically ritualized – the phenomenon of 'Roskilde Festival', which is symbolically represented by the orange signature colour and other signs representing the festival, motivates and justifies creative behaviour at the lower levels of the creative process of emergence.

Amateur DJs ignite the camps

A specific example of a living, energetic (lower) level of creativity is found in the camp areas at Roskilde Festival, for example at the DJ parties held around the site. At these 'private parties', massive loudspeakers and homemade, transportable and relatively advanced turntable set-ups are wheeled into the campsite avenues at night. Some even light up the grass/mud 'dancefloor' so that a regular club vibe is created. But, unlike a typical club, each avenue has around 20 of these set-ups, which people dance between. Unlike ordinary dance clubs, the DJs are not hired as professionals, and the resulting party arises out of uncoordinated behaviour. These events are not prepared or in any sense directed or structured by the professional festival organization, but the creative processes are in a sense held together by, infiltrated in and dependent on the emerging phenomenon. Obviously, Roskilde Festival provides an organizational and physical framework in which this little-c creative behaviour develops, but the 'club' is a result of work processes unfolding spontaneously, without any central coordination (Figure 2).

Again, these improvised, emergent clubs are elements in the larger macro-structure, which they also depend on; the separate elements of the festival are not dictated by the festival board, but shaped by the emergent, communal phenomenon in a

downwards-causational process. The clubs appear mainly in the 'pre-festival' days, when the main festival site is not yet open, and, though Roskilde Festival has therefore not officially started, the anticipation of the coming festival greatly affects the engagement of the expectant participants. In addition, the music and arts programme of the festival each year (and, for the nostalgic members of the audience, of previous years) often dominates the music played in the camps. Hence, the mood and vibrations created in these DJ clubs is both *creating* and *created by* the emergent phenomenon: it is *affected* by the larger community and, for example, the content booked for the year's programme (top-down), and at the same time *affects* how people enter the concert space and thereby the pro-c creativity, explored in the next section, of the artists performing at the festival (bottom-up).

Figure 2. DJ set-up at the festival camp site (photo: Astrid Marie Rasmussen).

Pro-c creativity and the lively crowd

To most musicians, but perhaps especially to artists from the northern part of Europe, performing at Roskilde Festival is something special. The history and scope of the

event, and the energy and dedication to even relatively unknown music of the often massive crowds, all contribute to the unique atmosphere, shaping behaviour at the pro-c creative level. Although much music in the digital age, performed at popular music festivals around the word, is often very well prepared and produced in detail, so that little room is left for failure, a concert at Roskilde Festival is situated in an active context which it is hard for even the best-prepared musician, with a completely pre-produced show, to ignore (Figure 3).

Figure 3. Crowd at the Orange Stage (photo: Vegard S. Kristiansen).

The obvious producers of sound on stage are the musicians with their instruments. At a distance, one is inclined to think that the individual creator of music, the artist on stage, is operating in a creative vacuum – that there is a hierarchy of the situation, with the creative artists on top of the pyramid and everything else in the physical and social situation below. The artist is well prepared, powerful, full of confidence and 'on top of the situation'. However, while the musician is (as is in a sense obvious) at the centre and leading the audience through the performance, the creative subject–object relationship between musician and instrument is highly dependent on the social atmosphere and materiality of the performance space (see, e.g. Small, 1998). Put simply, the socio-materiality of performing when 100 people show up after a long day at work, sober and yawning, is different to when a crowd of 100,000 show up, readier than ever to listen and participate as they have had a wonderful time at the campsite prior to entering the performance space. The 'everyday' creative contributions of the festival participants are infiltrated in, and in that sense serve as a material for, the professionally creative, artistic, continuous development of the performance.

The individual musicians' experience of performing on stage must be understood as a learning experience: though concert halls are relatively similar, a concert at a historic place such as Roskilde Festival, with a strong culture and an immensely dedicated crowd, is something special for musicians, in an incremental sense developing their understanding of being a musician. At the little-c level, each individual musician affects their zone of influence, i.e. contributes to the collective concert performed by the musicians on stage and the crew realizing the technical aspects of a large-scale concert: a small, individual and improvised change, inspired by the situation, potentially changes other contributions to the whole. Hence, the creative processes of musicians serve as a good example of how difficult it is to demarcate everyday and professional activities, as the musicians on stage are drawing on both. Without doubt, the performance of music is for them also a pro-c activity, depending – as further elaborated elsewhere (see Hvidtfeldt & Tanggaard, 2018) – on the acoustics, aesthetics and general atmosphere of the venue. The apparently simple relationship between bass player and individual note played is infiltrated in the complex of relations between elements, all contributing to the meaningful, emerging whole. Creative and musical processes on stage are dependent on situational elements and the emergent, developing macro-structure.

The difference between performing at a typical concert hall and at Roskilde Festival (and, obviously, at other similar events) is immense for several reasons. The acoustic and general physical setting is significantly different, but the behaviour of the crowd also has an influence on the creative behaviour on stage. A (good) concert is in a sense always an escape from reality for the participating audience, but the combination of the duration, content and history of Roskilde Festival has made it into a liberating 'refuge'-like break with the chaos of everyday life. A place where people – literally and for more than 2 hours – forget their everyday worries. Without doubt, this quality of the festival predisposes the audience at each concert to become much more open towards the music, ready to take in all kinds of musical expression – a quality of the 'festival feeling' holding a top-down potential at various creative levels of the emergence process.

The general value of emergent phenomena to creative processes

The above exemplifies how not only the work processes of musicians, but, more broadly, social, performative creative processes, must be understood through a holistic language such as the one provided by the basic conception of emergence in collaborative settings. The creative subject–object relationship between musicians and instruments demands a certain type and level of musicality, or an 'ear' for the continuously developing music, just as the emergence of Roskilde Festival demands musicality of the participants, ensuring that the creative processes leading to the event

become meaningful. Roskilde Festival is not a 'thing' in the sense that you can physically demarcate the boundaries of its character and hold it as a tangible 'product' in your hand. Still, the event is relatively well defined and 'graspable': festival participants have a clear idea of what the festival is and how it is (re) performed. This character, developed and ritualized over the years, holds the various participant contributions together by motivating and justifying creative behaviour – an emergent phenomenon arising out of a multitude of elements to the mere sum of which it is not reducible.

Depending on the analytical level, socially emergent structures can generate small communities including family or colleagues, or the larger and more abstract communities of, for example, organizations. Societies have been the focus of sociological research on emergence (Sawyer, 2005), but the constituent elements of the creative process become increasingly blurry as the proportions increase and variations of elements multiply. Generally speaking, however, we argue that the conceptualization of creativity as developing in socio-(im)material emergent processes discussed here arguably has a much broader appeal and can be useful as a theoretical framework in analysing creative processes at various levels, and how they develop with reference to a more or less specific and (in)tangible socio-material reference.

Inspired by the apparent value of the community to the creative processes at Roskilde Festival, we might ask: what are the analytical and organizational advantages of paying closer attention to, and supporting the development of, meaningful and emergent phenomena around creative processes? At Roskilde Festival, people typically point to the artists heading the bill as the main contributors to the fellowship, and they are the ones receiving (by far) the best payment to show up, yet, as the above examples show, the emergent process of the event is just as dependent on many other creative contributions, and that these are connected in a musical manner. If the goal is to support creativity, be it at lower or higher levels, would it make more sense to nurture the development of a *musical community* and thereby secure the process of emergence in which the individual creative process becomes meaningful? When and how are the things we develop in these types of socio-material community creative, and how can we organize for them? These are open questions deserving further theoretical and analytic attention.

Conclusions

This article seeks to take a step further in the understanding of the contribution of emergence theory to the theoretical understanding of creativity as a socio-material practice. It revisits a classic theme within creativity research, namely the connection between community and creativity. The article illustrates how Roskilde Festival is

developed in a musical, communal process involving various levels of entangled creative contribution and materialities: from volunteers and paying participants, through the professional organization, to the headlining artists, the festival is ritually (re-)created in a process saturated with cultural, symbolic meaning. We argue that the understanding of creative processes involved in producing social, collaborative phenomena such as Roskilde Festival, a holistic ontological language such as the one provided by emergence theory, is needed, as the isolated subject–object relationships are meaningless in themselves: there is no 'Roskilde Festival' in the artists' creative contributions seen individually. Roskilde Festival, as a major social and artistic event, becomes meaningful when a thousand elements 'act in concert' – when they come together as an emergent, meaningful phenomenon: a macro-structure which, at various levels of the organization, function – as music does for musicians – as a living, ephemeral (im)material for the continuous development and persistence of the event. We argue that increased attention to emergent phenomena which musical creative processes contribute to and depend on can be a relevant trajectory for further understanding of the socio-materiality of creative processes.

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APPENDICES B-I: INTERVIEW TRANSCRIPTS

Owing to GDPR regulations, interview transcripts are only included in the version submitted to the committee assessing the dissertation.

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